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Title Records of the Botanical survey of India

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RECORDS

OF THE

BOTANICAL SURVEY OF INDIA

VOLUME XVI.—No. 1

THE FLORA OF KHANDALA ON THE WESTERN GHATS OF INDIA

BY

H. SANTAPAU, S.J., PH.D., D.I.C., F.N.I.,
St. Xavier's College, Bombay.

WITH A FOREWORD

BY

R. K. BISWAS, M.A., D.Sc. (EDIN.), F.R.S.E., F.N.I., F.B.S.,



PUBLISHED BY THE MANAGER OF PUBLICATIONS, DELHI.
PRINTED BY THE GOVERNMENT OF INDIA PRESS, CALCUTTA, INDIA,
1953.

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FOREWORD.

It is my pleasure and privilege to get the Flora of Khandala on the Western Ghats of India published in Volume XVI, No. 1. Due to war and consequent financial and other difficulties issue of the Records of the Botanical Survey of India had to be kept in abeyance for about 8 years. Immediately after the war and as soon as the conditions improved, publications of the Records of the Botanical Survey of India were renewed under the orders of the Govt. of India, and Vol. XV, Pt. I and Pt. II—Common Fresh and Brackish Water Algal Flora of India and Burma, 1949 by K. Biswas was published. Soon after materials for the 'Flora of Khandala' were received from Father H. Santapau and 'Studies in Indian Berberidaceae' from Dr. R. Chatterjee. Govt. sanctions for the publication of both these works were obtained as soon as possible and the Govt. of India Press are good enough to take up printing work of these almost immediately on receipt of these manuscripts.

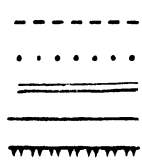
Although the Flora of Khandala on the Western Ghats of India occupy a small space, it is none-the-less an important and interesting spot in the Bombay Presidency. My esteemed friend late Father E. Blatter with whom I had the good fortune to travel together to Poona mentioned to me years ago while passing through the then denser vegetation of Khandala by train about the need for thorough exploration and study of this spot and also of the flora of the Mahabaleswar hills in Panchghani district where he lived in his Parish house. Father Santapau by taking up this floristic work has thus contributed much to our knowledge of the flora of this part of the country. His work is extremely valuable as it contains more or less complete record of his detailed observations made actually in the field during his many visits to the Khandala Valley. The data contained in his monograph 'the Flora of Khandala on the Western Ghats of India' are therefore of greatest value to science in the preparation on modern lines of future floras of other parts of India. He has left no stone unturned to collect and record briefly all possible information which a systematist can possibly expect in a work of this kind. Then again his work has been brought to perfection by comparison and examination

with the sincere hope that other local floras may in time be published and so help gradually to make our very rich flora better known to the scientific world.

St. Xavier's College, Bombay ;

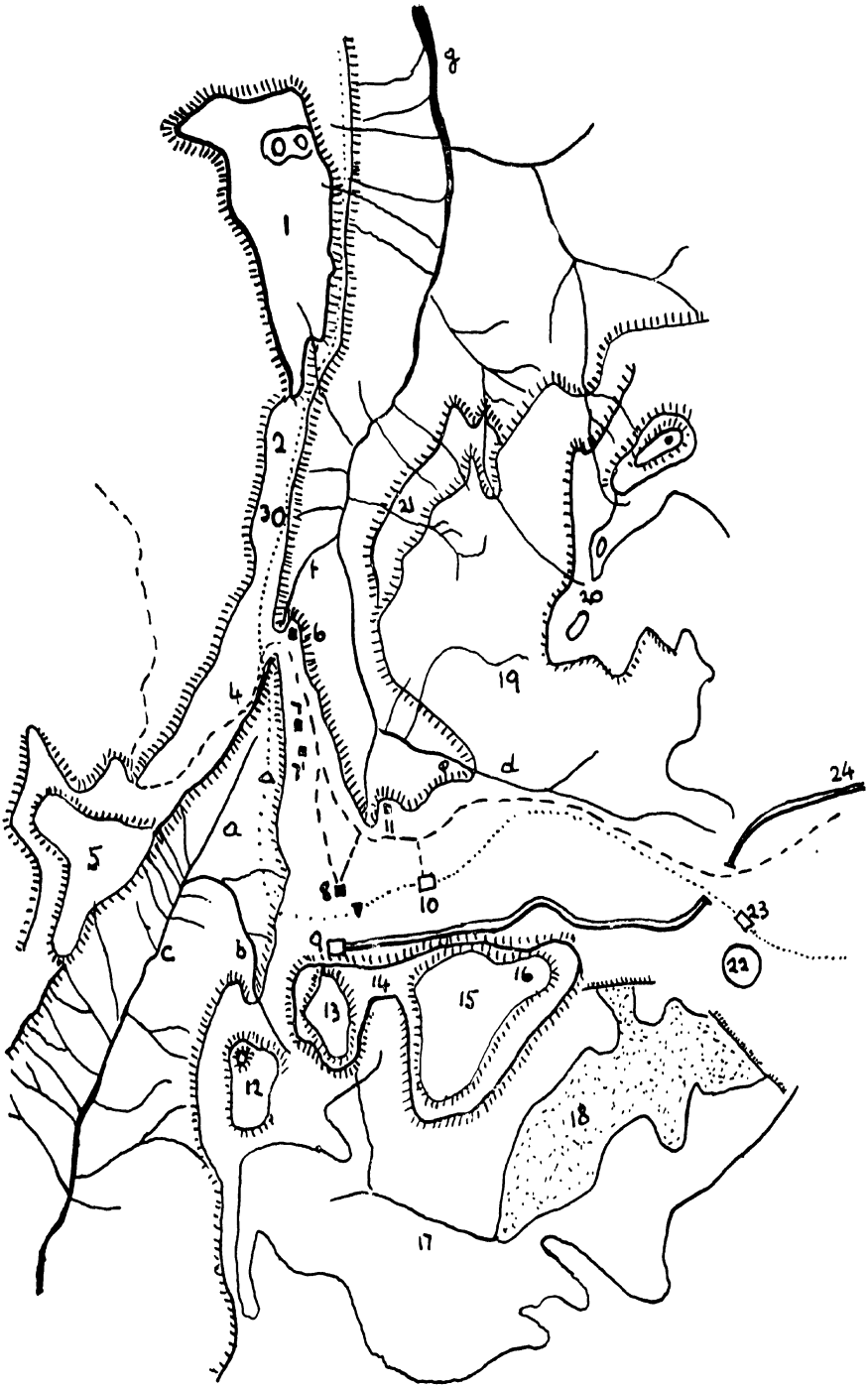
Easter Sunday, 25th March 1951. H. SANTAPAU, S. J.

Explanation of Map of Khandala.



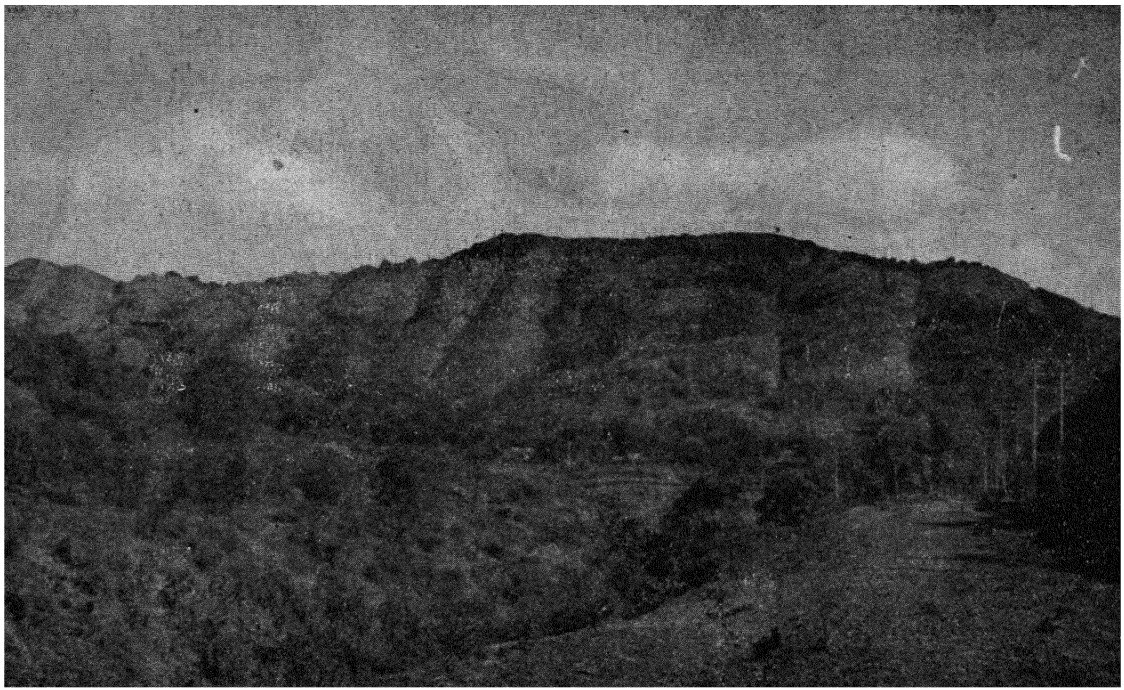
1. Behran's Plateau.
2. Monkey Hill Plateau.
3. Monkey Hill.
4. Battery Hill Plateau & Reversing Station.
5. Patanmal Plateau.
6. Elphinstone Point.
7. St. Xavier's Villa.
8. Khandala Hotel.
9. Forbay.
10. Khandala Station.
11. St. Mary's Villa.
12. Duke's Nose
13. Echo Point.
14. Saddle.
15. Bhoma Hill.
16. Barometer Hill.
17. Korinda Valley.
18. Lanavla Lake.
19. Kune Plateau.
20. Ghira Hill.
21. Meroli Plateau.
22. Lanavla Grove.
23. Lanavla Station.
24. Tata Canal.

a. St. Xavier's Ravine.
b. Echo Point Ravine.
c. Duke's Nose Ravine.
d. Kune Stream
e. Dhobi Falls.
f-g. St. Mary's Ravine.



MAP OF KHANDALA

(Scale approx. 1 : 63,000)



View of Bhoma Hill.

INTRODUCTION.

The District of Khandala.

Geographical position.—Khandala is a small Maratha village and a railway station on the main G. I. P. South East Line, situated at the western edge of the Decan Plateau, 116 Km. by road from Bombay and 66 Km. from Poona. The position of the railway station, the centre of the present village, is 73° 23′ E. and 18° 0′ N. (See No. 10 on the map). The highway from Bombay to Poona passes through the middle of the village, and from the Konkan plains to Khandala itself follows, at least in some stretches, the very old Bhore Ghat road of the Maratha days. The original village of Khandala lies about 300 m. to the south of the station, on one of the many spurs or "Sausages" of Bhoma Hill. The elevation of the railway station is about 677 m. above sea level, and about 630 m. above the Konkan plains to the West.

Main features of the district.—The district covered in the present flora and referred to in these pages as "Khandala District" consists of a level plateau about 25 km. sq. made up of three semi-independent plateaus. Karvanda or Korinda Valley is the southernmost part or plateau (Nos. 17 & 18 on the map), and is separated from Khandala proper by Bhoma Hill and Echo Point; it is, however, united to Khandala through the eastern part where Bhoma Hill comes suddenly to an end. The northern portion is the larger plateau, known as Kune Plateau (no. 19 on map), and is separated from the central portion by the Kune stream and ravine, the latter often referred to in these pages as "St. Mary's Ravine" (d—f on map). The western boundaries of the district are formed by the long ravine that runs from a spot roughly between the old Reversing Station and St. Xavier's Villa southwards to the base of Duke's Nose (a—c on map); the eastern boundaries are rather arbitrary, and for convenience sake were fixed as the line passing through the top of Ghira Hill (no. 20 on map) to the eastern side of Barometer Hill (no. 16 on map), as the eastern portion of Bhoma Hill is often called. Somewhat cut off from the main part of Khandala are Behran's Plateau, 4—5 km. north of Khandala station (no. 1 on map), and Patanmal Plateau (no. 5 on map) about 5 kms. SW. of the station; both these plateaus and the intervening country have been included as part of the district, mainly because they are of easy access from St. Xavier's Villa and the elevation of the plateaus above sea level is about the same as that of the main or central Khandala plateau.

The highest spot in the district is Bhoma Hill (No. 15); the highest part being marked on the Survey maps as 2,782 ft. (about 848m.) above sea level; to the west of Bhoma Hill is Echo Point (No. 13), which is but a little lower than Bhoma Hill itself; the spur joining these two hills is known locally as the "Saddle" and is about 722m. above sea level (No. 14); through the Saddle passes the path that connects Khandala with Korinda village through Khandala Hotel (No. 8) and the Forbay

terminus of the Tata Hydroelectric Canal (No. 9). Slightly to the south-west of Echo Point and rising in isolated majesty is the massive hill known as " Duke's Nose ", so called after the Duke of Wellington on account of the remarkable similarity between the western edge of the hill and the profile of the human face (No. 12).

To the north of Khandala rises a massive plateau, known locally as " Behran " and to English-speaking visitors as " Rama's Bed and Pillow " ; the latter name graphically describes the shape of the plateau : it consists of a level stretch about 1·5 km. long and 900—1,400 m. broad, and is bounded on the north by two hills which are joined by a neck slightly lower than the hills themselves ; from some distance away the two hills with their connective link do look like a pillow on which a head has rested. The plateau ends very abruptly on all sides, more especially so on the eastern and north sides. In geological times Behran's Plateau, Patanmal Plateau and Matheran (about 18 kms. away to the NNW) were obviously connected to the main Deccan Plateau, from which they have been cut off in the course of time through the intense erosive action of winds and rains ; this explains the fact that all these plateaus have about the same elevation over sea level and that their vegetation is typically the same as that of Khandala.

St. Mary's or Kune Ravine is a deep chasm with very steep, almost vertical sides, running in a north westerly direction between Khandala and Kune for about 1·5 km.; then it turns north and runs in this new direction for several kilometers (c—g on map) ; the ravine may be said to start at the foot of Dhobie Falls (83 m. high, a magnificent sight during the monsoon) just behind St. Mary's Villa, hence the name of " St. Mary's Ravine " given to it by school boys and visitors. Occasionally the slopes of this Ravine open out into a ledge-like plateau, as *e.g.* at Meroli.

St. Xavier's Ravine runs in a S. or SSW. direction for about 3 kms. and passing through the village of Chavni goes to swell the waters of the river Ambar. About 1·5 km. from the upper end of this ravine it is joined by a stream that runs between Echo Point and Duke's Nose (b on map) ; for the sake of convenience in the following pages I refer to this stream and ravine as " Echo Point Ravine ", whilst the lower part of the main stream and ravine I have called " Duke's Nose Ravine ". Locally there is no name for these ravines ; I have given them arbitrary names for the sake of brevity in my field books and in the pages of this flora.

Climatic Conditions.

Reference has already been made to the intense erosive action of winds and rains. In order to get a clear idea of the climatic conditions prevailing in the district, I had a meteorological observation post set up in Khandala, and for three whole years was thus able to obtain a fairly complete set of records. Through the kindness of the Director General of Observatories, Poona, I also obtained rainfall data for a number

of years previous to those during which I explored the district. During my absences from Khandala most of the instruments were left in charge of the Rev. O. More, the missionary in charge of Kune Katkari Settlement, to whom I gladly acknowledge my indebtedness.

Rainfall.—Owing to its position on the edge of the Ghats, Khandala is exposed to the full blast of the monsoon ; an occasional shower of rain may fall towards the end of May or beginning of June ; the monsoon proper sets in some time in the first half of June and continues with unabated force until the beginning of September ; there is then generally a break of a few days with only occasional showers ; the winds and rains then change to a NW.—SE. direction and this constitutes what is termed the " second monsoon ". About the beginning of October or occasionally a little earlier the rains come to a stop, and until the middle of May of the following year there is either no rain at all or only in such small quantities that they can scarcely be measured with the ordinary rain gauge. During the rainy months, the amount of rainfall in 24 hours may go from a few mm. to well over 335 mm.; it is clear that under such conditions, botanizing may be rather trying.

The following table gives the total rainfall from June 1st to September 30th, for the years 1931 to 1946. The highest total is that for 1942 (230·90 in.=585·5 cms.), the lowest that for 1941 (128·6 in.=326·6 cms.) ; the average for the 16 years is 192·9 in. = 489·9 cms.

TABLE 1.

Total Rainfall June—September.

Year.	Total in In.	Total in Cms. (Approx.)	REMARKS.
1931	213·6	542·5	
1932	154·8	593	
1933	224·9	571·3	
1934	172·5	437·3	
1935	168·1	427·3	
1936	165·6	420·6	
1937	180·3	457·7	
1938	226·6	573	
1939	173·2	439·5	
1940	218·7	555·8	
1941	128·6	326·4	The lowest in 16 years.
1942	230·9	586·5	The highest in 16 years.
1943	215·5	547·6	
1944	163·6	431·5	
1945	223·1	566·1	
1946	226·1	574·3	

To make my data comparable with those given by Champion in his book " Preliminary Survey of the Forest Types of India and Burma " (Ind. For. Rec. 1(1), 1936) Table 2 has been added to show the distribution of the annual rainfall throughout the months of the year.

TABLE 2.

Rainfall in cms. for 1944--1946.

Months.	1944.	1945.	1946.
January	..	..	..
February	..	..	..
March	..	..	..
April	..	..	..
May	Traces.	Traces.	Traces.
June	52·8	80·3	80·5
July	213·1	234·9	203·4
August	137·9	183·9	212·3
September	27·7	67·1	78·2
October	13·9	3·5	Traces.
November	..	..	..
December	Traces.	..	..
Total for Year	445·4	569·7	574·4
Rainy days	96	112	112
Months with less than 5 cms.	7	8	8

The erosive action of such torrential rains can best be seen in parts of the district where the forest has been cut down in recent years. Extensive deforestation was carried out on the spurs of Echo Point behind Khandala Hotel from 1939 to 1945 ; for the first few years the soil could support a fair crop of *Nachni* (*Eleusine coracana* Gaertn.) and other cereals ; but gradually the upper soil is being washed away and the rocks begin to appear ; at the present rate in the course of a few years all the soil will have been washed away and there will be another bare and rocky spot added to the many that so considerably disfigure the district.

Winds.—During the first half of the monsoon winds blow in a S.W.—N.E. direction and often reach the speed of 60 kms. and more per hour ; when the wind force is coupled with heavy rains it often results in bringing

down some of the tallest trees of the forest, a frequent occurrence in Khandala during the first half of the monsoon. During the second half of the rainy season winds are more moderate. Outside the monsoon months there are fairly strong winds blowing from the N. or N.E., and during the months of December and January such winds may attain the velocity of gales, but their duration is only from the early hours of the morning to about 10 a.m. or at most till noon. For the rest of the year there is but a gentle breeze from the sea that springs up in the evening and lasts throughout the night and considerably freshens the atmosphere.

Temperature.—The hottest months of the year are March and April, with noon temperatures in the shade often reaching 37·8°C (=100°F); the hottest hours of the day are between 1·30 and 3 p.m. The lowest temperatures recorded during 1945 were only 8·9°C (=48°F) on January 7th, and 11·1°C (=52°F) on December 27th. In the course of the day even in January or December temperatures often rise to 26·6°C (=70°F). The range for any particular day in the year between the maximum and minimum for that single day may be over 17°C; during the rains the range may be as low as 0·5 °C and is seldom above 5·5°C. Table 3, built after the fashion of those in Champion, *loc. cit.*, gives the temperature data for 1945.

TABLE 3.

Temperature in °C for Khandala for the Year 1945.

—	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Mean	20·2	22·5	28	28·9	29·2	25·7	22·0	23·1	23·6	27	25·1	22·3
Mean Maxim.	25·0	28·2	35·3	34·6	34·6	27·8	24·4	24·8	26·7	32·2	32·7	30·4
Mean Maxim.	14·5	16·8	20·6	21·9	23·9	23·6	21·6	21·5	20·5	19·8	17·6	14·2
Max. Highest	29·4	34·4	39·4	37·8	37·8	37·8	27·2	28·9	30·3	35	34·4	32·8
Lowest Min.	8·9	12·8	17·8	20·0	22·2	21·1	20·5	20·0	19·4	17·8	14·4	11·1
Mean Rel. Hm. at 9 a.m.	67·7	65·2	78·4	87·2	88·2	91·2	96·7	94·0	85·4	91·8	80·6	79·6

Mean Yearly temparature . . .	25·2°C.
Mean Maxim. temparature . . .	29·7 ,,
Mean Maxim. temparature . . .	19·0 ,,
Highest Maximum	39·4 ,,
Lowest Maximum	8·9 ,,
Mean Rel. Humid. 9 a.m. . . .	84·7 per cent.

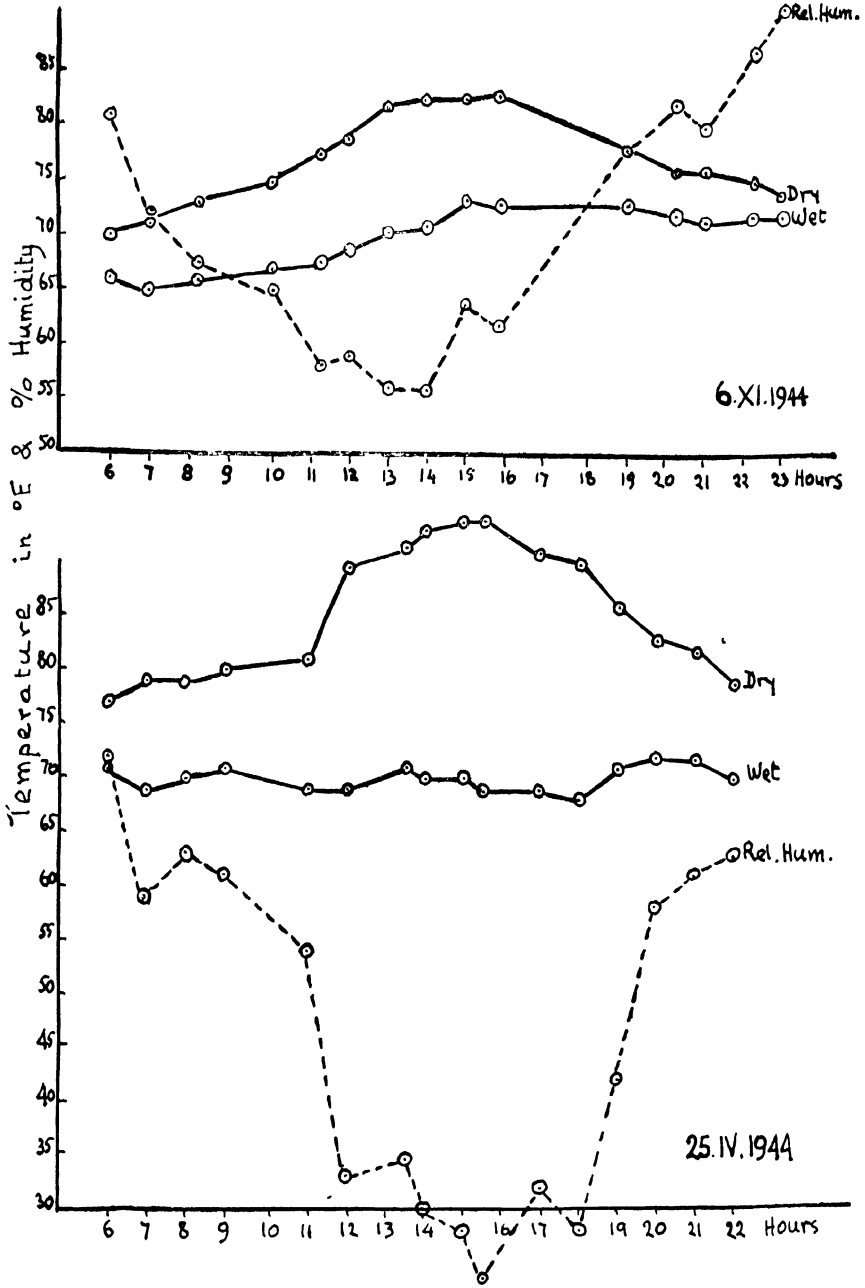
Relative Humidity.—Owing to its position on the western edge of the Ghats, Khandala receives the breezes from the sea which is only about 60km. away, and in consequence the atmosphere never gets as dry as *e.g.* in Poona and other places further inland. Even during the hottest and driest months of the year, the relative humidity during the night and in the early hours of the morning is fairly high, often about 90 per cent.; during April the relative humidity is generally above 70 per cent. in the morning, during the course of the day the air dries up and the moisture content may come down to 25 per cent. at about 3 p.m.; thereafter it rises again so that by 10 p.m. it is again over 60 per cent. During the rainy season the moisture content of the air is seldom below 90 per cent. and often is near 100 per cent. Table no. 3 gives the mean monthly relative humidity for 1945; all the readings have been calculated from the Dry and Wet Bulb Thermometer readings, the official Hygrometric Tables of the Meteorological Dept., Govt. of India, being used for the calculations.

The two diagrams, Nos. 1 and 2, give the Dry and Wet Bulb Thermometer readings for April 25 and November 6, 1944, and the percentage relative humidity as calculated from the thermometer readings.

During the summer months of 1946, April to June, I had a thermograph set up in St. Xavier's Villa, in the shade, about 1·5m. from the ground. The records obtained show a very regular daily curve with a maximum of about 100° F (=37·8°C) in the early afternoon and a fairly gradual descent lasting until 7—8 a.m. of the following day; after 8 a.m. there was a steep rise to the afternoon maximum. Occasional showers of rain during May and the first half of June were recorded as a sharp, almost vertical drop; when the rains set in, the record became an almost straight line at about 70°F (=21·1°C). As a specimen of the records obtained, those of the week beginning on 22 April 1946 are here reproduced.

Soil and Geology.

Khandala forms the western edge of the Deccan Plateau, and its rocks are mostly, like those of the rest of the plateau, of very dark basalt. The northern wall of St. Mary's Ravine shows the rocks laid down in very regular horizontal strata of varying thicknesses, separated by rather thin, snow-white quartz layers. In such localities the upper strata may be missing, and this gives rise to horizontal ledges varying in width from a few cms. to several hundred meters; thus for instance, Meroli Plateau is formed by one of these ledges about 300m. wide and 1·5—2km. long. Generally all over Khandala the amount of loose soil is very scanty except in places where the silt brought down by the rains from the higher ground has been retained by some natural or artificial barrier, as is the case in the cultivated fields on either side of the railway station. Where the vegitation is dense, as in most of the ravines and their slopes, there is



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always plenty of humus on the ground; but where the vegetation has been cut down, the upper soil is easily washed away, as on many of the slopes of either side of Bhoma Hill, Echo Point and the " Bed " or flat tableland of Behran's Plateau.

The Botanical Exploration of Khandala.

John Graham (1805-1839), was the first of the " modern " botanists to explore Khandala; in his Catalogue Graham mentions Khandala 101 times, " Lanovlee Grove near Kandalla " 14 times, the Ghats about Khandala or the Ghats generally over 90 times. Whilst reading the Catalogue, one may notice that when Graham mentions, *e.g.* Belgaum, S. Concan and other places, he generally gives Law, Gibson, and others as his authorities; as regards Khandala, except on very rare occasions, he mentions the place and various points in the district directly, and, it would seem, from his own observations. Graham spent considerable time in Khandala, but from the plants listed in his Catalogue it appears that he was there only during the dry season of the year or at most from October onwards; as regards monsoon plants, he merely cites them as " common " without any reference to Khandala. He died in Khandala on May 28, 1839, and was buried in a small cemetery which is at present enclosed within the grounds of St. Mary's Villa. The funeral inscription on the well-preserved tomb records that Graham was " an active originator, warm supporter and accomplished member of the Agricultural Society of Western India " and that the tomb was " erected by his numerous friends...in commemoration of...his disinterested labours and valuable contributions in the cause of Botanical Science ".

Hooker f. and Thomson in the introductory essay to their Flora Indica (p. 52) have a few very hard expressions on Graham and his Catalogue; " the Catalogue...has unfortunately been of little use to us...; internal evidence occasionally enables us to recognize with certainty the plant named; but more frequently it shows that the identification is erroneous...". In spite of the many obvious deficiencies of Graham's Catalogue, it has been quoted by practically every subsequent writer on the flora of Western India, including several of the authors who helped Hooker f. in his Flora of British India. For my part, I have been able to trace, with but few exceptions, all the plants that Graham mentioned as occurring in Khandala in his time. In general I may say that Graham's Catalogue has been of real service to me in the exploration of the district.

Blatter, Hallberg and McCann.—These botanists with Blatter as the leader, carried out extensive work in the district and made large collections during the years 1917—1919; as a matter of fact their collections form the main nucleus of the Blatter Herbarium. McCann, working on his own, made a special collection of the Gramineae, Cyperaceae and Orchidaceae from 1919 to 1931. Many of the plants of the earlier collections

of these workers are not too well preserved and often not too carefully pressed; moreover, these collections were made mainly during October and March to May, so that monsoon plants are rather poorly represented. Blatter seems to have planned writing the Flora of Khandala and for this purpose recorded his findings in a card index, which is at present in the Blatter Herbarium, and will be quoted in this flora as "Blatter in MS. catalogue". Similarly, Hallberg kept a record of the plants he collected in Khandala; his catalogue consists of a series of marginal notes to his own copy of Nairne's Flowering Plants of Western India: this series of annotations is mentioned in this flora as "Hallberg, in MS. catalogue". Shortly before C. McCann left India for New Zealand I had occasion to examine his private herbarium, which consisted of several thousand well preserved specimens; his collection at the time of writing this flora is in Wellington, New Zealand.

Occasional Visitors.—Among the many botanists who have paid occasional visits to Khandala the following deserve special mention: Dr. *A. Gibson*, the superintendent of the Botanic Garden at Dapuri; *J. S. Law* of the Bombay Civil Service; Dr. *J. E. Stocks*, Bombay Medical Staff; *G. M. Woodrow*, Professor of Botany, College of Science, Poona; Dr. *Th. Cooke*, Principal of the College of Science, Poona and Director of the Botanical Survey of Western India; the Rt. Rev. *R. D. Acland*, Bishop of Bombay; *J. L. Sedgwick*, of the Bombay Civil Service, and others such as *Gammie*, *Meebold*, *Bhide*, *Bhiva*, *Kanitkar*, etc. Their collections are scattered through several herbaria in India and Europe; for the purpose of this Flora, I have examined the collections of Blatter, Hallberg, and McCann, Sedgwick and Bell, Acland, Woodrow, Cooke in Poona and in Kew, etc. The bulk of the collections from Khandala of Stocks, Law, Gibson, Dalzell and a few sheets of Meebold are kept in Kew Herbarium; a large number of sheets of Cooke, Gammie, Bhide, Bhiva, etc. are preserved in the Herbarium of the Economic Botanist, Bombay Government, in the Agricultural College, Poona, where recently I have had occasion to examine them at leisure.

My Exploration of Khandala.

Methods.—The present flora is based on the results of ten years of study in Khandala. Almost from the very beginning of my work I was fortunate in having the company and assistance of C. McCann, the only survivor of the trio Blatter, Hallberg & McCann, who until 1946 was my almost constant companion in many of my visits through the district. With McCann's help, the following method was evolved for the exploration of Khandala:

1. For the purposes of obtaining a record not only of the vegetation of Khandala, but also of the seasonal changes, excursions were made regularly at least once, often twice or more times every month in the year, including the monsoon and winter months; this has been kept up for 1940—1946 and 1948—1949.

2. St. Xavier's Villa was made the centre or base camp for the work. In a large room in the villa I set up a laboratory where scientific instruments and chemicals could be kept permanently and where all dissection and other work could be carried out in comfort. Radiating from St. Xavier's Villa, the district was so divided into sections that each of these could be explored in little more than half a day ; parts of the district which on account of distance could not be visited in this regular fashion have been left out of this flora entirely.

3. In the course of the day's excursion, plenty of observations were entered in a rough log book and specimens were collected. On the return to St. Xavier's Villa, all the specimens were carefully checked, rough notes studied and entered into the proper field books ; the specimens were then poisoned, labelled and pressed. When a plant had been repeatedly collected and pressed, new specimens were again collected and examined, and, should they add nothing further to the previous collections, an entry was made in the field book merely to record the presence of the plant and its condition, and the specimens were discarded. An attempt was made in every case at the identification of the plant before pressing or discarding ; any specimen that could not be identified on the spot, was preserved for future study. The laboratory work at times was very heavy, especially during the monsoon ; but the general plan was to finish the study of one set of plants before attempting another collection. This, on occasion, meant staying up in the laboratory till nearly midnight, but generally speaking the plan was carried out smoothly and without undue fatigue.

4. On numerous occasions plants were found in the vegetative condition and their identity could not be ascertained ; then the exact position of the plant in question was determined by reference to several points in the district, this was done with a prismatic compass ; in the course of ten years I have never failed to find again a plant that had been so marked.

5. Special attention was paid to the sizes of trees, etc., as it appeared that the measurements given by Cooke often seemed to disagree with my findings in Khandala. For the purposes of accurate measurements, I made use of an Abney level or of a pocket sextant ; the trigonometrical method of measuring trees has been found to be the most accurate and at the same time the easiest, for trees over 4m. in height.

6. The colour of the flowers, often so vaguely and inaccurately described in some of the Indian floras, was determined whilst the flowers were still fresh by reference to the tables in Ridgway's Standard Colours and Nomenclature ; references are given in the body of this book as "Ridg. 1, b," etc.

Results.—Practically every plant found in Khandala by previous collectors has been recorded again in this flora ; the relative abundance of most plants and their life cycles have been determined ; moreover, a fairly good number of plants not previously recorded for the district has been added ; several new species, varieties and forms have been described. The flowering and fruiting seasons for most plants have been

accurately recorded, and these have been found to vary considerably from the data given by Cooke. The colours of most flowers have been noted down, and where they did not agree with published descriptions, reference was made to Ridgway's book, which has always been part of my equipment in my excursions.

Plants which in Cooke's Flora are given as " rare " or " very rare " have been repeatedly found in Khandala ; from my findings, I would rather say that they are restricted in their occurrence or in the length of time during which they are conspicuous for their flowers ; thus, *e.g.*, Cooke writes of *Phaseolus khandalensis* Santapau (*Ph. grandis* Cooke) : " A very rare plant, found only on Konkan and Deccan hills " ; similarly of *Dolichos bracteatus* Baker Cooke writes : " A very rare plant, the only specimens seen being those in Herb. Kew marked ' Konkan, Stocks' "; both plants are abundant in Khandala and Purandhar ; unfortunately their flowering times coincide with the worst part of the monsoon, and so specimens in herbaria are rather scanty. Some of the typical monsoon plants passing as rare in the literature are not rare at all, but " unfortunately they flower in July, at which time the whole of the hill-sides are streaming with water, rendering plant-collecting a task of no ordinary difficulty " (Cooke, 2 : 734) ; some of these rare plants have proved to be about the commonest and most abundant ones in Khandala during the heavier part of the monsoon.

In the course of my excursions, I have paid special attention to plants of the families Liliaceae, Amaryllidaceae and other tuberous or bulbous plants ; in the past they have often been missed by previous collectors, because their flowers are of very short duration and come out immediately after the very first monsoon showers. Such is the case, for instance, with several species of *Pancratium*, *Crinum* and with the vernal form of *Curcuma pseudomontana* Grah. ; residence in Khandala throughout the month of June has afforded me a good opportunity to collect interesting data heretofore not recorded on these early monsoon plants.

The Vegetation of Khandala.

On several occasions, both in the field and in the laboratory, I have tried to fit the various types of vegetation found in Khandala into one of the groupings described by Champion in his book " Preliminary Survey of the Forest Types of India and Burma "; but I have found great difficulty in this, the reason being that the species mentioned by Champion are quite different from those of my district. For this reason I have finally decided to omit all reference to Champion's types, and to give my own description.

One of the remarkable features of the vegetation of the district taken as a whole, is the almost complete absence of deciduous trees ; it is only on the " Bed " or flat tableland on Behran's Plateau that deciduous trees are sufficiently numerous to affect the general character of the

place. In other parts of Khandala there are deciduous trees, but their leaves are shed at different times or seasons for different trees, so that the district as a whole must be classed among the evergreen parts of the country. Some trees shed their leaves at the beginning of the cold season, others during the hot summer months, most trees, however, are evergreen. One tree has often attracted my attention, *Heterophragma quadriloculare* Schum. (*H. Roxburghii* DC. in Cooke's Flora); it is one of the few trees that are generally leafless during the first part of the monsoon.

1. *Meroli Plateau.* As indicated above, Meroli consists of a practically flat ledge varying in width between 200 and 300m. and about 1·5—2 km. in length. Its altitude is about 275—310m. Botanically it is one of the most interesting spots in the district, as its forest on account of its inaccessibility has not been cut down to any considerable extent and the spot is in consequence about the only piece of virgin forest left in Khandala. The forest at Meroli seems to be made up of several clear layers. Actual measurements of the tallest trees shows that the upper layer reaches an average of 30 m. (about 100 ft.); the most common trees in the top layer are the following:

Caryota urens Linn.	*Ficus glomerata* Roxb.
Ficus nervosa Heyne	*Tetrameles nudiflora* R. Br.
Schleichera oleosa Merr.	*Dysoxylon binectariferum* Hook. f.
Chukrasia tabularis Juss.	*Holoptelea integrifolia* Planch.
Mangifera indica Linn.	*Alstonia scholaris* R. Br.
Pongamia pinnata Pierre	*Albizzia procera* Benth.
Albizzia odoratissima Benth.	*Holigarna grahami* Hook. f.

Climbing over the tops of these trees are the most powerful climbers in the district, among which are the following:

Entada phaseoloides Merr.	*Calycopteris floribunda* Lamk.
Diploclisia glaucescens Diels.	*Combretum* [illegible] Roxb.

Towards the edges of Meroli away from the ravine, on rising ground are some large specimens of

Cleidion spiciflorum Merr.	*Bridelia squamosa* Gehrm.
Garcinia malabarica Talb.	*Garcinia indica* Choiss.
Lepisanthes tetraphylla Raddlk.	*Lagerstroemia lanceolata* Wall.

with *Cylista scariosa* Wt. & Arn., *Symphorema involucratum* Roxb. and *Mezoneuron cucullatum* Wt. & Arn. and other climbers.

The second layer of the forest at Meroli is constituted by much smaller trees, which reach but 12—18 m. high, among which the following deserve special mention as being the commonest:

Hymenodictyon obovatum Wall.	*Ochrocarpus longifolius* Bth. & Hk.
Gmelina arborea Roxb.	*Syzygium Cumini* Skeels.
Pouteria tomentosa Baehni	*Ixora brachiata* Roxb.
Sterculia guttata Roxb.	*Emblica officinalis* Gaertn.
Meyna laxiflora Robyns	*Knema attenuata* Warb.
Grewia tiliaefolia Vahl.	*Saccopetalum tomentosum* Hk.f.& Th.
Erinocarpus Nimmonii Grah.	*Murraya paniculata* Jacq.
Murraya Koenigii Spreng.	

These trees are remarkable in Meroli on account of their height; in the open or in other parts of the district they seldom reach 10m., but in Meroli they often go up to 18m.

A third layer of the forest is almost exclusively formed by

Glycosmis pentaphylla Corr.	*Carissa congesta* Wt.
Mezoneuroon cucullatum Wt. & Arn.	*Pristimera grahami* Smith., etc.

The ground in large tracts is practically bare, in others it is more or less densely covered with ferns, *Stachyphrinium spicatum* Schum., and a few grasses, among which the broad-leaved *Oplismenus compositus* Beauv. is common. Climbing over rocks and tree trunks, but seldom going high, is the udiquitous *Piper nigrum* Linn. The finest specimens of *Gnetum Ula* Brongn. of the district are found here, climbing over some not very high trees on rising ground near the southern path leading to the plateau from Kune.

As to the general changes induced by the monsoon, there is little here that is typical, except that at the northern end of the plateau there are some large clumps of *Impatiens*, *Zingiberaceae*, a few orchids, etc. At that spot there is a large clump of *Costus speciosus* Seem., and this is the only spot in Khandala from which I have recorded this plant. The relative humidity of the forest is very high throughout the year, and possibly for this reason the forest is heavily infested with mosquitoes; this may account for the fact that except for a few monkeys and squirrels, both of which keep to the high branches of trees, we have never encountered any wild animals in a very wild spot of forest.

2. *St. Xavier's and Duke's Nose Ravines.* The composition of the forest in these ravines is in general similar to that of Meroli, but the separation of the forest into layers is not so clear, the heights of trees not so uniform nor so large, and the dominant trees slightly different. Among the commoner plants are the following:

Mangifera indica Linn.	*Schleichera oleosa* Merr.
Lepisanthes tetraphylla Radlk.	*Sterculia guttata* Roxb.
Holoptelea integrifolia Planch.	*Terminalia chebula* Retz.
Terminalia belerica Roxb.	*Salmalia malabarica* Schott. & Endl.

Salmalia insignis Schott & Endl.	*Bridelia squamosa* Gehrm.
Olea dioica Roxb.	*Sageraea laurifolia* Blatt.
Mimusops elengi Linn.	*Ficus glomerata* Roxb.
Hibiscus hirtus Linn.	*Neuracanthus trinervius* Wight.
Blepharis asperrima Nees.	*Haplanthus* sp.

Among the climbers, the largest plants are *Bauhinia Vahlii* Wt. & Arn., *Butea superba* Roxb., *Butea parviflora* Roxb.; these are the giants not only among climbers but also among forest trees, but are rather rare, except locally in some parts of the ravines. One of the commonest climbers in the undergrowth, even in poor light conditions, is *Teramnus labialis* Spreng.; among conspicuous climbers going high over large trees and common all over the ravines are the following:

Ventilago bombaiensis Dalz.	*Ancistrocladus heyneanus* Wall.
V. maderaspatana Gaertn.	*Diploclisia glaucescens* Diels.
Combretum extensum Roxb.	*Gnetum Ula* Brongn.
C. ovalifolium Roxb.	*Strychnos colubrina* Linn.
Anodendron paniculatum DC.	*Hoya wightii* Hook. f.
Cylista scariosa Roxb.	*Calycopteris floribunda* Lamk.

Most of the species of climbing Ampelidaceae or Vitaceae found in Khandala are common in these two ravines. Suberect or climbing shrubs are *Capparis Moonii* Wt., *Carissa congesta* Wt., *Elaeagnus conferta* Roxb., etc.; at the edges of the forest *Mezoneuron cucullatum* Wt. & Arn. forms an almost impassable barrier. Scattered through the ravine slopes in fairly large clumps are several species of the plants hitherto classed under *Strobilanthes*, of which *S. callosus*, *S. ixiocephalus* and *S. perfoliatus* are the commonest. On ravine slopes in more or less open ground there are numerous specimens of *Enstete superbum* Cheesm., often seen growing in almost inaccessible situations.

In general, one of the most noticeable features of the ravines and their slopes is that whilst the vegetation is more or less uniform throughout, there are some small corners where some of the otherwise rare trees or plants are to be found in relative abundance; such rare plants do not seem to spread to other parts of the forest. The slopes below Echo Point show a good example of such a restricted abundance: on the upper southern portion *Beilschmiedia* is the commonest and largest tree; about half way down *Strombosia ceylanica* Gard. and *Sageraea laurifolia* Blatt. are dominant; near the base there are a number of trees seldom seen anywhere else in the ravines, *Sapindus*, *Knema*, etc.; at the very bottom of the ravine along the stream course *Bambusa Bambos* has taken possession of the ground to the almost complete exclusion of all competitors.

3. *Top and Upper Slopes of Bhoma Hill.* These are the parts of Khandala most exposed to the winds and rains of the monsoon; moreover, deforestation has caused much of the higher ground to become so bare

of soil that only a few hardy plants can now manage to live on some of the slopes except during the monsoon. Among the trees of the upper plateau, the most common are the following :

Terminalia chebula Retz.	*Actinodaphne angustifolia* Nees.
T. bellerica Roxb.	*Diospyros montana* Roxb.
T. crenulata Roth.	*Ixora brachiata* Roxb.
Bridelia squamosa Gehrm.	*Ficus glomerata* Roxb.
Albizzia chinensis Merr.	*Eriolaena quinquelocularis* DC.
Syzygium Cumini Skeels.	*Allophyllus serratus* Radlk.
Heterophragma quadriloculare Sch.	*Salmalia insignis* Schott & Endl.
Emblica officinalis Gaertn.	*Sterculia guttata* Roxb.
Crotalaria retusa Linn.	*Dillenia pentagyna* Roxb.
Grewia disperma Rottl.	*Osyris wightiana* Wall.
Glochidion Hohenackeri Bedd.	*Celastrus paniculata* Willd.

Among the trees and shrubs which, though rare in the district, are found on the upper slopes and plateau, the following may be mentioned :

Heynea trijuga Heyne.	*Canthium dicoccum* Merr.
Cordia obliqua Willd.	*Kydia calycina* Roxb.
Rauwolfia densiflora Bth.	*Atylosia lineata* Wt. & Arn.
Lobelia nicotianaefolia Heyne.	*Pittosporum floribundum* Wt. & Arn.

Among climbing plants, the most typical of Bhoma Hill and its slopes are the following :

Clematis hedysarifolia DC.	*Hemidesmus indicus* R. Br.
Tragia hispida Willd.	*Smilax zeylanica* Linn.
Olax wightiana Wall.	*Diploclisia glaucescens* Diels.
Gnetum Ula Brongn.	*Entada phaseoloides* Merr.
Elaeagnus conferta Roxb.	*Hoya wightii* Hook. f.
Argyreia elliptica Choiss.	

A number of introduced or naturalized plants are found on Bhoma and its slopes :

Vitex Negundo Linn.	*Lantana camara* var. *aculeata* Mold.
Stachytarpheta urticaefolia Salisb.	*Psidium guayava* Linn.

Forbay and its neighbourhood seems to have been the place from which several exotic plants have been introduced into the district; in addition to *Psidium guayava* Linn., one may find very numerous specimens of the brightest flowered Asclepiad of Khandala, *Asclepias curassavica* Linn., and the common *Lycopersicon esculentum* Mill. spreading from Forbay down to the ravines along the stream beds.

The undergrowth often consists of pure stands of *Carvia callosa* Bremek., growing in such dense clumps that very few other plants manage to obtain sufficient light for growth. Where the vegetation has been removed on the slopes and upper plateau, *Euphorbia neriifolia* Linn. is one of the most conspicuous plants at present.

4. *Behran's Plateau.* The whole of this plateau rises isolated with deep ravines on at least two sides, and is joined to Khandala through Monkey Hill Plateau on the south side. On the eastern side the vegetation is scanty, and this is due to a great extent to the almost vertical slope of the hill sides. The western and northern sides are covered with small trees and shrubs, which seem to be the result of secondary growth or natural regeneration of the original forest; much damage is caused annually to the plateau and its slopes by the constant cutting of trees and the firing of the grasses just immediately before the rains.

The general aspect of the plateau is that of a savannah, consisting of large bare tracts with occasional groups of small trees; during the monsoon the open spaces become covered with grass and then the name "savannah" can be applied with accuracy. The ground is rocky, and most of the soil has been washed away by the heavy monsoon rains, which here are heavier than in Khandala itself. The commonest tree on the plateau is *Terminalia crenulata* Roth, a stunted tree which is generally covered with insect galls. Other common trees or shrubs are:

Memecylon talbotianum Brand.	[illegible] *obovatum* Wall.
Ficus arnottiana Miq.	*Bridelia squamosa* Gehrm.
F. [illegible] Roxb.	*Randia brandisii* Gamb.
Sapium insigne Bth. var. *malabaricum* Hook. f.	*Grewia tiliaefolia* Vahl.
	[illegible] *koenigii* Spr.
Heterophragma quadriloculare Sch.	[illegible] *parviflora* Roxb.
Ixora brachiata Roxb.	*Pouteria tomentosa* Baehni.

Scattered through the Plateau, but not abundant are:

Careya arborea Roxb.	*Allophyllus serratus* Radlk.
Cassia fistula Linn.	*Syzygium cumini* Skeels.
Sterculia guttata Roxb.	

Among the climbers, the most noticeable are:

Tinospora cordifolia Miers.	*Smilax zeylanica* Linn.
Asparagus racemosus var. *javanica* Baker.	*Argyreia elliptica* Choiss.
	Ventilago maderaspatana Gaertn.

One of the remarkable features of the plateau itself is the complete change of aspect that sets in with the advance of the season; during the summer months, most of the plateau is dry and practically bare; with the advent of the rains, all the open places become covered with a mass of yellow flowers, generally of the large-flowered *Senecio grahami* Hook. f.;

when these flowers disappear or become rare, *Neuracanthus sphaerostachyus* becomes the dominant plant; towards the end of the rainy season large patches are occupied by *Dysophylla stellata* Benth., *Cyathocline lutea* Law, *Hygrophila* [illegible] Anders. with its attendant parasite, *Striga gesneroides* var. *minor* Sant., several species of *Utricularia*, etc., each of these plants growing in almost pure formations in large patches. Among the undergrowth towards the western edge of the plateau, several Amaryllidaceae are about the only plants in flower with the exception of a few grasses. Towards December, the most common herb is *Blumea* [illegible] DC., a highly scented but otherwise scarcely noticeable plant. With the coming of the hot season, grasses and most other herbaceous plants die out and at the time the ground becomes entirely bare but for a few specimens of *Lepidagathis trinervis* Wall. and *Vernonia cinerea* Less. Shortly before the coming of the rains, the slopes and the plateau itself are set on fire by shepherds with the idea that better crops of grass are obtained from burnt ground; much damage is caused to trees by this burning, as generally herbaceous plants tend to accumulate under the shade of trees.

Another feature of the plateau is the great abundance of orchids (*Dendrobium*, *Aerides*, *Eriæ*, etc.) supported by various trees, especially by the scraggy-looking *Terminalia crenulata* Roth. and the evergreen *Memecylon umbellatum* Burm.

At the foot of the plateau there is a large flat portion of land that extends up to Monkey Hill and has been under cultivation for a long time; this flat land deserves mention on account of the numerous specimens of *Dolicandrone falcata* Seem. var. *Lawii* Haines, *Lannea grandis* Engl., *Erythropsis colorata* Burk., and [illegible] *latifolia* Wall. scattered through it; some of these trees are nowhere else to be seen in the whole district.

5. *Khandala and Kune Plateaus.* The village of Khandala and its immediate neighbourhood is distinguished from the rest of the district by the large number of showy plants that have been successfully introduced. Among trees and shrubs, the following are outstanding for their flowers:

Delonix regia Raf.	*Peltophorum inerme* Nav.
Duranta repens Linn.	*Bougainvillea spectabilis* Willd.
Thunbergia grandiflora Roxb.	*Plumeria acuminata* Ait.
[illegible] *leptopus* Hk. & Arn.	*Thespesia populnea* Soland.
Artocarpus integra Merr.	*Anacardium occidentale* Linn.
Carica papaya Linn.	*Syzygium jambos* Alst.

Of trees that are native of the district, *Cassia fistula* Linn., *Erythropsis colorata* Burk., and *Olea dioica* Roxb. have been introduced into gardens, the sfirt two for their flowers, the last one for its shade. *Ficus retusa* Linn., *Bambusa bambos* Voss., *Adhatoda vasica* Nees, *Duranta repens* Linn., *Vitex negundo* Linn. etc. are often used as garden plants especially

as hedge plants. *Casuarina equisetifolia* Linn. and *Eucalyptus* sp. are also found in some gardens, and both make fine trees. Among the introductions, mention must also be made of *Lantana camara* var. *aculeata* Mold. of relatively recent introduction, which is spreading very widely and causes much damage; *Pedilanthus tithymaloides* Poir. has escaped from gardens and may be found in flower, but it is not an attractive plant. Of the genus *Opuntia* only one plant has been observed in the district (*O. elatior* Mill.); it flowers readily throughout the year, but does not seem inclined to spread. *Ricinus communis* Linn. is also found in some gardens, and is occasionally found as an escape.

These two plateaus are fairly intensely cultivated, at least during the monsoon and post-monsoon periods; there are no forests on either plateau, and the trees to be mentioned occur scattered singly or in small clumps.

Mangifera indica Linn.
Randia brandisii Gamble.
Grewia tiliaefolia Vahl.
G. disperma Rottl.
Garcinia indica Choiss.
Flacourtia latifolia Cooke.
Erythrina stricta Roxb.
Caryota urens Linn.
Sterculia guttata Roxb.
Syzygium cumini Skeels.
Ixora brachiata Roxb.
Bridelia squamosa Gehrm.
Pongamia pinnata Pierre.
Meyna laxiflora Robyns.
Salmalia malabarica Sch. & Endl.
Ficus glomerata Roxb.
Butea monosperma O. Kuntze.
Sapium insigne var. *malabaricum* Hk. f.

Scattered through the two plateaus and rather localised are a number of trees, that are native of the district, but are far from common:

Albizzia chinensis Merr.
Phoenix sylvestris Roxb.
Mimusops elengi Linn.
Linociera malabarica Wall.
Gmelina arborea Roxb.
Carallia brachiata Merr.
Zizyphus jujuba Lamk.
Madhuca latifolia Macbr.
Macaranga peltata Muell. Arg.
Vitex leucoxylon Linn.
Holoptelea integrifolia Planch.
Toona ciliata Roem.
Acacia arabica Willd.
Garuga pinnata Roxb.
Stereospermum personatum Chatt.

Among the commoner shrubby, suberect or climbing plants, are:

Hiptage benghalensis Kurz.
Combretum ovalifolium Roxb.
Anodendron paniculatum DC.
Stephania hernandifolia Walp.
Cynanchum callialata Buch. Ham.
Thunbergia fragrans Roxb.
Dalbergia volubilis Roxb.
Jasminum malabaricum Wt.
Clematis hedysarifolia DC.
Elaeagnus conferta Roxb.
Capparis moonii Wt.
Smilax zeylanica Linn.
Acacia torta Craib.
Carissa congesta Wt.

Among the commoner shrubs are :

Calotropis gigantea R. Br. *Colebrookea oppositifolia* Sm.
Holarrhena antidysenterica Wall. *Pavetta indica* Linn.
Casearia graveolens Dalz. *Vitex negundo* Linn.
Lantana camara var. *aculeata* Mold.

Among herbaceous plants flowering during the dry part of the year, the following stand out as more common and noticeable :

Argemone mexicana Linn. *Salvia plebeia* R. Br.
Leucas stelligera Wall. *Pogostemon plectranthoides* Desf.
Solanum xanthocarpum Schr. & Wendl. *Polygonum glabrum* Willd.
Datura innoxia Mill. *Eclipta alba* Linn.

In and around the village tank

Nymphaea pubescens Willd. *Limnanthemum indicum* Thw.
Bacopa monnieri Pennell *L. cristatum* Griseb.
Centella asiatica Urb.

In general these two plateaus are the parts of the district most affected by man's interference. Among the cultivated plants commonly seen in Khandala are *Oryza sativa* Linn., which is cultivated in fields which have a tolerably good soil and abundant water supply ; Natchi (*Eleusine coracana* Gaertn.) is grown in fields which are too poor either on account of the stony nature or of the steep slope of the ground ; occasionally during the after-monsoon period *Cicer arietinum* Linn., *Solanum tuberosum* Linn., *Lycopersicon esculentum* Mill., *Solanum melongena* Linn., several vars. of *Capsicum annuum* and a few of the commoner varieties of *Phaseolus* are also cultivated. Much damage, however, is caused to these cultivated plants either by wild animals or insects ; in the case of the potato and tomato plants there is another serious cause of trouble, and that is that very few insects are attracted to their flowers, and in consequence fertilisation has to be carried out by artificial means.

6. *Elphinstone slopes.* This is an interesting corner just below Elphinstone Point, and near mile stone No. 70 along the main road from Bombay ; the forest here extends from about 780 to 300 m. ; by far the most abundant tree in this part of the forest in *Atalantia racemosa* Wt. & Arn., a pleasant sight when in flower ; the following are also common :

Putranjiva roxburghii Wall. *Tetrameles nudiflora* R. Br.
Dysoxylon binectariferum Hk. f. *Pristimera grahami* Smith.
Ventilago bombaiensis Dalz.

For the rest this part of the forest both in composition and in the sizes of the larger trees is very similar to Meroli Plateau, but the division of the forest into layers is not so clearly marked here. At certain times of the year, particularly in the early morning and towards sunset, this

place is considered dangerous on account of panthers and other wild animals which have made it their home.

7. *Changes induced by the rainy season.* Soon after the first isolated showers towards the end of May or beginning of June, bulbous plants of the families Amaryllidaceae, Zingiberaceae and others come into flower very suddenly, often long before the leaves appear above ground. Among such plants are :

Pancratium sp. — *Crinum latifolium* Linn.
Curcuma pseudomontana Grah. — *Curculigo orchioides* Gaertn.
Arisaema murrayi Hook.

Soon after the beginning of the monsoon the following plants are conspicuous :

Asparagus racemosus var. *javanica* Baker. — *Tylophora fasciculata* Ham.
Impatiens kleinii Wt. & Arn. — *Enstete superbum* Cheesm.
Cissus elongata Roxb. — *Zingiber* sp.
Hypoxis aurea Lour. — *Fimbristylis digitata* Boeck.

and several of the Cucurbitaceae, among which *Dicoelospermum ritchiei* Clke, is common. After about a week of steady rains, new grasses cover the whole ground with a beautiful light green. Throughout the monsoon, the most conspicuous plants, excluding grasses which on account of their abundance form the outstanding feature of open places, are the following :

Curcuma pseudomontana Grah. — *Zingiber* [illegible] Dalz.
Impatiens balsamina L. var. *rosea* Hook. — *Swertia minor* Knoblauch.
Ceropegia attenuata Hook. — *Exacum pumilum* Grisb.
Thespesia lampas Dalz. & Gibs. — *Chlorophytum tuberosum* Baker.
Thunbergia fragrans Roxb. — *C. glaucum* Dalz.
Asystasia dalzelliana Sant. — *Begonia crenata* Dryand.
Barleria prattensis Sant.

Orchids are also common and showy, among the ground ones the genus *Habenaria* being the commonest and most conspicuous :

H. rariflora Rich. — *H. grandiflora* Lindl.
H. digita Lindl. — *H. longecalcarata* Rich.
H. heyneana Lindl. — *H. marginata* Coleb. etc.

On Bhoma Hill and its slopes the "Queen" of Khandala orchids, *Platanthera susannae* Lindl. is found in fairly large numbers. Utricularias cover large spaces on rocks and tree trunks, whilst *Hygrophila serpyllum* Anders. covers much of the rocky ground. About the middle of the rainy season, the commonest plants in flower are :

Senecio grahami Hook. — *Neuracanthus sphaerostachyus* Dalz.
Adelocaryum coelestinum Brand. — *Heracleum concanense* Dalz.

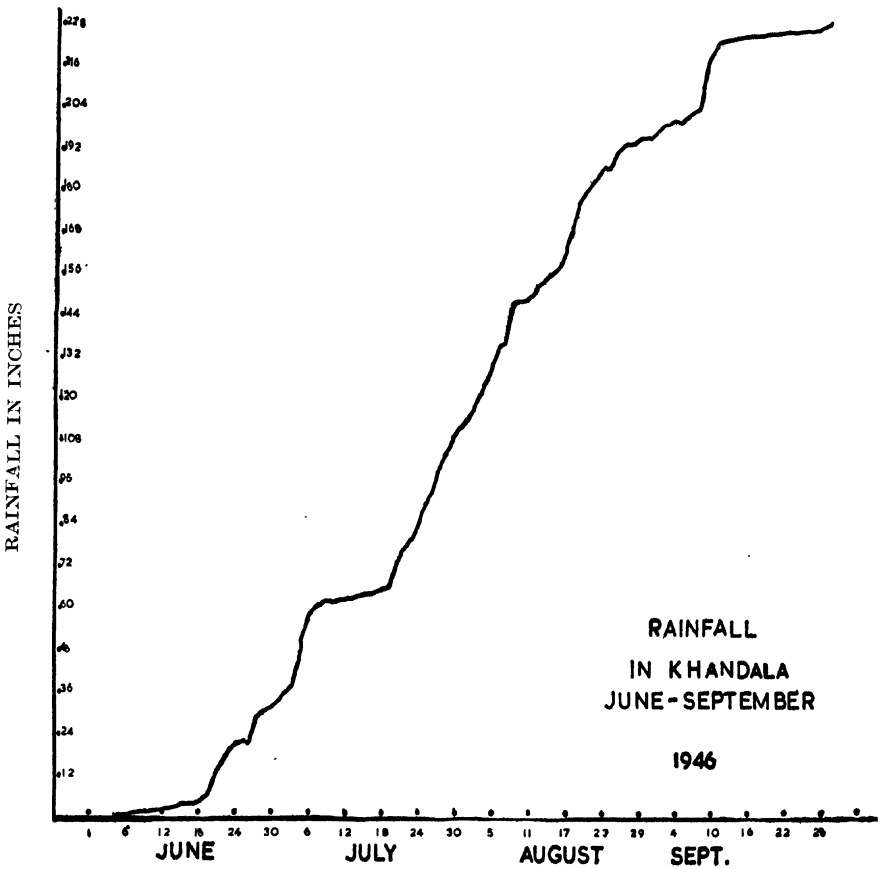
Plectranthus mollis Spr.	*Smithia setulosa* Dalz.
Tricholepis amplexicaulis Clke.	*Elephantopus scaber* Linn.
Anothis foetida Bth. & Hk.	*Dioscorea* several species,
Linum mysorense Heyne.	*Clerodendrum serratum* Moon.
Commelina obliqua Buch.-Ham.	*Cyanotis tuberosa* Schult.
Fleurya interrupta Gaud.	*Geissaspis cristata* Wt. & Arn.
Drosera indica Linn.	*Melanthesa turbinata* Wt.
Striga gesneroides Vatke.	*Rhamphicarpa longiflora* Bth.
Sopubia delphinifolia Don.	*Lindernia* several species

Restricted in their habitat but rather showy are these plants :

Oroxylum indicum Vent.	*Exacum bicolor* Roxb.
Dolichos bracteatus Baker.	*Phaseolus khandalensis* Sant.
Begonia concanensis DC.	*Kaempfera scaposa* Bth.
Mussaenda glabrata Hutch.	*Trichosanthes bracteata* voigt.
Rhynchoglossum obliquum Bl.	*Sonerila scapigera* Hook.
var. *parviflora* Clke.	*Impatiens acaulis* Arn.
Barleria strigosa var.	*Ceropegia evansii* McC.
terminalis Clke.	*Leea robusta* Roxb.
B. lawii Anders.	*L. setuligera* Clarke.

During the years 1943-1945 the most noticeable monsoon plants were the large clumps of *Carvia callosa* Bremek., which covered the slopes above and around Khandala and added a vivid touch of colour to the hillsides.

As may be seen from the accompanying rainfall chart, at the beginning of September there is generally a lull in the rains lasting for a few days ; at such a time, when the ground is covered with dense vegetation and high waterfalls plunge into the ravines and the weather is cool and not too wet, Khandala is one of the most attractive spots in Western India. The only snag in the otherwise perfect picture is that deadly snakes (Cobras, Russel's Vipers, etc.) and other dangerous animals are common not only among grasses, but even or perhaps more so in the neighbourhood of human dwellings. The differences in general appearance among the various parts of the district described above, seem to disappear during the monsoon ; many of the plants just mentioned as belonging to the monsoon, are common everywhere, except in dense forests where want of light prevents many of the herbaceous plants from growing. One of the main difficulties encountered in the exploration of the district during the rains is the fact that the ground is covered with liverworts (*Funaria, Anthoceros*, etc.) and is thereby rendered very slippery ; in my experience of nearly ten years this has been a greater difficulty even than a heavy monsoon day with a rainfall of 10 or more inches and with the stormiest winds of the season.


RAINFALL IN INCHES
.12
.24
.36
.48
.60
.72
.84
.96
1.08
1.20
1.32
1.44
1.56
1.68
1.80
1.92
2.04
2.16
2.28
1 6 12 18 24 30 6 12 18 24 30 5 11 17 23 29 4 10 16 22 28
JUNE
JULY
AUGUST
SEPT.
RAINFALL
IN KHANDALA
JUNE-SEPTEMBER
1946

Plan Followed in This Flora.

The present work is primarily a record of ten years of exploration of Khandala. The data given in these pages are all first-hand, and have been carefully recorded on the spot on the day itself of the collection. As for the collections of specimens, I made them myself, since the study of the literature convinced me that generally collectors seem to gather the most obvious specimens and easily avoid difficult parts of the country. Often in my excursions I had two or three local men, but as a rule they only collected what was pointed out to them, so that even when they saw the plants before I did, I insisted on examining every specimen on the spot before it was disturbed ; this has entailed much labour and to some extent has reduced the number of specimens ; but on the other hand, I have been able to obtain direct evidence concerning all the specimens gathered in the district.

The more immediate work connected with this flora was carried out mainly in London during may stay lasting just over two years. Most of my time was spent in such institutions as Kew Gardens, British Museum of Natural History, London, and Linnean Society. All my Khandala specimens were checked against the actual types, when these were available in London, or with the best specimens in those institutions. Another important part of the work done in London was the adjusting of the nomenclature of Khandala plants and bringing it up to date. In Hooker's Flora of British India there are many plant names which, to say the least, were rather arbitrarily chosen ; Cooke himself did little in this respect except follow almost blindly the lead of Hooker. For my work I made use of every recent available monograph, so that any change in the names of plants in this book has been introduced on the authority of the latest monographers. As a result many of the names given by Cooke in his Flora have been relegated to the synonymy, and new names or new combinations have been adopted ; this however, has only been done where such changes have proved strictly necessary in accordance with the Rules.

In the preparation of this Flora, I have consulted, in addition to my own ample field notes and numerous specimens (over 16,000 plants were collected in Khandala between 1940 and 1949), the few notes and ample herbarium materials in Blatter Herbarium, Sedgwick and Bell's Herbarium, Acland's collections, McCann's private and very interesting herbarium, Dr. Lisboa's collections, and the three London Herbaria mentioned above ; I have lately examined a large number of specimens of Cooke, Woodrow, Gammie, Bhide, Bhiva, etc. in the herbarium of the Agricultural College, Poona. Following the common practice, I have inserted an exclamation mark after a number when I have examined the sheet in question and been satisfied as to the identity of the plant.

Of the vernacular or local names, only those are given here which I have ascertained to be in use locally ; vernacular names vary greatly from place to place, and often the same name is used to indicate several plants. In general I have noticed in Khandala that only those plants

which are economically useful have local names ; small herbs which are not used either medicinally or as an article of food have no names.

The order followed in this book is the same as that of Cooke in his Flora. The remarks given against individual plants are not meant to be a full description of the plant ; only such data as correct or complete Cooke's description are entered here. Throughout this work the decimal system is used, occasionally the common English system is added as for instance in the case of rainfall or temperature measurements ; such data were first obtained with instruments marked with English units, the conversion to decimal units being done with the help of the Handbook of Chemistry and Physics, 31st edition.

ABBREVIATIONS.

For economy of space, titles of journals and names of the more commonly occurring authors have been cut down from the conventional abbreviations to shorter or even mere initials, as follows :

ABGC	Annals of the Royal Botanic Garden, Calcutta.
C.	Cooke, Th. : The Flora of the Presidency of Bombay.
D.	Dalzell, N.
D. & G.	Dalzel, N. & A. Gibson : The Bombay Flora.
FBI.	Flora of British India by Sir J. D. Hooker *et al.*
F.	Fischer, C.E.C., joint author with Gamble of the Flora of the Presidency of Madras.
G.	Gamble, J. S. : The Flora of the Presidency of Madras.
Gr.	Graham, J. : A catalogue of the Plants growing in Bombay.
Hk. f.	Hooker, filius, *i. e* , Sir J. D. Hooker, the editor of Flora of British India.
JAA	Journal of the Arnold Arboretum.
JASB	Journal of the Asiatic Society of Bengal.
JBNHS	Journal of the Bombay Natural History Society.
JIB	Journal of Indian Botany or the Journal of the Indian Botanical Society.
JLS	Journal of the Linnean Society of London.
Merr., Enum.	E. D. Merrill : An Enumeration of Philippine Flowering Plants.
N.	Nairne, A. K. : The Flowering Plants of Western India.
PLS	Proceedings of the Linnean Society of London.
Pfam.	Engler and Prantl, Die naturlichen Pflanzenfamilien.
Pfreich.	Engler, Das Pflanzenreich.

RBSI	-	Records of the Botanical Survey of India.
Talb.		Talbot. W. A. : Forest Flora.
TLS		Transactions of the Linnean Society of London.
Wall.		Wallich, N.
WI		The Wealth of India. A Dictionary of Indian Raw Materials and Industrial Products. Vol. 1.

RANUNCULACEAE.

CLEMATIS Linn.

Clematis gouriana Roxb., Hort. Beng. 43, 1814 & Fl. Ind. 2 : 671, 1832 ; FBI. 1 : 4 ; Gr. 1 ; D. & G. 1 ; C. 1 : 2 ; N. 5.

Cl. vitalba Linn., subsp. *gouriana* O. Kuntze, in Monogr. Gatt. Clematis, in Verh. Bot. Ver. Prov. Brandenb. 26 : 100, 1885.

According to Cooke this plant is common in thickets on the Ghauts ; the authority for the inclusion of this plant in this book are two manuscript catalogues left by Blatter and Hallberg. I have not seen this plant in Khandala, there are no specimens from that locality in any of the Herbaria I have consulted. (1)

Clematis hedysarifolia DC., Syst. 1 : 148, 1818 ; FBI. 1 : 4 ; O. Kuntze, loc. cit. 151 ; C. 3.

Very common about Khandala ; these plants may be seen almost throughout the year, especially along the railway line embankment at the foot of Behran's Plateau. Flowers are not showy in themselves, but as they grow in dense masses, they render the plant an attractive one. The plant is especially attractive in fruit.

Flowers.—October to November. *Fruits.*—November to May.

Blatter Herbarium 17423 ! 27534 ! 27623 ! 28353 ! 28567 ! 28204 ! *Santapau* 35/2 ! 761 ! 825 ! 1128 ! 1133 ! 1226 ! 1288 ! 1432 ! 1688 ! 2022 ! 2811 ! 3193 ! 3341 ! 3521 ! 5094 ! 5095 ! 5135 ! 5182 ! 5788 ! 5789 ! 5848 ! 8080 ! 9003 !

DELPHINIUM Linn.

Delphinium dasycaulon Fres., Mus. Senckenb. 2 : 272, 1837 ; FBI. 1: 25 ; D. & G. 2 ; Huth, Mon. Gatt. Delphin. in Engl. Bot. Jahrb. 20 : 435 ; C. 1: 5 ; N. 6.

Fairly abundant in Khandala along the edge of the ravine from Khandala Cemetery to the foot of Echo Point ; not seen elsewhere in the district. This plant is said to be rare by Cooke. At Purandhar, Poona Dt., this is one of the commonest and most abundant flowering plants ; in every case this plant seems to thrive in well-watered and well-drained soil, it does not grow except on steep slopes. A very fine plant when in flower.

Flowers and *Fruits.*—In Khandala during October only. At Purandhar this plant is very common, and can be seen in flower and fruit from October to December.

Santapau 5138—5147 ! 5161 ! 5162 ! 5411 ! 5412 ! 7448—7453 ! *Chibber* (in Herb. Econ. Bot. Agric. Coll., Poona) 84 !

(1) On Nov. 29th, 1951 for the first time I collected this plant in flower (*Santapau* 13962—13969 !) and on Dec. 27th, 1951 in fruit (*Santapau* 13990—13993 !) on the slopes below Forbay.

DILLENIACEAE.

Dillenia Linn.

Dillenia pentagyna Roxb., Pl. Corom. 1 : 21, t. 20, 1795 ; FBI. 1 : 38 ; Gr. 2 ; C. 1 : 6 ; N. 7.

A fairly common tree scattered through the ravines or slopes of the various hills about Khandala. In the seedling stage leaves may reach and even exceed 90×30 cms. On 26th November 1945 I found a tree about half way down St. Xavier's Ravine with buds and leaves on ; I have not seen this irregularity about flowering time on any other occasion. The wood is soft, and is only used for fuel.

Local name : Karumbel.

Flowers.—March to June. *Fruits.*—April to September.

Bl. Herb. 17438 ! 17440 ! 18029 ! 19439 ! *McCann* 3711 ! 3712! *Santapau* 59/1 ! 59/3-4 ! 59/7 ! 540 ! 1883 ! 8863 ! 9959 ! 9960 !

MAGNOLIACAE.

Michelia Linn.

Michelia champaca Linn., Sp. Pl. 536, 1753 ; FBI. 1 : 42 ; C. 1 : 7 ; N. 7.

Rare in the district ; only seen in some of the gardens in Khandala.

Flowers.—29 May 1931. *Fruits.*—29 May 1931, 15 August 1950.

McCann 3703 ! *Santapau* 11177 !

ANONACEAE.

Saccopetalvm Bennett.

Saccopetalum tomentosum Hk. f. & Thoms., Fl. Ind. 152, 1855 ; FBI. 1 : 88 ; C. 1 : 16 ; King in ABGC. 4(1) : 159, t. 207 ; Blatter in JBNHS. 34 : 293 ; N. 9.

Not a very common tree about Khandala ; I have found it in Meroli Plateau, at the base of the slopes below Elphinstone Point and on Monkey Hill Plateau.

Flowers.—March 1943. *Fruits.*—March to June.

Garade (in Herb. Econ. Bot.) 22. 3.1905 ! *Blatter* in MS. catalogue, *Santapau* 1770 ! 1771 ! 2180 ! 2181 ! 8822 ! 8823 ! 8824 ! 8825 !

SAGERAEA Dalz.

Sageræa laurifolia (Grah.) Blatter, loc. cit. 294, 1930; Chatterjee in PLS. 154 : 266.

Guatteria laurifolia Graham, Cat. 4, 1839.

Sageraea laurina Dalz. in Kew Journ. Bot. 3 : 207, 1851 ; D. & G. 2 ; FBI. 1 : 93 ; Beddome, Icon. t. 9 ; King, loc. cit. 7, t. 35 B *pro parte* ; Talb. 1 : 33 *pro parte.*

Bocagea Dalzellii Hook. f. & Thoms., in FBI. 1 : 92, 1872 ; C. 1 : 17 *pro parte.*

Not common about Khandala ; occasional specimens are found scattered on ravine slopes.

King, loc. cit., has separated *Sageraea* from *Bocagea* St. Hil. ; Hook. f. and Thoms. (in FBI.), Benth. and Hook. (in Gen. Plant.) and Baillon (in Hist. Plant.) retain *Sageraea* as distinct from *Bocagea.* But in FBI., loc. cit., Hook. f. and Thoms. unite the two genera into one with the name of *Bocagea.* Among the more recent authors, Talbot (For. Fl. 1 : 33, 1909), Brandis (Ind. Tr. 13, 1911), Gamble (Ind. Timb. 15, 1902), and Blatter, loc. cit., follow King in separating the two genera ; King does not think it possible to combine the extreme imbrication of the sepals and petals in *Sageraea* with the valvate calyx and corolla of *Bocagea.*

Local names : Sajeri and Undi.

Flowers.—November. *Fruits.*—December to March.

Blatt. Herb. 28432 ! *Santapau* 30/2-3, 7 ! 1351 ! 1524 ! 1563 ! 3285-3288 ! 3585 ! 6010 !

MENISPERMACEAE.

TINOSPORA Miers.

Tinospora cordifolia (Willd.) Miers. in Ann. Hist. Nat. (Ser. 3). 7 : 38, 1851 ; Hook. f. & Thoms., Fl. Ind. 184, 1855 ; FBI. 1 : 97 ; D. & G. 8 ; C. 1 : 18 ; Diels, in Pfreich. 46 : 139 ; Blatter 31 ; 549 ; N. 10.

Menispermum cordifolium Willd., Sp. Pl. 4 : 826, 1806.

Cocculus cordifolius DC., Syst. 1 : 518, 1818 & Prodr. 1 : 97 ; Gr. 4 ; Wight, Icon. tt. 285, 486.

Fairly common about Khandala ; very common on Behran's Plateau. Unfortunately this plant flowers when there are no leaves on it, and in consequence it is often confused with other species of *Tinospora.* In Khandala, however, I have not seen any but *T. cordifolia* growing.

Flowers.—January to March. *Fruits.*—April to June.

Santapau 937 ! 938 ! 1199 ! 2017 ! 2018 ! 2043 ! 2050 ! 3840 ! 4373 , 4617 ! 8710 ! 9123 !

Diploclisia Miers.

Diploclisia glaucescens (Blume) Diels, in Engl., Pfreich. l. c. 225, t. 77, 1910; G. 28; Blatter, loc. cit. 551.

Cocculus glaucescens Blume, Bijdr. 25, 1825.

Cocculus macrocarpus Wight & Arn., Prodr. 13, 1834; Gr. 5; Wight, Ill. 1: 22, t. 7; FBI. 1: 101; C. 1: 20; N. 11.

This plant, both in flower and in fruit, is one of the finest sights in the jungle around Khandala. During the flowering season numerous insects, particularly the small Indian bee, *Apis indica*, can be seen and heard hovering about the plant.

The leaves are used locally for cigarette wrappers.

Local name: Vatoli.

Flowers.—March to June. *Fruits.*—April to September.

Garade 22.3.1905 (in Herb. Econ. Bot.)! *Loele* 18045! *Meebold* 4489! *Blatt. Herb.* 17460! 17473! 18048! 18056! *McCann.* 4228! *Santapau* 37/5, 10, 20! 456! 457! 1722! 1870! 1891! 2499! 2500! 4110! 4227! 8691!

Stephania Lour.

Stephania hernandifolia (Willd.) Walp., Repert. 1: 96, 1842; FBI. 1: 103 *pro parte*; C.1: 22 *pro parte*; Diels, l. c., 279; Blatter, loc. cit. 35.

Cissampelos hernandifolia Willd., Sp. Pl. 4: 861, 1805; DC., Prodr. 1: 100.

Clypea hernandifolia Wight & Arn., Prodr. 14, 1834; Wight, Ic. t. 939.

The description found in FBI. and followed by Cooke is based on mixed material consisting of *S. hernandifolia* proper and *S. japonica*. On the whole question of *Stephania*, see Blatter loc. cit.

The following details have to be added to Blatter's description. The general colour of the inflorescence is green or greenish yellow. The fruit at first is green, at maturity is generally white or creamy white, occasionally one finds fruits with a tinge of orange colour on them; I cannot tell whether this colour is a transition from the green to the white or is final and definite.

A common climber widely spread about Khandala; it seems to grow best on open plateaus and exposed situations; the whole plant looks somewhat pale in colour.

I have examined all the specimens of *Stephania* in Blatter Herb. and have found that all the fruits have a perforated condyle; *St. hernandifolia* must, then, be considered by far the commoner of the two species in Khandala.

Local name: Tan.

Flowers.—June to November. *Fruits.*—August to January.

Woodrow; *Blatt. Herb.* 27958 ! 28294 ! *Santapau* 47/11, 13, 14 ! 653 ! 758 ! 901 ! 1032 ! 1077 ! 1086 ! 1109 ! 1129 ! 1234 ! 1252 ! 2472 ! 2473 ! 2641 ! 3095 ! 4476 ! 4583 ! 6860 ! 6886 ! 6975 ! 6976 ! 9231 ! 9290 !

Stephania japonica (Thunb.) Miers, in Ann. Nat. Hist. (Ser. 3) 18 : 14, 1866 ; Blatter, loc. cit.

Menispermum japonicum Thunb., Fl. Jap. 195, 1784.

Stephania hernandifolia Miq., Prol. Fl. Jap. in Ann. Mus. Lugd. Bat. 1 : 103, 1867 ; FBI. 1 : 103, *pro parte* ; C. 1 : 22 *pro parte.*

The identification of this species is a difficult one ; Diels loc. cit. 377, gives the following characteristics : glabrous shrubby plant, leaves glabrous, inflorescence glabrous ; condyle not perforated. I have examined all the specimens in Blatt. Herb. where mature fruits are present, and in all cases without exception I find the condyle perforated. S. *japonica*, therefore, must the considered a rare species in Khandala. The specimen mentioned below was identified by Blatter ; but in the absence of mature fruits I cannot confirm the identification.

Blatter and *McCann* 17475.

Cocculus DC.

Cocculus hirsutus (Linn.) Diels, in Pfreich. 46 : 236, 1910 ; Blatter 552.

C. villosus DC., Syst., 1 : 525, 1818 ; FBI. 1 : 101 ; C. 1 : 21 ; N. 11.

Menispermum hirsutum Linn., Sp. Pl. 341, 1753.

The occurrence of this plant in Khandala is given on the authority of Chibber, who found the plant in the district in June 1909 ; I have seen the specimen in the Herb. Econ. Bot., Poona, and found it too defective for satisfactory identification.

Chibber, June 1909 !

Cissampelos Linn.

Cissampelos pareira Linn., Sp. Pl. 1031, 1753 ; FBI. 1 : 103 ; Diels 286, f. 91 A-K ; Blatter 555 ; C. 1 : 22 ; N. 11.

A climber on hedges, etc. The long pendulous female bracteate racemes make this an elegant plant.

Flowers.—June to September. *Fruits.*—August to September.

Woodrow ; *Blatter* and *McCann* 18058 ! 28303 ! *Santapau* 37/9 ! 521 ! 1050 ! 1051 ! 2588 ! 5109 ! 6937 ! 6938 ! 6939 ! 6986 ! 9010 ! 9011 !

Cyclea Arn.

Cyclea burmanni (DC.) Hk. f. & Thoms., Fl. Ind 201, 1855 ! FBI. 1 : 104 ; C. 1 : 23.

Cocculus Burmanni DC., Prodr. 1 : 96, 1824.

Menispermum peltatum Lam., Encycl. 4 : 96, 1797.

Cyclea peltata Diels, loc. cit. 312, 1910 ; G. 31 ; Blatter 556 (non *C. peltata* Hook. f. & Thoms., nec Miers).

Diels in his monographic treatment of the genus *Cyclea* adopted the name *C. peltata* for the present species. The specific name *peltata* is not available, it being preoccupied by two older homonyms. In the circumstances, the oldest available name for the present species is that of Hook. f. and Thoms.

The identification of this plant is not easy ; male flowers are quite distinct, and if present render identification easy. The female flowers and fruits of this species and those of *C. fissicalyx* Dunn are practically identical. I have based my identification of the female flowers on the following character, which is given by Cooke, and accepted as correct by Blatter in his Revision :

Sepal hairy.....*C. Burmanni* Hook. f. & Th.

Sepal glabrous.....*C. fissicalyx* Dunn.

All the specimens listed below and showing female flowers have a sepal that is densely hairy outside.

A common plant in Khandala ; when young it is glaucous in colour and often densely hairy ; when old it is more or less pubescent on the stem and either glaucous or green in the rest of the plant. Male flowers are very characteristic in their structure, but they are also very easely caducous.

Flowers and *Fruits*.—Throughout the whole year.

Blatter 18054 ! *McCann* 4238 ! *Blatter* and *McCann* 18057 ! 18059 ! 18060 ! 18061 ! 27960 ! 17454 ! *Santapau* 37/4, 6 ! 897 ! 1252 ! 1329 ! 1514 ! 1569 ! 1570 ! 1677 ! 2202 ! 3057 ! 3085 ! 3086 ! 3590 ! 3734 ! 4117 ! 4284 ! 4467 ! 4994-4996 ! 5240 ! 8938-8941 !

Cyclea fissicalyx Dunn in Gamble, Fl. Madr. 31, 1915 & in Kew Bull. 1916 : 60 ; Blatter 557.

C. peltata Miers, Contr. Bot. 3 : 236, 1874 ; C. 1 : 44 (non Hook. f. & Thoms., nec Diels).

There is but one specimen of this species in Blatt. Herb., and unfortunately it is without flowers or fruits ; the sheet bears the identification of Blatter. According to this author, the plant is "apparently rare"; in Khandala I have not seen any specimen which may be taken as belonging undoubtedly to this species.

Blatter 18055 !

NYMPHAEACEAE.

Nymphaea Linn.

Nymphaea pubescens Willd., Sp. Pl. 2 : 1154, 1799 ; G. 34 ; Blatter 34 : 294 *pro parte.*

N. rubra Roxb. *ex* Salisb., Parad. Lond. 1, sub t. 14, 1805; Wight, Illustr. t. 10; Gr. 5.

N. Lotus Hk. f. & Thoms., FBI. 1 : 114, 1872; C. 1 : 25; N. 12 (non Linn.).

N. Lotus var. *pubescens* Hk. f. & Thoms. loc. cit.; C. loc. cit.

Conard (Rhodora 18 : 161-164, 1916) does not identify any of the Indian species of *Nymphaea* with the *N. Lotus* of the Linnean Herb. Following Wight and Arn. (Prodr. 17), Conard distinguishes two different species on the strength of the colour of the flowers: *N. rubra* Roxb., and *N. pubescens* Willd. Blatter, loc. cit., follows Conard; Gamble, disregarding the colour of the flowers, distinguishes two species on the pubescense or glabrousness and the structure of the margin of the leaves.

In my opinion, colour cannot be made into the basis of classification. For a number of years I have been observing these plants in Khandala and have come to the conclusion that there is a very wide variation in colour from deep red to pure white, with an extensive range of pinks, etc. in between. Moreover, on one and the same flower one can see variation in the intensity of the colour from the outer perianth segments inwards. In every case, the structure of the anthers and stigmatic rays and of the leaf margins place these Khandala plants among *N. Lotus* or *N. Lotus* var. *pubescens* of Cooke, and *N. pubescens* of Gamble. For this reason I have followed Gamble and S. T. Dunn (Kew Bull. 1916 : 60—61) in the classification of Khandala *Nymphaeas*.

The plant is commonly in flower in Khandala village tank almost throughout the year, with the exception of the first months of the monsoon. Just before the monsoon the tank is generally cleaned and all *Nymphaea* plants removed; leaves and flowers only begin to reappear towards the end of September.

Roots, petioles and peduncles are collected and eaten locally; Cooks states that the seeds are also eaten, and this may account for the rarity of fruits in Khandala.

Blatt. Herb. 18098! 27452! 27453! *Santapau* 1141! 5265! 5266! 5474! 8759!

Nelumbo Adans.

Nelumbo nucifera Gaertn., Fruct. 1 : 73, t. 19, f. 2, 1788; Blatter 294.

Nelumbium speciosum Willd., Sp. Pl. 2 : 1258, 1800; Gr. 5; FBI. 1 : 116; C. 1 : 26.

The occurrence of this plant in Khandala is given on the authority of Hallberg; I have not seen the plant growing in Khandala, there are no specimens from this locality in Blatt. Herb.

Hallberg, in MS. catalogue.

PAPAVERACEAE.

ARGEMONE Linn.

Argemone mexicana Linn., Sp. Pl. 508, 1753; Bot. Mag. t. 243; Gr. 6; FBI. 1: 117; Wight, Illustr. t. 11; C. 1: 27; Fedde in Pfreich. 40: 273, t. 36 B; N. 13; Wl 116.

The colour of the flowers in Khandala is always yellow; I have not seen white flowers, as mentioned by Cooke for the genus.

Very common all over Khandala in waste lands; in the ravines it generally occurs along stream beds, showing the course or method of distribution of the plant. It is not found in dense jungle, nor on Bhoma Hill. During the rainy season the plant seems to be washed away from the district, and is very rare or altogether absent; immediately after the rains, the seeds germinate and seedlings and plants once more become very common and remain so till the next rainy season.

The sap of the plant is yellow or greenish yellow.

Local name: Piula Dhotara.

Flowers and *Fruits.*—Throughout the year, rare during the rains.

Blatter and *Hallberg* in MS. catalogues. *Blatt. Herb.* 18106! *Santapau* passim.

PAPAVER Linn.

Papaver somniferum Linn., Sp. Pl. 508, 1753; FBI. 1: 117; Gr. 6; Blatter, 295; Fedde, 338, t. 37 A; N. 13.

Blatter listed this plant in his MS. catalogue as having seen it in Khandala; there are no specimens in Blatt. Herb. I have often seen it cultivated in gardens in Bombay and elsewhere, but not in Khandala.

Blatter in MS. Cat. "Cultivated".

CRUCIFERAE.

RORIPPA Scop.

Rorippa indica (Linn.) Hochreut. in Candollea 2: 370, 1925.

Sisymbrium indicum Linn., Mant 1: 93, 1767

Nasturtium indicum DC., Prodr. 1: 139, 1824; FBI. 1: 134; C. 1: 30.

Common particularly on the old railway line from below Elphinstone Point to the Railway station ; especially abundant on the waste ground near the village tank.

Flowers and *Fruits*.—January to June.

Santapau 4168 ! 4169 ! 4383 ! 5906! 6041 ! 6042 ! 6043 ! 8638 !

CARDAMINE Linn.

Cardamine trichocarpa Hochst. *ex* Rich., Tent. Fl. Abyss. 1 : 18, 1847; Schulz, Mon. Cardamine in Engl. Bot. Jahrb. 22 : 462, 1903 ; Dunn in Kew Bull. 1916 : 61 ; Blatter, 295.

Cardamine hirsuta Linn. var. *subumbellata* Dalz. in Hook. Journ. Bot. 4 : 294, 1852.

Cardamine subumbellata Hk. f., FBI. 1 : 138, 1872 ; C. 1 : 30 ; K. Biswas, MS. in Kew Herb.

Common in moist waste places, especially on the old railway line near the village tank ; common also in stream beds. Everywhere gregarious in habit.

Flowers and *Fruits*.—March to October.

Woodrow ; Hallberg in MS. catalogue ; *Blatt. Herb.* 17512 ! 17522 ! 17530 ! 17574 ! 17586 ! 27971 ! *Sedgwick* 2596 ! *Santapau* 642 ! 715 ! 2230 ! 4593 ! 4609 ! 4667 ! 4668! 4418 ! 6796 ! 6797 ! 9223 ! *Bhiva* 15.8.1891 (in Herb. Econ. Bot.).

SISYMBRIUM Linn.

Sisymbrium brassicaeforme C. A. Mey. in Ledeb., Fl. Alt., 3 : 129, 1831.

An erect herb, up to 1m. high ; leaves lyrate, the apical segment hastate to sagittate ; flowers small, yellow ; pods linear, nearly clindrical, long.

This plant has only been observed on one occasion ; it was growing in a ditch near the railway station.

Flowers and *Fruits*.—24 March 1949.

Santapau 10000—10005 !

CAPPARIDACEAE.

CLEOME Linn.

Cleome viscosa Linn., Sp. Pl. 672, 1752 ; FBI. 1 : 170 ; Wight, Icon. t. 2 ; C 1 : 39 ; Blatter, 31 ; Pax & Hoffm. in Pfam. (2) 17 B ! 213 ; N. 16.

Cleome icosandra Linn., loc. cit. 1753.

Polanisia viscosa DC., Prodr. 1 : 22, 1824.

Polanisia icosandra Wight & Arn., Prodr. 22, 1834; Gr. 8; Merrill, Enum. Phil. Fl. Pl. 2 : 209.

This is a very common plant in Bombay and Salsette islands, but relatively rare in Khandala. Its flowers are yellow and the whole plant is densely clothed with glandular hairs, which make the plant very "sticky" to touch. In Khandala I have only seen it in a ditch near running water on sandy soil, near the railway station.

Flowers and *Fruits*.—May 1946.

Blatt. Herb. 28299 ! *Santapau* 8966 !

Cleome chelidonii Linn. f., Suppl. 300, 1781; FBI. 1 : 170; C. 1 : 39; Blatter, 900.

Polanisia Chelidonii DC., Prodr. 1 : 242, 1824; Gr. 7; Wight & Arn., Prodr. 22; Wight, Icon. t. 319.

The only specimens collected in Khandala have a strongly developed stem and a large number of radical leaves; stem at ground level up to 20mm. thick, gradually tapering upwards. Radical leaves usually 7-foliate, petioles up to 15cms. long; leaflets up to 5×2cms., obovate, tapering into the petiole.

Stems, petioles and leaflets covered with short, stout hairs from broad bases, which render the whole plant very hispid. The pubescence mentioned by Cooke is absent from my Khandala specimens.

Santapau, in stream bed of St. Mary's Ravine, 1944 !

Gynandropsis DC.

Gynandropsis gynandra (Linn.) Briq., in Ann. Cons. Jard. Bot. Genève 17 : 382, 1914; Merrill, loc. cit. 209; Pax & Hoffm. 218.

Cleome gynandra Linn., Sp. Pl. 671, 1753.

Cleome pentaphylla Linn., Sp. Pl. (ed. 2) 938, 1762.

Gynandropsis pentaphylla DC., Prodr. 1 : 238, 1824; FBI. 1 : 171; Gr. 7; C. 1 : 40; N. 16.

Cooke gives June as the flowering time of this plant. Blatter gives December. Examination of the specimens in Blatt. Herb. shows that the plant is in flower practically throughout the year.

A rare plant in Khandala, only found near habitations, possibly an escape from cultivation.

Blatter in MS. catalogue; *Santapau* 2953 ! 5497 ! 5498 ! 8676 !

Capparis Linn.

Capparis moonii Wight, Illustr. 1 : 35, 1840; FBI. 1 : 175; C.1 : 46; Blatter, 905; Pax & Hoffm. 176.

This is a common plant in Khandala, especially about St. Xavier's Villa and along the road to the Reversing Station. Flowers are very conspicuous; the fruit remains on the parent plant for a long time, on a stout gynophore. But the presence of short, stout and hooked thorns makes collection and preservation of specimens a task of no mean danger.

Flowers.—October to April. *Fruits.*—March to August.

Stocks; Woodrow! Cooke! Nene! Garade 22.3.1905! *Chibber* June 1909! *Gammie* 16124! *Locle* 18140! *Hallberg* in MS. catalogue! *Blatt. Herb.* 18149! 27498! 27560! *McCann* 4287! 4288! *Santapau* 41/5, 20, 23, 24! 1447! 1656! 1974! 3304(2)! 3316! 3317! 3318! 3971! 8601!

Capparis sepiaria Linn., Syst. (ed. 10) 1071, 1759; FBI. 1 : 177; Gr. 9; C. 1 : 48; N. 18.

Capparis incanescens DC., Prodr. 1 : 247, 1824; Hook., Icon. t. 123.

There is in my collection from Khandala but one specimen of this plant, and that specimen has neither flowers nor fruits; the general character of the leaves, however, seems to place my specimen under this species. Until further material be collected from the same locality, the occurrence of this plant in Khandala is uncertain.

Santapau 4425!

Capparis zeylanica Linn., Sp. Pl. (ed. 2) 720, 1762; Dunn in Kew Bull. 1916 : 62; Blatter, 903 (sub *C. brevispina*) & 906 (non *C. zeylanica* Hk. f. & Thoms. in FBI. 1 : 174).

Capparis horrida Linn. f., Suppl. 264, 1781; Wight & Arn., Prodr. 26; Wight, Icon. t. 173; FBI. 1 : 178; C. 1 : 48; N. 18.

This is an interesting plant, mainly on account of the complications in nomenclature; see Dunn, loc. cit. and further notes by Blatter, loc. cit.

Not a common plant in Khandala; I have only seen it three times in six years.

Blatter and *McCann* 1813[illegible]! 18148! *Santapau* 1982! 5803! 8672! 8673!

BIXACEAE.

Bixa Linn.

Bixa orellana Linn., Sp. Pl. 512, 1753; FBI. 1 : 190; Gr. 10; Wight, Illustr. 17; D. & G. Suppl. 5; C. 1 : 53; Talb. 1 : 72, t. 46; Blatter, 909; Pilger in Pfam. (ed. 2) 21 : 315, t, 139; WI. 196, t. 31.

The only authority for the inclusion of this plant is Blatter, who states, in his MS. catalogue, that he has seen the tree in Khandala, growing in gardens. I have not seen the tree in the district, there are no specimens from Khandala in Blatt. Herb.

Blatter in MS. catalogue : " Cultivated ".

FLACOURTIACEAE.

FLACOURTIA Commers.

Flacourtia montana Graham, Cat. Bomb. Pl. 10, 1839 ; C. 1 : 55 ; Talb. 1 : 76, t. 48 ; Blatter, 912 ; Pilger in Pfam. (ed. 2) 21 : 440 ; N. 19.

Both Cooke and Blatter speak of rather long spines on the trunk and branches of this tree. My specimens from Khandala have no spines of any sort. Among the specimens in Kew Herb. originating from Bombay and Madras, I have searched for such spines in vain.

The ripe fruit is eaten by the Katkaris ; it has a pleasantly acid taste. The red fruits stand out very conspicuously on the deep green background of the foliage. The tree is middle-sized to very large, at times one of the largest in the district. The size of the tree, the absence of spines and the size of the fruit for a long time prevented me from identifiying this species ; I must thank Dr. S. K. Mukerjee of the Indian Botanical Garden, Calcutta, for his help in identifying it.

Not common in Khandala ; the best specimens are to be found on the steep slopes below Elphinstone Point.

Local name : Tara Bor.

Flowers.—December 1943. *Fruits.*—December to April.

Blatter in MS. catalogue. *Santapau* 3266 ! 3273 ! 3400 ! 3658-3662 ! 3780-3782 ! 8696 ! 8697 !

Flacourtia occidentalis (Hook. f. & Thoms.) Blatter in JBNHS. 31 : 914, 1927.

F. Ramontchi L'Herit. var. *occidentalis* Hook f. & Thoms. in FBI. 1 : 193, 1872 ; C. 1 : 56 ; Talb. 1 : 77, t. 51.

The following is Blatter's description (loc. cit.) : " A small tree ; whole plant more or less covered with permanent grey velvety tomentum ; bark grey, scaly, thin. Spines slender, straight. Leaves 3—8 by 2—5 cms., broadly oblong, oblong-elliptic, orbicular or obovate or lanceolate, rarely elliptic or ovate, crenate or serrate, base rounded, cuneate or cordate, rounded or acute at the apex, more or less tomentose ; petioles tomentose or velvety. Racemes tomentose. Sepals ovate, ciliate. Styles about 5, distinct, reflexed, and 2-divided at the apex ".

According to Blatter this species differs from *F. Ramontchi* in having its branchlets, leaves, petioles and inflorescence permanently more or less velvety or tomentose, and spines being slender.

A rare plant in Khandala ; I have seen no other specimens but the one mentioned by Blatter in his Revision, which is kept in Blatt. Herb.

Flowers.—According to Blatter, November to March.

Blatter 18189 !

Flacourtia latifolia (Hook. f. & Thoms.) Cooke, in Fl. Pres. Bomb. 1 : 56, 1901 ; Blatter, 913.

F. Ramontchi L'Her. var. *latifolia* Hk. f. et Thoms., FBI. 1 : 193, 1872.

F. inermis (*?*) Graham, 10, 1839 (non Roxb.).

This is one of the commonest, not only of Flacourtias, but also trees in Khandala. Generally a small tree with fairly large leaves. Spines may be present or absent on young branches, but they are practically always present on older stems and branches. Spines on older stems compound, massed, up to 25 cms. long, very sharp and hard ; on younger stems or branches simple, and at the beginning very soft and reddish in colour. The whole stem is at times a solid mass of dangerous-looking spines.

For the identification of this tree and its separation from *F. Ramontchi* I have followed Cooke :

Stigmas 3—4	*F. latifolia.*
Stigmas 5—11	*F. Ramontchi.*

I have examined all the specimens in Blatt. Herb. from Khandala and in every case have found 3—4 stigmas, occasionally 5 on a few flowers, but the majority of flowers or fruits on a particular branch has only 3—4 stigmas.

The fruit is strongly astringent when immature ; when ripe it attains a size of 9mm. in diam., and is very dark purple, almost black in colour ; the ripe fruit has an agreeable taste.

Local name : Tambat.

Flowers.—January to June. *Fruits.*—January to October.

Blatt. Herb. 18196 ! 18200 ! 27422 ! 28475 ! 28475 ! *McCann* 3697 ! 3699 ! 4294 ! 4295-4296 ! *Santapau* 53/3, 4, 7, 9, 11, 16 ! 586 ! 4456 ! 4530 ! 4531 ! 8619 ! 8803 ! 9034 ! 9157 !

Flacourtia sepiaria Roxb., Pl. Cor. 1 : 48, t. 68, 1795 ; FBI. 1 : 194 ; Gr. 10 ; C. 1 : 56 ; Blatter, 914 ; Gilg, in Pfam. (ed. 2) 21 : 440.

F. indica Merrill, Interpret. Herb. Amboin. 377, 1917.

A small shrub with rigid branches, and spines bearing flowers and leaves. In his Revision, Blatter mentions No. 18197 as a specimen of this species from Khandala. On examination, the specimen turns out to be not *Flacourtia* but *Flueggea.*

Santapau June 1942, May and June 1946.

PITTOSPORACEAE.

Pittosporum Banks.

Pittosporum floribundum Wight & Arn., Prodr. 154, 1834; FBI. 1 : 199 *pro parte* ; Gr. 38 ; C. 1 : 58 ; Talb. 1 : 81.

P. nepaulense Blatter in JBNHS. 34 : 302, 1930 (non Rehder & Wils.).

Blatter, loc. cit., gives the name of this tree as *P. nepaulense* Rehder and Wils., and adds the synonyms *Senacia nepaulensis* Wall. and *Celastrus verticillata* Roxb. Rehder and Wils. in Sargent, Pl. Wils. 3 : 326, 1916 distinguish between *P. nepaulense* and *P. floribundum* Wight : the former seems to have flowers in an elongated umbelliferous panicle, whilst the latter has them in a much branched paniculate corymb ; in Hook. f., FBI., the description is based on mixed material of the two species. *P. nepaulense* is the typical plant of the Eastern Himalayas, Sikkim and Khasia Hills ; *P. floribundum* belongs to the South and Western parts of India.

A fairly common tree on Bhoma Hill from Forbay upwards. The most typical part of the plant is the fruit, which at maturity turns jet black and retains its apiculation.

Local name : Pisara.

Flowers.—July to August. *Fruits.*— August to May.

Graham ; *Cooke ! Blatt. Herb.* 18206 ! 28247 ! *Sedgwick* 7988 ! *Santapau* 95/1 ! 4638—4642 ! 4651 ! 4652 ! 4713 ! 4885 ! 6077 ! 6820 ! 6854—6855 !

POLYGACEAE.

Polygala Linn.

Polygala erioptera DC., Prodr. 1 : 326, 1824 ; FBI. 1 : 203 ; Chodat, Mon. Polygal. 2 : 424, t. 28, f. 1-4 ; idem in Pfam. 3(4) : 336 ; C. 1 : 60 ; Blatter 34 : 302 ; N. 21.

Rare in Khandala ; I have not seen it growing in the district, there are no specimens from Khandala in any of the herbaria I have examined.

Blatter in Revision, loc. cit.

CARYOPHYLLACEAE.

POLYCARPON Linn.

Polycarpon indicum (Retz.) Merrill in Phil. Journ. Sci., Bot., 10 : 30[illegible]; 1905 ; Blatter 34 : 304.

Loeflingia indica Retz., Obs. 4 : 38, 1785.

P[illegible] depressum (Linn.) Rohrb. in Mart., Fl. Bras. 14(2) : 257, 1872 (non Nutt., 1838).

Pharnaceum depressum Linn., Mant. 2 : 562, 1771.

Hapalosia Loeflingiae Wall., Cat. 6962, 1832, nom. nud. ; Wight & Arn., Prodr. 358, 1834.

Polycarpon Loeflingiae (Wall.) Benth. & Hook. f., Gen. Pl. 1 : 153, 1862 ; C. 1 : 65 (Loeflingiae).

Cooke lists this plant as one of the rare plants in the Presidency. In Khandala far from being rare, it is one of the commonest herbs found in rice fields after the harvest and in other moist places where grasses are not the dominant feature of the vegetation. It is particularly abundant during the dry season in dried or drying up pools. In a corner of the Soldier's Playing Fields they form a very dense mat in an almost pure formation and cover a space of about 7×10m. It is often associated with *Polygonum plebeium* Br., which it much resembles in habit and appearance ; it can easely be distinguished from the latter by the fact that *Polygonum* has alternate leaves and bright red or pink flowers.

Flowers and *fruits*.—Throughout the dry season.

Bhiva (in Herb. Econ. Bot.) ! *Blatt. Herb.* 17731 ! 19471 ! 27956 ! *Santapau* 422 ! 535 ! 2115 ! 4093 ! 4133 ! 4195—4199 ! 4281 ! 4369 ! 4384 ! 4434 ! 8068 ! 8605 ! 8737 ! 8967—8972 ! 9106 ! 9127 ! 9128 !

SAPONARIA L.

Saponaria vaccaria L., Sp. Pl. 409, 1753 ; FBI. 1 : 217 ; C. 1 : 62 ; G. 61 ; N. 22.

An erect, glabrous herb, up to 35 cm. high. Flowers of about the same colour as those of *Canscora diffusa* R. Br., ; calyx deep green along the midrib, white at the edges.

Found as a weed in gardens in Khandala and elsewhere in Western India ; it is not common.

Flowers.—December to February. *Fruits*.—March.

Santapau 6119 !

PORTULACACEAE

Portulaca Linn.

Portulaca oleracea Linn., Sp. Pl. 445, 1753; FBI. 1 : 246; C. 1 : 68; Pax & Hoffm. in Pfam. (ed. 2) 16C : 247, f. 108B; N. 23.

Common all over Khandala, especially along the village streets, near the village tank and in stream beds, or in general in moist ground. It is common but scarcely abundant. Locally the plant is not mentioned as being used as a vegetable.

Flowers and *fruits*.—Throughout the dry season.

Blatter in MS. catalogue; *McCann* 43311 ! *Santapau* 26/2 ! 2128 ! 3770 ! 3981 !

Portulaca quadrifida Linn., Mant. 1 : 73, 1767; FBI. 1 : 247; C. 1 : 68; Wight, Ill. 2 : 109; Pax & Hoffm. 247; N. 23.

A rare plant in Khandala; I have not found it there. In Blatt. Herb. there are no specimens from Khandala. Hallberg is the only authority for the inclusion of this plant in this flora.

Hallberg in MS. catalogue.

ELATINACEAE.

Bergia Linn.

Bergia ammannioides Roxb., Hort. Beng. 34, 1814, nom. nud.; Roth, Nov. Pl. Sp. 219, 1821; FBI. 1 : 251; Wight, Ill. 1: t. 25; C. 1 : 73; Blatter 34 : 623; Niedenzu, in Pfam. (ed. 2) 21 : 274, t. 119 K-R; N. 24.

Elatine ammannioides Wight & Arn., Prodr. 41, 1834; Gr. 12.

A fairly common herb in Khandala, especially about the village tank or in moist places; in habit it is very similar to *Ammannia* and *Rotala* from both of which it is easy to distinguish on account of the shape of the capsule.

Flowers and *Fruits*.—October to April.

Blatt. Herb. 17806 ! *Santapau* 311 ! 3354 ! 3364 ! 5277 ! 8121 ! 9763 ! 10011 !

GUTTIFERAE

Garcinia Linn.

Garcinia indica (Du Petit-Thou.) Choiss., in DC. Prodr. 1 : 561, 1824; FBI. 1 : 261; C. 1 : 76; Blatter 34 : 623; Engler, in Pfam. (ed. 2) 21 : 219, t. 87H-J; N. 25.

Brindonia indica Du Petit-Thouars, in Dict. Sc. Nat. 5 : 339, 1804.
Garcinia purpurea Roxb., Fl. Ind. 2 : 624, 1832 ; Gr. 25 ; D. & G. 31.

The rind of the fruit is used locally for pickling ; the pulp is eaten and has a delicate flavour. A small tree, common on the Khandala Plateau ; in the ravines it attains a fairly large size.

Local names : Kokam or Kokambi ; by Anglo-Indians or Europeans this tree is sometimes called " The Tomato Tree ".

Flowers.—November to March. *Fruits.*—January to August.

Graham ; Gammie 16162 (in Herb. Econ. Bot.) ! *McCann* 3708 ! *Santapau* 62/3, 10, 11, 13, 14 ! 1554(2) ! 2147 ! 3122 ! 3253 ! 3596 !

Garcinia xanthochymus Hk. f., FBI. 1 : 269, 1874 ; C. 1 : 78 ; N. 25 ; Blatter, 624.

Xanthochymus pictorius Roxb., Pl. Cor. 2 : 51, t. 196, 1798 ; (non *Garcinia pictoria* Roxb.).

X. *tinctorius* DC., Prodr. 1 : 562, 1824 (sphalm. pro " *X. pictorius* Roxb.) "

Garcinia tinctoria Dunn, in Kew Bull. 1916, 64 ; G. 74.

The occurrence of this plant is given on the authority of Blatter ; I have not seen any specimens from the district. It is very easy to confuse this species with *G. malabarica* Talbot, as will be explained below ; from the leaves alone it is not possible to distinguish these two trees ; in every doubtful case I have based my identifications on the flowers or fruits and I have found that all my Khandala plants belonged to *G. malabarica* Talbot.

Blatter in MS. catalogue.

Garcinia spicata (Wight & Arn.) Hook. f. in JLS. 14 : 486, 1875 ; C. 1 : 78 ; G. 74 ; Blatter 624.

Xanthochymus spicatus Wight & Arn., Prodr. 102, 1834.

X. ovalifolius Roxb., Fl. Ind. 2 : 632, 1832.

Garcinia ovalifolia (Roxb.) Hk. f., FBI. 1 : 269, 1874 (non Oliver).

A rare plant in Khandala ; Blatter mentions the tree from Khandala in his MS. catalogue, and in the Revision he further states that he has seen the specimens from Khandala.

Gammie 16163 of 21.3.1903 ! *Blatter* in MS. catalogue and in Revision, loc. cit.

Garcinia malabarica Talbot, in JBNHS. 11 : 234, t. 1, 1897 & For. Fl. 1 : 96 ; Blatter 624.

G. ovalifolia var. *macrantha* Anders. in FBI. 1 : 269, 1874.

G. spicata var. *macrantha* Cooke, Fl. Pres. Bomb. 1 : 79, 1901.

Xanthochymus ovalifolius Graham, Cat. 26, 1839 (non Wight & Arn.).

The description of *Xanthochymus ovalifolius* given by Graham, the time of flowering and fruiting and the type of fruit seem to indicate

that he was dealing with this species; moreover, the present species is about the commonest in the ravines at Khandala.

A small tree, easely confused with *G.* [illegible], from which it can be distinguished by the number of stigmatic lobes, *G. malabarica* having 3, *C. xanthochymus* 5-6.

A fine small tree with very typical leaves and fruits. Common on ravine slopes.

Local name: Pansara.

Flowers.—November to January. *Fruits.*—February to May.

Graham; *Blatt. Herb.* 27647 ! 28438 ! *Santapau* 62/7—9, 12 ! 1747 ! 1892 ! 3251 ! 3252 ! 3331-3333 ! 3560 ! 4210 !

Ochrocarpos Du Petit-Thou.

Ochrocarpos longifolius (Wight) Benth. & Hook. f., Gen. Pl. 1 : 980, 1876; FBI. 1 : 270; C. 1 : 79; Blatter, 624; Engler in Pfam. (ed. 2) 21 : 192.

Calysaction longifolium Wight, Ill. 1 : 130. 1840.

Occasionally found on steep slopes or in the ravines; flowers remain on the tree for a fairly long time; the fruit persists until the beginning of the rains. The wood is red and hard, but no use is made of it locally except for fuel.

Local name: Undi.

Flowers.—February to April. *Fruits.*—April to June.

Bhiva March 1891 ! *Bhide*, 16.5.1909 ! *Blatt. Herb.* 18275 ! 18277 ! *Blatter* in Revis. loc. cit.; *Santapau* 62/4 ! 62/15 ! 1764 ! 3684 ! 3686 ! 4008 ! 8652 ! 9071 ! 9966 !

ANCISTROCLADACEAE.

Ancistrocladus Wall.

Ancistrocladus heyneanus Wall., Cat. 7262, 1832; Gr. 28, 1839; Wight, Icon. tt. 1987—1988; FBI. 1 : 299; C. 1 : 87; N. 26; Talb. 1 : 116, t. 69; Gilg in Pfam. (ed. 2) 21 : 592, t. 270 A.

A dimorphic shrub with hooked branches. In the young stages, or even later when support is not available, it is an erect shrub with very large, strap-shaped leaves, which are scattered all over the stem or branches. At later stages, when near support, it is a climber with much smaller leaves, which are gathered at the ends of branches.

Fairly common in the ravine just below St. Xavier's Villa. This is a very typical plant on account of the following characteristics: (*a*) The

hooks which are especially noticeable on young branches ; (*b*) The size and shape of the fruits, with the large winged calyx ; (*c*) The particular revolving movement, propeller-like, of the fruits in falling.

Flowers.—February to May. *Fruits.*—February to June.

Graham ; *Blatt. Herb.* 24269(2) ! *Santapau* 63/1-2 ! 1745 ! 2165 ! 3706-3715 ! 4119-4121 ! 6060-6062 ! 9039 !

MALVACEAE.

SIDA Linn.

Sida acuta Burm., Fl. Ind. 147, 1768 ; C. 1 : 93 ; Blatter 34 : 628.

S. carpinifolia Linn. f., Suppl. 307, 1781 ; FBI. 1 : 323.

Althaea coromandeliana angustis, praelongis foliis, semine bicornio Plukenet, in Herb. vol. 1, fol. 53 (in Brit. Mus., Nat. Hist.).

Burmann cites Plukenet's plant as the type of this species ; Plukenet's specimens are preserved in the British Museum, Natural History, London, and have been examined in connection with the present work.

The leaves of Plukenet's specimens are all glabrous, the petioles hairy ; after studying Plukenet's specimens, I went through all the sheets of *Sida acuta* in Kew Herb. ; all agree with Plukenet's specimen, except one from Tinnivelly, collected by Beddome (No. 519). From the specimens of this plant in the Brit. Mus. and Kew Herb., the distribution of this plant is quite clear : it extends through India, Ceylon, Malaya, the Philippine Islands, Timor and other Pacific Islands, Formosa and China.

Blatter, loc. cit., mentions the occurrence of this plant in Khandala. In the Blatt. Herb. there are several specimens of *Sida* labelled by Blatter " *Sida acuta* Burm. " ; on careful examination, all such sheets have turned out to belong to *S. rhombifolia* var. *rhomboidea*. Until further evidence is obtained, I consider the occurrence of this plant in Khandala very doubtful.

Blatter and *McCann, ex* Revision, loc. cit.

Sida rhombifolia Linn., Sp. Pl. 684, 1753, var. **rhomboidea** Masters, in FBI. 1 : 324, 1874.

S. rhombifolia forma *rhomboidea* Blatter 34 : 629, 1930.

Not in Cooke. A number of sheets from Bombay at present in Kew Herb. have been identified as *S. acuta* Burm. but belong to the present species. Blatter has reduced Master's variety to a form, or account of the extreme variability of the plant.

Externally this plant is very similar to *S. acuta* Burm., for which it is often mistaken ; *S. acuta* Burm. has glabrous leaves and very long awns, whilst the present species has hairy leaves and very short or 0 awns.

Fairly common and abundant in Khandala. Local woodmen use the stems as ropes for their grass or firewood bundles.

Local name : Chikankara.

Flowers.—September to December. *Fruits.*—October to January.

Blatter Herb. 18341 ! 18333 ! 18342 ! 18328 ! 18340 ! 20033 ! *Santapau* 65/27 ! 1211 ! 2745 !

Sida rhombifolia Linn., var. **retusa** Masters in FBI. 1 : 324, 1874; C. 1 : 93.

Sida retusa Linn., Sp. Pl. (ed. 2) 961, 1762 ; Gr. 16 ; D. & G. 17.

S. rhombifolia Linn., forma *retusa* Blatter 629, 1930.

A common plant in Khandala in open places and by the road sides. Local people use the stems as ropes for grass or firewood bundles.

Merrill (Enum. Phil. Fl. Pl. 2 : 35) has restored Linne's *S. retusa* to specific rank ; Blatter on the other hand finds the different varieties of *S. rhombifolia* so variable that he has made them all forms of the same species. My findings in Khandala agree with those of Blatter ; I have, however, retained the plants as varieties (and not merely as forms) in deference to authority.

Local name : Chikankara.

Graham ; Blatt. Herb. 18263 ! 18284 ! *Santapau* 811 ! 1021 ! 2593 !

Kydia Roxb.

Kydia calycina Roxb., Hort. Beng. 51, 1814 & Pl. Cor. 3 : 12, t. 215, 1819 ; FBI. 1 : 348 ; Gr. 20 ; C. 1 : 94 ; N. 33 ; Talb. 1 : 127, t. 78 ; Blatter, 629.

A common tree all over the district ; when in bloom, its white masses of flowers and the many insects around it, make this tree a showy one in Khandala. Leaves fall off during the hot season ; fruits or their remains persist to the beginning of the monsoon.

Local name : Warang or Warengi.

Flowers.—October to January. *Fruits.*—November to May.

Gammie 16130 (in Herb. Econ. Bot.) ! *Blatt. Herb.* 18490 ! 18491 ! 28047 ! 28180 ! 28344 ! 28345 ! 29343 ! *Santapau* 65/28 ! 1163 ! 1300 ! 1488 ! 2974 ! 5251 ! 5485 ! 5804 ! 8050 !

Abutilon Linn.

Abutilon polyandrum (Roxb.) Wight & Arn., Prodr. 55, 1834; Gr. 15 · FBI. 1 : 325 ; C. 1 : 95 ; Blatter 629 ; N. 28.

Sida polyandra Roxb., Hort. Beng. 50, 1814, & Fl. Ind. 3 : 173, 1832.

Sida persica Burm. f., Fl. Ind. t. 47, f. 1, 1768 !

Fairly common and often gregarious; one of the brightest flowers in Khandala. The plant would be worth cultivating in gardens, except for the spreading habit of its branches.

Flowers.—November to March. *Fruits.*—December to March.

Graham; Cooke, 19.1.1892 (in Herb. Econ. Bot.)! *Blatter. Herb.* 18347! 18348! *Hallberg* in MS. catalogue; *McCann*; *Santapau* 65/30! 65/31! 1326! 1724! 3264(2)! 3830(2)! 3872!

URENA Linn.

Urena lobata Linn., Sp. Pl. 692, 1753; FBI. 1: 329 (excl. *U. palmata*); C. 1: 100; Hochreut. in Ann. Cons. Jard. Bot. Genève 5: 134; Merrill, Enum. Phil. Fl. Pl. 3: 36; N. 29.

U. sinuata Linn., Sp. Pl. 692, 1753; FBI. & C. ll. cc.; Gr. 13; Blatter 34: 631.

I have followed Hochreutiner and Merrill in uniting Linne's two species under *U. lobata*. The distinction between the two species on the ground of the leaf structure cannot be maintained. Some plants have all their leaves deeply lobed, others have them more or less shallowly lobed, and yet others have their upper leaves not lobed at all whilst their lower ones are more or less deeply lobed, with a gradual passing from the unlobed upper to the deeply lobed lower leaves. The structure and colour of flowers, fruits, etc., is uniform and indistinguishable in the two species. In Khandala the lobing of the leaves seems to be a matter of age or position of the leaves on the stem.

Common after the rains, and in moist places even during part of the hot season. A poor looking plant. Local people make use of the stem fibres as ropes for grass or firewood bundles.

Flowers and *Fruits.*—October to March.

Graham; Gammie 15468! *Blatt. Herb.* 17909! 18348! 18382! 18383! *Blatter* and *McCann, ex* Blatter in Revision; *Santapau* 65/26, 29! 1134! 1245! 1736! 2892! 4949! 4950! 4951! 5374!

HIBISCUS Linn.

Hibiscus hirtus Linn., Sp. Pl. 694, 1753; FBI. 1: 335; Gr. 14; Whight, Icon. t. 41; D. & G. 20; Hochreutin. in Ann. Cons. Jard. Bot. Genève 1: 86; C. 1: 106; Talb. 4: 122, t. 73; Blatter 632; N. 30.

Common in flower or in fruit throughout the year except during the rainy season; generally it occurs on the edges of the forest or in clearings or by paths in dense forest; but it is not a gregarious plant.

The flowers look beautiful but the plant as a whole is a poor sight. A very fibrous plant, but on account of its relative scarcity no use is made of the fibres by local people.

Local name: Nareri.

Flowers and *Fruits*.—October to June.

Woodrow ! *Cooke*, 19.1.1892 ! *Blatt. Herb.* 18409 ! 18410 ! 28237 ! *Sedgwick* 7972 ! 7974 ! *McCann* 4326 ! *Hallberg* in MS. catalogue ; *Santapau* 65/25, 32 ! 1157 ! 1161 ! 1306 ! 3340 ! 6025 ! 9047 !

Hibiscus micranthus Linn. f., Suppl 308, 1781 ; FBI. 1 : 335 ; D. & G. 20 ; C. 1 : 107 ; Blatter 632 ; N. 30.

A rare plant in Khandala ; in Blatt. Herb. there is only one specimen from Khandala ; I have not seen the plant growing in the district.

Hallberg ex MS. catalogue ; *Blatter ex* Revision, loc. cit. ; *Blatt. Herb.* 28327 !

Hibiscus rosa-sinensis Linn., Sp. Pl. 694, 1753 ; FBI. 1 : 344 ; Bot. Mag. t. 158 ; Gr. 13 ; C. 1 : 113 ; Blatter 634.

Introduced probably from China and cultivated in Indian gardens, where it flowers most of the year. According to Blatter, no fruits are produced in India ; I have seen no fruits, although I have kept several of these plants under observation for a number of years. Generally the colour of the flowers is red ; other colours, pink, yellow or pale creamy yellow, occur, but have not been seen in Khandala.

Blatt. Herb. 18473 ! *Blatter* in MS. catalogue ; *Santapau* in gardens !

Hibiscus schizopetalus Hook. f. in Bot. Mag., t. 6524.

H. mutabilis Blatt. loc. cit. 34 : 634, 1930 (non Linn.).

In Khandala I have seen the plant cultivated in gardens for the last eight years. There are several good plants in St. Mary's Villa, and in the gardens near the Hindu temple on the South side of the village tank. The flowers are either pure red or more often red streaked with white or creamy lines. The plant does not seem to fruit in India.

Santapau 9584 !

Abelmoschus Medik.

Abelmoschus manihot (Linn.) Medik., Malv. Fam. 46, 1787 ; Hochreut. in Candollea 2 : 87, 1924.

Hibiscus manihot Linn., Sp. Pl. 696, 1753 ; Hochreut. in Ann. Cons. Jard. Bot. Genève, 4 : 153, 1900 ; Blatter 633.

H. tetraphyllus Roxb., Hort. Beng. 52, 1814, & Fl. Ind. 3 : 211, 1832 ; FBI. 1 : 341 ; C. 1 : 111 ; Talb. 1 : 123, t. 74 ; N. 31.

Abelmoschus tetraphyllus Graham, Cat. 14, 1839 ; D. & G. 19.

Shrubby, erect, up to 1m. high, sometimes higher.

Involucral bracts generally longer than the calyx. Roxburgh named his plant *H. tetraphyllus* on account of the four bracts of the epicalyx ; for a few years I have been searching in Khandala and elsewhere for a plant with only four bracts, but only on very rare occasions did I see any flower with four bracts, their number being generally 5, occasionally 3 or 6, and very rarely 4.

Hochreutiner distinguishes three varieties of *H. manihot*: *genuinus*, *tetraphyllus* and *pungens*; I cannot assign my Khandala plants to any of these varieties, as my plants seem to be intermediate between the first two varieties.

Tolerably common in Khandala, but not gregarious.

Local name: Ran Bhendi.

Flowers and *Fruits*.—October to December.

Blatt. Herb. 18452 ! 18466 ! 18463 ! 18462 ! *McCann* 28087 ! *Santapau* 1132 ! 2859 ! 5107 !

Abelmoschus esculentus (Linn.) Moench., Meth. 617, 1794; Gr. 14; Schumann in Pfam. 3(6): 48, t. 20K.

Hibiscus esculentus Linn., Sp. Pl. 696, 1753; FBI. 1: 343; C. 1: 112; Blatter, loc. cit.

Blatter mentions the occurrence of this plant in his MS. catalogue. I have not seen it growing in the district, although the fruits are sold in the local market as a vegetable. The plant is obviously cultivated in the district, but in what particular part I am unable to say.

Local name: Bhendi.

Blatter in MS. catalogue: " Cultivated as a vegetable ".

THESPESIA Soland.

Thespesia populnea (Linn.) Soland. *ex* Corr., in Ann. Mus. Par. 9: 290, 1807; FBI. 1: 345; Gr. 15; C. 1: 114; Blatter 635; Blatter & Millard, Beautif. Ind. Tr. 106; Kerr, in KB. 1941: 18.

Hibiscus populneus Linn., Sp. Pl. 694, 1753.

Ipomoea campanulata Linn., Sp. Pl. 160, 1753 (non FBI., nec Cooke nec. alior. auct. ante Kerr, 1941).

A fairly large tree planted along the main road from Khandala to St. Xavier's Villa. I have not seen it anywhere in the jungle.

Flowers when young are pale yellow or sulphur yellow with a large deep-purple spot inside the corolla near its base; when the flowers begin to fade, they turn pinkish red, the purple spot inside becoming almost black.

Local name: Bhendi.

Thespesia lampas (Cav.) Dalz. & Gibs., Bomb. Fl. 19, 1861; FBI. 1: 345; Talb. 1: 124, t. 75; Hutch., Sil. & Steph., Evol. Gossyp. 6; N. 32.

Hibiscus Lampas Cav., Diss. 3: 154, t. 56, f. 2, 1787; Gr. 13; Wight, Icon. t. 5; Hochreut. in Ann. Cons. Jard. Bot Genève 4: 57; Blatter 634.

Shrubby, erect, up to 3 m. high, generally about 1·5-2 m. The whole plant when young is densely covered with simple and compound hairs which, however, fall off in the mature plant; branching sparse, occasionally profuse, the branches spreading and long.

This is a very common plant all over the district; it is especially common on the slopes of Monkey Hill or of Battery Hill, among grasses. The size and colour of the flowers render the plant very conspicuous. The bark is used by hill people to make rough cordage to tie bundles of firewood for the market.

Local name : Ran Bhendi.

Flowers.—September to November. *Fruits.*—September to January, and occasionally till May.

Cooke; *Blatter* in Revision; *Blatt. Herb.* 18476 ! 18477 ! 18478 ! *Santapau* 65/15 ! 1058(2) ! 1239 ! 2219 ! 8904 !

BOMBACACEAE.

Salmalia Schott & Endl.

Salmalia malabarica (DC.) Schott & Endl., Melet. 35, 1832.

Bombax malabaricum DC., Prodr. 1 : 479, 1824 ; FBI. 1 : 349 ; Gr. 16 ; C. 1 : 120 ; Talb. 1 : 130, tt. 79-80 ; Blatter & Millard, Beaut. Ind. Tr. 9 ; N. 33.

Fairly common in Khandala, but scarcely as common as the following species. Locally the wood is used for firewood ; commercially the cotton of the fruit is collected for stuffing pillows and mattresses ; the wood is used in the manufacture of matchsticks. Of late years there has been extensive cutting of these trees for the match industry ; in time this may lead to the total extermination of the tree from Khandala.

When the tree is in full bloom, it is visited by a number of birds in search of the abundant nectar produced by the flowers.

Local name : Saur.

Flowers.—February to March. *Fruits.*—March to April.

Blatt. Herb. 18502 ! *McCann* 4319 ! *Santapau* 1700 ! 6079 ! 8630 ! 10757 !

Salmalia insignis (Wall.) Schott & Endl., Melet. 35, 1832.

Bombax insigne Wall., Pl. As. Rar. 1 : 71, 1830 ; FBI. 1 : 349 ; C. 1 : 120 ; Blatter, 637 ; Blatter & Millard, 13.

Corolla very prominent, petals up to 16·5 × 3·5 cms., tomentose outside. The colour varies between very pale pink to deep red, but generally is much paler than in the preceding species.

Stamens between 450 and 500. Filaments at first pale, almost white, becoming brick red on drying up ; in length up to 10 cms. Anthers small, at first yellow, at length purplish. Style about the same colour as the filaments, but tinged reddish pink in the upper third, 2 cms. longer than the massed filaments. Stigma 5-lobed, inconspicuous.

This is much more common than *S. malabarica*; at the time of the dehiscence of the fruit, masses of cotton covering the seeds are common on the floor of the forest. It is impossible or nearly so to distinguish this species from *S. malabarica* when both trees are in leaf; *S. insignis* comes into flower and fruit several months earlier, the size of its flowers is much larger and the colour much paler, the number of stamens about 8 times larger, the size of the fruit is also much bigger. When in flower or fruit, the identity of the Salmalias of Khandala is quite clear.

Locally the tree is only used for fuel; commercially it is used for matchsticks.

Local name: Saur.

Flowers.—November to January. *Fruits.*—December to April.

Blatt. Herb. 18505 ! *Santapau* 1258 ! 1259 ! 1470 ! 1713 ! 2112 ! 10655 !

STERCULIACEAE.

Sterculia Linn.

Sterculia urens Roxb., Pl. Cor. 1 : 25, t. 24, 1795; FBI. 1 : 355; C. 1 : 123; Talb. 1 : 137, t. 83; Blatter 878; N. 34.

After leaf fall the trunk and branches appear white, the bark peeling off in large irregular patches; this gives the tree a patchy appearance. The wood is mucilaginous and when an incision is made on the wood the mucilage comes out and solidifies into a colourless gum, which is used locally as an article of food; in the rainy season this gum easely decomposes with an unpleasant odour. For the rest this tree is only used for fuel.

Not a common tree in Khandala, except at the foot of Behran's Plateau, on the narrow ledge between the railway line and St. Mary's Ravine, and on the slopes below Elphinstone Point.

Local name: Kaundal.

Flowers.—November to March. *Fruits.*—January to May.

Blatt. Herb. 2464 ! *Santapau* 67/13 ! 8997 ! 8998 !

Sterculia villosa Roxb., Hort. Beng. 50 & Fl. Ind. 3 : 153, 1832; Gr. 19; FBI. 1 : 355; C. 1 : 124; Blatter 878.

Leaves on young seedlings of very large proportions, up to 60 cms. diam., with a petiole 75 cms. long. A rare tree in Khandala.

Flowers.—December 1942. *Fruits.*—Not seen.

Blatter Herb. 17426 ! *Santapau* Dec. 1942 ! Oct. 1949.

Sterculia guttata Roxb., Hort. Beng. 50, 1814, & Fl. Ind. 3 : 148, 1832; FBI. 1 : 355; Gr. 17; Wight, Icon. t. 487; C. 1 : 124; Talb. 1 : 139, t. 84; G. 106; N. 34.

The seeds of this tree are eaten by monkeys, but until dehiscence they are difficult to get at on account of the thick, fibrous pericarp. A common tree in Khandala, flowering and fruiting abundantly. A short branch collected on Battery Hill on 21 December 1943 had 21 follicles with a total weight of 5 kilograms (follicles only). The seeds are occasionally eaten raw or roasted by local people.

Local name : Kukrul or Kukar.

Flowers.—November to March. *Fruits*.—December onwards, persisting for a year or more on the tree.

Blatt. Herb. 6386 ! 28435 ! *Hallberg* in MS. Catalogue ; *McCann* 4306-4309 ! *Santapau* 67/2, 4, 24 ! 1477 ! 1502 ! 3096 ! 3303 ! 3304 ! 3342(2) ! 3432—3433 !

ERYTHROPSIS Lindl.

Erythropsis colorata (Roxb.) Burkill, in Gard. Bull. Straits Settl. 5 : 231, 1931 ; Ridley in Kew Bull. 1934 : 214—217.

Sterculia colorata Roxb., Pl. Cor. 1 : 26, t. 25, 1795 ; FBI. 1 : 359; Gr. 17 ; C. 1 : 125 ; Talb. 1 : 140 , tt. 85-86 ; Blatt. & Millard, 102 ; N. 35.

Firmiana colorata R. Br. in Benn., Pl. Jav. Rar. 235, 1844 ; G. 107 ; Blatter, 79.

During the flowering and fruiting season, and when the leaves first appear, this is one of the more colourful trees in Khandala ; the wood is soft, and is only used for fuel. Common, though not abundant, in the district ; the best specimens are to be found on Monkey Hill Plateau.

Local name : Kausi.

Flowers and *fruits*.—March to May.

Blatter in Revis. ; *Blatt. Herb.* 6349 ! 6350 ! *McCann* 3698 ! *Santapau* 67/16 ! 514 ! 1950 ! 1964 ! 1965 ! 3904 ! 4016 ! 4017 ! 4280 ! 8729 ! 8730 ! 8819 ! 8820 ! 8943—8946 !

PTERYGOTA Schott & Endl.

Pterygota alata (Roxb.) R. Br. in Benn., Pl. Jav. Rar. 234, 1844 ; G. 104 ; Blatter 879.

Sterculia alata Roxb., Hort. Beng. 50, 1814, & Pl. Cor. 3 : 84, t. 287, 1819 ; FBI. 1 : 360 ; C. 1 : 125.

Cooke seems to be the only author to mention the occurrence of this plant in Khandala ; Blatter in his Revision follows Cooke, but adds no further details. I have not seen the plant in Khandala ; there are no specimens from this place in any of the Herbaria I have consulted.

Cooke ; *Blatter* " Planted at Khandala and Poona ".

PTEROCYMBIUM R. Br.

Pterocymbium tinctorium (Blanco) Merrill, in Gov. Lab. Publ. (Philip.) 27 : 24, 1905 ;

Heritiera tinctoria Blanco, Fl. Filip. 653, 1837.

Sterculia campanulata Wall., *ex* Masters, in FBI. 1 : 362, 1874 ; C. 1 : 126 ; Blatter 878.

A large tree cultivated in the grounds of Khandala Hotel, the only specimen in the district. In March 1942 the ground beneath the tree was covered with flowers. In May 1944 Mr. Nanaboy, the owner of the Hotel, kindly presented me with some of the fruits which he had collected some time previously ; the seeds seem to remain alive for a very short period once they are separated from the parent tree. It is not a particularly fine tree.

Flowers.—March 1942. *Fruits.*—May 1944.

Cookè ; Blatter in Revision ; *Santapau* March 1942, May 1944.

HELICTERES Linn.

Helicteres isora Linn., Sp. Pl. 963, 1753 ; FBI. 1 : 365 ; Gr. 16 ; Wight, Icon. t. 180 ; D. & G. 22 ; C. 1 : 138 ; Talb. 1 : 146, t. 89 ; G. 197 ; Blatter 879 ; N. 35.

The colour of the flowers and the structure of the fruit render this a conspicuous plant. Common in Khandala in the undergrowth on the slopes below Duke's Nose. No practical use is made of the stem or fruits.

Local name : Murdi.

Flowers.—August to November. *Fruits.*—September to June.

Blatter in Revision ; *Blatt. Herb.* 6340 ! 6344 ! 27584 ! 28476 ! *Santapau* 67/18 ! 1331 ! 1536 ! 1752 ! 2890 ! 2891 ! 3355 ! 4285 ! 5164 ! 5829 ! 5830 !

ERIOLAENA DC.

Eriolaena quinquelocularis Wight, Icon. 3 : 7, 1847 ; FBI. 1 : 371 ; C. 1 : 132 ; Talb. 1 : 115, tt. 92-93 ; G. 110 ; Blatter 881.

Common and somewhat gregarious on the higher parts of the district ; especially common on the upper plateau of Bhoma and Ghira Hills ; lower down it is not common. Except perhaps when the new leaves are on, the tree is a poor sight even when in flower ; at the best of times it looks bare and rugged.

Local name : Buti.

Flowers.—May to June. *Fruits.*—June to August, but persisting for a year or more before dehiscence.

Woodrow ; *Blatt. Herb.* 6318 ! 6382 ! 27634 ! *Sedgwick* 7934 ! *Santapau* 67/17 ! 440 ! 533 ! 807 ! 4492 ! 8897 !

PTEROSPERMUM Schreb.

Pterospermum acerifolium Willd., Sp. Pl. 3 : 729, 1801 ; FBI. 1 : 368 ; C. 1 : 129 ; Talb. 1 : 149 ; Blatter 880.

There is but one tree in a garden near St. Mary's Villa ; I have kept the tree under observation for a number of years. It is a small tree with large leaves and large, white flowers. Flowers and fruits : from November onwards till the beginning of the monsoon.

Santapau 9580-9583 !

MELOCHIA Linn.

Melochia umbellata (Houtt.) Stapf in Kew Bull. 1913 : 317 ; G. 110 ; Blatter 883.

Visenia umbellata Houtt., Handl. 8 : 309, t. 46, f. 3, 1777 ; Wight, Icon. t. 509.

Melochia velutina Wall., ex-Bedd., For. Man. in Fl. Sylv. xxxv, t. 5, f. 3, 1871 ; FBI. 1 : 374 ; C. 1 : 135 ; N. 36.

Riedleia tiliaefolia DC., Prodr. 1 : 491, 1824 ; Gr. 19 ; D. & G. 24.

Blatter mentions in his MS. catalogue that this plant flowers in November. I have not seen the plant in Khandala. Graham, loc. cit., adds that it grows on " the hill above Sir Herbert Compton's Bungalow at Kandalla " ; there is no record of such a bungalow even in the Collector's Office, Poona ; but from information gathered from Mr. Nanaboy, it seems probable that the bungalow occupied the present side of the Khandala Hotel, and that the slopes mentioned by Graham are the lower slopes below Forbay.

Graham ; *Blatter* in MS. catalogue.

WALTHERIA Linn.

Waltheria indica Linn., Sp. Pl. 673, 1753 ; FBI. 1 : 374 ; Gr. 246 ; C. 1 : 135 ; G. 111 ; N. 36.

W. americana Linn., Sp. Pl. 673, 1753 ; Merrill, Enum. Phil. Fl. Pl. 3 : 47 & Pl. Life Pac. World 140.

A rare plant in Khandala ; I have not seen it in the district. There is but one specimen in Blatter Herbarium.

Blatter in his Revision places this plant among the *Bombacaceae*, but gives no explanation for the change ; all the authorities consulted place *Waltheria* among the *Sterculiaceae*.

Blatter 28332 !

TILIACEAE.

GREWIA Linn.

Grewia tiliaefolia Vahl, Symb. Bot. 1 : 35, 1790 ; FBI. 1 : 386 *pro parte* ; Gr. 21 ; Wight & Arn., Prodr. 80 ; C. 1 : 141 ; Talb. 1 : 160, t. 98 ; Burret in Notizbl. Bot. Gart. Berlin 9 : 659 ; Blatter 887 ; N. 37.

Microcos lateriflora Linn., Sp. Pl. 514, 1753 (non *Grewia lateriflora* G. Don, 1831).

Grewia arborea Roxb., ex Rottl. in Neue Schr. Ges. Nat. Freund. 4 : 205, 1803 ; Roth, Nov. Pl. Sp. 247.

A small erect tree, 4-6 m. high ; on one occasion I measured a specimen on Meroli Plateau reaching 18 m. high.

Very common in Khandala, especially in deciduous forests and on open plateaus ; particularly common in the slopes above Forbay. The tree as stated above may reach large sizes in dense forests.

Local name : Dhaman.

Flowers.—March to June. *Fruits.*—April to August.

Blatt. Herb. 6172 ! 6169 ! 6171 ! 6154 ! 6155 ! 6159 ! 6168 ! 6163 ! *McCann* 4342 ! 4340 ! 4341 ! *Santapau* 64/4-6, 12, 13, 33 ! 4182 ! 8930 ! 9153 !

Grewia disperma Rottl. ex Spreng., Syst. 2 : 579, 1825 ; Burret, loc. cit. 681 ; G. 118 ; Haines, Fl. Bih. & Or. 91 ; Drummond, MS. in Kew Herb.

Grewia laevigata auctor. plur. (non Vahl) ; FBI. 1 : 389 ; C. 1 : 143 ; Talb. 1 : 164, t. 101 ; Blatter 888.

A common tree in Khandala ; in deciduous forests or on open plateaus.

Many authors have identified the Indian tree with *G. laevigata* Vahl, but as far as Khandala is concerned, I have seen no specimen of the true *G. laevigata* Vahl. Many specimens so labelled in Blatt. Herb. belong to *G. disperma* Rottl. The differences between these two species are small but quite clear : *G. laevigata* has leaves with rounded, eglandular bases, whilst *G. disperma* has leaves with rounded bases and with several glands on either side. Vahl in his description in Symb., loc. cit., positively states that his plant has no glands at the base of the leaf, and he uses this point as one of the specific differences. In my treatment, I have followed Drummon in Kew Herb., who has revised most of the sheets of the genus at Kew. According to this author, *G. laevigata* Vahl seems to be a rare tree in India.

Flowers.—September to November. *Fruits.*—October to March.

Blatt. Herb. 28064 ! 27531 ! 27582 ! 28057 ! 28227 ! 28238 ! *Santapau* 64/15 ! 25 ! 29 ! 1111 ! 1131 ! 1257 ! 2914 ! 2942 ! 3192 ! 4987-4989 ! 5219 ! 5220 ! 5925 ! 5926 ! 6064 ! 6065 !

Grewia abutifolia Vent., ex Juss. in Ann. Muss. Par. 4 : 92, 1804 ; FBI. 1 : 390 *pro parte* ; Burret, loc. cit. 723 ; C. 1 : 144 ; Talb. 1 : 165 ; t. 102.

Grewia aspera Roxb., Hort. Beng. 42, 1814 & Fl. Ind. 2 : 591, 1832 ; G. 119 ; Blatter 888.

Not common in Khandala ; a few good specimens have been kept under observation for several years on Monkey Hill and Battery Hill Plateaus. Generally it occurs at the edges of the forest.

Flowers.—March to August. *Fruits.*—June to December.

Blatt. Herb. 27508 ! 27413 ! *Santapau* 2200 ! 2985 ! 3099 ! 3328 ! 4265 ! 4629 ! 9094 ! 9095 !

ERINOCARPUS Nimmo.

Erinocarpus nimmonii Graham, Cat. 21, 1839; D. & G. 27; C. 1: 146; Talb. 1: 168, tt. 104-105; Blatter 889; Burret, loc. cit. 861.

E. Nimmoanus Masters in FBI. 1: 394, 1874; N. 38.

Small to middle-sized tree; erect, very conspicuous when in flower or in fruit. Leaves deciduous, large.

On October 18, 1944 I found a tree on the slopes of Patanmal Plateau with fruits only occasionally triquetrous, most fruits having only two wings and being in consequence flat; the central portion of the 2-winged fruit was clearly purple in colour and bulged noticeably on account of the seeds enclosed.

A common tree in Khandala; it is particularly abundant on the plateau below Echo Point or about the stream passing through Kune Plateau. The tree seems to be endemic on the Western Ghauts.

Local name: Cher.

Flowers.—August to November, exceptionally on 30th April 1943. *Fruits.*—September to next flowering season.

Graham; *Woodrow*; *Meebold* 9094 ! *Blatt. Herb.* 6392 ! 18741 ! 28464 ! 28935 ! 28235 ! *Acland* 114 ! *Santapau* 64/5, 17 ! 906 ! 4962 !

TRIUMFETTA Linn.

Triumfetta pilosa Roth, Nov. Pl. Sp. 223, 1821; FBI. 1: 394; C. 1: 174; G. 120; N. 38.

T. cana Blume, Bijdr. 113, 1825; FBI. 1: 396.

T. tomentosa Noronha, in Verh. Batav. Gen. 5: ed. 1, Act. 4: 27, 1790; Blatter 889.

The name *T. tomentosa* Noronha is a 'nomen nudum', as it was published without any description or plates or without any reference to a previous description. The name, therefore, has no value from the point of view of nomenclature; the oldest valid name is that of Roth.

A rare plant in Khandala; I have not seen any living specimen, and in the herbarium the only sheets examined are those mentioned below. The leaves are much more hairy than those of *T. annua* Linn., and the fruits are covered with hairy spines, the fruits being as large as or slightly larger than those of *T. annua* L.

Blatter and McCann in Revision; *Blatt. Herb.* 6285 ! 6288 !

Triumfetta bartramia Linn., Syst. (ed. 10) 1044, 1759; Roxb., Fl. Ind. 2: 463; Fawcett & Rendle, in Journ. Bot. 59: 224; Blatter 890.

Bartramia indica Linn., Sp. Pl. 389, 1753.

Triumfetta rhomboidea Jacq., Enum. Pl. Carib. 22, 1760; id. in Select. Stirp. Amer. Hist. 147, t. 70, 1763; FBI. 1: 395; C. 1: 147; G. 120; N. 38.

A very common shrub in the undergrowth of the forest, especially in St. Xavier's Ravine, particularly just below St. Xavier's Villa. Gregarious and persisting in fruit and occasionally in flower for the greater part of the year. The structure and size of the fruit and the shape of the leaves are characteristic. Locally the stems and branches are used to tie firewood or grass bundles for the market.

Flowers.—September to January, occasionally to April. *Fruits.*—September to May.

Blatter in Revision ; *Blatt. Herb.* 6252 ! 6269 ! *McCann* 4356 ! *Santapau* 64/26-28 ! 1055 ! 1186 ! 2944 ! 3061 !

Triumfetta annua Linn., Mant. 1 : 73, 1767 ; FBI. 1 : 396 ; G. 120 ; Blatter 890.

A common plant in Khandala, especially on Battery Hill Plateau and in the undergrowth of St. Xavier's Ravine. The structure of the fruit and its spines distinguish this species from all other species of *Triumfetta* in Western India. The plant is not mentioned in Cooke's Flora.

Flowers.—October to November. *Fruits.*—October to December.

Blatt. Herb. 6285 ! 28199 ! 28270 ! *Santapau* 64/26 ! 1185 ! 2906 ! 2971 ! 5108 ! 8643 !

Corchorus Linn.

Corchorus capsularis Linn., Sp. Pl. 529, 1753 ; FBI. 1 : 397 ; Gr. 246 ; D. & G. 25 ; C. 1 : 148 ; Blatter 891.

A rare plant in Khandala ; the only specimens from the district which I have examined being those mentioned below ; the plant is common lower down on the Konkan plains and in Bombay Island.

Blatt. Herb. 28335 !

Corchorus fascicularis Lamk., Encycl. 2 : 104, 1786 ; FBI. 1 : 398 ; C. 1 : 149 ; Blatter loc. cit.

Erect, suberect or prostrate ; leaves acute or subacute, serrate, the lower serratures not produced into filiform appendages. Flowers small, pale yellow.

A rare plant in Khandala ; on the banks of the village tank it grows with its branches closely appressed to the ground, but not rooting at the nodes.

Flowers.—October to November. *Fruits.*—October to January.

Santapau 5272 ! 5910 ! 8122 !

Corchorus aestuans Linn., Syst. (ed. 10) 1079, 1759 (non Forsk.) ; Fawcett & Rendle in Journ. Bot. 59 : 225 ; Blatter 892.

C. acutangulus Lamk., Encycl. 2 ; 104, 1786 ; FBI. 1 : 398 ; Gr. 20 ; D. & G. 25 ; C. 1 : 150.

A rare plant in Khandala ; I have only seen one specimen from the district. The plant is fairly common down on the Konkan, and the fact that it was found in Khandala along the main road points out the way along which it was probably introduced into the district.

Santapau 2999 ! In fruit on 22nd October 1943.

Corchorus olitorius Linn., Sp. Pl. 529, 1753 ; FBI. 1 : 297 ; Gr. 20 ; D. & G. 25 ; C. 1 : 149 ; Blatter 891 ; Merrill, Plant Life Pac. World 140, t. 151.

Erect, shrubby plant, up to about 1 m. high ; stems very fibrous. Leaves up to 12×4 cms., serrate, the last serrature on either side of the base produced into a filiform appendage up to 10 mm. long ; petioles up to 4·5 cms. long. Flowers yellow.

Rare in Khandala.

Santapau 2637 ! 2638 ! In flower and fruit on 4 September 1943.

ELAEOCARPACEAE.

Elaeocarpus Linn.

Elaeocarpus sphaericus (Gaertn.) Schumann in Engl. & Prant., Pfam. 3(6) : 5, 1895.

Ganitrus sphaerica Gaertn., Fruct. 2 : 271, t. 139, 1791.

Elaeocarpus Ganitrus Roxb., Hort. Beng. 42, 1814 & Fl. Ind. 2 : 592, 1832 ; FBI. 1 : 400 ; Gr. 22 ; D. & G. 27 ; C. 1 : 151 ; Talb. 1 : 170 ; Blatter 892.

According to Cooke, this tree occurs on the Western Ghauts, but is not common ; Blatter adds that the presence of this species on the Western Ghauts can scarcely be doubted, but judging from its distribution one is allowed to conclude that it is not indigenous in the Presidency.

There are no specimens of this tree in Blatter Herb.; Blatter's reference to it in his MS. catalogue is my only authority for the inclusion of this tree.

Blatter in MS. catalogue.

LINACEAE.

Linum Linn.

Linum usitatissimum Linn., Sp. Pl. 277, 1753 ; FBI. 1 : 410 ; Gr. 34 ; Reiche in Pfam. (ed. 1) 3(4) : 28, t. 25 E, J, K, N ; Winkler in eod. op. (ed. 2) 19 A : 87, t. 43, & 89, t. 44.

The only place in Khandala where this plant has been seen growing is the railway station and some ditches near it. This clearly shows how the plant has been introduced into the district. I have not seen it in cultivation in Khandala. Flowers are blue, fruits spherical.

Lately, 24th March 1949, I collected a number of specimens from a ditch near the station along the railway line ; there the plant was growing abundantly in a large, dense patch, individual plants reaching 50 cms. high ; branching was very rare.

Flowers.—January 1945 and May 1949. *Fruits.*—February 1945 and May 1949.

Blatter Herb. 29612 ! 28562 ! *Santapau* 5865 ! 5866 ! 5867 ! 6040 ! 10006-10008 !

Linum mysorense Heyne in Wall., Cat. 1507, 1820 ; Wight & Arn., Prodr. 134, 1834 ; FBI. 1 : 411 ; Gr. 33 ; D. & G. 16 ; C. 1 : 155 ; Winkler, loc. cit. 114.

Annual herb, up to 47 cms. high. Stem erect, slender, at first covered with leaves from near the ground up to its apex, soon becoming leafless in the lower part. In Khandala I have observed the following types of plants : (*a*) Erect, unbranched stem, more or less extensively branched only in the upper quarter of the plant. (*b*) Branching extensive from near the ground only, each branch erect and similar in structure to the main stem and about equally long as the main stem. (*c*) Plants extensively branched from near the ground and all along the stem ; this type of branching is very rare in Khandala. In types (*a*) and (*b*) and occasionally in (*c*), the branches form a sort of corymb reaching as high as the main stem.

Very common and abundant in grass fields where grass is short ; also common in cultivated fields. Often this plant occurs in almost pure stands in cultivated fields and elsewhere. A pretty plant.

Flowers.—September to December. *Fruits.*—October to December.

Graham ; *Blatter* in MS catalogue ; *Santapau* 1017 ! 1120 ! 2557 ! 2749 ! 2814 ! 3038 ! 3476 ! 4997 ! 5025 ! 5199 ! 5211 ! 5414 ! 5915 !

REINWARDTIA Dumort.

Reinwardtia trigyna (Roxb.) Planch. in Hook. Lond. Journ. Bot, 7 : 522, 1848 ; FBI. 1 : 412 ; C. 1 : 155.

Linum trigynum Roxb. in As. Res. 6 : 357 ; Smith, Exot. Bot. 1 : t. 17 ; Bot. Mag. t. 1100 ; Gr. 34.

This plant was collected in flower in Convalescent Home on Jan. 28, 1951 ; it was growing near the garden, but obviously as an escape.

Santapau 12184 !

MALPIGHIACEAE.

HIPTAGE Gaertn.

Hiptage benghalensis (Linn.) Kurz in Journ. As. Soc. Beng. 14: 36, 1879; Blatter 34: 893.

Banisteria benghalensis Linn., Sp. Pl. 427, 1753.

Hiptage madablota Gaertn., Fruct. 2: 169, t. 116, 1791; FBI. 1: 418; Gr. 28; C. 1: 157; Talb. 1: 178, t. 110.

Common on Kune Plateau where it climbs over small trees; common also along the stream bed that runs along the lower portion of St. Xavier's Ravine. I have not been able to discover any scent in the flowers.

Local name: Kaori.

Flowers.—January to March. *Fruits.*—March to May.

Blatter in Revision; *Blatt. Herb.* 17813! 17814! 28056! *McCann* 4332! 4333! 4334! *Santapau* 77/1, 2! 173! 194! 1661! 1662! 1663! 3607-3610! 3793! 4441! 4441! 6053! 6116! 6117!

ASPIDOPTERIS Juss.

Aspidopteris indica (Roxb.) Hochreut. in Bull. Inst. Buitenz. 19: 45, 1904; Hutchinson in Kew Bull. 1917: 96.

Triopteris indica Roxb., Pl. Cor. 2: 32, t. 160, 1798.

Aspidopteris roxburghiana A. Juss. in Ann. Sci. Nat. (ser. 2) 13: 267, 1840; FBI. 1: 420 (excl. vars. et syn. A. Juss.); D. & G. 33; C. 1: 158.

It is with great hesitation that I include this plant. Dalzell and Gibson in their Bombay Flora, and Blatter in his MS. catalogue assert that this plant is to be found in Khandala. Of the three species into which Jussieu's plant has been split, "there is some likelihood that *A. indica* may occur in the Bombay Presidency" (Blatter in Journ. Bomb. Nat. Hist. Soc. 34: 894, 1931). There are no specimens from Khandala in any of the herbaria examined.

D. & G.; *Blatter* in MS. catalogue.

Aspidopteris cordata (Heyne) A. Juss. in Ann. Sc. Nat. (ser. 2) 13: 267, 1840; FBI. 1: 421; D. & G. 34; C. 1: 158; Blatter 894.

Hiraea cordata Heyne in Wall., Cat. 1060, 1829; Wight & Arn., Prodr. 108, 1834.

Common on Battery Hill Plateau, rare elsewhere in the district. The fruit appears in large bunches and remains on the parent plant even when the whole plant seems to be dry.

Flowers.—September to October. *Fruits.*—October to February.

Blatt. Herb. 27589! 28021! 28365! *Santapau* 1249! 1344! 2642-2645! 2885-2889! 2958! 2959! 3056! 3102! 4896! 5087-6092! 7426! 7427! 8685!

OXALIDACEAE.

Oxalis Linn.

Oxalis corniculata Linn., Sp. Pl. 435, 1753; FBI. 1: 436; Wight, Icon. t. 18; C. 1: 167.

O. monadelpha Roxb., ex Wight & Arn., Prodr. 142, 1834.

A common herb in moist places; particularly common on damp walls near Forbay. The leaves are sometimes eaten by local people, they are pleasantly acid and refreshing.

Flowers and fruits.—January to August.

Halberg in MS. catalogue; *Blatt. Herb.* 27951 ! 29685 ! *McCann* 4365 ! *Santapau* 3737-3741 ! 3853 ! 4148 ! 4149 ! 4365 ! 8609 !

Oxalis sp., prope **O. latifolia** H.B.K., Nov. Gen. & Sp. Pl. 5: 184, t. 567, 1821.

There is only one specimen in Blatt. Herb., collected by Blatter probably in a garden in Khandala. The specimen is in too poor a condition for identification.

Blatt. Herb. 18725 !

TROPAEOLACEAE.

Tropaeolum L.

Tropaeolum maius Linn., Sp. Pl. 345, 1753; Pfreich. 10: 21, f., 3 A-C, G, J; Hutch., Fam. Fl. Pl. 1: 142, f. 70.

A garden plant occasionally cultivated in Khandala gardens, both for its flowers and for the leaves which are locally used as a vegetable.

Santapau, cultivated in St. Xavier's Villa, 15. 3. 1945 !

BALSAMINACEAE.

Impatiens Linn.

Impatiens acaulis Arn., in Hook., Comp. Bot. Mag. 1: 325, 1835; FBI. 1: 443; D. & G. 42; C. 1: 170; Blatter in JBNHS 36: 309.

I. scapiflora Hook. in Bot. Mag. 64: t. 3587, 1837 (non Heyne).

This is the only scapigerous, perennial or semi-perennial balsam of Khandala; it is common under water-falls, or on rocks where abundant water trickles down. It is also one of the first balsams to come into flower in the district, and one of the first to disappear.

In general appearance it is very similar to *I. scapiflora* Heyne, from which it is easely distinguishable by its wing having only two lobes. *I. acaulis* is a gregarious plant, at times covering the whole surface of rocks on the ravine slopes.

Flowers and Fruits.—September.

Woodrow; *Cooke*; *Hallberg* in MS. catalogue; *Blatter* in Revision; *McCann* 4379 ! *Blatt. Herb.* 28063 ! 28081 ! 28082 ! *Santapau* 71/5 ! 842 ! 875 (1-5) !

Impatiens oppositifolia Linn., Sp. Pl. 937, 1753; FBI. 1: 448; Gr. 34; Wight, Icon. t. 883; C. 1: 172.

I. rupicola Hook. f. in Kew Bull. 1910: 292; Blatter 310.

Examination of all the *I. oppositifolia* and *I. rupicola* material available at Kew shows that these two species are but one and the same plant; the structure of the flowers and of the leaves is the same in both species; Hook. f. gives as one of the distinguishing characters of *I. rupicola* that it is "foliis integerrimis...distincta", but none of the specimens mentioned by Hook. f. as typical has perfectly entire leaves. Another character is the cymbiform lip, with ascending obtuse mouth; this is so in one or two of the plants mentioned as typical, but in the great majority of the sheets in Kew Herbarium the lip does not differ from that of *I. oppositifolia*.

Common in Khandala almost from the beginning of the rains till the end of October; generally it is not gregarious, and occurs in open ground or on grassy slopes, but is rare in dense forests.

Flowers and Fruits.—August to November.

Meebold 8813 ! *Blatt. Herb.* 17785 ! 28249 ! *Santapau* 71/3 ! 759 ! 781 ! 2479 ! 2625 ! 2657 ! 2658 ! 2659 ! 2660 ! 4821 ! 4981 ! 6869 ! 7461 ! 7462 ! 7463 ! 9277 ! 9278 ! 9279 ! 9280 ! 9281!

Impatiens kleinii Wight & Arn., Prodr. 140, 1834; FBI. 1: 445; Wight, Icon. t. 884; Hook. f. in Kew Bull. 1910: 293; C. 1: 171; Blatter 311.

This is the smallest-flowered balsam of Khandala. It is also one of the commonest; it appears at the beginning of the rains and may be seen throughout the rainy season till well into October. It occurs generally as a solitary plant, on hedges, or under the shade of trees, sometimes on tree trunks. Occasionally it is a gregarious plant, but it is never as abundant as the following species.

Flowers and Fruits.—July to October.

Blatt. Herb. 18791 ! *McCann* 4380 ! *Santapau* 71/4 ! 625 ! 644 ! 2232 ! 2402 ! 2867 ! 2868 ! 4572 ! 4982 ! 6793 ! 6794 ! 6795 ! 6870 ! 6871 ! 6872 ! 9242 ! 9243 ! 9282 ! 9283 !

Impatiens balsamina Linn., Sp. Pl. 938, 1753, var. **rosea Hook. f.** in FBI. 1: 554, 1874; Blatter 314.

I. rosea Lindl. in Bot. Reg. t. 27, 1841.

I. Balsamina var. *brevicalcarata* Cooke, Fl. Pres. Bomb. 1 : 174, 1901.

Very common in Khandala from the beginning of July onwards till the end of October or beginning of November; flowers only appear about the middle of August, and become very abundant from September. For the rest of the year an occasional plant may be seen in flower in moist shaded spots. During the second half of the rainy season this is undoubtedly the most conspicuous plant in the district, owing to its gregarious habit and its numerous bright coloured flowers.

Local name : Tirda.

Flowers.—June to November, exceptionally April 1946 in a ditch. *Fruits.*—August to November.

Blatt. Herb. 18784 ! 18788 ! 28226 ! 29661 ! 29666 ! *McCann* 4378 *C. Hooker* in Kew Herb ! *Santapau* 872 ! 1066 ! 1067 ! 2480 ! 2530 ! 2754 2755 ! 4979 ! 4980 ! 6971 ! 6972 ! 6973 !

Impatiens balsamina Linn. var. **corymbosa** Santapau in Kew Bull. 1948 : 489, 1949.

The structure of the plant is in general similar to that of the var. *rosea*; the flowers are slightly smaller. The type of inflorescence is quite distinct : in the new variety flowers are axillary, arranged in corymbose racemes. The common peduncle or rachis of the raceme is up to 1·3 cms. long, bearing 3—5 flowers disposed along the rachis at varying distances, 2 or more mm. from each other; the pedicels vary in length in such a manner that the inflorescence makes almost a perfect corymb; each pedicel is supported by a small bract, which is about 1 mm. long, acute, pubescent.

The type of this plant was collected on Kune Plateau on November 2nd, 1944, and is kept in Blatt. Herb. (Santapau 5459).

RUTACEAE.

Evodia Forst.

Evodia lunu-ankenda (Gaertn.) Merrill, in Phil. Journ. Sci. 7 : 378, 1912 ; G. 148.

Fagara lunu-ankenda Gaertn., Fruct. 1 : 334, t. 68, f. 9, 1788.

Fagara triphylla Roxb., Fl. Ind. 1 : 416, 1832 (non Lamk.).

Zanthoxylum triphyllum Graham, Cat. 36, 1839.

Evodia roxburghiana Benth., Fl. Honk. 59, 1861 ; FBI. 1 : 487 ; C. 1 : 177 ; Talb. 1 : 185, t. 113 ; Blatter 315.

A rare plant in Khandala of which I have seen only one specimen in six years.

Graham ; *Blatter* in MS. catalogue ; *Santapau* 1080 !

FAGARA Linn.

Fagara budrunga Roxb., Hort. Beng. 11, 1814 & Fl. Ind. 1 : 437, 1820 ; Engler in Pfam. (ed. 2) 19A : 216, 1931.

Zanthoxylum Budrunga DC., Prodr. 1 : 728, 1824 ; G. 150 ; Blatter 315.

Fagara Rhetsa Roxb., Hort. Beng. 11, 1814 & Fl. Ind. 1 : 438, 1820.

Zanthoxylum Rhetsa (Roxb.) DC., Prodr. 1 : 728, 1824 ; FBI. 1 : 495 ; D. & G. 45 ; C. 1 : 173 ; G. 150 ; Merr., Enum. 2 : 327.

Not common in Khandala except on the lower slopes below Duke's Nose. It is not a noteworthy tree except for the numerous prickles on stem and other parts. As far as I have been able to ascertain, no use (medicinal or otherwise) is made of this tree in the district, the numerous prickles making it difficult to handle.

Flowers.—July to August. *Fruits.*—September to November.

Arbuckle ex Graham ; *Blatter* in MS. catalogue ; *Blatt. Herb.* 27428 ! *Santapau* 78/15 ! 795 ! 3138 ! 3139 ! 3140 ! 4564 ! 4565 ! 11073-11075 ! 11151-1153 !

TODDALIA Juss.

Toddalia asiatica (Linn.) Lamk., Ill. 2 : 116, 1793, G. 150 ; Haines, Bot. Bih. & Or. 160 ; Blatter 316.

Paullinia asiatica Linn., Sp. Pl. 365, 1753.

Toddalia aculeata Pers., Syn. 1 : 249, 1805 ; FBI. 1 : 479 ; Gr. 37 ; D. & G. 46 ; Wight, Ill. t. 66 ; C. 1 : 179 ; Talb. 1 : 189, t. 115.

Limonia oligandra Dalz. in Kew Journ. Bot. 2 : 258, 1850 ; D. & G. 28.

The occurrence of this tree in Khandala is given on the authority of Dalzell and Gibson in their Flora and of Blatter in his MS. catalogue. I have seen no specimen from Khandala.

D. & G.; *Blatter* in MS. catalogue.

GLYCOSMIS Corr.

Glycosmis pentaphylla (Retz.) Corr. in Ann. Mus. Hist. Nat. Paris 6 : 386, 1805 ; FBI. 1 : 499 ; Gr. 23 ; C. 1 : 181 ; Talb. 1 : 191, t. 117 ; Blatter 36 : 317 ; Narayanaswami in RBSI 14 : 12 seq., t. 1.

Limonia pentaphylla Retz., Obs. 5 : 24, 1789 ; Roxb., Pl. Cor. 1 : 60, t. 84.

Glycosmis triphylla Wight, Icon. t. 167, 1839.

An erect shrub, up to 2·5 m. high, with stout stem and branches.

Very common in the undergrowth of evergreen forests ; particularly Common on Meroli Plateau and on the slopes below Echo Point and St. Xavier's Villa. Buds, flowers and fruits in all stages of maturity are present at the same time. Flowering and fruiting goes on practically throughout the year.

Local name : Gangoan.

Flowers and Fruits.—October to June.

Woodrow ; *Blatt. Herb.* 1969 ! 28350 ! *McCann* 4387 ! *Santapau* 78/15, 16 ! 349 ! 1523 ! 2164 ! 3537 ! 3538 !

MURRAYA Koen. ex Linn.

Murraya koenigii (Linn.) Spreng., Syst. 2 : 315, 1826 ; FBI. 1 : 503 ; C. 1 : 182 ; Blatter 318.

Bergera Koenigii Linn., Mant. 1 : 565, 1767 ; Roxb., Pl. Cor. 2 : t. 112 ; Gr. 24 ; Wight, Icon. t. 13.

Chalcas Koenigii Kurz ex Swingle, in Barley, Stand. Cycl. 2076, 1916 Tanaka, in Journ. Soc. Trop. Agric., Taiwan, 1 : 29.

Small to middle sized tree ; the largest specimen seen in Khandala is one on Behran's Plateau, the stem of which measures 45 cms. diam. at the base and is about 6 m. high.

The whole plant is strongly and not unpleasantly aromatic, but the fruits are especially so. The leaves are regularly collected by local people and exported to neighbouring towns as an article of commerce ; they are used for the seasoning of curries, hence the local name of this plant. Due to frequent cutting of branches and leaves, it is seldom that the tree is allowed to come to any large size. The hot months of the year seem to be the best for the collection of the leaves, and large bales of them may be seen in the local railway station ready for export during April and May.

Common all over the district, in open places or in dense jungle.

Local name : Kurry Patta.

Flowers.—March to April. *Fruits.*—March to June.

Blatter in MS. catalogue ; *Blatt. Herb.* 19683 ! 27555 ! *McCann* ex Blatter in Revision ; *Santapau* 78/2, 3, 13 ! 399 ! 1783 ! 1887 ! 2016 ! 4246 !

Murraya paniculata (Linn.) Jack., in Mal. Misc. 1 : no. 5, 31, 1820 ; Gr. 24 ; D. & G. 29 ; Blatter 317 ; Merr., Enum. 2 : 336.

Chalcas paniculata Linn., Mant. 1 : 68, 1767 ; Tanaka, loc. cit. 24.

Murraya exotica Linn., Mant. 2 : 563, 1771 (*Murraea*) ; FBI. 1 : 502 ; Gr. 24 ; Wight, Icon. t. 96 ; C. 1 : 182 ; Talb. 1 : 193, t. 118 ; G. 155.

A small unattractive tree with a sombre appearance.

Flowers scented, more particularly so at night, with a fairly strong scent which is very similar to that of orange blossom.

Fairly common on Meroli Plateau, elsewhere only occasional. Often found in gardens, where it is cultivated for the sake of the perfume of the flowers.

Local name : Limbu.

Flowers.—June to January. *Fruits.*—September to May.

Woodrow; *Blatt. Herb.* 19700! 19712! 21274! *Santapau* 78/1! 857! 1084! 1195! 1253! 1336! 1550!

ATALANTIA Corr.

Atalantia monophylla (Roxb.) DC., Prodr. 1: 535, 1824; FBI. 1: 511; Gr. 23; D. & G. 22; C. 1: 187; Blatter, 310; Engler in Pfam. 3(4): 191, t. 111 C—D & (ed. 2) 19A: 328, t. 150 C-D; Airy-Shaw in Kew Bull. 1939: 290-293.

Limonia monophylla Roxb., Pl. Cor. 1: 60, t. 83, 1795 (non Linn.).

Trichilia spinosa Willd., Sp. Pl. 2: 554, 1799.

Atalantia spinosa (Willd.) Tanaka, in Journ. Bot. 68: 232, 1930; Alston in Trim., Hand. Fl. Ceyl. 6: 38, 1931.

Graham, loc. cit., states that this tree is "Common on the Ghauts.. at Sidney Point, Mahableshwar"; Talbot, however, remarks that Graham was probably referring to the common *A. racemosa* which is found there. Cooke adds that in the Herb. of the College of Science, Poona, there were a number of sheets labelled *A. monophylla*, but that they were wrongly named, as they all belonged to *A. racemosa*. In the Blatt. Herb. I have examined a larger number of sheets from Khandala, which, although named *A. monophylla*, have proved to be *A. racemosa*. My identification is based on the structure of the calyx and the type of inflorescence. Blatter published his Revision of the *Rutaceae* in 1933, and was aware of the definite assertions of Cooke and Talbot on the subject; in spite of this, Blatter gives Bombay Island and Khandala as two localities where he himself had seen the plant, but he gives no reference to any herbarium specimen.

In Kew Herb. there are no specimens of *A. monophylla* from Bombay Presidency; there are plenty of sheets from South India, and the difference between the two species is quite clear. During my exploration of Khandala I have made an intensive search for this plant, but without any positive results.

In consequence, until further evidence be obtained, I consider the existence of this plant not only in Khandala but in the whole of the Presidency of Bombay as rather doubtful.

Blatter in Revision: "Khandala (Blatter!)".

Atalantia racemosa Wight & Arn., Prodr. 91, 1834; FBI. 1: 512; C. 1: 187; Talb. 1: 201, t. 123; Blatter 423.

Sclerostylis atalantoides Wight & Arn. in Wight, Icon. t. 71, 1838; D. & G. 29.

One of the commonest trees on the slopes below Elphinstone Point and on the slopes of St. Xavier's Ravine, from the main road to the base of Duke's Nose. The tree in general has a rather sombre appearance, but when in full bloom the perfume of the open flowers is strong and very pleasant, somewhat reminiscent of orange-blossom. The fruit is intensely

bitter and seems to act by a sort of delayed action; in spite of its taste the fruit seems to be eaten by some animals, probably monkeys, to judge from the remains found beneath the trees.

Local name: Limbu, Ran Limbu, Makar Limbu.

Flowers.—October to February. *Fruits.*—December to July.

Cooke; *Blatt Herb.* 19681 ! 19711 ! 27572 ! 27592 ! 28031 ! 28181 ! 28210 ! 28241 ! *McCann* 3709 ! 3710 ! *Santapau* 78/2, 6, 11, 12 ! 1152 ! 1184 ! 1666 ! 2026 ! 6025 ! 6026 ! 6027 ! 9027 ! 9037 ! 9038 ! 9070 !

CITRUS Linn.

Citrus sp.

In the last few years an attempt has been made in St. Xavier's Villa at the cultivation of some species of *Citrus*; the attempts, however, have resulted in complete failure. Trees grow up to a height of about 2 m. but do not produce flowers or fruits; local farmers attribute such a failure to a soil that is too poor and to a rainfall that is excessively heavy during the monsoon. I have not been able to determine the species or variety of *Citrus* with which the attempt has been made.

SIMARUBACEAE.

AILANTHUS Desf.

Ailanthus malabarica DC., Prodr. 2: 89, 1825; FBI. 1: 518; Gr. 37; D. & G. 46; C. 1: 194; Talb. 1: 209.

The occurrence of this plant in Khandala is only given on the authority of Graham and Blatter; I have searched for it but have failed to find any specimen in the district.

Graham; *Blatter* in MS. catalogue.

BURSERACEAE.

GARUGA Roxb.

Garuga pinnata Roxb., Hort. Beng. 33, 1814, & Pl. Cor. 3: 5, t. 208, 1819; FBI. 1: 528; Gr. 43; Wight, Icon. tt. 1594 & 1595; C. 1: 199; Talb. 1: 217, t. 130; Engler in Pfam. (ed. 1) 3(4): 257, t. 150, & (ed. 2) 19 A: 416; id. in DC., Mon. Phan. 4: 5, t. 1, ff. 1-6.

The tree is conspicuous in the district on account of its deciduous habit and of the position of the flowers and fruits at the ends of branches; when in leaf, it is very often attacked by insects, which produce large bright red or purple galls. I have not heard of the fruits being used locally as an article of food. Common in Khandala in deciduous forests and on open plateaus.

Local name : Kakad.

Flowers.—November to April. *Fruits.*—March to August.

Hallberg in MS. catalogue; *Blatt. Herb.* 27908 ! *Santapau* 80/81 ! 116 ! 1053 ! 1348 ! 1659 ! 2188 ! 3791 ! 3792 ! 4455 ! 8780 !

MELIACEAE.

TURRAEA Linn.

Turraea villosa Benn., Pl. Jav. Rar. 182, 1840; FBI. 1: 542; Wight, Icon. t. 1593; C. 1: 204; DC., Mon. Phan. 1: 442; Talb. 1: 224, t. 124;

T. virens Graham, Cat. 31, 1839 (non Linn.).

Large shrub or small tree; younger branches quadrangular. Leaves softly villous when young, hairy on the nerves and margins on the under-side when old; up to 11×6 cms.; appearing at or shortly after the flowering time.

Flowers at end of branches in the axils of fallen leaves or of leaf initials, solitary or fascicled; peduncles very short, pedicels about 1 cm., occasionally up to 2·5 cms. long, pubescent. Calyx campanulate, about 3 mm. long, teeth triangular, 1 mm. long, the whole calyx being pubescent outside. Corolla pure white; petals linear spathulate, very narrow below, broadening up to 5 mm. above, and up to 45 mm. long, free. In bud the flowers are perfectly regular; but after opening, the petals seem to be pushed to one side by the staminal tube, so that when fully opened the flower seems to be bilabiate with the upper lip missing; the corolla, however, is regular except in appearance.

The whole flower is faintly and sweetly scented and pure white; with age it turns yellow. Cooke mentions yellow as the only colour of the flower; it is obvious that he only observed old or decaying flowers; I have not seen any freshly opened flower with any colour other than pure white or at most white with a touch of green at the base of the petals.

Very common on the western end of Korinda Valley, near the top of the path leading into the ravine between Echo Point and Duke's Nose; common also near the bridge over Kune stream. Except when in full bloom, it is a poor looking shrub; even when it is in full bloom the shrub looks rather bare due to the fact that leaves only come out at or near the ends of branches.

Local name : Pandre.

Flowers.—June. *Fruits.*—June to December.

Graham ; *Blatt. Herb.* 28220 ! 28222 ! 27402 ! *Acland* 155 ! *Santapau* 181/4 ! 820 ! 2104 ! 2109 ! 2110 ! 2176 ! 2177 ! 2270 ! 4585 ! 5448 ! 9043 ! 9044 ! 9045 ! 9188(2) !

Cipadessa Blume.

Cipadessa baccifera (Roth) Miq., in Ann. Mus. Lugd. Bat. 4 : 6, 1868-69 ; DC., Mon. Phan. 1 : 426, t. 16, f. 1 a-c ; G. 176.

Melia baccifera Roth, Nov. Pl. Sp. 215, 1821.

Cipadessa fruticosa Blume, Bijdr. 162, 1825 ; FBI. 1 : 545 ; C. 1 : 206 ; Talb. 1 : 227, t. 135.

Mallea Rothii A. Juss. in Mem. Mus. Par. 19 : 222, t. 13, f. 6, 1830 ; Gr. 31 ; D. & G. 37.

Woodrow and Blatter are my authorities for the inclusion of this tree ; I have not seen it growing in the district, nor have I seen any herbarium sheet from Khandala.

Woodrow ; *Blatter* in MS. catalogue.

Dysoxylon Blume.

Dysoxylon binectariferum (Roxb.) Hook. f. ex Bedd. in TLS. 25 : 212, 1866 ; FBI. 1 : 546 ; DC., Mon. Phan. 1 : 493 ; C. 1 : 208 ; Talb. 1 : 231, t. 187.

Epicharis exariliata Arn. : D. & G. 37.

Guarea binectarifera Roxb., Hort. Beng. 28, 1814 & Fl. Ind. 2 : 240, 1824 ; Gr. 31.

On Meroli Plateau, generally a small tree ; on the slopes below Elphinstone Point, one of the giants of the forest.

There is a group of these trees on the slopes below Elphinstone Point practically the largest trees in that part of the forest. At the time of flowering, the scent is strong and very pleasant ; this is very noticeable on Meroli Plateau. Buds come on the tree when the fruits of the previous season are still on. Seeds seem to germinate fairly easily, for during the rainy season the floor of the forest under or near these trees is covered with very numerous seedlings.

Local name : Yerindi.

Flowers.—August to September. *Fruits.*—September to June.

Graham ; *Woodrow* ; *Talbot* ; *Blatt Herb.* 27465 ! 28437 ! *Santapau* 1894 ! 1895 ! 1896 ! 2575 ! 3280-3284 ! 3529 ! 3530 ! 3672 ! 3673 ! 4012 ! 4673 ! 4674 ! 6014 ! 6015 ! 10599 !

AMOORA Roxb.

Amoora lawii (Wight) Bedd., in Fl. Sylv. t. 133, 1869-1872 FBI. 1 : 561 ; DC., Mon. Phan. 1 : 585 ; C. 1 : 212 ; Talb. 1 : 239, t. 142.

Nimmonia Lawii Wight, in Calc. Journ. Nat. Sci. 7 : 13, 1847.

Epicharis exarillata Nimmo ex Graham, Cat. 31, 1839 (non Arn.).

Nemedra Nimmonii Dalz. in D. & G. 37, 1861.

A fair-sized tree, rather hard-wooded.

A very common tree in Khandala. A peculiarity of this tree is that flowers and fruits are present almost thoughout the year, both flowers and fruits being on a particular branch at the same time. Fruits are very abundant and often branches are heavily weighed down by them. Normally this is a small to middle-sized tree, but on May 26, 1946, I measured a specimen in St. Xavier's Ravine that was one of the biggest trees in that part of the forest, its height reaching 22 m.

Local name : Télya.

Flowers.—November to June. *Fruits.*—January to September.

Graham ; *Blatt. Herb.* 18921 ! 27904 ! 28456 ! 28490 ! *Santapau* 181 ! 1552 ! 1778 ! 1779 ! 2097 ! 3216 ! 3217 ! 3261 ! 3301 ! 3302 ! 3305 ! 3879 ! 3880 ! 3881 ! 3989 ! 4445 ! 4474 ! 6034 ! 6035 ! 8782 ! 9063 !

Amoora rohituka (Roxb.) Wight & Arn., Prodr. 119, 1834 ; F.B.I. 1 : 559 ; DC., Mon. Phan. 1 : 581 ; C. 1 : 211 ; Talb. 1 : 238, t. 141 ; G. 181.

Andersonia Rohituka Roxb., Fl. Ind. 2 : 213, 1832.

Amoora macrophylla Nimmo ex Graham, Cat. 31, 1839.

Male flowers not seen. Female or hermaphrodite flowres in racemes up to 30 cms. long ; calyx 5-partite ; petals 3, creamy or yellowish in colour ; staminal tube of the same colour as the petals ; anthers included or just exserted ; style 0. The whole flower is about 6 mm. diam. Fruit spherical, yellowish ; seeds 3, brown, oblong, with a scarlet aril.

There are only two trees of this species in Khandala, as far as I have been able to ascertain.

Local name : Shémod.

Flowers.— August to November. *Fruits.*—December to June.

Graham : " A solitary tree, grows in the ravine at Kandalla below the old Toll House " ; *Blatter* in MS. catalogue ; *Santapau* 3 ! 957 ! 1110 ! 1446 ! 1993 ! 3975 ! 4953 ! 5126 ! 5127 ! 5128 ! 7439 ! 7449 ! 8103 ! 8104 !

HEYNEA Roxb.

Heynea trijuga Roxb., Hort. Beng. 33, 1814 ; Bot. Mag. t. 1738, 1815 ; Pl. Cor. 3 : t. 260, 1819 ; Fl. Ind. 2 : 390, 1832 ; FBI. 1 : 565 ; Gr. 31 ; D. & G. 38 ; DC., Mon. Phan. 1 : 713, t. 9, f.6 ; C. 1 : 214 ; Talb. 1 : 242, t. 144 ; G. 183.

Walsura trijuga (Roxb.) Kurz, in JASB. 44 : 148, 1875 ; Adelbert in Blumea 6 : 322.

In the whole of Khandala district I have observed but a solitary specimen at the Saddle, about half way between Echo Point and Bhoma Hill. Even at a distance this tree stands out on account of the colour of its leaves.

Flowers.—April 1944. *Fruits.*—April to October.

Graham ; *Woodrow* ; *Gammie* 15481 (in Herb. Econ. Bot.,Poona) ! *Blatter* in MS. catalogue ; *Santapau* 2396 ! 2497 ! 2840-2844 ! 4094 ! 4593 ! 5177 ! 5196 ! 6852 ! 6853 ! 8925 ! 8926 ! 8927 !

CHUKRASIA Juss.

Chukrasia tabularis Juss., var. **velutina** King in JASB. 64 : 88, 1895 ; C. 1 : 216 ; Harms in Pfam. (ed. 2) 19 b 1 : 66.

Chickrassia velutina Wall., Cat. 1270, 1829.

Chukrasia velutina Roem., Syn. Mon. 1 : 135, 1846 (" Chikrasia ") ; Livera in Ann. Roy. Bot. Gard. Perad. 9 : 307, 1925.

Chikrasia Nimmonii Graham, in Wight, Ill. 1 : 148, 1839 & Cat 253, 1839 ; D. & G. 38.

The leaves of the Khandala trees are all pubescent or at times even subhispid with fairly stout, stiff hairs, especially on the nerves above, much more pubescent but not so hispid beneath.

A rare tree in Khandala ; I have only seen four or five specimens on the slopes below St. Mary's Villa. It is an elegant tree, except for the colour of the leaves, which is rather dull, at least when the leaves are old.

Flowers.—April to May. *Fruits.*—May to the next flowering season.

Santapau 81/1 ! 892 ! 1352 ! 3674 ! 3990 !

TOONA Roem.

Toona ciliata Roem., Syn. Hesp. 139, 1846 ; Harms in Pfam. 3(4) : 278, t. 151 D & (ed. 2) 19 b 1 : 45 & 42, t. 2 D.

Cedrela Toona Roxb., ex Rottl. & Willd. in Ges. Naturl. Fr. Neue Schr. 2 : 198, 1803 ; FBI. 1 : 568 ; Wight, Icon. t. 161 ; Gr. 246 ; D. & G. 38 ; DC., Mon. Phan. 1 : 745 ; C. 1 : 217 ; Talb. 1 : 249, tt. 148 & 149.

Widely scattered through the district, in evergreen and deciduous forests, but nowhere abundant. Both in flower and in leaf this is a fine tree of majestic appearance.

Local name : Nim.

Graham ; *Dalz. and Gibs.* ; *Woodrow* ; *Blatter* in MS. catalogue ; *Blatt. Herb.* 19738 ! *Santapau* 464 ! 494 ! 1767 ! 1768 ! 1769 ! 3289-3294 ! 4045 ! 4046 ! 4047 ! 8693 !

OLACACEAE.

OLAX Linn.

Olax scandens Roxb., Pl. Cor. 2 : 2, t. 102, 1798 ; FBI. 1 : 575 ; Wight & Arn., Prodr. 89 ; Gr. 22 ; C. 1 : 221 ; Talb. 1 : 257 ; Sleumer in Pfam. (ed. 2) 16 B : 27.

Cooke, on the authority of Graham and Woodrow, gives this plant as occurring in Khandala ; Blatter in his MS. catalogue probably copies Cooke. In the course of several years I only found one specimen that seemed to belong to this species, but the specimen was immature and scarcely fit to form the basis of any conclusion. Talbot, loc. cit., writes : " I can find no record of this climber having been found in the Bombay Presidency, and have never observed it myself in the Khandesh Satpudas. Cooke in his Fl. Bomb. Pres. I, 221, states that it has been found in N. Kanara (Nilkund) and on the Khandala Ghauts by Mr. Woodrow. The specimens collected by Woodrow from Khandala in the Poona College of Science Herbarium are all *O. Wightiana* Wall."

Graham ; Woodrow ; Blatter in MS catalogue ; *Santapau* 195 ?

Olax wightiana Wall., Cat. 6779, 1832 ; Wight & Arn., Prodr. 89, 1834 ; D. & G. 27 ; C. 1 : 221 ; C. 190.

Olax scandens Roxb. : Sleumer, loc. cit.

Among the authors who have dealt with this plant, Sleumer is the only one to fuse *O. wightiana* with *O. scandens*. The materials at my disposal are too scanty to allow me to reach any conclusion.

Not common in Khandala.

Local name : Kúkarbit.

Flowers.—5th March 1944. *Fruits.*—15th April 1946.

Santapau 3675-3680 ! 6049-6052 ! 7443 ! 8839 !

STROMBOSIA Blume.

Strombosia ceylanica Gardn. in Calc. Journ. Nat. Hist. 6 : 350, 1846 ; FBI. 1 : 579 ; C. 1 : 222 ; Sleumer, loc. cit. 22.

Sphaerocarya leprosa Dalz. in Hook. Kew Journ. Bot. 3 : 34, 1851 ; D. & G. 223.

Strombosia leprosa Talbot, in JBNHS. 11 : 235, 1897.

A fine tree with spreading branches and fairly tall trunk ; abundant on the slopes below Echo Point at an altit. of 500 m., rare elsewhere in the district.

Local name : Ráktrórar or Rágatrórar.

Flowers.—December to January. *Fruits.*—March to May.

Santapau 179 ! 1548 ! 1549 ! 1740 ! 1741 ! 1853 ! 1854 ! 1959 ! 3218 ! 3510-3514 ! 3887-3890 ! 4134 ! 4135 ! 4287 ! 4288 ! 4289 ! 8781 !

OPILIACEAE.

CANSJERA Juss.

Cansjera rheedii Gmel., Syst. 2 : 280, 1791 ; FBI. 1 : 582 ; Wight, Icon. t. 1861 ; C. 1 : 223 ; G. 193 ; Sleumer in Pfam. (ed. 2) 16 B : 36, t. 19.

Fairly common especially on the slopes from Forbay to the Saddle ; common also within the grounds of Convalescent Home. It is neither a conspicuous nor an attractive plant.

Local name : Lal Kukarbit, Taroli, Tarli.

Flowers.—October to December. *Fruits.*—November to March.

Blatt. Herb. 28043 ! 28044 ! 28569 ! *McCann* 4402 ! *Santapau* 171 ! 1121 ! 1319 ! 1416 ! 1559 ! 3012 ! 3200 ! 3201 ! 3441-3444 ! 4841 ! 5858 ! 5959 !

ICACINACEAE.

MAPPIA Jacq.

Mappia foetida Miers, Contrib. 1 : 64, 1851 ; FBI. 1 : 589 ; C. 1 : 225 ; G. 196.

Mappia oblonga D. & G., Bomb. Fl. 28, 1861.

Blatter's mention of this plant is my only authority for including it among Khandala plants ; I have not seen it in the district or in any of the herbaria consulted.

Blatter in MS. catalogue.

HIPPOCRATEACEAE.

PRISTIMERA Miers.

Pristimera grahami (Wight) A. C. Smith in JAA. 26 : 178, 1945.

Hippocratea Grahamii Wight, Ill. 1 : 134, 1840 ; FBI. 1: 624 ; Wight, Icon. t. 380 ; D. & G. 32 ; C. 1 : 235 ; Talb. 1 : 283, t. 168.

Cooke gives as one of the characteristics of *H. obtusifolia* Roxb. that the style overtops the stamens ; I have examined many flowers from Khandala and in every case the style does overtop the stamens, the style, however, in the present species is considerably shorter than in *H. obtusifolia* ; this I have also confirmed by examination of the type sheets in Kew Herb.

Common on the slopes below Elphinstone Point; there is a very good specimen growing in the grounds of Convalescent Home. I find this shrub an attractive one.

Local name : Dáushir, Lokandi.

Flowers.—December to March. *Fruits.*—March to September.

Gammie 16165 ! *Blatter* in MS. catalogue ; *Santapau* 87/4, 11 ! 1433 ! 1562 ! 1639 ! 1640 ! 1641 ! 1962 ! 2124 ! 2125 ! 3681-3683 ! 3705 ! 4065 ! 5842 ! 6005 ! 8650 ! 8651 ! 8745 ! 8746 ! 8804 !

Salacia Linn.

Salacia prinoides DC., Prodr. 1 : 571, 1824 ; FBI. 1 : 626 ; Gr. 27 ; D. & G. 33 ; C. 1 : 236 ; Talb. 1 : 286 ; G. 215.

For several years I have searched for this plant on the spot indicated by Graham, but have failed to find it ; I give this plant on the authority of Graham and Blatter. There are no specimens from Khandala in any of the herbaria consulted.

Graham : " On the Corinda side of the Hill above Kandalla tank "; *Blatter* in MS. catalogue.

CELASTRACEAE.

Celastrus Linn.

Celastrus paniculata Willd., Sp. Pl. 1 : 1125, 1798 ; FBI. 1 : 617 ; Gr. 38 ; D. & G. 47 ; Wight, Ill. t. 72 & Icon. t. 158 ; Losener in Pfam. 3(5) : 194, t. 120 E. H. & t. 122 K-L ; C. 1 : 231 ; Talb. 1 : 276, t. 163.

Common in Khandala, particularly in evergreen forest near Khandala Cemetery, conspicuous because of the colour of the arils and of the pendulous panicles.

Local name : Pingui or Pingwi.

Flowers.—April to May. *Fruits.*—May to October.

Santapau 87/10 ! 515 ! 570 ! 1235 ! 1929 ! 1967 ! 1968 ! 1975 ! 2100 ! 4102 ! 8719 ! 8720 !

Gymnosporia Benth. & Hook.

Gymnosporia rothiana (Wight & Arn.) Laws. in FBI. 1 : 619, 1875; C. 1 : 232 ; Talb. 1 : 278, t. 164.

Celastrus rothiana Wight & Arn., Prodr. 1 : 159, 1834 ; D. & G. 47 & 318.

Celastrus emarginata Graham, Cat. 39, 1839 (non Roth).

Shrubby, usually about 2-4 m. high, occasionally a small tree; unarmed, sparingly armed with an occasional spine or heavily armed.

The leaves are often attacked by a yellowish orange rust.

A very common shrub in deciduous and evergreen forests; particularly abundant in the higher parts, from St. Xavier's Villa upwards. This shrub is conspicuous by its leaves and by the fruit's shape and colour. When in bloom this shrub is visited by numerous insects. The local name suggests that monkeys eat the fruit, but I have never seen any traces showing that the fruit has been touched by such animals.

Local names: Leuchi, Makhar Khana, Wandar Roti.

Flowers and fruits.—More or less throughout the year.

Blatt. Herb. 17950 ! 15832 ! 18559 ! 25397 ! 25534 ! 25535 ! 27586 ! *Acland* 171 ! *Santapau* 87/3 ! 558 ! 1886 ! 1956 ! 2024 ! 2065 ! 2111 ! 3669 ! 4035 ! 4887 !

RHAMNACEAE.

VENTILAGO Gaertn.

Ventilago bombaiensis Dalz. in Hook. Kew Journ. Bot. 3: 36, 1851; FBI. 1: 631; D. & G. 48; C. 1: 239; Santapau in JBNHS. 44: 496.

A pretty climbing shrub, very common on the slopes below Echo Point at an altit. of about 500 m.; common also below Elphinstone Point about half way down to the ravine. During the fruiting season fruits may be seen scattered over large tracts of forest; but in spite of careful search I have failed to find any germinating seeds.

Local name: Lókhandi.

Flowers.—December to January. *Fruits.*—February to March.

Santapau 90/41 ! 1847-1849 ! 1936-1941 ! 2137 ! 3502-3509 ! 3581 ! 3643-3656 ! 4075-4076 ! 4138 ! 4276 ! 4444 ! 6007 ! 6008 ! 6054 ! 8796 ! 8797 ! 8836-8838 ! 10587-10590 !

Ventilago madraspatana Gaertn., Fruct. 1: 223, t. 49, f. 2, 1788; FBI. 1: 631; Gr. 40; Wight, Icon. t. 163; D. & G. 48; C. 1: 238; Talb., For. Fl. 1: 290 (excl. tt. 172-173).

A large woody climber, occasionally seen in ravines going over the top of high trees, but generally of smaller dimensions than *V. bombaiensis*.

Common all over the district, in dense forests and in open country; young seedlings are erect, but the climbing habit develops very early in the life cycle of the plant.

Local name: Lokhandi.

Flowers.—November to January.

Graham ; D. & G.; Blatter in MS. catalogue ; *Gammie* 16261 (in Herb Coll. Sci. Poona) ! *Herb. Coll. Sci.* Poona, 16115 ! *McCann* 4412 ! 4413 ! 4414 ! *Santapau* 90/14, 15 ! 1450 ! 1703 ! 1777 ! 3256-3259 ! 3827 ! 3973 ! 4274 ! 5813 ! 5923 ! 5924 ! 8081 !

Ventilago madraspatana Gaertn., var. **fructifida** Santapau in Kew Bull. 1949 : 340.

Very similar in most respects to *V. madraspatana* Gaertn., from which it differs in having the wing of the fruits more or less deeply bifid. The apex of the wing is divided for 10 mm., the two portions being somewhat divergent, and their apices rounded, subrounded or acute, occasionally one side being longer than the other. The type of this variety is *Garade 1*, in the herbarium of the College of Science Poona, and was collected in Khandala by Garade on March 22, 1905. Iso- and para-type in Blatt. Herb., Bombay.

Zizyphus Linn.

Zizyphus horrida Roth, Nov. Pl. Sp. 159, 1821 ; FBI. 1 : 636 ; C. 1 : 243.

Regarding the specimen listed below, Blatter remarks : " This is a noticeable plant. With its rotund leaves with marked *apiculi*, and profuse armature I think it may certainly be assigned for the present to *Z. horrida* Roth. If this could be collected again in flower and fruit it would be an advantage."

The following are the characteristics of the specimen : prickles twin, one straight and 15 mm. long, the other hooked and 6 mm. long, both arising from broad bases, glabrous, brown. The leaves are practically sessile and conspicuously mucronate ; young branches tomentose.

Blatter 9305 !

Zizyphus jujuba Lamk., Encycl. 3 : 318, 1789 ; FBI. 1 : 632 ; Gr. 39 ; D. & G. 49 ; Weberbauer in Pfam. 3(5) : 403, t. 198 A-D ; C. 1 : 240 ; Talb. 1 : 294, t. 175.

In Khandala this plant is not found in a truly wild state ; it is common along the railway line, especially along the disused line below Elphinstone Point and by the sides of the main road. I have noticed a few small trees reaching 2—3 m. in height, but generally it is a small shrub. The fruits are edible.

Local name : Bor or Ran Bor.

Flowers.—April to June. *Fruits.*—June to March of the following year.

Blatter & Hallberg in MS. catalogues. *Santapau* 90/3 ! 1971 ! 1972 ! 2121 ! 3635 ! 3931 ! 4351 ! 4442 ! 5828 !

Zizyphus oenoplia Mill., Gard. Dict. (ed. 8) no. 3, 1768 ; FBI. 1 : 634 ; Gr. 39 ; D. & G. 48 ; C. 1 : 242 ; Talb. 1 : 296, t. 176.

Not common. I have only seen it on Battery Hill Plateau. Every specimen of this plant seen in Khandala exhibited remarkable examples of the proliferation known as "Witches' Broom"; the leaves of affected branches are similar in structure to the normal ones, but in size they are only up to 10×4 mm. Plants so affected do not seem to bear flowers or fruits.

Blatter Herb. 28338 ! *Santapau* 1485 ! 4303 ! 4304 ! 8826 !

Zizyphus rugosa Lamk., Encycl. 3 : 319, 1789 ; FBI. 1 : 636 ; Gr. 39 ; D. & G. 49 ; C. 1 : 243 ; Talb. 1 : 298, t. 177.

A very common plant all over the district, especially in open country. During March it is one of the commonest plants in flower. The strong prickles make it a difficult plant to handle. The fruit is edible when ripe.

Local name : Toran.

Flowers.—January to April. *Fruits.*—January to May.

Woodrow ; *Hallberg* in MS. catalogue ; *Blatter* 9315 ! *Blatt. Herb.* 9303 ! 9320 ! *McCann* 3707 ! *Santapau* 90/2, 17 ! 1664 ! 3599 ! 36181 3700 ! 3851 ! 4339 !

Zizyphus xylopyra Willd., var. **glaberrima** Santapau, in Kew Bull. 1948 : 489, Jan . 1949.

An erect small tree up to 4 m. high, very sparingly armed, often unarmed or nearly so. Leaves acute to obtuse, strongly 3-nerved from the base (the nerves not converging at the apex of the leaf), acute or rounded at the base, very unequal-sided, entirely glabrous on both sides except for a few hairs which occasionally are found on the nerves of the lower surface ; margins irregularly denticulate ; petioles up to 6 mm. long, tomentose. Stipules 2, filiform, up to 5 mm. long, very easely caducous, but leaving a scar that is recognizable even in dry herbarium specimens.

Flowers mostly 5-merous, pale greenish. Calyx lobes triangular, acute. Petals spathulate and somewhat cucullate, caducous. Anthers opposite the petals, greenish. Disc large and prominent. Stigmas usually 3 ; fruits at first green, at length dark brown or black and glabrous, up to 21 mm. diam., globose or slightly compressed at the "poles".

A common tree in Khandala, growing in open country ; especially abundant on Battery Hill and Patanmal Plateaus. The glabrous leaves, the almost complete absence of prickles and the size of the fruit distinguish this new variety from all the other species of *Zizyphus* found in the district.

Local name : Got.

Flowers.—March to June. *Fruits.*—May to September.

Blatter Herb. 9318 ! 9302 ! 27636 ! 26818 ! *Santapau* 537 ! 21441 2145 ! 2168 ! 3894 ! 3895 ! 4298 ! 4308 ! 4309 ! 4313 ! 4344 type ! 4345-4349 iso- and para-types ! 8894 ! 8959 ! 8960 ! 8961 ! 9135 ! .

SCUTIA Commers. ex Brongn.

Scutia myrtina (Burm.) Kurz. in JASB 44 : 168, 1875 ; G. 223.
Rhamnus myrtinus Burm., Fl. Ind. 60, 1768.
Scutia indica Brongn. in Ann. Sc. Nat. 10 : 363, 1827 ; FBI. 1 : 640 ; Gr. 39 ; Wight, Ill. t. 73 ; D. & G. 50 ; C. 1 : 244 ; Talb. 1 : 302, t. 179.

Blatter's mention in his catalogue is my only authority for the inclusion of this shrub ; I have not seen it growing either at Khandala or elsewhere near Bombay.
Blatter in MS. catalogue.

COLUBRINA Rish.

Colubrina asiatica (Linn.) Brongn. in Ann. Sc. Nat. 10 : 369, 1827 ; FBI. 1 : 642 ; Gr. 39 ; D. & G. 50 ; C. 1 : 246 ; Talb. 1 : 304, t. 170.
Ceanothus asiaticus Linn., Sp. Pl. 196, 1753.

The occurrence of this plant is given on the authority of Blatter ; I have not seen the plant in the district. At Purandhar it is fairly common, at an altit. of about 1000 m., but in all probability it has been planted there ; it is found only along one of the paths within the fort area and does not occur on any of the neighbouring hills.
Blatter in MS. catalogue.

AMPELIDACEAE

AMPELOCISSUS Planch.

Ampelocissus latifolia (Roxb.) Planch., in Journ. Vigne Amer. 374, 1884 & in DC., Monogr. Phan. 5(2) : 370, 1887 ; G. 230.
Vitis latifolia Roxb., Hort. Beng. 18, 1814 & Fl. Ind. 1 : 661, 1820 ; FBI. 1 : 652 ; C. 1 : 253 ; Talb. 1 : 315.
Cissus latifolia Graham, Cat. 32, 1839 ; D. & G. 39 (an Vahlii?).

This is the most common species of *Ampelidaceae* on Battery Hill Plateau, where it is abundant. Elsewhere in the district it is a rare plant.
Flowers.—May to June. *Fruits.*—May to August.
Santapau 392 ! 394 ! 520 ! 2093 ! 4261 ! 4262 ! 4426 ! 4485 ! 4626 ! 4485 ! 4626 ! 9199 !

CISSUS Linn.

Cissus discolor Blume, Bijdr. 181, 1825 ; D. & G. 10 ; Bot. Mag. t. 4763 ; Planch. 496 ; G. 235.

Vitis discolor Dalz. in Hook. Kew Journ. Bot. 2 : 39, 1850 ; FBI. 1 : 647 ; C. 1 : 250 ; Talb. 1 : 309.

An elegant climber with red or reddish stems ; leaves spotted white above, deep red or purple beneath. A rare plant in Khandala found only occasionally in deep forests, usually trailing along the ground or climbing on neighbouring shrubs.

Flowers and *Fruits.*—September 1942.

Blatt. Herb. 28223 ! 28224 ! *Santapau* 91/18 ! 815 ! 11037-11039 !

Cissus elongata Roxb., Fl. Ind. 1 : 411, 1820 ; Planch. 621.

Vitis elongata Wall., Cat. 6116, 1831-1832 ; Wight & Arn., Prodr. 128, 1834 ; FBI. 1 : 658 ; C. 1 : 256 ; Talb. 1 : 320, t. 190.

This is the commonest species of the whole family in Khandala ; abundant everywhere. Stems are sometimes used locally as ropes for grass or firewood bundles.

Flowers.—April to October.

Fruits.—May to January.

Bhiva ; Blatt. Herb. 18614 ! 27643 ! 27274 ! *Sedgwick* 2621 ! *Santapau* 91/16 ! 490 ! 568 ! 742 ! 790 ! 2550 ! 4048 ! 4131 ! 4278 ! 4375 ! 4751 ! 8728 ! 8991 !

Cissus repanda Vahl, Symb. 3 : 18, 1794 ; Gr. 32 ; D. & G. 39 ; Planch., 474 ; G. 234.

Vitis repanda Wight & Arn., Prodr. 125, 1834 ; FBI. 1 : 648 (excl. *C. vitiginea* L.) ; C. 1 : 215 ; Talb. 1 : 312, tt. 184-185.

This is one of the finest vines of Khandala ; with the help of the sucker-like tendrils it climbs along thick trunks of trees and covers them with its beautiful foliage. At all times when in leaf, but especially when the foliage is young and brightly coloured, this plant is a pleasant sight in the district.

Flowers and *Fruits.*—April to June but rare. *Leaves.*—May to November.

Santapau 405 ! 529 ! 848 ! 1859-1861 ! 1879 ! 1880 ! 1934 ! 2020 ! 2021 ! 4183 ! 4184 !

Cissus woodrowii (Stapf) Santapau in Kew Bull. 1948 : 276, 1948.

Vitis Woodrowii Stapf ex Cooke, in Fl. Pres. Bomb. 1 : 248, 1902.

Cissus vitiginea D. & G., Bomb. Fl. 40, 1861 (non Roxb.).

An erect shrub with thick trunk and large leaves. This plant has often been observed by me in Khandala, but was often taken for *C. repanda*, from which it clearly differs by its erect habit. It is also closely allied to *C. pallida* Planch., from which it differs by its erect habit and the total absence of tendrils. It is a very conspicuous and common shrub at Purandhar Fort, Poona Dt. In Khandala it is common on Kune Plateau.

Flowers and *fruits.*—May to June.

Santapau 3128 !

Cissus tenuifolia Heyne ex Wall., Cat. 6022, 1831-1832 ; Planchon 563, 1887.

Vitis tenuifolia Wight & Arn., Prodr. 129, 1834; FBI. 1 : 660 (excl. syns.); C. 1 : 257 ; Talb. 1 : 322, t. 192 (omnes pro parte, non Leconte).

Scandent; tendrils leaf-opposed, forked. Leaves typical; leaflets usually 5, the lateral ones pedately arranged, the terminal leaflet bigger and with longer petiolule. Flowers all 4-merous, bisexual; petals falling off very easely. Fruit not seen. The tendrils and young parts of the plant are reddish in colour.

Seen only on two occasions on Battery Hill Plateau; on the second occasion, August 1945, the plant was very abundant on the whole plateau in fairly dense forest.

Flowers.—August 1945. *Fruits.*—Not seen.

Santapau 5370 ! 5371 ! 6994 ! 6995 ! 6996 !

TETRASTIGMA Planch.

Tetrastigma canarense (Dalz.) Gamble, in Fl. Madr. 228, 1918.

Vitis canarensis Dalz. in Hook. Kew Journ. Bot. 3 : 123, 1851 ; FBI. 1 : 655 ; C. 1 : 255 ; Talb. 1 : 319, t. 189.

Cissus canarensis Planchon in DC., Monogr. Phan. 5(2) : 620, 1887.

A large climber, going over the tops of high trees in the forest and hanging down in long pendulous festoons. Fruits at first green, then cadmium yellow, at length scarlet.

A very elegant climber, common below Echo Point, along the ravine stream; elsewhere in the district rare. Leaves dry to a paler yellow than most other leaves and remain on the parent plant for some time; this renders the plant rather conspicuous.

Flowers.—December to January.

Fruits.—December to April.

Santapau 91/3 ! 1856 ! 1857 ! 1858 ! 1935 ! 3226 ! 3403 ! 3579 ! 4223 ! 4224 ! 4443 ! 4808 !

LEEA Linn.

Leea edgeworthii Santapau, nom. nov.

Leea aspera Edg. in TLS 20 : 36, 1841 ; FBI. 1 : 665 ; Clarke, in Trim., Journ. Bot. 19 : 136, 1881 ; C. 1 : 260 ; G. 240. (Non Wall., in Roxb., Fl. Ind. 2 : 468, 1824).

A shrub 0·75-1·50 m. high; stems not winged. Leaves simply pinnate, occasionally the lower pair of leaflets or one of them compound; leaflets elliptic, often fairly long acuminate, somewhat hairy above, hairy on the nerves beneath, rounded at the base, side nerves parallel

among themselves and straight or nearly so; stipules large adhering to the petiole, easily caducous.

Flowers white or whitish; cymes pubescent, at length glabrous or subglabrous. Lower bracts long, filiform; higher ones much smaller. Calyx shallowly lobed, lobes rounded and gland-tipped. Petals about twice as long as the sepals. Staminal tube divided about half way down or a little less. Berry black, depressed-globose, not at all or only slightly lobed.

Rather rare in the district, except on Behran's Plateau.

Flowers and *fruits*.—August to November.

Cooke; Blatter in MS. catalogue; *Sedgwick* 2609 ! *Santapau* 91/14 ! 2634 ! 2665 ! 4722 ! 5113 ! 9130 ! 9131 ! 9156 !

Leea robusta Roxb., Hort. Beng. 18, 1814, & Fl. Ind. 1 : 655, 1832; Clarke, 164; King in JASB 65 : 417; C. 1 : 261; G. 240.

Leea diffusa Laws. in Hook. FBI. 1 : 667, 1875.

Leea aspera Wall., Cat. 6825, 1831-1832 (non Edg.).

A shrub about 1 m. high. Leaves pinnate to tripinnate. Petioles angled, channeled but not winged. Flowers pure white; bracts caducous. Berry at first green, then red, at length black, lobed.

Not a common plant. I have seen it mainly on Battery Hill Plateau.

Flowers and *Fruits*.—August to October.

Blatt. Herb. 28590 ! *Santapau* 91/13 ! 2617 ! 2618 ! 2632 ! 2633 ! 2876 ! 4577 ! 5114 ! 6997 !

Leea indica (Burm.) Merrill, in Phil. Journ. Sci. Bot. 14 : 245, 1919 & Enum. 3 : 11, 1923.

Staphylea indica Burm., Fl. Ind. 75, t. 24, f. 2, 1768.

Aquilicia sambucina Linn., Mant. 2 : 211, 1771.

Leea staphylea Roxb., Hort. Beng. 18, 1814 & Fl. Ind. 1 : 658, 1832; Gr. 33; Wight, Icon. t. 78; D. & G. 41.

Leea sambucina Willd., Sp. Pl. 1 : 1177, 1797; Clarke 139; FBI. 1 : 666 pro parte; C. 1 : 260; G. 240.

A shrub, occasionally a small tree, 1·5-6 m. high; stem up to 30 cms. diam, at 20 cms. from the ground level; branches striate.

A very common shrub found in open country or in dense forest. The largest specimens seen and measured were observed in secondary forest about Forbay. The young shoots are gathered by local people and eaten as vegetables. The large pith of the stem and branches is often used in place of elder pith in biological laboratories. The aerial roots mentioned by Cooke and Talbot have been observed on plants growing on Behran's Plateau but only during the rainy season.

Flowers.—February to October. *Fruits*.—The whole year.

Cooke; Blatt. Herb. 19611 ! 19625 ! 19650 ! *Hallberg* in MS. catalogue ! *Santapau* 91/2 ! 361 ! 3702 ! 3703 ! 6998 !

Leea setuligera Clarke, in Trim., Journ. Bot. 19 : 105, 1881 ; C. 1 : 262.

A shrub about 1 m. high. Leaves compound, bipinnate ; petioles channelled above ; leaflets purplish or vinaceous beneath when young, at length green ; lateral leaflets sessile or nearly so. Stipules adnate to the petioles, up to 2 cms. long. The hairs on the leaflets have a large almost bulbous and shinning red base.

Flowers 5- and 4- merous, in small compact umbellate cymes ; bracts linear subulate, caducous ; peduncles 2-6 cms. long, rather stout ; pedicels 1 mm. long or shorter. Calyx glabrous, divided to about the middle, lobes subacute or obtuse. Corolla very pale green, almost white. Staminal tube deeply lobed almost down to the base, each lobe shallowly notched ; stamens deep purple in colour.

This is a rare plant in Khandala, and to judge from the fact that there is but one sheet in Herb. Kew, very rare elsewhere too. My specimens have been compared with Clarke's type at Kew and they match perfectly.

Flowers.—June 1946. *Fruit.*—Not seen.

Santapau 9132 ! 9133 !

SAPINDACEAE.

Lepisanthes Blume.

Lepisanthes tetraphylla (Vahl) Radlk., Sap. Holl.-Ind. 35 (105), 1877, & in Pfreich. 98 : 743, t. 15.

Sapindus tetraphyllus Vahl, Symb. 3 : 54, 1794 ; Gr. 29 ; D. & G. 35.

Hemigyrosa canescens Blume, in Rumph. 3 : 166 in obs., 1847 ; FBI. 1 : 671 (excl. syn. *H. trichocarpa* Th.) ; C. 1 : 264 ; Talb. 1 : 332, t. 196.

A common tree in the ravines ; particularly common below St. Xavier's Villa. A poor looking tree.

Local name : Harki.

Flowers.—March to May. *Fruits.*—April to May.

Graham ; *Gammie* 21st March 1903 ! *Blatt. Herb.* 18919 ! 18927 ! 24629 ! 28508 ! 28728 ! 24267(2) ! *Santapau* 83/5 ! 83/7 ! 8! 10 ! 1780 ! 1781 ! 1875 ! 3716 ! 3784 ! 3785 ! 4010 ! 4228 ! 4229 !

Allophyllus Linn.

Allophyllus serratus (Roxb.) Radlk. in Pfam. 3(5) : 313, 1895 & Pfreich. 562 ; G. 246.

Ornitrophe serrata Roxb., Pl. Corom. 1 : 44, t. 61, 1795.

Schmidelia serrata Wight & Arn., Prodr. 110, 1834 ; Wight, Ill. 141.
Sapindus Cobbe Graham, Cat. 29, 1839.
Allophyllus Cobbe Hiern in FBI. 1 : 674, . 1875 (pro parte, nec Blume) ; C. 1 : 265 ; Talb. 1 : 334, t. 197.

Common all over the district in low forest, especially towards the edges of the forest. In Khandala I have not noticed the climbing habit mentioned by Cooke.

Flowers.—April to August. *Fruits.*—July to September.

Chibber, June 1909 ! *Blatt. Herb.* 11146 ! 25301 ! 25344 ! 25524 ! 25532 ! 19788 ! 25328 ! *Segdwick* 2567 ! *McCann* 4422 ! 4423 ! 3694 ! *Santapau* 83/3 ! 398 ! 429 ! 442 ! 462 ! 786 ! 2095 ! 4475 ! 4643 ! 8921 ! 8922 !

SCHLEICHERA Willd.

Schleichera oleosa (Lour.) Oken, Allg. Naturgesch. (3) 2 : 1341, 1841 ; Merr., Int. Herb. Amb. 337 & JAA. 31 : 284.
Pistacia oleosa Lour., Fl. Coch. 2 : 615, 1790.
Schleich. trijuga Willd., Sp. Pl. 4 (2) : 1096, 1805 ; FBI. 1 : 681 ; Gr. 29 ; Wight, Ill. t. 141 ; D. & G. 35 ; C. 1 : 266 (excl. *Sap. trifoliata* L.) ; Radlk. 874 ; Talb. 1 : 335, t. 198.

One of the largest trees in the district. Leaves " ox-blood Red " (Ridg. 1, k) when young, later red beneath, dark green above, at length brightly and uniformly green. Flowers greenish yellow, often on short branches. Calyx 4-merous ; corolla 0. Fruit up to 18 × 12 mm., sharply pointed, often echinate with sharp prickles which are nearly as long as the diameter of the fruit or occasionally longer ; the points of the prickles often break away at maturity and then the prickles seem to be blunt.

The fruits seem to be eaten by monkeys ; I have not noticed the local people eating them.

One of the most conspicuous trees in St. Xavier's ravine, the young leaves giving it a bright red colour which is distinguishable for long distances. When the tree is in flower it is visited by a large number of insects.

Local name : Kósimb or Kóshimb.

Flowers.—March to April. *Fruits.*—April to June.

Woodrow ; *Bhide* 28th May 1909 ! *Blatt. Herb.* 25329 ! 28427 ! 24265(2)! *Santapau* 83/2, 6, 10 ! 1963 ! 3772 ! 3773 ! 3774 ! 3775 !

SAPINDUS Linn.

Sapindus trifoliatus Linn., Sp. Pl. 367, 1753 ; FBI. 1 : 682 ; Radlk. 656.
S. laurifolius Vahl, Symb. 3 : 54, 1794 ; Gr. 29 ; D. & G. 34 ; C. 1 : 266.

A tall tree, scarcely branched below, not extensively branched above, about 15 m. high. Leaves paripinnate; leaflets somewhat leathery, pale green. Inflorescence terminal in rusty pubescent, close panicles; bisexual flowers as many as or more than male ones. Sepals 5, unequal in length, fulvous-pubescent outside, glabrous inside. Petals 4-5, pure white when fresh, dull white later on, villous on both sides, distinctly twisted to the right. Disc very hairy all over. Stamens 8; filaments villous, white; ovary hairy. Fruit not seen in Khandala.

In the whole district I have only seen a group of tall trees growing in dense forest below Echo Point. At the flowering time the trees were observed to be covered by a veritable cloud of small white butterflies.

Flowers.—November to May.

Santapau 493 ! 1317 ! 1873 ! 5446 ! 5447 !

Dodonaea Linn.

Dodonaea viscosa (Linn.) Jacq., Enum. Pl. Car. 19, 1760; FBI. 1 : 697; Wight, Ill. t. 52; C. 1 : 269; Talb. 1 : 324, t. 202; Radlk. 1363.

Ptelea viscosa Linn., Sp. Pl. 118, 1753.

Dodonaea Burmanniana Graham, Cat. 30, 1839; D. & G. 36.

Graham, loc. cit., and Blatter are my only authorities for the inclusion of this plant. I have not seen it in the district.

Graham; *Blatter* in MS. catalogue.

Blighia Koen.

Blighia sapida Koenig, in Koen. & Sims, Ann. Bot. 2 : 571, tt. 16-17, 1806; Gr. 30; D. & G. Suppl. 13; C. 1 : 262; Radlk. 1142, t. 32.

An introduced plant, sometimes found in cultivation. Blatter mentions it in his MS. catalogue as growing in Khandala. I have not seen it in the district.

ANACARDIACEAE.

Mangifera Linn.

Mangifera indica Linn., Sp. Pl. 200, 1753; FBI. 2 : 13; Gr. 41; D. & G. 51; Engler in DC., Monogr. Phan. 4 : 198, t. 4, f. 10-12; C. 1 : 273; Talb. 1 : 348.

A large tree with spreading branches; the largest specimens seen measured well over 29 m. in height. Leaves in young seedlings up to

50×15 cms., usually much smaller, purplish green when young, dark green above and paler beneath when old. Flowers in dense, many-flowered panicles. Petals, when fresh, pure white with a yellow spot near the base on the inner side, in old ones the spot turns brown, the rest of the petals yellow. Drupe up to 7×4×3 cms., rarely larger on wild trees ; the 'stone' is very fibrous ; the fleshy part of the fruit is inconsiderable ; young fruits are pickled and eaten in curries ; when untreated, they taste very strongly of turpentine ; ripe fruits are eaten raw, and are very pleasant, but not of good quality on account of the large ' stone ' and the many fibres ; they are collected and sold locally in the bazaar ; the fleshy part is often used in the preparation of ' Mango Fool '.

A very common tree in jungles all over the district ; particularly common in St. Xavier's Ravine and in "Mango Valley " on Kune Plateau.

Local name : Amb.

Flowers.—January to March. *Fruits*—March to May.

Blatter in MS. catalogue ; *Santapau* 82/1 ! 3790 ! 3912 !

Anacardium Linn.

Anacardium occidentale Linn., Sp. Pl. 583, 1753 ; FBI. 2 : 20 ; Gr. 40 ; D. & G. Suppl. 18 ; C. 1 : 274 ; Talb. 1 : 350, t. 205.

Cultivated in Khandala ; not seen wild. In the grounds of St. Xavier's Villa it flowers and fruits practically the whole year. Generally there are flowers and fruits in all stages of development at the same time. Flowers are reddish or red ; fruit is either pure green or green with a touch of pink, especially on the greatly enlarged thalamus. When immature the fleshy thalamus is very acid ; when ripe it is said to be very tasty.

Local name : Kaju.

Blatter in MS. catalogue ; *Santapau* 82/2 ! 5 ! 8936 ! 8937 !

Lannea A. Rich.

Lannea grandis (Dennst.) Engler in Pfam., Nachtr. 1 : 213. 1897.

Haberlia grandis Dennst., Schluess. Hort. Malab. 30, 1818.

Odina Wodier Roxb., Hort. Beng. 29, 1814 & Fl. Ind. 2 : 293, 1832 ; FBI. 2 : 29 ; Gr. 42 ; Wight, Icon. t. 60 ; D. & G. 51 ; Engler in DC., Monogr. Phan. 4 : 267, t. 8, f. 27-29 ; C. 1 : 277 ; Talb. 1 : 353, t. 207 ; G. 263.

Rare in Khandala ; there are several fairly good specimens on the north side of Monkey Hill, but these are doubtfully wild.

Flowers.—February to March. *Fruits.*—March to June.

Gammie 16148 ! *Bhiva* ! *Blatter* in MS. catalogue ; *Santapau* 3898 ! 3899 ! 3900 ! 3901 ! 4307 ! 4431 ! 8683 ! 8821 ! 9033 !

HOLIGARNA Buch.-Ham.

Holigarna grahami (Wight) Hook. f. in FBI. 2: 37, 1876; Engler in DC., Monogr. Phan. 4 : 499 ; C. 1 : 280 ; Talb. 1 : 359, t. 210.

Semecarpus Grahami Wight, Icon. t. 235, 1839 ; Ill. 1 : 185 ; D. & G. 52.

A large evergreen tree, growing up to 18 m. in height in dense forest. In six years I have only found one specimen in Meroli, where collection of specimens was very difficult on account of the many spinous climbers round its trunk.

Local name : Bìbu.

Woodrow; *Blatt. Herb.* 27509 ! *Santapau* 4703 !

PAPILIONACEAE.

HEYLANDIA DC.

Heylandia latebrosa DC., Mem. Leg. 201, 1825; FBI. 2 : 65 ; Gr. 44 ; D. & G. 54 ; C. 1 : 291 ; G. 280.

This is one of the commonest among the Papilionaceae all over the Deccan ; but it is also one of the rarest in Khandala. Neither Blatter nor McCann have found it in the neighbourhood of Khandala ; I have found it on but one occasion, although careful search has been made for the purpose. It is a plant growing in districts which are much drier than Khandala.

Santapau !

CROTALARIA Linn.

Crotalaria filipes Benth., in Hook. Lond. Journ. Bot. 2 : 475, 1843 ; FBI. 2 : 66 ; D. & G. 56 ; C. 1 : 292 ; G. 292.

This is one of the commonest of the Papilionaceae in the district ; it is particularly common in grass fields, especially when the grasses are not too tall.

Flowers.—September to April. *Fruits.*—October to April.

Hallberg in MS. catalogue ; *Blatt. Herb.* 10100 ! 10499 ! 10572 ! 10990 ! 11127 ! 10268 ! *Segdwick* 6026 ! *Santapau* 102/25, 92, 96 ! 1025 ! 1256 ! 1299 ! 2968 ! 5065 !

Crotalaria filipes Benth., var. **trichophora** (Baker) T. Cooke, in Fl. Pres. Bomb. 1 : 293, 1902.

Crotalaria trichophora Baker in FBI. 2 : 67, 1876.

Except for the hairiness of the stems and leaves and a more luxuriant habit, this plant resembles *C. filipes*.

Flowers and *Fruits*.—4th November 1941.
Santapau 102/96 !

Crotalaria vestita Baker in FBI. 2 : 67, 1876 ; C. 1 : 293 ; Prain in JASB 66 : 349.

This is not easy to distinguish from other very similar species of *Crotalaria* ; the following characteristics make it possible clearly to separate the species : absence of stipules, large leafy bracts, glabrous pods and number of seeds (15-20).

Specimen No. 4954 is heavily infected with fungal spots, which have been kindly identified for me by Dr. B. B. Mundkur as *Parodiella paraguayensis* Speg.

Flowers and *Fruits*.—October to March.

Bhiva ! *Herb. Cooke* in Herb. Coll. Sci. Poona ! *Blatt. Herb.* 27950 ! 27957 ! 10259 ! 10646 ! *Acland* 313 ! *Santapau* 1122 ! 1187 ! 1299 ! 2916 ! 2951 ! 2595 ! 3749 ! 4954 ! 4975 ! 7434 !

Crotalaria bifaria Linn. f., Suppl. 322, 1781 ; FBI. 2 : 69 ; Gr. 45 ; D. & G. 55 ; Wight, Icon. t. 30 ; C. 1 : 294.

I have not seen this plant in Khandala ; there are no specimens in either Blatter or Sedgwick herbaria ; neither Woodrow nor Cooke mentions it as occurring in Khandala; the plant is given on the authority of Hallberg.

Hallberg in MS. catalogue.

Crotalaria mysorensis Roth, Nov. Pl. Sp. 338, 1821 ; FBI. 2 : 70 ; C. 1 : 294 ; G. 295.

This is not a common herb in Khandala ; it grows among grasses and generally attains a much bigger size that is mentioned by Cooke. The size and structure of the stipules, and the colour of the hairs on the inflorescence distinguish it from any other species of *Crotalaria* growing in Khandala.

Flowers.—September to December. *Fruits*.—October to December.

Blatt. Herb. 10603 ! 10621 ! 10651 ! 10652 ! 10264 ! *Sedgwick* 7942 ! *Santapau* 1196 ! 2789 ! 2790 ! 2791 ! 5063 ! 5044 ! 5221 ! 7433 !

Crotalaria triquetra Dalz. in Hook. Kew Journ. Bot. 2 : 34, 1850 ; FBI. 2 : 71 ; D. & G. 56 ; C. 1 : 295.

Common about Khandala ; very conspicuous especially when it grows among tall grasses ; under such conditions the stems are often unbranched, the leaves are large and bright green and almost bifarious, the whole plant is strictly erect.

Flowers.—October to December. *Fruits*.—October to April.

Hallberg in MS. catalogue ; *Blatt. Herb.* 10091 ! 10092! 10571 ! 11103 ! 11107 ! 10645 ! *Acland* 319 ! *Santapau* 1107 ! 1225 ! 1280 ! 2948 ! 2949! 2950 ! 3029 ! 3030 ! 3748 ! 5068 !

Crotalaria albida Heyne, ex Roth, in Nov. Pl. Sp. 333, 1821; FBI. 2: 71; C. 1: 295; G. 297.

C. punctata Graham, in Wall., Cat. no. 5401, 1831-1832.

C. epunctata Dalz. in Kew Journ. Bot. 3: 210, 1851; D. & G. 56.

This species has only been found on two occasions in Khandala, growing on or near the railway line. It is clearly an introduced plant in the district, the railway being the means of introduction.

Flowers.—April 1942, October 1944. *Fruits.*—October 1944

Santapau 102/123 ! 5426 ! 5427 ! 5428 !

Crotalaria nana Burm., Fl. Ind. 156, t. 48, f. 2, 1758; FBI. 2: 71; D. & G. 56; C. 1: 296; G. 294.

C. umbellata Wight in Wall., Cat. No. 5383, 1831-1832; Gr. 45; D. & G. 56.

Both the branched and the unbranched varieties mentioned by Cooke occur in Khandala, though not abundantly. Stems hairy with spreading or somewhat appressed hairs. Leaves subacute or acute, apiculate with a small tuft of hairs at the tip.

Flowers small, yellow, in dense capitate racemes.

This plant is rather noticeable on account of the type of inflorescence and of the colour of its pods.

Flowers and *Fruits.*—September to October.

Blatt. Herb. 10262 ! *Santapau* 1044 ! 5066 ! 5067 ! 5197 !

Crotalaria linifolia Linn. f., Suppl. 322, 1781; FBI. 2: 72; Gr. 45; D. & G. 56; C. 1: 297; G. 294.

C. sobolifera Graham, in Wall. Cat. 5420 A.

This plant has not been found by me in Khandala; it is a common herb further inland. It is included on the authority of the following: *Graham; Dalzell & Gibson; Hallberg* and *Blatter* in their MS. catalogues.

Crotalaria retusa Linn., Sp. Pl. 715, 1753; FBI. 2: 75 (excl. syn. D. & G.); Bot. Mag. t. 2561; C. 1: 298; G. 293.

C. Leschenaultii Graham, Cat. 44, 1839; D. & G. 54 (non DC.).

A robust shrub 0·6—3 m. high; generally the Khandala plants are from 1 m. to 1·5 m. tall but one may find plants 2 or 3 m. high especially on the plateau below Echo Point. Branches striate, appressedly pubescent; the glabrous form has not been seen in Khandala. Leaves oblanceolate-oblong, subacute, obtuse or sometimes emarginate, occasionally mucronate; glabrous above, hairy with appressed hairs beneath; margins entire. Petioles very short or 0. Stipules up to 4 mm. long, subulate, persistent, reflexed, hairy. Size of the leaves up to 13 × 2·5 cms.

Flowers very showy, in terminal erect racemes up to 30 cms. long. Pedicels from 2·5 to 12 mm. long. Bracts up to 5 mm. long, subulate; bracteoles 2, about half way up the pedicel, 2·5 mm. long. Corolla "Pale Lemon Yellow" to "Picric Yellow" (Ridg. 23b-d) without any traces of purple; occasionally the nerves on the corolla show a little

tinge of purple. Pods at first green, later purplish, finally black; the style and stigma persist on the pod practically till dehiscence.

A very common plant in Khandala, especially on the plateau below Echo Point; it is in such a locality that the plant reaches its largest size. When the plants are in full bloom, they are one of the finest sights about Khandala.

Local name : Gágra, Kulkula.

Woodrow ; Hallberg in MS. catalogue; *Blatt. Herb.* 10568 ! 10589 ! 11921 ! *Acland* 303 ! *Santapau* 102/99 ! 308 ! 1276 ! 1428 ! 3191 ! 5493!

Crotalaria leptostachya Benth., in Hook. Lond. Journ. Bot. 2 : 562, 1843; FBI. 2 : 78; C. 300.

Not common on this part of India; specimens in Blatter Herbarium have been collected at Pen, Karjat, Khandala, Purandhar, Poona. In Khandala solitary patches of a few plants are found scattered over a wide area.

Flowers.—October 1944. *Fruits.*—Not seen in Khandala.

Cooke ; Woodrow ; Blatt. Herb. 10658 ! 10296 ! *Santapau* 5383! 8082 !

Crotalaria juncea Linn., Sp. Pl. 714, 1753; FBI. 2 : 79; C. 1 : 301; G. 297.

Rare in Khandala; the fact that the only specimens were collected along the main road confirms the idea that this is but a cultivated species. Inflorescence and young leaves shine with golden silky hairs, and this renders the plant very easy of identification.

Santapau October 1944 !

Trigonella Linn.

Trigonella oculta Delile, Fl. Aeg. Ill. 71, 1812; FBI. 2 : 87; C. 1 : 305; Sirjaev, Gen. Trig. Rev. Crit. 2 : 6, t. 2, f. 41 & t. 3, ff. 78-82.

According to Cooke, this is a very rare plant outside Sind; Woodrow has collected it at Lanowla, 3 miles away from Khandala; Blatter has also collected it at Khandala itself, but there are no specimens preserved in Blatt. Herb.; I have not seen the plant in Khandala.

Flowers.—November to March. *Fruits.*—November to May.

Blatter, in MS. catalogue.

Melilotus Juss.

Melilotus indica All., Fl. Pedem. 1 : 308, 1785; C. 1 : 305; G. 303.

M. parviflora Desf., Fl. At. 2 : 192, 1800; FBI. 2 : 89; Gr. 46; D. & G. Suppl. 21.

A small erect herb, reaching 8-30 cms. high; flowers in very close racemes, minute, yellow or yellowish. A rare plant in Khandala, which

seems to be spreading ; in Febr. 1951, this plant was seen growing rather abundantly along the old railway line near the village talao.

Flowers.—March 1949, February 1951. *Fruits.*—February 1951.

Santapau 9996! 12208! 12221-12224.

INDIGOFERA Linn.

Indigofera linifolia Retz., Obs. 4 : 29, 1786 & ibid. 6 : t. 2, 1791 ; FBI. 2 : 92 ; Gr. 46 ; D. & G. 58 ; Wight. Icon. t. 333 ; C. 1 : 310 ; G. 309.

Common in the drier parts of the Deccan and on the Konkan plains ; but very rare in Khandala proper, the nearest specimen coming from about half way down from Khandala to Kampoli along the main road.

Blatter 10641!

Indigofera glandulosa Roxb. ex Willd., Sp. Pl. 3 : 1227, 1803 ; Roxb., Fl. Ind. 3 : 372, 1832 ; FBI. 2 : 94 ; D. & G. 58 ; Wight, Icon. t. 330 ; C. 1 : 311 ; G. 310.

Common on the drier plains of the Deccan Plateau, but very rare in Khandala.

Blatt. Herb. 12718(2) ! 10276 !

Indigofera prostrata Willd., Sp. Pl. 3 : 1226 , 1803 ; G. 310.

I. trifoliata Baker in FBI. 2 : 96 pro parte.

This is about the only species of *Indigofera* that is somewhat common about Khandala ; a group of plants have been observed for a number of years growing at a spot not far from the railway line. Owing probably to the dense growth of grasses in the neighbourhood, this plant seems to be practically erect ; it grows in dense clumps.

This plant comes under *I. trifoliata* Linn. in Cooke's Flora ; Gamble has separated *I. prostrata* Willd. from Linne's *I. trifoliata* in his Flora of Madras. Whilst writing his Flora, Gamble corrected many of the sheets in Kew Herb., even those which he himself had originally identified as *I. trifoliata*. I have followed Gamble in separating these two plants ; *I. prostrata* has long and slender stems, and very thin, almost filiform pods, which are so deflexed that they are practically parallel with the stem. *I. trifoliata* has much stouter pods, and their deflexion is never so pronounced as in the former species. The general slender habit of the former and the stoutness of the latter species render them quite distinct even at first sight.

Flowers and *Fruits.*—October.

Blatt. Herb. 10274 ! *Santapau* 1042 ! 5069 ! 5070 ! 5086 !

PSORALEA Linn.

Psoralea corylifolia Linn., Sp. Pl. 764, 1753 ; FBI. 2 : 103 ; Gr. 46 ; D. & G. 60 ; C. 1 : 321 ; G. 314.

Rare in Khandala; I have not collected it from anywhere in the district. In the Blatt. Herb. there is but one specimen from Khandala. The plant is very common further inland, and the flowers are either purple or pure white. This plant is cultivated for its seeds, which are used as an article of food.

Flowers.—October 1918.

Blatt. Herb. 10632 !

TEPHROSIA Pers.

Tephrosia tinctoria Pers., Syn. 2 : 329, 1807 ; FBI. 2 : 111 ; Wight, Icon. t. 38 ; C. 1 : 324 ; G. 319.

In the Khandala specimen, leaflets are only 9-11. Peduncles up to 14 cms. long, bare in the lower part, bearing 3-12 flowers at the upper end. A rare plant of which I have only seen one specimen from Khandala.

Blatt. Herb. 10251 !

Tephrosia coccinea Wall., Cat. 5633 & in Pl. As. Rar. 1 : t. 60, 1830 ; C. 1 : 324.

T. tinctoria var. *coccinea* Baker in FBI. 2 : 112, 1876.

Leaves up to 13 cms. long ; stipules subulate from a broad base, persistent. Leaflets usually 5, the terminal leaflet solitary, the lower ones opposite ; the terminal leaflet up to 9×2·9 cms., the lower ones gradually decreasing in size downwards, the lowest being about 12 mm. long and about 6 mm. broad ; all membranous ; lateral nerves almost parallel among themselves, very close, slender, conspicuous. Petiole of leaf about 2·5-4 cm. long ; petiolules of lateral leaflets very short, about 1·5 mm., those of the terminal leaflet slightly longer, up to 2·5 mm. Pods nearly straight, slightly curved upwards near the apex ; dehiscing violently and the valves curving 4 or 5 turns.

Flowers.—October. *Fruits.*—October to December.

Blatt. Herb. October 1918 ! *Santapau* 22nd December 1943 !

SESBANIA Scop.

Sesbania bispinosa (Jacq.) Fawcett & Rendle, Fl. Jam. 4 : 24, 1920.

Aeschynomene bispinosa Jacq., Icon. Pl. Rar. 3 : t. 564, 1793.

Coronilla aculeata Willd., Sp. Pl. 3 : 1147, 1803.

Sesbania aculeata Pers., Syn. 2 : 316, 1807 ; FBI. 2 : 114 ; Gr. 48 ; D. & G. 62 ; C. 1 : 328 ; G. 323.

A weak-stemmed plant, up to 3 m. high, sparsely branched, gregarious ; it is very abundant along the railway line from the base of the Ghats up to about 10 Km. from Khandala. In December 1949 for the first time I found the plant on Battery Hill Plateau, in open ground.

Flowers.—October 1951. *Fruits.*—December 1949.
Santapau. October 1951 ! 10668-10672, Dec. 1949 !

GEISSASPIS Wt. & Arn.

Geissaspis cristata Wight & Arn., Prodr. 218, 1834; FBI. 2: 141; D. & G. 62; Taubert in Pfam. 3(3): 82, t. 45B; C. 352; G. 324.

A pretty, delicate plant.

The size of the bracts varies from 6 to 15 mm.; but the stout long hairs on the edges of the bracts readily distinguish this species from *G. tenella*, which with this exception, seems to be but a minute form of *G. cristata.*

Flowers.—September to November, occasionally to March. *Fruits.*—October to November.

Cooke; Blatt. Herb. 11105 ! 10602 ! *Hallberg* in MS. catalogue; *Santapau* 102/26 ! 1212 ! 1277 ! 1692 ! 2548 ! 4411 ! 4837 ! 5217 ! 7468 !

Geissaspis tenella Benth., in Flora 32: 559, 1849; FBI. 2: 141; C. 1: 332; G. 324.

A procumbent annual herb; stem and branches from a thickened root, the stem and branches being wiry, terete, and up to 66 cms. long. Leaves abruptly pinnate; petioles up to 9 mm. long; stipules scarious and prolonged beyond their insertion into short sagittate points, strongly ciliate, more or less deciduous. Leaflets 4, of the same structure as those of *G. cristata,* but smaller, up to 6 mm. long, rounded or truncate or slightly emarginate at the apex, base cuneate.

Flowers in axillary dense racemes; peduncles 25-36 mm. long filiform; pedicels short. Bracts ovate, mucronate, dentate, the bases shortly sagittate, up to 6 mm. long, very oblique. Corolla yellow, about as long as or slightly longer than the enclosing bracts. Pods in Khandala specimens 1-jointed, 2-seeded.

Flowers and *Fruits.*—October to November.

Blatt. Herb. 10601 ! *Sedgwick* 7992 ! *Santapau* 1263 ! 2931 ! 5218 !

ZORNIA Gmel.

Zornia diphylla (Linn.) Pers., Syn. 2: 318, 1807; FBI. 2: 147; Taubert 325, t. 125D; C. 1: 334; G. 325.

Hedysarum diphyllum Linn., Sp. Pl. 747, 1753.

Zornia angustifolia Sm.: Gr. 48; D. & G. 62.

Common on roadsides and on the railway line at the base of Behran's Plateau.

Flowers.—September to Octoer. *Fruits.*—September to November.

Blatt. Herb. 10256(2) ! *Santapau* 1047 ! 2596 ! 2787 ! 44836 ! 7421 !

Zornia conjugata (Willd.) Smith in Rees, Cyclop. 39, no. 3, 1820.
Hedysarum conjugatum Willd., Sp. Pl. 3 : 1178, 1803.
Zornia zeylonensis Pers., Syn. 2 : 318, 1807 ; D. & G. 62 ; G. 325.
Z. zeylanica Spreng., Syst. 3 : 311, 1826 ; Gr. 48.
Z. diphylla var. *zeylonensis* Baker in FBI. 2 : 148, 1876 ; C. 1 : 334.

Leaflets ovate, subacute or almost obtuse.

This is quite a distinct variety, the general appearance of the leaves being conspicuously different from that of the typical species. Both the latter and the present variety grow side by side along the railway line at the base of Behrau's Plateau, and each seems to maintain its identity.

Flowers.—September 1943.

Santapau 2596(2) ! 2601 ! 4758 !

SMITHIA Ait.

Smithia sensitiva Ait., Hort. Kew. 3 : 496, 1789 ; FBI. 2 : 148 ; Gr. 48 ; D. & G. 63 ; C. 1 : 335 ; G. 329.

In general appearance this plant is very near to *S. conferta*, with which it is often associated. The peduncles and pedicels of *S. sensitiva* are much longer than those of the other species. A rare plant in Khandala.

Cooke mentions that this herb is used as a pot herb in India ; this, perhaps on account of the rarity of the plant, does not seem to be the case in Khandala.

Flowers and *Fruits*.—September to October.

Cooke ; Blatt. Herb. 11137 ! 11110 ! 10261! 10653 ! *Santapau* 1026 ! 1048 ! 5059 ! 7402 !

Smithia sensitiva var. **flava** (Dalz.) Cooke in Fl. Pres. Bomb. 1 : 336, 1902 ;

Smithia flava Dalz., MS. ex Prain in JASB 66 : 378, 1898.

This is a much stouter plant than the typical species ; in the Khandala specimens the plant reaches 90 cms. and more in length ; leaves up to 8 cms. long, including the petiole ; leaflets up to 22 mm. long, excluding the terminal bristle. The stems in Khandala specimens are somewhat reddish or purplish in colour.

I have only found the plant growing by the side of streams, in moist and shaded spots ; under such conditions it grew gregariously.

Flowers and *Fruits*.—October to January.

Santapau 5206 ! 5207 !

Smithia conferta Sm. in Rees, Cycl. 33 : no. 2, 1819 : C. 1 : 335 G. 329.

S. geminiflora Roth, Nov. Pl. Sp. 352, 1821.

S. geminiflora var. *conferta* Baker, in FBI. 3 : 149, 1876.

Annual, erect or prostrate herb, or erect with long straggling or pro cumbent branches. Corolla yellow.

This is a common herb growing in grass fields or on grassy slopes, often together with *S. sensitiva*, which it much resembles.

Flowers and *Fruits*.—August to October.

Blatt. Herb. 10094 ! 11711 ! 10263 ! *Santapau* 882 ! 1308(2) ! 2652 ! 5235 ! 7422 !

Smithia purpurea Hook., Bot. Mag. t. 4283, 1847 ; FBI. 2 : 149 ; D. & G. 64 ; C. 1 : 337.

A rare plant, but conspicuous on account of the colour of its flowers. In my Field Diary for 18th October 1944 I find the following entry : "Flowers of a beautiful blue, the same colour as that of *Exacum pumilum* ; when examined in the evening, they had turned into a beautiful purple, between " Royal Purple " and " Hyacinth Violet " (Ridg. 59, d—61, i). Seen only one specimen in the whole of today's excursion."

The colour of the flowers is very characteristic among the Smithias ; but the structure of the plant, especially the arrangement of the stamens is the typical of the genus.

Rare. Among low grasses on Bhoma Hill.

Flowers and *Fruits*.—October.

Cooke ; Blatt. Herb. 10245 ! 10256 ! *Santapau* 2984 ! 5108 ! 5181 !

Smithia setulosa Dalz. in Kew Journ. Bot. 3 : 208, 1851 ; FBI. 2 : 149 ; D. & G. 63 ; C. 1 : 337 ; G. 329.

A very gregarious plant, very showy on account of its size and of the bright colour of its flowers. It grows generally among grasses in well-drained situations. The large patches of bright yellow colour over the Saddle towards Bhoma Hill overlooking Korinda Valley can be seen from a long distance. Among *Papilionaceae*, this plant is remarkable for the ease with which good specimens can be pressed for the Herbarium.

Flowers and *Fruits*.—September to November.

Blatt. Herb. 10095 ! 10567 ! 10265 ! 12496 ! *Santapau* 1059 ! 1060 ! 1061 ! 1062 ! 2830-2832 ! 5000 ! 5012-5014 ! 5193 !

Smithia pycnantha Benth., ex Baker in FBI. 2 : 150, 1876 ; C. 1 : 338.

A rare plant in the district ; I have not collected it from anywhere near Khandala. In the Blatt. Herb. there are only two specimens collected in 1918 ; Cooke also mentions the plant as rare.

Blatt. Herb. 10653 ! 10246 !

Smithia bigemina Dalz. in Kew Journ. Bot. 3 : 208, 1851 ; FBI. 2 : 149 ; D. & G. 64 ; C. 338 ; G. 329.

The corolla is either pure yellow or yellow with two bright scarlet spots or streaks at the base of the standard on the inner side.

Fairly common among grasses during the rainy season or that immediately following the rains, or during the dry season in moist spots. Sedgwick found it in moist fallow fields " closely interwoven with *Geissaspis cristata*, which it resembles. "

Flowers and *Fruits*.—March to June and September to October.

Blatt. Herb. 10098 ! 11951 ! 11703 ! 11123 ! 11039 ! 11705 ! 11104 ! 10259 ! *Sedgwick* 2599 ! *Hallberg* in MS. catalogue ; *Santapau* 730 ! 1038 ! 1075 ! 2766 ! 4151 ! 4257 ! 4414 !

Smithia blanda var. **racemosa** Baker in FBI. 2 : 151, 1876 ; C. 1 : 338.

S. racemosa Heyne ex Wall., Cat. 5670, 1831-1832 ; D. & G. 63.

S. hirsuta Dalz., in Hook. Journ. Bot. 3 : 135, 1851 ; D. & G. 63 ; G. 330.

Rare in Khandala ; I have seen no living specimens in the district. It is fairly common further inwards in the Deccan.

Fruits.—Oct. 1918.

Blatt. Herb. 10644 !

Smithia salsuginea Hance, in Journ. Bot. 7 : 164, 1869 ; C. 1 : 340.

S. dichotoma Dalz., MS. ex Baker in FBI. 2 : 150, 1876.

An erect or semierect herb ; specimen no. 2782 shows several of the lower nodes giving off adventitious roots. The colour of the corolla in the Khandala specimens is very pale yellow almost white.

Not common in Khandala. Cooke, loc. cit., states that the plant is rare. This is not correct ; this herb is very common about Andheri in Salsette Island ; Sedgwick in a marginal note to his own copy of Cooke's Flora wrote : " *Very* common in Kanara below the Ghats ". In Khandala it is not common except on the railway line at the base of Behran's Plateau.

Flowers and *Fruits*.—September to October.

Santapau 2622 ! 2781 ! 2782 ! 2783 !

Alysicarpus Neck.

Note : The synonymy of *Alysicarpus* and *Desmodium* here adopted is rather doubtful and does not agree with that of Schindler in his various papers on these two genera. Until, however, a monograph be produced on the subject, I do not feel justified in departing from the commonly accepted synonymy.

Alysicarpus vaginalis (Linn.) DC., Prodr. 2 : 353, 1825 ; FBI 2 : 158 ; D. & G. 64 ; C. 1 : 346 ; G. 338 ; Merrill, in Enum. Phil. Leg. in Phil Journ. Sci., Bot. 5 : 92.

Hedysarum vaginale Linn., Sp. Pl. 746, 1753.

Erect or prostrate, 20-90 cms. long, leaflets very variable in shape and size, from suborbicular or broadly ovate to oblong or oblong-lanceolate. Fruit not at all or only faintly moniliform, massed at the ends of branches. Common in Khandala.

Flowers and *Fruits*.—April to October.

Blatt. Herb. 10796 ! 8789 ! 9366 ! 12689 ! *Santapau* 102/42 ! 2518 ! 4167 ! 4838 ! 4839 !

Alysicarpus bupleurifolius (Linn.) DC., Prodr. 2 : 352, 1825 ; FBI. 2 : 158 ; Gr. 50 ; D. & G. 64 ; C. 1 : 347 ; G. 338.

Hedysarum bupleurifolium Linn., Sp. Pl. 745, 1753 ; Roxb., Pl. Cor. 2 : t. 194, 1798.

Stems profusely branched from rear ground level. Pods included or slightly exserted. Not common in Khandala. I have not seen it in the living condition.

Fruits.—October 1918.

Blatt. Herb. 12695 ! 12709 !

Alysicarpus longifolius Wight & Arn., Prodr. 233, 1834 ; FBI. 2 : 159 ; D. & G. 63 ; C. 1 : 347 ; G. 338.

A rare plant, found occasionally among grasses in open country.

Flowers.—Not seen. *Fruits*.—October 1918, October 1945.

Blatt. Herb. 12696 ! 50254 ! *Santapau* 2982 ! 5241 !

Alysicarpus rugosus (Willd.) DC., Prodr. 2 : 353, 1825 ; FBI. 2 : 159 ; C. 1 : 348 ; G. 338.

Hedysarum rugosum Willd., Sp. Pl. 3(2) : 1172, 1803.

The only specimen in Blatt. Herb. from the district was collected in October 1918 from Khandala to Kampoli ; there are no specimens from Khandala itself.

Fruits.—October 1918.

Blatt. Herb. 12688 !

Alysicarpus rugosus var. **ludens** Baker in FBI. 2 : 159, 1876.

This variety is not mentioned by Cooke ; it was collected by Blatter, probably in October 1918, in the [illegible] of Khandala. I have seen no other specimen from the district.

Blatter 12691 !

Alysicarpus belgaumensis Wight, Icon. t. 92, 1840 ; FBI. 2 : 160 ; D. & G. 65 ; C. 1 : 349.

Common among grasses, very conspicuous on account of the colour of its flowers and of the shape and colour of the leaves. When the plant grows among dense, tall grasses, it attains its greatest height, and the stem is then often unbranched.

Flowers.—September to November. *Fruits*.—October to November.

Blatt. Herb. 10595 ! 28589 ! 12707 ! 12693 ! 12697 ! 12698 ! *Sedgwick* 7942 ! *Acland* 296 ! 297 ! *Santapau* 1102 ! 1114 ! 2983 ! 2986 ! 2987 ! 3131 ! 5167 ! 5168 ! 8088 !

Alysicarpus sp.

Blatt. Herb. 12694 ! *Santapau* 912 ! 1040 ! These specimens are with flowers but without fruits ; Blatter identified his specimen as *A. bupleurifolius ;* my specimens are possibly *A. rugosus.* But in the absence of fruits, it is not easy to decide the correct species ; they are definitely *Alysicarpus.*

Desmodium Desv.

Desmodium triangulare var. **congestum** (Prain) Santapau in Kew Bull. 1948 : 276, 1948.

D. Cephalotes var. *congestum* Prain, in JASB 66 : 389, 1898; C. 1 : 352 ; G. 344.

Branches appressedly hairy, very clearly triquetrous. Corolla 8 mm. long, creamy white in colour. Leaflets acuminate.

Cooke, loc. cit., gives the colour of the corolla as red, and that of *D. umbellatum* as white. It would seem, therefore, as if the identification of the specimens from Khandala had been wrongly given by Blatter. His specimen, however, shows the characteristic acuminate leaflets and trigonous stems, both of which are typical of *D. triangulare* var. *congestum* (*D. Cephalotes* var. *congestum*) ; the colour of the corolla was noted as white by Blatter at the time of collection. There is no doubt, then,that the colour of the flowers of *D. triangulare* var. *congestum* is at least occasionally white.

Rare in Khandala. I have not found it in the district. The nearest spot where I have found it is along the Ulhas river at Karjat, about 30 Kms. from Khandala ; it is to be noted, however, that the river Ulhas is the continuation of the stream that passes through Kune Plateau and St. Mary's Ravine in Khandala.

Flowers.—September 1918. *Fruits.*—Not seen in Khandala.

Blatt. Herb. 12492 ! 12494 !

Desmodium laxiflorum DC. in Ann. Sci. Nat. 4 : 100, 1825, & Prodr. 2 : 335, 1825 ; FBI. 2 : 164 ; C. 1 : 353.

D. recurvatum Wall., Cat. 5717, 1831-1832 ; Gr. 49 ; Wight, Icon. t. 374.

This is a common plant in the ravines by the sides of paths. The distinguishing characters of this *Desmodium* are the narrow, long, straight or falcate pods with their hooked hairs ; when walking through the ravines, one may easely get covered with the segments of the pods of this plant, and it is not easy to remove them from one's clothing or person.

The size of the terminal leaflet is up to 15×7·5 cms., that of the lateral ones up to 11·5×5 cms.; the terminal leaflet is regular at the base; the lateral ones are conspicuously unequal-sided and oblique at the base.

Standard white or whitish; wings lilac or even pure blue. Pods very thin, long, easily separating at the joints.

Flowers and *Fruits*.—September to November.

Blatt. Herb. 10611 ! 10281 ! 10629 ! *Acland* 328 ! *Santapau* 102/100 ! 1045 ! 1069 ! 1095 ! 2847 ! 4972 !

Desmodium polycarpum (Poir.) DC., Prodr. 2 : 334, 1825 ; FBI. 2 : 171 ; Gr. 49 ; D. & G. 69 ; Wight, Icon. t. 404 ; C. 1 : 354.

Hedysarum polycarpum Poir., Encycl. 6 : 413, 1804.

Stipules very persistent. Colour of corolla purple or purplish-blue.

This a conspicuous plant on account of its massed fruits ; when dry, the pods easily break into separate pieces at the joints, and the segments are practically square, at least those in the middle of the pod.

Flowers.—September to October. *Fruits*.—October to November.

Blatt. Herb. 12690 ! 19278 ! 10267 ! *Santapau* 4957 ! 5461 !

Desmodium triflorum (Linn.) DC., Prodr. 2 : 334, 1825 ; FBI. 2 : 173 ; Gr. 49 ; D. & G. 67 ; C. 1 : 355 ; Wight, Icon. t. 292.

Hedysarum triflorum Linn., Sp. Pl. 749, 1753.

A common herb particularly in waste lands, where either the grass does not grow or is so grazed upon by cattle and goats that it never reaches any considerable height. With its branches spreading in all directions from the stem, and its leaves being flat on the ground, this is a pretty little herb ; its flowers are so minute that they can scarcely be seen unless carefully sought for ; the fruit is even more "invisible", on account of its small size and its being covered by the leaves.

Flowers.—March to November. *Fruits*.—March to June and October to November.

Blatt. Herb. 11334 ! 10998 ! 28528 ! *Santapau* 1027 ! 2408 ! 2516 ! 4170 ! 4372 ! 4381 ! 4382 ! 4974 ! 8749 ! 8769 !

Desmodium triquetrum (Linn.) DC., Prodr. 2 : 326, 1825 ; FBI. 2 : 163 (excl. syn. *D. auric.*, *D. pseudotr.*, & *D. alat.*) ; Gr. 49 ; D. & G. 66 ; C. 1 : 355 ; G. 345 ; Merrill, Enum. Phil. Leg., loc. cit. 86.

Hedysarum triquetrum Linn., Sp. Pl. 746, 1753.

A very distinct species on account of the winging of the petioles and of the broad pods. It is common among grasses in open grass lands, and by the sides of paths in forest clearings.

Flowers and *Fruits*.—October to December, occasional during the hot season in forest clearings.

Hallberg in MS. catalogue ; *Blatt. Herb.* 11597 ! 11499 ! *Sedgwick* 2569 ! *Santapau* 1153 ! 1318 ! 2522 ! 2809 ! 2810 ! 3129 ! 3930 ! 3243 ! 3244 ! 4187 ! 4188 ! 4959 !

Desmodium gangeticum (Linn) DC., Prodr. 2 : 327, 1825 ; FBI. 2 : 168 ; Gr. 49 ; D. & G. 66 ; C. 1 : 356 ; G. 345.

Hedysarum gangeticum Linn., Sp. Pl. 746, 1753.

An undershrub, up to 1 m. high ; stems and branches striate. Leaflets up to 20 × 6·5 cms , petioles up to 2·5 cms. long. Corolla purplish-pink or violet, sometimes white ; perhaps the difference in colour is due to the age of the flowers, but this I have not been able to prove satisfactorily. Pods deep brown purple.

Fairly common by the sides of paths in dense forests. The shape of the pods and of their joints is characteristic.

Flowers and *Fruits.*—October to December, occasionally during the hot season in dense forest.

Local name : Leuchi.

Blatt. Herb. 1116 ! *Santapau* 102/103 ! 1194 !

Desmodium renifolium (Linn.) Schindler in Fedde, Report. 22 : 262, 1926.

Hedysarum renifolium Linn., Syst. Nat. (ed. 10) 2 : 1169, 1759.

H. reniforme Linn., Sp. Pl. (ed. 2) 1051, 1763.

Desmodium reniforme DC., Prodr. 2 : 327, 1825 ; FBI. 2 : 173 ; D. & G. 67 ; C. 1 : 357.

Cooke gives the plant as occurring in the Presidency on the authority of Dalzell and Gibson, but as the plant has not been found by any subsequent collector, and there are no specimens at Kew from Bombay, its existence in this part of the country is considered very doubtful.

The specimen mentioned below seems to belong to the present species. From its flowers it is clearly a *Desmodium* ; its leaves are unifoliate, broader than long, slightly emarginate ; the petioles, however, are slightly hairy just below the leaf blade, and the calyx teeth are not triangular but subulate, very hairy and ciliate and about three times as long as the calyx tube. On this last characteristic, the plant may perhaps be a specimen of *Desmodium parviflorum*, or an intermediate species. Absence of fruit renders complete identification impossible.

Hallberg in MS. catalogue ; *Santapau* 1074 ?

Desmodium rotundifolium Baker, in FBI. 2 : 172, 1876 (non Wall.) ; C. 1 : 357.

At first sight this plant might be confused with *D. parviflorum* ; the colour of the corolla, the shape and size of the calyx and the pod are about the same in both species. It is easily distinguished by the leaves, which in the present species are rounded or orbicular and simple. From *D. renifolium* it is distinguished by the shape of the leaves and by the size and shape of the calyx teeth.

Rare in Khandala.

Flowers and *Fruits.*—March 1917, October 1918.

Blatt. Herb. 11956 ! 12699 ! 12699(2) !

Desmodium parviflorum (Dalz.) Baker in FBI. 2 : 172, 1876 ; C. 1 : 358.

Alysicarpus parviflorus Dalz. in Kew Journ. Bot. 3 : 211, 1851 ; D. & G. 65.

Cooke mentions that this species is a connecting link between the two genera *Alysicarpus* and *Desmodium;* Dalzell placed it in the genus *Alysicarpus ;* Blatter and myself have had no slight difficulty in identifying the plant as a *Desmodium* and not as an *Alysicarpus*.

Flowers and *Fruits.*—July to October.

Blatt. Herb. 12701 ! 8832 ! 28589 ! 12700 ! 12702 ! 12704 ! 12705 ! 12706 ! 12708 ! *Santapau* 1939 ! 2983 ! 7437 !

Teramnus Sw.

Teramnus labialis (Linn. f.) Spreng., Syst., 3 : 235, 1826 ; FBI. 2 : 14 ; C. 1 : 363 ; G. 352.

Glycine labialis Linn. f., Suppl. 325, 1781 ; D. & G. 68 ; Wight, Icon. t. 168.

G. warreensis Dalz. in Kew Journ. Bot. 3 : 210, 1851 ; D. & G. 68.

Petioles up to 7·5 cms. long ; terminal leaflet up to 10 × 3·5 cms, the lateral leaflets slightly smaller.

The colour of the corolla seems to vary considerably, and probably is dependent on the age of the flower ; sometimes it is reddish, or it may be bluish purple, or deep violet, all these colours being present at the same time on different flowers but the same inflorescence.

Common, especially in deep forest, under the shade of tall trees ; the thin and long stems, with long internodes, the variation in the colour of the flowers and the recurved and stout, upward bent beak of the pod are characteristic.

Flowers.—October to November. *Fruits.*—October to November, persisting throughout the dry season.

Blatt. Herb. 11133 ! 10260 ! 10598 ! 10631 ! 10292 ! 28458 ! *Santapau* 1330 ! 2875 ! 3013 ! 3014 ! 4243 ! 4244 ! 4245 !

Mucuna Adans.

Mucuna prurita Hook., Bot. Misc. 2 : 348, 1830-1831 ; Gr. 53 ; D. & G. 70 ; G. 356.

M. pruriens Baker in FBI. 2 : 187, 1876 ; C. 1 : 365 (non DC. 1825).

The colour of the corolla is purple, almost black, *i.e.* " Aster Purple " to " Dahlia Purple " (Ridg. 67, i-k). The fruit in its young stages is almost straight ; with age it bends so as to form almost a perfect S.

Except for Kune and Battery Hill Plateaus, this plant is not common about Khandala. The irritation caused by the fine bristles on the pods

is very intense, and may last for several hours ; handling of this plant requires great care, as the stinging hairs come off readily and may spoil the whole of a day's collection. I have found application of Ammonnia considerably to reduce the burning sensation produced by this plant.

Flowers.—October to January. *Fruits.*—October to March.

Cooke ; *Blatter* in MS. catalogue ; *Santapau* 1294 ! 2962 ! 3088 ! 5460 ! 5505 !

ERYTHRINA Linn.

Erythrina variegata Linn. var. **orientalis** (Linn.) Merrill, Interpr. Herb. Amb. 276, 1917.

Erythrina corallodendron Linn. var. *orientalis* Linn., Sp. Pl. 706, 1753.

E. indica Lamk., Encycl. 2 : 391, 1786 ; FBI. 2 : 788 ; Gr. 54 ; D. & G. 70 ; C. 1 : 366 ; G. 533.

Graham, loc. cit. states that this tree " grows common throughout the Concans " ; Talbot, For. Fl. 1 : 401, 1909, mentions that it grows " in the deciduous forest of the Konkan and North Kanara, probably an escape from plantations ". In several years of intensive search through the district of Khandala I have been unsuccessful in finding the tree except in a garden near the Railway station. It is, then, a rare tree in Khandala ; in Bombay and Salsette Islands it is about the commonest species of the genus *Erythrina*.

Flowers.—February 1946, 1951.

Santapau 8698 !

Erythrina stricta Roxb., Hort. Beng. 53, 1814, & Fl. Ind. 3 : 251, 1832 ; Wight & Arn., Prodr. 260, 1834 ; Gr. 54 ; D. & G. 70 ; C. 1 : 367 ; G. 354.

Small or middle-sized tree ; the following notes are extracted from my Field Diary for 17 March 1944 :

" Calyx split down one side, the tip of the calyx entire. Colour of the flowers " Scarlet " (Ridg. 5). Flowers full of water ; pedicels come out from all sides on the peduncle, but buds turn upwards, so that the inflorescence seems to be one-sided on the peduncle. Plenty of birds about the tree, which at present is leafless. Standard up to 46 mm. long, 25 mm. broad ; keel 23 × 18 mm., greenish with strong parallel or fan-like venation ; wings 5 × 2·5 mm. of the same colour as the keel (measurements taken from the top of the calyx cup after the removal of the limb). Stamens 10 in number, 9 + 1 in arrangement, alternating long and short; the free stamen united to the rest by about half its length ; stamens about 41·5 and 36 mm. long, forming a tube in the lower quarter of their length, then opening out like a hand or spatula. Style incurved, as long as the longer stamens, greenish, tomentose. Colour of the filaments same as that of the standard, but slightly paler ; anthers

greenish yellow, small. Standard with strong, whitish nerves, about 25 in number."

A very common three in Khandala, in open country or in dense jungle; usually the tree stands out very clearly on account of its flowers which are of a much deeper red colour that those of *Salmalia malabarica*, or *S. insignis* or *Erythropsis colorata*. In young specimens, the size of the leaflets is considerably larger than is mentioned by Cooke. Collection of flowers from these trees is difficult, on account of the stem prickles and the soft nature of the wood.

Local name: Pángara.

Flowers.—January to May. *Fruits*.—March to May.

Santapau 590 ! 1660 ! 1720 ! 1920 ! 3832 !

Butea Roxb.

Butea parviflora Roxb., Hort. Beng. 53, 1814, & Fl. Ind. 3 : 248, 1832; DC., Prodr 2 : 415, 1825; Gr. 54; D. & G. 71; Wight, Icon. t. 210; Blatter in JIB. 8 : 137.

Spatholobus Roxburghii Benth., Pl. Jungh. 238, 1851-1852; FBI. 2 : 193; C. 1 : 370.

One of the largest climbers in the district; stem as thick as a man's body, climbing over the tops of some of the highest trees, and fluted all along the lower parts.

When the plant is in flower it is quite clearly distinct from any other plant in the district; when in fruit, it might be mistaken for *B. monosperma* except that in the latter pods are bigger, more greenish-yellowish and the calyx is larger. In the district around Khandala this plant attains much bigger size then any other *Buteas*.

Flowers.—October to March. *Fruits*.—December to March.

Gammie 16150 ! *Blatt. Herb.* 12850 ! 10279 ! *Santapau* 1757-1762 ! 3319-3324 ! 3573 ! 12153-12157 !

Butea monosperma (Lamk.) O. Kuntze, Rev. Gen. Pl. 202, 1891; Blatter, loc. ult. cit., 134.

Erythrina monosperma Lamk., Encycl. 1 : 391, 1783.

Butea frondosa Koenig ex Roxb., in As. Res. 3 : 469, 1792; id. in Pl. Cor. 1 : 21, t. 21, 1795; FBI. 2 : 194; Gr. 54; D. & G. 71; C. 1 : 371; G. 357.

Common; when it is in full bloom, it is a passably good sight; but at any other time it looks poor, except perhaps when the young velvety leaves come out. Insects seem to have a particular liking for the seeds of this tree, and hence it becomes somewhat difficult to secure good herbarium specimens when the fruit has reached maturity. The gum is not collected in Khandala.

Local name: Pallas.

Flowers.—December to March. *Fruits.*—February to April, occasionally to June.

Stocks ; Hallberg in MS. catalogue ; *Blatt. Herb.* 10207 ! 11965 ! *Santapau* 1749 ! 3097 ! 3098 ! 3909 ! 3910 ! 3911 ! 4332 !

Butea superba Roxb., Pl. Cor. 1 : 23, t. 22, 1795 & Fl. Ind. 3 : 247, 1832 ; FBI. 2 : 195 ; Gr. 54 ; D. & G. 71 ; C. 1 : 372 ; Prain in Kew Bull. 1908 : 305 ; Blatter 135.

A very large climber, going over the tops of high trees in dense jungle. The main difference between this species and *B. monosperma* is its climbing habit.

This is not common in Khandala ; I know of but two groups of this plant, one in S. Xavier's Ravine, the other in dense jungle below Duke's Nose. For a number of years, I have been watching them both, and have been unable to find any flowers ; only on one occasion did I find the remains of the fruit on the ground, the seeds being all eaten away by insects as mentioned for the preceding species. The group of plants below Duke's Nose I have watched more carefully, as the plants are not so tall and therefore specimens can be easily collected ; unfortunately I have seen nothing but leaves in nearly ten years of observation.

Local name : Pallasvel, or Pallas vel.

Flowers.—Not seen in Khandala. *Fruits.*—On the ground on 25 March, 1942.

Santapau 3992 !

Canavalia DC.

Canavalia stocksii Dalz. in D. & G. 69, 1861 ; C. 1 : 372 ; Chatterjee in JIB. 28 : 93.

From the description given by Dalzell it is impossible to determine with certainty the actual identity of the plant ; Chatterjee is of opinion that it may be *C. microcarpa* Piper, or *C. virosa* Wt. & Arn. ; Cooke remarks that this plant is very rare ; I have not seen it in Khandala ; Blatter recorded it for Khandala, but left no herbarium specimen in his herbarium ; there are no specimens in Sedgwick or Acland herbaria.

Krishna " Hills near Lanoli " ; *Blatter* in MS. catalogue.

Canavalia gladiata (Jacq.) DC., Prodr. 2 : 404, 1825; Gr. 52 ; D. & G. Suppl. 23.

Dolichos gladiatus Jacq., Coll. Bot. 2 : 276, 1788.

Canavalia ensiformis Baker in FBI. 2 : 195, 1876, et alior, auct. (non DC, nec *Dolichos ensiformis* Linn.).

The whole of this plant is often covered with red ants, which make collection rather dangerous. Such ants seem to attack flowers and young fruits, so that the number of fruits reaching maturity is very small indeed in comparison with the number of flowers produced. The seeds are used locally as an article of food.

There is, to my knowledge, but one large plant in the [illegible] of a small Katkari village, on Battery Hill Plateau, at a spot locally known as "Now Number". The plant may have escaped from cultivation.

Flowers.—November 1944. *Fruits.*—January 1945.

Santapau 5501 ! 5827 !

PUERARIA DC.

Pueraria tuberosa (Roxb.) DC., Prodr. 2 : 240, 1825 ; FBI. 2 : 197 ; D. & G. 67 ; Wight, Icon. t. 412 ; C. 1 : 374.

Hedysarum tuberosum Roxb. ex Willd., Sp. Pl. 3 : 1197, 1803, & Fl. Ind. 3 : 363, 1832.

Abundant along the stream passing through Kune Plateau; elsewhere very rare. The young stems are very attractive with their bluish bloom and long internodes. The pods are said to cause almost as much irritation as those of *Mucuna prurita*, but I have not experienced this personally.

Flowers.—March. *Fruits.*—March to April.

Santapau 3799-3809 ! 4077 ! 4078 !

PHASEOLUS Linn.

Phaseolus khandalensis Santapau, in Kew Bull. 1948 : 276, 1948.

Phaseolus grandis Dalz. in D. & G. 72, 1861 ; FBI. 2 : 202 ; C. 1 : 375 (non Wall., nec Benth.).

The name *Phaseolus grandis* was first used by Wallich, Cat. 5602, and by Benth., in Miq., Pl. Jungh. 239, in note, 1852 for quite a different plant. Dalzell's name, therefore, is a later homonym and according to the Rules, an illegitimate one. I have called it *Ph. khandalensis* to commemorate the fact that this, so-called rare plant, is abundant in Khandala.

The seed is eaten by the Katkaris in times of scarcity, but the quality is poor.

This plant is very abundant along the banks of Kune stream, and on the top and slopes of Bhoma Hill; at Purandhar, Poona Dt., it is one of the most abundant plants along the northern slopes of the Fort. The plant may be said to be restricted in its occurrence, but abundant wherever it occurs.

Flowers and *Fruits.*—October to November (in Purandhar up to the end of December.)

Blatt. Herb. 10131 ! *Santapau* 1285 ! 1286 ! 2895-2901 ! 3039 ! 3040 ! 3041 ! 5183-5191 ! 5210 !

Phaseolus dalzellii Cooke, in Fl. Pres. Bomb. 1 : 376, 1902.

Ph. pauciflorus Dalz. in Kew Journ. Bot. 3 : 209, 1851 ; FBI. 2 : 202 ; D. & G. 72 (non Benth., 1840).

This plant is very similar to *Ph. radiatus* Linn. (=*Ph. sublobatus* Roxb.) but differs in the following characters : (a) It is glabrous all over, including the pods ; (b) Occasionally the leaflets show some tendency to lobing, the lobes being very shallow, but quite distinct.

Not common about Khandala. The absence of hairs on stems, leaves and fruits makes it quite a distinct plant among the *Phaseoli*.

Flowers and *Fruits*.—April to May and October.

Sedgwick 7176 ! *Santapau* 4150 ! 5233 ! 5261 !

Phaseolus radiatus Linn., Sp. Pl. 725, 1853 ; Piper, in Bull. U. S. Dept. Agric. 119 : 16-25.

Ph. sublobatus Roxb., Hort. Beng. 54, 1814 & Fl. Ind. 3 : 288, 1832 ; Prain in JASB. 66 : 423 ; C. 1 : 377.

Ph. trinervius Heyne in Wall., Cat. 5603, 1831-1832 ; Gr. 51, 1839 ; FBI. 2 : 203 ; D. & G. 71.

In the young stages, this herb is erect or suberect ; then, when it grows a little in length and meets some support, it turns into a climber. Leaves trifoliate ; petioles up to 15 cms. long. In Khandala I have found two different kinds of leaflets : (*a*) Ovate or rhomboid-ovate leaflets, reaching in size up to 9·5 × 7·5 cms. ; (*b*) Lanceolate leaflets, reaching 11·5 × 2·5 cms. ; all leaflets acuminate or at least acute, the terminal one equal-sided and generally larger than the laterals ; the latter unequal sided, the lower side being nearly half as large again as the upper side. Stipels very conspicuous, persistent, subulate, spreading at right angles to the petioles. Pulvinus and petioles up to 12 mm. long together ; peduncles up to 16 mm. long ; bracts 6-8 mm., bracteoles up to 15 mm. long.

Flowers of a pale yellow ; pods cylindric or nearly so, with the sutures slightly thickened, very hairy. Corolla up to 18 mm. diam.

One of the commonest species of Papilionaceae in Khandala ; very abundant along edges of grass fields, by paths in the forest, etc. The seeds are eaten by the Katkaris in times of scarcity, but they are said to be of inferior quality.

Local name : Burao or Borao.

Flowers.—August to November. *Fruits*.—September to December, occasionally also during March and June.

Blatt. Herb. 10093 ! 10097 11121 ! 10244 ! 10634 ! *Santapau* 102/94 ! 846 ! 925 ! 1041 ! 1063 ! 1177 ! 2610 ! 2945 ! 4973 !

Phaseolus angularis (Willd.) W. F. Wight, in U. S. Dept. Agric. Bur. Pl. Ind., Bull. 137 : 17, 1909 ; Piper, loc. cit. 3, t. 1, & 2, f. 1.

Dolichos angularis Willd., Sp. Pl. 3 : 1051, 1803.

Ph. Mungo auctorum, non Linn.

Ph. radiatus auctorum, non Linn.

Stems suberect or flexuose, but not twining.

Fairly common along the railway line, especially at the base of Behran's Plateau. Probably an escape from cultivation, or the seeds may have fallen from some passing train. I have not seen the plant anywhere else in the district.

Flowers.—August 1942 and 1945. *Fruits.*—July 1943.

Blatter October 1918 ! *Santapau* 716 ! 2251 ! 6948 !

Phaseolus aconitifolius Jacq., Obs. 3 : 2, t. 52, 1768 ; FBI. 2 : 202 ; Gr. 52 ; C. 1 : 378 ; G. 363 ; Piper, loc. cit. 28, t. 7, f. 5.

Only seen along the railway line, where it grows abundantly, even in the midst of ballast stones ; under such conditions the plant is invariably erect. When it grows by the side of the line among grasses, it assumes the climbing or twining habit.

Flowers and *Fruits.*—October to November.

Blatt. Herb. 12379 ! *Santapau* 748 ! 2211 ! 3078 ! 7417 ! 7418 !

VIGNA Savi.

Vigna capensis Walp., in Linnaea 13 ; 533, 1839 ; C. 1 : 279.

V. vexillata A. Rich., in Sagra, Hist. Cub., Bot. 440, 1845 ; FBI. 2 : 206.

Phaseolus sepiarius Dalz. in Kew Journ. Bot. 2 : 33, 1851.

About the middle of the rainy season, this is one of the commonest plants in flower ; the fruits, too, can be seen for a long time clustered at the end of long peduncles. The Katkaris and Marathas eat the seeds. The flowers very nearly resemble those of the Sweet Pea of our gardens, but they have no perceptible scent.

Flowers and *Fruits.*—September to November.

Santapau 102/52 ! 831 ! 927 ! 1174 ! 2543 ! 2752 ! 2753 ! 4976 !

Vigna sinensis (Linn.) Savi, ex Hassk., Cat. Hort. Bogor. 279, 1844 ; Merrill, Enum. 2 : 32.

Dolichos sinensis Linn., Cent. Pl. 2 : 28, 1756.

Vigna Catjang Walp., in Linnaea 13 : 533, 1839 ; FBI. 2 : 205 ; C. 1 : 380.

This is a new record for the Presidency.

Annual, erect (in Khandala) or suberect or twining ; stipules attached above their base which project downwards for about 1/4 of their lengths. Leaflets membranous, up to 6·5 × 5 cms. ; petioles up to 8 cm. long, prolonged for 12 mm. after the insertion of the lateral leaflets. Flowers axillary, peduncles up to 7 mm. long, pedicels very short or 0. Corolla purplish in colour, about 2·5 cms. diam. Pods softly tomentose in the young stages.

Only found on one occasion along the railway line.

Flowers and *Fruits*.—October 1944.
Santapau 5072 !

CLITORIA Linn.

Clitoria biflora Dalz. in Kew Journ. Bot. 2 : 35, 1850 ; FBI. 2 : 208 ; D. & G. 68 ; C. 1 : 380.

This is a conspicuous plant in Khandala ; there is no other Papillonaceous plant with such a colour on the corolla, or with the pair of deflexed flowers or fruits. It is fairly abundant along the railway line at the foot of Behran's Plateau ; it generally grows among grasses by the side of the line ; on one or two occasions I have seen it growing among the ballast stones of the railway line.

Flowers.—July to October. *Fruits*.—August to October.
Santapau 102/47 ! 1043 ! 2246 ! 2624 ! 2650 ! 4765 !

DOLICHOS Linn.

Dolichos bracteatus Baker in FBI. 2 : 210, 1876 ; C. 1 : 381.

A fairly large perennial climber ; stems terete, smooth, glabrous or with a few hairs. Leaves trifoliate ; stipules up to 12 × 8 mm., parallel-veined ; petioles up to 20 cms. long, channelled above, pubescent when young, nearly but not quite glabrous later on ; pulvinus at the base of the petiole conspicuous. Leaflets up to 18×16 cms., the terminal one equal-sided, the rest distinctly unequal-sided ; leaflets all obovate, cuneate, acuminate ; petiolules up to 6 mm. long, channelled, hairy ; stipels up to 12 × 3 mm., subulate, persistent ; all leaflets strongly 3-nerved at the base, with about 4-5 pairs of nerves higher up on the blade.

Flowers in racemes up to 20 cms. long ; peduncles very long, in some specimens reaching 53 cms. in length (excluding the raceme in the upper part of the peduncle), pubescent ; pedicels 12-18 mm. long. The number of flowers in a raceme is generally small, as the lower flowers fall off before the upper ones open ; in all there may be about 25 flowers in a raceme.

Corolla up to 6 × 3 cms. in diam. ; colour of corolla is " Hortense Violet " (Ridg. 61, b) ; occasionally some plants have pure white flowers in some of their branches, other branches on the same plant bearing violet flowers. Standard broader than long, emarginate or almost 2-lobed, the division or lobing reaching about 1/4 of the total length of the standard. Style filiform below, broadening upwards into a very broad, [illegible] stigma, which is generally lateral with a strong line of hairs on one side ; the broad end of the style, and therefore the stigmatic surface, is on some good specimens 6 mm. broad, but thin. Pods up to 16 cms. long, nearly 1·2 cms. broad, flattened, slightly recurved.

This is one of the finest flowers in Khandala. It is not a common plant, but I have found two groups of them on top of Bhoma Hill ; the Katkaris eat the pods (when fresh as a vegetable, later on they use the seeds) ; one of the groups was of easy access, and in consequence was destroyed by Katkaris during the fruiting season of 1944.

In the past few years I have collected the plant from Purandhar Hill, Poona Dt., where it has been growing fairly abundantly on the South slopes of the upper fort.

Flowers.—August to October. *Fruits.*—October to November.

Sedgwick 7944 ! *Santapau* 1145-1148 ! 2821-2828 ! 5007-5009 ! 5169-5173 ! 5192-5200 !

Dolichos biflorus Linn., Sp. Pl. 727, 1753 ; FBI. 2 : 210 ; G. 367.
D. uniflorus Lamk., Encycl. 2 : 299, 1786 ; Gr. 52 ; D. & G., Suppl. 23.
Johnia congesta Dalz. & Gibs., Bom. Fl. 69, & Suppl. 23, 1861.

Erect or suberect, with long branches which tend to become scandent if near support.

Corolla pale yellow ; style filiform, bearded just below the stigma, but " beard " not decurrent down into the style ; pods flat, somewhat falcate. Generally flowers appear in pairs in the axils of leaves, each flower being borne on a short pedicel, but there is no common peduncle. I have found this plant only along the railway line, and this on but one occasion.

Flowers and *Fruits.*—November 1943.

Santapau 3082 ! 3083 !

Dolichos falcatus Klein ex Willd., Sp. Pl. 3 : 1047, 1803 ; FBI. 2 : 211 ; G. 366.

This is a new record for the Presidency ; its occurrence is not mentioned by Cooke, nor by any of the earlier floras. I have found this plant growing in Khandala and at Purandhar Hill, Poona Dt.

A climbing herb. Stems very slender, glabrous. Leaves trifoliate ; petiole up to 11 cms. long ; stipules basifixed, lanceolate. Leaflets entire, about as broad as long, up to 7·5 cms., acute or acuminate, the terminal leaflet equal-sided at the base, the lateral ones distinctly unequal-sided, all 3-nerved from the base, with two or three pairs of nerves higher up. Peduncles about 2·5 cms., slender, axillary.

Corolla about 18 mm. in diam. ; Baker gives the colour of the flowers as yellow ; Gamble gives it as lilac or pink ; my observations agree with those of Gamble, my Khandala plants all showing pink or lilac flowers. Corolla strongly nerved with parallel nerves. Stamens diadelphous, anthers uniform ; style thin, filiform, bearded just below the stigma, but not along the inner edge ; stigma terminal, small, greenish, somewhat peltate. Pods up to 8 cms. long, 1·2 cms. broad, more or less recurved, flattened ; seeds about 6, reniform, brownish. After dehiscence the valves twist conspicuously in opposite directions ; the pods are tipped with the remains of the style.

Not common in Khandala ; but the localities where the plant has been found suggest that the plant is native in the district, being as they are far away from the main road or railway line.

Flowers and *Fruits.*—October 1943, 1944.

Santapau 2902-2905 ! 5224-5232 ! 10494-10496 !

Dolichos lablab Linn., Sp. Pl. 725, 1753 ; FBI. 2 : 209 ; G. 36.

Lablab vulgaris Savi, Diss. 19, 1821 & Obs. Phas. & Dol. 19, 1822 ; Gr. 52 ; D. & G. Suppl. 23.

A rare plant in Khandala ; in the Blatter Herb. there is but one specimen from Khandala ; I have not seen the plant growing in the district, either wild or cultivated.

Flowers and *Fruits.*—November 1916.

Blatter 12570 !

ATYLOSIA Wight & Arn.

Atylosia sericea Benth. MS., ex Baker in FBI. 2 : 213, 1876 ; C. 1 : 383 ; G. 369.

A very common plant in grass fields and elsewhere ; it is conspicuous on account of its erect, unbranched (or very sparingly branched) habit and the form of its leaves ; fresh or dry plants can be seen throughout the year, the dry stems (occasionally with fruits still on) remain aloft in places from which practically every other form of vegetation has disappeared during the dry season.

Local name : Ran Tur or Rantur.

Flowers.—September to December, occasionally during the hot season. *Fruits.*—October to February, but undehisced fruits may be seen untill May.

Blatt. Herb. 10218 ! 10537 ! 10587 ! 10588 ! 11128 ! 11927 ! 11102 ! 10298 ! 10622 ! 10642 ! *Acland* 348 ! *Santapau* 102/16, 98 ! 1046 ! 1221 ! 1243 ! 1342 ! 2980 ! 3134 ! 4037 ! 5195 !

Atylosia lineata Wight & Arn., Prodr. 258, 1834 ; FBI. 2 : 213 ; C. 1 : 382 ; G. 368.

Cajanus lineatus Graham, in Wall., Cat. 5578, 1831-1832.

Glycine lineata Heyne in Wall., Cat. 5578, 1831-1832.

Atylosia Lawii Wight, Icon. t. 93, 1838 ; Gr. 53 ; D. & G. 74.

Common and abundant on top and upper slopes of Bhoma Hill, not seen elsewhere in the district. It is generally more branched than the preceding species, and the lower part of the stem and branches are often bare of leaves.

Flowers.—January 1945, May 1944. *Fruits.*—Not seen.

Blatt. Herb. 10295 ! *Hallberg* in MS. catalogue ; *Santapau* 3132 ! 3133 ! 4240 ! 4241 ! 4491 ! 5874 ! 5875 ! 5876 !

CYLISTA Ait.

Cylista scariosa Roxb., Pl. Corom. 1 : 64, t. 92, 1795 ; FBI. 2 : 219 ; Gr. 54 ; D. &. G. 74 ; C. 1 : 386 ; G. 371.

Calyx white, scarious, strongly nerved ; corolla yellow.

One of the commonest plants about Khandala during the December-February season ; it is a good climber, overtopping many of the shrubs and trees in the forest, and very conspicuous on account of its white calyces. Some parts of the forest, like the slopes of Echo Point, seem to turn almost white when this plant comes into flower.

Local name : Gyaura.

Flowers.—December to April. *Fruits.*—February to April.

Santapau 102/19, 108 ! 1435 ! 1844 ! 3576 ! 3717 ! 8777 ! 8778 !

MOGHANIA St. Hil.

Moghania strobilifera (Linn.) St. Hil. ex Jacs., Ind. Kew. 2 : 252, 1894 ; Li in Am. Journ. Bot. 31 : 227.

Hedysarum strobiliferum Linn., Sp. Pl. 764, 1753.

Flemingia strobilifera R. Br. ex Ait., Hort. Kew. (ed. 2) 4 : 350, 1812 ; FBI. 2 : 227 (excl. vars.) ; Gr. 51 ; D. & G. 75 ; C. 1 : 390 ; G. 377.

An erect, much-branched shrub, reaching 4·5 m. high.

Common all over the district, in dense forest, in clearings towards the edges, or in open country. The persistent large bracts are the most conspicuous part of the plant. There seem to be plenty of insects attacking the fruits of the plant, so that in general it is rather difficult to obtain whole fruits.

Flowers.—December to March. *Fruits.*—March to May.

Hallberg in MS. catalogue ; *Blatt. Herb.* 10991 ! 11148 ! 11936 ! *Santapau* 102/4 ! 3 ! 1431 ! 1505 ! 1727 ! 3588 ! 3795 ! 3796 ! 5780 ! 5873 ! 6055-6058 ! 8659 ! 8660 !

Moghania gracilis Mukerjee, spec. nov.

Nova haec species *M. nilgheriensem* inter et *M. tuberosam* media est ; a priore differt foliis sparse pubescentibus et remotis, petiolis longioribus, stipulis minutis atque caducis, calycis lobis minoribus ; a *M. tuberosa* vero foliis minoribus, capitulis florum pluribus, calyce minore et corolla majore atque exserta inter alia recedit.

Typus lectus est a cl. Bell in loco Castle Rock, in montibus Western Ghats, altit. 700 m., mense septembri anni 1918 (Bell No. 4347) et positus in Herb. Calcuttensi ; paratypus lectus a H. Santapau, in loco Khandala, in ima parte collis Echo Point, die 14 septembris anni 1942 (Santapau No. 949) et positus in Blatter Herb., Bombay.

Trailing herb with slender strigose stems. Leaves digitately 3-foliate ; petiole 1·5-3·5 cms. long, densely strigose ; stipules caducous,

minute ; leaflets lanceolate or linear lanceolate, acute, entire, rounded at the base, 1·2-2·5 cms. long, 0·2-0·9 cms. broad ; lateral leaflets oblique ; upper surface of leaflets sparsely pubescent with long scattered hairs, lower surface pale, gland-dotted, pubescent only on the nerves with long hairs ; margin recurved, densely pubescent with shorter hairs. Inflorescence capitulate, 3-6-flowered ; bracts caducous, lanceolate, striate, ferrugineo-tomentose, forming an involucre round the flower buds, 3 mm. long ; peduncles varying much in length, from 0·5-5 cms. long, pedicels almost absent. Calyx densely ferrugineo-tomentose, 5-fid, campanulate glandular ; tube 3 mm. long ; lobes acuminate, 4-5 mm. long. Corolla deep purple, exserted, glandular ; vexillum 9 mm. long, 5 mm. broad, keel and carina 8 mm. long ; stamens 9 + 1. Ovary 1·5 mm. long, glabrous, 2-ovuled ; style glabrous, inflated at the middle.

Flowering in September.

Castle Rock, Western Ghats, alt. 600 m., Bell No. 4347, September 1918 (Type in Herb. Calc.) ; Khandala, top of Echo Point, H. Santapau No. 949, 14-9-1942.

Dalbergia Linn. f.

Dalbergia latifolia Roxb., Pl. Cor. 2 : 7, t. 113, 1798 ; Fl. Ind. 3 : 221, 1832 ; Wight, Icon., t. 1156 ; Gr. 55 ; D. & G. 77 ; Prain in ABGC. 10(1) : 80 t. 62 ; C. 1 : 396.

A small tree scarcely reaching 9 m. high in Khandala. Leaves imparipinnate ; on the 19th August 1944 I found a young shrub or seedling up to 2 m. high, with very large leaves. In normal plants the whole leaf, including the petiole, may reach up to 30 cms. long, the leaflets 15 × 11·5 cms. ; generally, however, the leaves and leaflets are smaller, as stated by Cooke.

Corolla pure white, or creamy white ; calyx white.

Fairly common in Khandala ; it grows in open country or at the edges of the forest ; I have seen no specimen growing in dense forest.

Local name : Sissu.

Flowers and Fruits.—March to April.

Blatt. Herb. 10247 ! 10642 ! *Santapau* 102/18 ! 1699 ! 3977 ! 3978 ! 3979 ! 4036 ! 4698 ! 8786 ! 8787 !

Dalbergia sympathetica Nimmo ex Graham, Cat. 55, 1839 ; FBI. 2 : 234 ; D. & G. 78 ; C. 1 : 398.

D. multiflora Heyne, ex Wall., Cat. sub 5848, 1832 (nom. nud.) ; Prain 43, t. 18, 1904.

A common climber in Khandala ; when the plant meets support, it becomes a climber ; if there is no such support, it is an erect plant with long branches. The main points separating this species from *D. volubilis* Roxb. are the arrangement of the stamens (10, and not 5 + 5) and

the pubescence of the leaflets ; the colour of the corolla, when present, may also serve as a distinguishing character.

Local name : Lokhandi.

Flowers.—November to April. *Fruits.*—December to August.

Woodrow ; Gammie 16109 ! *Blatter* 11120 ! 11131 ! *Santapau* 102/93, 97 ! 1429 ! 1473 ! 1508 ! 1509 ! 1558 ! 1698 ! 2076 ! 3262 ! 3594 ! 5791 ! 5857 ! 8087 !

Dalbergia lanceolaria Linn. f., Suppl. 316, 1781 ; FBI. 2 : 235 ; D. & G. 78 ; C. 1 : 399 ; Prain, loc. cit. 93, t. 76.

D. frondosa Roxb., Hort. Beng. 53, 1814 & Fl. Ind. 3 : 236, 1832 ; Wight & Arn., Prodr. 266.

Rare in Khandala ; up to April 1946, I have been able to find only one specimen in the whole district.

Flowers.—April to June. *Fruits.*—June to October.

Santapau 2979 ! 4251-4256 ! 4415 ! 4416 ! 8814 ! 8815 ! 8816 !

Dalbergia volubilis Roxb., Pl. Corom. 2 : 48, t. 191, 1798 ; FBI. 2 : 235 ; Gr. 55 ; D. & G. 78 ; C. 1 : 400 ; Prain, loc. cit. 100, t. 85.

A large woody climber, with typical spiral hooks on the branches. Flowers in axillary and terminal panicles ; corolla bluish or purplish ; stamens in two bundles of 5 each.

Common in Khandala ; it is easely confused with *D. sympathetica* Nimmo from which it can be distinguished by the glabrous apiculate leaflets, and the arrangement of the stamens.

Flowers and *Fruits.*—December to April.

Dalzell and *Gibson*, loc. cit. ; *Woodrow ; Blatt. Herb.* 28472 ! *Santapau* 102/113 ! 1472 ! 3574 ! 3575 ! 3842 ! 3843 ! 3844 !

Pterocarpus Linn.

Pterocarpus marsupium Roxb., Pl. Corom. 2 : 9, t. 116, 1798, var. **acuminatus** Prain, in JASB. 66 : 455, 1898 ; C. 1 : 402.

P. Marsupium Graham 56, 1839 ; D. & G. 76 (non Roxb.).

In nearly ten years I have only found one specimen of this tree, on the south side of St. Xavier's Villa ; I kept the tree under observation but failed to see when it comes into flower or fruit.

Leaflets are distinctly acuminate, the acumination reaching 12-18 mm. in length, and ending up suddenly in a blunt point.

Santapau 4517 ! 4518 !

Pongamia Vent.

Pongamia pinnata (Linn.) Pierre, Fl. For. Cochinch., sub t. 385, 1899 ; Merrill, Pl. Life Pac. W. 32, t. 19.

Cytisus pinnatus Linn., Sp. Pl. 741, 1753.

Pongamia glabra Vent., Jard. Malm. 28, 1803 ; FBI. 2 : 240 ; Gr. 55 ; D. & G. 77 ; Wight, Icon. t. 59 ; C. 1 : 402.

In open country this tree reaches a height of 12-15 m. ; in the dense forest of Meroli I have found specimens over 31 m. high.

Flowers in racemes which are up to 20 cms. long.

The following variations in the colour of the corolla have been noted in Khandala : (*a*) all the petals pure white, or at most, creamy white ; (*b*) all the petals white with a touch of lilac on the wings ; (*c*) standard and wings pale lilac or violet, the keel white ; (*d*) the whole flower of a deep reddish purple. These colour variations do not seem to depend on the age of the flowers, though these generally pale down with age ; generally all the flowers on a particular tree are of a uniform colour.

New pods seem to begin to set about the beginning of June and may remain green even after they reach their full size. At maturity, they may persist on the parent tree even after leaf fall till well into the next flowering season. It is unusual for the pods to be destroyed by insects ; on the other hand, germination takes place easely at the beginning of the rainy season, when the pods may be brought down by the strong prevailing winds.

Common in Khandala ; planted in many gardens as a fine shade-tree. It is found in dense forest away from all human habitation, so that in all probability the tree is native to the district.

Local name : Kâranj.

Flowers.—February to June. *Fruits.*—The whole year.

Blatt. Herb. 10209 ! 10211 ! *Santapau* 102/15, 120 ! 1835 ! 1836 ! 8670 ! 8711 ! 8712 !

Derris Lour.

Derris scandens (Roxb.) Benth., in JLS. 4 (Suppl.) : 103, 1860 ; FBI. 2 : 240 ; C. 1 : 404.

Dalbergia scandens Roxb., Pl. Cor. 2 : t. 102, 1798 ; Gr. 55.

Brachypterum scandens Benth. in Ann. Wien. Mus. 2 : 101, 1840 ; D. & G. 76.

Stems dark-purple, lenticellate. Inflorescence, before the opening of the flowers, and in general all young parts, rusty pubescent. Flowers white. Pods 1-4-seeded, slightly constricted laterally between the seeds, strongly reticulately veined on the parts covering the seeds.

An extensive climber, going over some of the high trees on Monkey Hill Plateau ; this is the only place in Khandala where I have found the plant growing. With its long, hanging branches, and its dark green leaves, this plant is a fine sight in the forest.

Flowers.—June to August. *Fruits.*—July to August.

Blatt. Herb. 27939 ! 28109 ! *Santapau* 4319-4325 ! 4662 ! 4663 ! 6989 ! 6990 ! 6991 ! 10194 !

Arachis Linn.

Arachis hypogaea Linn., Sp. Pl. 741, 1753 ; FBI. 2 : 161 ; C. 1 : 408.

Cultivated, not a native.

An important crop in many parts of India ; I have not seen it cultivated in Khandala ; in Blatt. Herb. there are two specimens from the district, collected on the railway line.

Flowers.—October 1918 and 1944.

Blatt. Herb. 10280 ! *Santapau* 5043 !

Cajanus DC.

Cajanus cajan (Linn.) Mills p. in Field. Columb. Mus. Bot. 2 : 53, 1900 ; Merrill, Pl. Life Pac. W. 148, t. 197.

Cytisus Cajan Linn., Sp. Pl. 739, 1853.

Cajanus indicus Spreng., Syst. 3 : 248, 1826 ; C. 1 : 408.

A rare plant in the district ; I have found it only on or near the railway line, and have not seen it cultivated anywhere near Khandala.

Flowers.—November 1941. *Fruits.*—January 1945.

Santapau 102/95 ! 5879 !

Cicer Linn.

Cicer arietinum Linn., Sp. Pl. 738, 1753 ; FBI. 2 : 176 ; C. 1 : 408.

Cultivated in some low-lying fields near Khandala railway station ; the mature pods were being sold together with the rest of the plant to passengers in passing trains in Khandala station. The seeds were eaten raw. On several occasions I have found the plant growing along the railway line, obviously the result of accidental dropping of the seeds by railway passangers.

Local name : Harbara.

Blatt. Herb. 11706 ! *Santapau* 102/124 !

CAESALPINIACEAE.

Peltophorum Vogel.

Peltophorum inerme (Roxb.) Naves in Blanco, Fl. Fil. (ed. 3) t. 335, ex F.-Vill., Nov. Append. 69, 1880 ; Merrill, Enum. Phil. Leg. in Phil. Journ. Sci., Bot., 5 : 57.

Caesalpinia inermis Roxb., Hort. Beng. 90, 1814, & Fl. Ind. 2 : 367, 1832.

Peltophorum ferrugineum Benth., Fl. Austr. 2 : 279, 1864 ; FBI. 2 : 257 ; Blatt. & Millard, Beaut. Tr., 80 & T. opp. p. 80.

This is a tree of recent introduction in Khandala ; it is found in several gardens. It grows into a tall tree and flowers profusely during April and May. Leaves are deep green, flowers bright yellow. The appearance of the tree is rather sombre.

Flowers.—April 1946. *Fruits.*—I have observed them on several occasions but have not recorded the times.

Santapau 8754 ! 8755 !

Mezoneuron Desf.

Mezoneuron cucullatum (Roxb.) Wight & Arn., Prodr. 283, 1834 ; FBI. 2 : 258 ; Gr. 61 ; D. & G. 80 ; C. 1 : 414.

Caesalpinia cucullata Roxb., Fl. Ind. 2 : 358, 1832.

An extensive rambler, rather than a climber ; in Khandala it covers large areas at the edge of the forest, but I have not seen this plant going over high trees. Leaves after the flowering season.

Common in St. Xavier's Ravine and on Battery Hill Plateau. Both when in bloom and when in leaf, this is a very fine shrub, but the presence of very sharp spines on the stems, leaf rachises and peduncles makes handling of this plant a dangerous enterprise.

Local name: For about three years all my Katkari collectors gave Wâkiri or Wâgati as the name of this plant ; but when their attention was called to the fact that this was not *Wagatea spicata* Dalz. but *Mezoneuron*, they changed the name and informed me that the proper name is Râgi ; many people in Khandala, however, call the present plant Wâgati.

Flowers.—December to January. *Fruits.*—January to May.

Graham ; Blatter and *Hallberg* in MS. catalogues ; *Santapau* 102/114, 126 ! 1480 ! 1521 ! 3248 ! 3568 ! 3848 ! 5814 !

Delonix Raf.

Delonix elata (Linn.) Gamble, Fl. Madr. Pres. 396, 1919 ; Blatter & Millard, Beaut. Ind. Tr. x & 89.

Poinciana elata Linn., Cent. Pl. 2 : 16, 1756 ; FBI. 2 : 266 ; Gr. 61 ; D. & G., Suppl. 28 ; C. 1 : 414 ; Blatt. & Mill., loc. cit. 90.

Flowers are at first creamy white ; at length they turn yellow.

Blatter in MS. catalogue remarks that he has seen the plant in Khandala growing in a garden.

Delonix regia (Boj.) Raf., Fl. Tell. 2 : 92, 1836.

Poinciana regia Boj., ex Bot. Mag. t. 2884, 1829 ; FBI. 2 : 260 ; D. & G., Suppl. 27 ; C. 1 : 415 ; Blatt. & Mill., loc. cit. 88, & t. opp. p. 88.

Common in gardens in Khandala ; there is a fine number of these trees along the main road near the railway station. I have not seen the tree outside gardens.

Local name : Gul Mohor.

Blatter in MS. catalogue ; *Santapau* : cultivated in gardens.

WAGATEA Dalz.

Wagatea spicata Dalz., in Kew Journ. Bot. 3 : 89, 1851 ; FBI. 2 : 261 ; D. & G. 80 ; Wight, Icon. t. 1095 ; C. 1 : 416.

Caesalpinia digyna Graham, Cat. 60, 1839 (non Rottl.).

I have not seen this plant in Khandala. Graham, Cat. no. 477, remarks that the plant is " pretty common on the Ghauts ". On several occasions, during the months of January-February, when the plant is supposed to be in flower, I have searched for it, and had the Katkaris search for it practically all over the district ; I have so far failed to find the plant in Khandala. There are no specimens in the Blatter Herb.

Blatter in MS. catalogue.

CASSIA Linn.

Cassia fistula Linn., Sp. Pl. 377, 1753 ; FBI. 2 : 261 ; Gr. 62 ; D. & G. 80 ; C. 1 : 417 ; Blatt. & Mill., loc. cit. 20 & t. opp. p. 20.

Cassia rhombifolia Roxb., Hort. Beng. 31, 1814 ; Wight, Icon. t. 269.

Generally this is a small tree ; in dense forest at Meroli, it reaches a height of 18 m.

This is one of the finest trees in the jungle about Khandala, a tree worthy of cultivation in gardens. Flowers come out before the leaves, and the tree becomes then covered with long pendulous racemes of bright yellow flowers. The pods are very persistent ; they are very often attacked by insects.

The pulp of the pod is used locally as a mild purgative.

Local name : Bahau.

Flowers.—March to June. *Fruits.*—The whole year.

Blatter in MS. catalogue ; *Santapau* 102/24 ! 2007 ! 2447 ! 4125 ! 7002 ! 8700 !

Cassia tora Linn., Sp. Pl. 376, 1753 ; FBI. 2 : 263, pro parte ; Gr. 63 ; D. & G. 81, proparte ; Prain in JASB. 66 : 475 ; C. 1 : 420.

C. obtusifolia Linn., Sp. Pl. 377, 1753, sec. Merril, Interpr. Herb. Amb. 257.

Common in waste ground along the road or in the forest in open spaces. I have not seen it in the ravines. The plant has a typical scent especially when the leaves are bruised ; this scent is strong enough at times to show the presence of the plant even when otherwise it would pass unnoticed ; the scent is particularly strong in bright sunny weather.

Flowers and *Fruits*.—Most of the year, except at the beginning of the rainy season.

Santapau 683 ! 1312 ! 2395 ! 2396 ! 4269 !

Cassia absus Linn., Sp. Pl. 376, 1753 ; FBI. 2 : 265 ; C. 1 : 424.

A rare plant in Khandala ; in Blatt. Herb. there is but one specimen collected by Blatter himself, possibly in the neighbourhood of the railway line. In general this plant is very similar to the preceding species; it differs mainly in the following : leaflets 2 pairs, corolla reddish yellow or orange, pods short, broad, thin and practically erect. When the plant is in fruit, its appearance is very characteristic.

Fruits.—October 1918.

Blatter 10659 !

Cassia pumila Lamk., Encycl. 1 : 651, 1784 ; FBI. 2 : 266 ; D. & G. 82 : C. 1 : 424.

Rare in Khandala ; in the Blatt. Herb. there is but one specimen collected by Blatter. There is great similarity between this plant and *C. mimosoides* Linn. ; the main difference between these two species seems to be that *C. pumila* has short pedicels, whilst *C. mimosoides* has long pedicels when in flower.

Fruits.—October 1918.

Blatter 10600 !

Cassia mimosoides Linn., Sp. Pl. 379, 1753 ; FBI. 2 : 266 ; Prain in JASB. 66 : C. 1 : 426.

Prostrate or erect, up to 1·30 m. high when erect ; stems densely hairy ; leaves up to 33 cms. long ; stipules up to 12 mm. long, strongly nerved with parallel nerves.

On September 10th, 1944 I found a large clump along the railway line ; the following description was written from the fresh specimens : 'Erect stems, covered with short, recurved hairs ; gregarious, and up to 4½ ft. high. Leaves compound ; leaflets about 30 pairs ; leaf rachis up to 5 in. long, hairy with thin spreading hairs. Flowers and fruits supra-axillary, 2 or 3 together; peduncle very short, almost 0; pedicels up to 1 in. long with fine spreading hairs ; colour of the corolla pale yellow. Stamens 5, anthers opening by apical pores ; three of the anthers orange red, the other two yellow. Pods finely hairy, many-seeded, obliquely septate, straight when young, at length somewhat falcate. There is but one gland on the leaf rachis, and that is sessile, just below the lowest pair of leaflets. Corolla included or scarcely exserted. The flower is definitely one of the *Caesalpinieae*, and *Cassia*.

Local name: Barki.
Flowers and *Fruits*.—September 1944.
Blatt. Herb. 10243 ! *Santapau* 4870-4875 !

Saraca Linn.

Saraca indica Linn., Mant. 1 : 98, 1767 ; FBI. 2 : 271 ; C. 1 : 429 ; Blatt. & Mill., loc. cit. 94 & t. opp. p. 94.
Jonesia Asoka Roxb. : Gr. 62 ; D. & G. 82.

Woodrow, fide Cooke, states that the tree is common in the Western Ghauts ; Blatter recorded the occurrence of the tree in Khandala, but as he left no specimen in his herbarium, it is probable that he saw it in a garden.
Blatter in MS. catalogue.

Bauhinia Linn.

Bauhinia racemosa Lamk., Encycl. 1 : 390, 1783 ; FBI 2 : 276 ; Gr. 64 ; D. & G. 82 ; Hook. Icon. t. 341 ; C. 1 : 431.

Not a common tree in Khandala ; there are a few of them on Monkey Hill Plateau, and on the top part of Bhoma Hill. There is a constant defoliation of the tree due to the fact that its leaves are used in place of cigarette paper ; this constant defoliation may account for the rugged appearance of the tree.
Local name: Apta.
Flowers.—June 1944. *Fruits*.—August to October.
Blatt. Herb. 11814 ! *Hallberg* in MS. catalogue ; *Santapau* 2969 ! 4413 ! 4458 ! 4459 !

Bauhinia malabarica Roxb., Hort. Beng. 31, 1814, & Fl. Ind. 2 : 321, 1832 ; FBI. 2 : 277 ; D. & G. 82 ; Prain in JASB. 66 : 495 ; C. 1 : 432.

A middle-sized, or, in dense forest, a very large tree. Leaves up to 20 cms., broader than long ; lobes rounded. Petioles up to 5 cms. long. On the underside of the leaves there are numerous pits between the main nerves ; on this character alone it is impossible to separate this species from *B. foveolata* Dalz. Nerves of the leaves generally 11, occasionally 13.

Common in St. Xavier's Ravine ; at the edges of the forest it is a small tree ; in dense forest it is one of the tallest and largest trees, with large spreading branches. Fruits can be seen on the floor of the forest

most of the year ; their colour, reddish brown, and their venation, long ascending wavy lines from the centre to the edges, are very characteristic. Once the pods have fallen from the parent plant, they are easily attacked, possibly by insects, so that it is not easy to find an undamaged fruit after a time.

Flowers.—October 1944. *Fruits.*—January to April.

Blatt. Herb. 10257 ! *Santapau* 102/105 ! 1528 ! 1529 ! 3979 ! 5149 ! 5150 ! 5151 !

Bauhinia foveolata Dalz. in JLS. 13 : 188, 1873 ; Prain in loc. cit. 496 ; C. 1 : 432.

B. Lawii Benth. ex Baker in FBI. 2 : 277, 1876.

One of the largest trees growing in St. Xavier's Ravine, with a straight trunk and plenty of nearly horizontal branches. Leaves suborbicular, up to 30 cms. diam.; nerves generally 17, occasionally 15 ; petioles up to 9 cms. long, thickened at both ends. There are numerous small pits on the underside between the main nerves, each pit being "stoppered" with an elliptic or fusiform structure held in position by a thin filament ; these pits, from which the specific name is derived, are not exclusively characteristic of the present species of *Bauhinia.*

Flowers not seen in Khandala. Fruits up to 28×2·8 cms., much twisted, reddish, velvety, not at all or very faintly veined ; seeds about 25.

Local name : Chámbul.

Fruits : January 1943.

Blatt. Herb. 10203 ! 10221 ! 10222 ! 10223 ! *Santapau* 1531 ! 1531 (2) !

Bauhinia vahlii Wight & Arn., Prodr. 297, 1834 ; FBI. 2 : 279 ; Gr. 64 ; D. & G. 83 ; C. 1 : 433.

A very large climber, with typical opposite circinnate tendrils, and all young parts clothed with rusty tomentum.

Rare in Khandala ; I have seen it but once, and then only in leaf. The plant was seen about the middle of St. Xavier's Ravine. There are no specimens from Khandala in the Blatt. Herb.

Graham ; Blatter in MS. catalogue ; *Santapau* November 1942.

Bauhinia purpurea Linn., Sp. Pl. 375, 1753 ; FBI. 2 : 284 ; Gr. 64 ; D. & G., Suppl. 30 ; C. 1 : 433 ; Blatt. & Mill, loc. cit. 6, & t. opp. p. 6.

This tree is occasionally cultivated in gardens on account of the relatively large and bright coloured flowers ; in the Blatt. Herb. there are but two specimens from Khandala, without any further indication of the exact locality where the specimens were found.

Flowers and *Fruits.*—October 1918.

Blatt. Herb. 28606 ! 10635 !

MIMOSACEAE.

ENTADA Adans.

Entada phaseoloides (Linn.) Merrill in Phill. Journ. Sci., Bot. 9 : 86, 1914.

Lens phaseoloides Linn., in Stickm. Herb. Amb. 18, 1754 & Amoen. Acad. 4 : 128, 1759.

Mimosa entada Linn., Sp. Pl. 518, 1753.

M. scandens Linn., Sp. Pl. (ed. 2) 1501, 1763.

Entada scandens Benth. in Hook. Journ. Bot. 4 : 332, 1842 ; FBI. 2 : 287 ; C. 1 : 437.

A truly immense woody climber, the largest of the climbers in Khandala. On April 20th, 1943, I measured a stem at a point about 45m. from where it came out of the ground, and the circumference of that stem was 1·35 m. ; the estimated length of the same plant is well over 1·5 km.

Flowers in spikes, which are solitary, or more generally in large panicles, terminal or axillary. I have counted over 400 flowers in a spike. Flowers at first are green, then pure white, at maturity yellow, the yellowing of the spike beginning from below upwards ; the flowers are fairly strongly and disagreeably scented. Pods very large ; the largest specimen measured reached 124 × 8·5 × 4 cms., and weighed when fresh 1890 gms. ; peduncle of the pod enlarges to 30 cms. in fruit. Seeds orbicular, up to 6 × 2·8 cms., brown, shining and very hard.

Entada is not common in Khandala, but where it occurs it soon spreads widely ; often the presence of the plant can be detected by the numerous seeds scattered on the floor of the forest.

The pods or parts of them are used by the Katkaris as rattles or toys for their children. Young branches are often cut by Katkaris when hard-pressed for water ; I have been informed by my collectors that they can easely get a litre of water in this fashion ; the water is drinkable, though tainted with a definite taste.

Local name : Gárbi.

Flowers.—April to June. *Fruits*.—The whole year.

Santapau 1897 ! 1898 ! 1899 ! 1905-1910 ! 2078 ! 2266 ! 3370 ! 4097-4101 ! 4472 ! 8721-8726 !

LEUCAENA Benth.

Leucaena glauca (Linn.) Benth. in Hook. Journ. Bot. 4 : 416, 1842 ; FBI. 2 : 290 ; C. 1 : 440.

Mimosa glauca Linn., Sp. Pl. 520, 1753.

Acacia glauca Willd., Sp. Pl. 4 : 1075, 1805 ; Gr. 58.

A small tree, 3-4 m. high. Flowers in round heads ; corolla at first greenish, then creamy white, then white, finally yellowish. The pods of this plant are very typical, on account of the maner in which they come from the original spherical head, and of the shape of the individual pods.

Rare in Khandala ; I have not seen it in the district ; but in the Blatt. Herb. there are two sheets from Khandala.

Blatt. Herb. 10206 ! 10210 !

Mimosa Linn.

Mimosa pudica Linn., Sp. Pl. 518, 1753 ; FBI. 2 : 291 ; Gr. 56 ; D. & G., Suppl. 25 ; C. 1 : 441.

This is a rare plant in Khandala ; I have only seen it once at the bottom of St. Xavier's Ravine, probably an escape from some gardens above. Neither Blatter nor Hallberg have any records of this plant.

Santapau April 1942.

Mimosa hamata Willd., Sp. Pl. 4 : 1033, 1806 ; FBI. 2 : 291 ; Gr. 56 ; D. & G. 85 ; C. 1 : 442.

My only authority for the inclusion of this plant is the reference of Hallberg in his MS. catalogue ; there are no specimens from Khandala in Blatt. Herb.

Hallberg in MS. catalogue.

Acacia Willd.

Acacia arabica (Lamk.) Willd., Sp. Pl. 4 : 1085, 1806 ; FBI. 2 : 293 ; Gr. 59 ; D. & G. 86 ; C. 1 : 443.

Mimosa arabica Lamk., Encycl. 1 : 16, 1783 ; Roxb., Pl. Cor 2 : 26, t. 149.

A small tree, rare in Khandala. I have only found two groups of such trees, one behind Khandala Hotel, the second on the slopes of Echo Point. Along the railway line it is fairly common. In Khandala they reach 4-5m. in height, and seldom produce fruits.

Local name : Bábul.

Flowers.—May to June. *Fruits.*—June.

Santapau 2068 ! 3877 !

Acacia suma Buch.-Ham., in Wall. Cat. 5227, 1832-1831; FBI. 2 : 294 ; Prain, loc. cit. 66 : 508 ; C. 1 : 447.

A. Catechu Wight & Arn. : D. & G. 86 ; (non Willd.).

Mimosa Suma Roxb., Hort. Beng. 41, 1814 & Fl. Ind. 2 : 563, 1832.

A small to middle-sized tree ; young branches white-pubescent. Leaves bipinnate ; petiole up to 5 cms. long, with a large sessile gland in the middle ; pinnae in the Khandala specimens 12-13.

Inflorescence before the opening of the flowers, densely white-pubescent ; spikes up to 15 cms. long ; calyx densely white-pubescent outside ; corolla at first white, turning yellowish with age ; stamens at first white, then yellowish, finally brick red.

Flowers.—June 1944.

Santapau 4489 !

Acacia chundra (Roxb.) Willd., Sp. Pl. 4 : 1078, 1806.

Mimosa Chundra Roxb. ex Willd., loc. cit. 1079, 1806.

M. Sundra Roxb., Pl. Cor. 3 : t. 225, 1819 ; Fl. Ind. 2 : 562, 1832.

Acacia Sundra DC., Prodr. 2 : 458, 1825 ; FBI. 2 : 295 ; D. & G. 86.

A. Catechu var. *Sundra* Cooke, Fl. Pres. Bomb. 1 : 448, 1902.

On the question of the spelling of the specific name, see Chatterjee in Sci. and Cult. 14(7) : 290-291, 1949.

A small tree, 3-4 m. high in Khandala. Young branches glabrous ; leaf rachis pubescent ; pinnae about 15 pairs.

The identification of this tree seems to have caused considerable difficulty to Indian botanists, to judge from the clear contradictions into which some of the writers of our Indian Floras have fallen.

For the separation of *A. Catechu* from *A. Chundra*, see Raizada, in Ind. For. 70 : 437, 1944. The main differences are that the leaf rachis, calyx and corolla of *A. Catechu* are pubescent outside, in *A. Chundra* they are glabrous. All the specimens from Khandala agree with the characteristics of *A. Chundra* except that the leaf rachis has a few small hairs on the upper side.

Local name : Khair.

Flowers.—May to August. *Fruits.*—May to October.

Blatt. Herb. 10606 ! *Santapau* 4316 ! 4317 ! 4352 ! 4353 ! 4354 ! 4659 ! 6987 ! 6988 !

Acacia concinna (Willd.) DC., Prodr. 2 : 464, 1825 ; FBI. 2 : 296 ; Gr. 59 ; D. & G. 87 ; C. 1 : 450.

Mimosa concinna Willd., Sp. Pl. 4 : 1039, 1806.

A climbing shrub, with brownish pubescence on the branches, especially the young ones, and with numerous spines placed irregularly on the stem. Flower heads are at first white, then yellowish ; finally, when dry, brick red.

Local name : Shembri.

Flowers.—March. *Fruits.*—March, persistent for several months.

Blatt. Herb. 11939 ! 11959 ! *Santapau* 102/116 ! 1685 ! 3260 ! 3776 ! 3777 !

Acacia torta (Roxb.) Craib, in Kew Bull. 1915 : 410, 1915 ; Santapau in JBNHS. 50 : 312.

Mimosa torta Roxb., Fl. Ind. 2 : 566, 1832.

Acacia caesia Wight & Arn., Prodr. 278, 1834, non Willd.

The identity of the common Khandala plant, that goes under the name of *Acacia Intsia* in Cooke's Flora, has vexed me for many years. In the nomenclature of the plant I have followed Craib loc. cit. For a full discussion of the question, see Santapau loc. cit., p. 310-312.

A fairly large shrub, generally scandent or rambling ; when growing away from a support, it becomes erect in habit. Inflorescence when in bud dark purple, the buds themselves, peduncles and young branches being of the same colour. Flowers white or creamy white, or pale yellowish, when old turning brick red. Pods brown, somewhat tomentose when young, glabrous and flat at maturity, persisting into the hot season.

Local name : Chilári.

Flowers.—April to November. *Fruits.*—April to January.

Blatt. Herb. 10090 ! 10101 ! 10596 ! 10794 ! 12890 ! *Sedgwick* 7981 ! *Santapau* 1031 ! 1547 ! 2750 ! 3489 ! 4850 ! 4877 !

Albizzia Durazz.

Albizzia lebbeck (Linn.) Benth., in Hook. Lond. Journ. Bot. 3 : 87, 1844 ; FBI. 2 : 298 ; D. & G. 88 ; C. 1 : 452.

Mimosa lebbeck Linn., Sp. Pl. 516, 1753.

Acacia speciosa Willd., Sp. Pl. 4 : 1066, 1806 ; Gr. 58.

A large tree, with a general bluish green appearance. Flowers white. Pods persisting on the tree for a long time.

Not common in Khandala ; there is a fine set of these trees just above the canal at Forbay.

Flowers.—May 1946, decaying. *Fruits.*—March to July.

Blatt. Herb. 11119 ! *Santapau* 562 !

Albizzia odoratissima (Linn. f.) Benth. in Hook. Lond. Journ. Bot. 3 : 88, 1844 ; FBI. 2 : 299 ; D. & G. 88 ; C. 1 : 452.

Mimosa odoratissima Linn. f., Suppl. 437, 1781.

Acacia odoratissima Willd., Sp. Pl. 4 : 1063, 1806 ; Gr. 58.

A tall tree ; leaves bluish green in colour, bipinnate, pinnae 3-5, leaflets up to 16 pairs. Corolla at first green, then white or whitish ; filaments white, prominent ; the calyx is very small, and both it and the corolla are densely pubescent. The flowers are arranged in large terminal panicles. Rare in Khandala.

Flowers.—April 1943. *Fruits.*—September 1943.

Blatter in MS. catalogue ; *Santapau* 1900-1904 ! 2582-2584 !

Albizzia procera (Roxb.) Benth. in Hook. Lond. Journ. Bot. 3 : 89, 1844 ; FBI. 2 : 299 : C. 1 : 453.

Mimosa procera Roxb., Pl. Cor. 2 : 12, t. 121, 1798.

A tall tree with a general bluish appearance. Leaves bipinnate, pinnae in Khandala 2 pairs. There is a large gland on the petiole near its base, and a smaller one near the end of the leaf rachis about 6 mm. from the last pair of pinnae ; towards the apex of the pinnae there are 1-3 small glands.

Flowers in globose heads, with a peduncle up to 4 cms. long ; peduncles solitary or fascicled 2-3 together in a large terminal panicle. Corolla pale yellowish white ; calyx teeth glabrous, except for a tuft of whitish hairs at the apex. Pods not seen in Khandala.

Flowers.—May and June 1943.

Santapau 2005 ! 2006 ! 2051 !

Albizzia chinensis (Osb.) Merrill, in Amer. Journ. Bot. 3 : 575, 1916.

Mimosa chinensis Osbeck, Dag. Ostind. Resa 233, 1757.

Mimosa stipulata Roxb., Hort. Beng. 40, 1814.

Acacia stipulata (Roxb.) DC., Prodr. 2 : 469, 1825.

Albizzia stipulata Boivin, in Encycl. XIX Siècl. 2 : 33, 1838 ; FBI. 2 : 300 ; D. & G. 88 ; C. 1 : 453.

Very common from Forbay upwards on the slopes of Bhoma Hill. The tree is one of the finest in Khandala. The top of the tree is flat, and during the flowering season is covered with flowers ; this habit of the tree makes it very conspicuous in the forest. This tree deserves a place in gardens.

Local name : Kazára.

Flowers.—April and May. *Fruits.*—May onwards.

Graham ; Blatt. Herb. 10205 ! 10996 ! *Santapau* 102/14 ! 1921 ! 3305 ! 3394 ! 4059 !

Albizzia lucida (Roxb.) Benth. in Hook. Lond. Journ. Bot. 3 : 86, 1844 ; FBI. 2 : 299 ; C. 1 : 455.

Mimosa lucida Roxb., Fl. Ind. 2 : 544, 1832.

The occurrence of this plant in Khandala is given on the authority of Blatter, who has noticed it in his MS. catalogue ; I have not seen it either wild or in gardens.

Blatter in MS. catalogue.

Pithecolobium Mart.

Pithecolobium dulce (Roxb.) Benth. in Hook. Lond. Journ. Bot. 3 : 199, 1844 ; FBI. 2 : 302 ; C. 1 : 456.

Mimosa dulcis Roxb., Pl. Cor. 1 : 67, t. 99, 1795.

Inga dulcis Willd., Sp. Pl. 4 : 1105, 1806 ; Wight, Icon. t. 98 ; Gr. 56 ; D. & G., Suppl. 25.

A moderately large tree, cultivated in gardens.

The seeds are eaten raw or in curries ; this tree occurs only in cultivation in the district.

Flowers.—January to March. *Fruits.*—March to May.

Blatt. Herb. 10204 ! 11147 ! *Santapau* 1681 ! 1682 ! 3524 ! 3525 ! 3526 ! 3626 ! 3627 !

ROSACEAE.

Pygeum Gaertn.

Pygeum gardneri Hook. f. in FBI. 2 : 321, 1878 ; C. 1 : 458 ; Talb. 1 : 505, tt. 286 & 287 ; G. 439.

P. acuminatum Graham, Cat. 247, 1839 (non Colebr.) ; Wight, Icon. t. 993.

P. [illegible] Dalz. & Gibs., Bomb. Fl. 89, 1861 (excl. syn. ; non Gaertn.).

The occurrence of this plant is given on the authority of Graham and Blatter. Graham in Addend. and Corrig. p. 247 says : " Mahableshwar and Kandalla, but rare ". I have seen no specimen from Khandala either in the field or in any of the herbaria consulted.

Graham ; *Blatter* in MS. catalogue.

Rosa Linn.

Rosa sp.

Roses of the polypetalous varieties are commonly cultivated in gardens all over Khandala, where they seem to thrive well. The colours of the flowers vary considerably, but white or red or pink seem to be common. I have not seen any roses growing wild or as escapes from gardens, nor roses of the type of *Rosa canina* with only five petals. In St. Xavier's Villa roses seem to be in flower most of the year, with the exception of the monsoon time ; but the rose plant in Khandala is far from beautiful, it soon turns into a wild looking shrub.

SAXIFRAGACEAE.

Vahlia Thunb.

Vahlia digyna (Retz.) O. Kuntze, Rev. Gen. Pl. 227, 1891.

Oldenlandia digyna Retz., Observ. 4 : 23, 1786 ; Willd., Sp. Pl. 1 : 674.

Vahlia viscosa Roxb., Hort. Beng. 86, 1814 & Fl. Ind. 2 : 89, 1832 ; FBI. 2 : 399 ; Wight, Icon. t. 563 ; D. & G. 90 ; C. 1 : 463.

A very rare plant in Khandala, the only specimen recorded from the district being the one mentioned below. Blatter has not collected it nor has he left any record that he saw the plant in Khandala.

Flowers and *Fruits*.—December 1943.

Santapau 3486 !

HYDRANGEA Linn.

Hydrangea macrophylla (Thunb.) DC., Prodr. 4 : 15, 1830 ; Engler in Pfam. (ed. 2) 18 A : 203, t. 115.

Viburnum macrophyllum Thunb. Fl. Jap. 125, 1784.

Hydrangea hortensis Sm., Ic. Pict. 12, 1789-1791 ; Woodrow, Gard. Trop. 299, 1910.

A cultivated plant, often seen in gardens in Khandala ; it thrives well in the district in spite of the heavy rainfall and produces large heads of flowers. A very showy plant.

Santapau June 1946, in several gardens !

CRASSULACEAE.

BRYOPHYLLUM Salisb.

Bryophyllum pinnatum (Lamk.) Oken, Allg. Naturgesch. 3 (3) : 1966, 1841 ; Kurz in JASB. 40(2) : 309, 1876 ; Merrill in JAA. 31 : 272.

Cotyledon pinnatum Lamk., Encycl. 2 : 141, 1786.

Bryophyl. calycinum Salisb., Par. Lond. t. 3, 1805 & Bot. Mag. t. 1409, 1811 ; Gr. 82 ; C. 1 : 465.

In the grounds of St. Xavier's Villa there is a group of these plants that has been growing unattended for many years ; there is a similar clump near Khandala station.

Flowers.—December 1949. *Fruits*.—Not seen in Khandala.

Hallberg in MS. catalogue ; *Santapau* 10069-10071 ! 10643-10648 ! 11165 !

DROSERACEAE.

DROSERA Linn.

Drosera indica Linn., Sp. Pl. 282, 1753 ; FBI. 2 : 424 ; Gr. 11 ; Wight, Ill. t. 20C ; C. 1 : 469 ; Diels in Pfreich. 26 : 77-79, t. 29 ; G. 452.

An erect herb 4-20 cms. high ; stems branched in larger specimens, unbranched or nearly so in smaller ones, glandular pubescent. Leaves cauline, alternate, 2·5-4·5 cms. long, very narrow, circinnate in vernation, the tip often remaining coiled up even when the rest of the leaf is fully expanded. Flowers in leaf-opposed or at least extra-axillary racemes. Pedicels up to 18 mm. long, filiform, glandular hairy. Corolla in Khandala always red or rose, never white ; the corolla is 8-12 mm. diam.

A common herb during the second half of the monsoon ; it generally grows in grass fields when the grass is short. It is often associated with *Burmannia*, *Exacum pumilum*, etc. Under the microscope one can see the skeletons of numerous insects on the leaves.

Flowers and *Fruits*.—End of August to October.

Blatt. Herb. 10265(2) ! 28083 ! *Santapau* 46/1 ! 928 ! 1015 ! 2600 ! 2770 ! 4739 ! 4814 ! 4970 ! 5034 ! 5037 ! 7424 !

HALORAGIDCAEAE.

MYRIOPHYLLUM Linn.

Myriophyllum spathulatum Blatt. & Hallb. in JIB. 2 : 44, t. 1, 1921.

For a full description of the plant, see Blatt. and Hallb. loc. cit. Khandala is the typical locality, and the type, McCann 12634, is preserved in the Blatter Herbarium, Bombay.

McCann 12634 !

RHIZOPHORACEAE.

CARALLIA Roxb.

Carallia brachiata (Lour.) Merrill, in Phil. Journ. Sci., Bot. 15. 249, 1919.

Diatoma brachiata Lour., Fl. Cochinch. 296, 1790.

Carallia lucida Roxb., Hort. Beng. 92, 1814 & Pl. Cor. 3 : 8, t. 211, 1819 ; Talb. 2 : 9, t. 292.

C. integerrima DC., Prodr. 3 : 33, 1828 ; FBI. 2 : 439 ; D. & G. 96 ; C. 1 : 476 ; G. 459.

C. ceylonica Wight, Ill. t. 90, 184

C. integrifolia Graham, Cat. 8,0.839.

A large tree with a general pale, shining green, colour. Leaves rounded at the apex, or occasionally subacute ; base acute or cuneate ; the whole leaf shining, coriaceous ; nerves 7-12 pairs, anastomosing freely among themselves.

Flowers : calyx greenish, corolla white, anthers, etc. white. Fruit bright red, when ripe, about 8 mm. diam., spherical or pisiform (not " filiform " as Cooke, obviously per sphalm. puts it).

It is not easy to press specimens for the herbarium on account of a gummy substance that seems to come out of the flowers and cover the whole of the inflorescence ; such a substance sticks to the drying papers and makes it almost impossible to study flowers from herbarium specimens. This gum is transparent, yellowish.

The shape and colour of its leaves give to this tree a very fine appearance ; it is common in the grounds of Convalescent Home and on the plains behind Khandala Hotel ; rare in the ravines.

Flowers.—October to March. *Fruits.*—March to May.

Graham ; Blatt. Herb. 20159 ! 28178 ! *Santapau* 1555 ! 1652 ! 1653 ! 1654 ! 1850 ! 1851 ! 3386 ! 3387 ! 3591 ! 3592 ! 4026 ! 5036 ! 5854 ! 5855 !

COMBRETACEAE.

TERMINALIA Linn.

Terminalia bellerica (Gaertn.) Roxb., Pl. Cor. 2 : 54, t. 198, 1798 ; FBI. 2 : 445 ; Gr. 69 ; Wight, Ill. t. 91 ; D. & G. 91 ; C. 1 : 478 ; Talb. 2 : 13, t. 294 ; Blatter in JIB. 8 : 251.

Myrobalanus bellerica Gaertn., Fruct. 2 : 90, t. 97, 1791.

A common tree in Khandala and a very fine one. The fruit remains on the tree for a long time, as neither insects nor mammals seem to touch it except in times of great scarcity. This tree is not sufficiently abundant in the district to warrant the collection of its fruits for the extraction of tannin.

Local names : Bela or Yela.

Flowers.—March to April. *Fruits.*—From March onwards for the rest of the year.

Blatt. Herb. 28478 ! 28479 ! *McCann* 4467 ! 4468 ! *Santapau* 109/24, 29 ! 956 ! 2083 ! 8714 ! 8715 !

Terminalia chebula Retz., Observ. 5 : 31, 1798 ; FBI. 2 : 446 Gr. 69 ; D. & G. 91 ; C. 1 : 478 ; Talb. 2 : 14, t. 295 ; Blatter 253.

Flowers yellow, scented, though not strongly. Fruit 5-ribbed or 5-angled when ripe, deep purple until maturity, then it turns yellowish

brown, persisting on the tree even when the flowers of the next season are on the tree.

A fine tree and very common all over the district ; in dense forest it attains very large proportions. The fruit is not collected for tannin. The fruit is not attacked by insects or monkeys, except in times of great scarcity.

Local names : Hirda or Hirad.

Flowers.—March to August. *Fruits.*—From April onwards.

Graham ; Blatt. Herb, 28489 ! 27573 ! *Santapau* 109/7, 12, 18, 25, 30 ! 1721 ! 1874 ! 2083 !

Terminalia crenulata Roth, Nov. Pl. Sp. 380, 1821 ; Wight & Arn., Prodr. 314.

Pentaptera crenulata Roxb., Hort. Beng. 34, 1814 & Fl. Ind. 2 : 438, 1832.

Terminalia tomentosa var. *crenulata* Clarke in FBI. 2 : 448, 1878.

T. tomentosa Cooke, Fl. Pres. Bombay 1 : 479, 1902 ; Talb. 2 : 18, t. 297 (non Wight & Arn., nisi partim, nec Mart.).

An erect small tree ; in open spaces, like Behran's Plateau, this tree scarcely reaches 2 m. in height, in thick jungle it becomes bigger, but I have seen no specimen of the proportions mentioned by Cooke.

Flowers come on either before or together with the leaves, the former being more common. The colour of the flowers is yellow, and their scent is rather strong and pleasant, somewhat similar to that of honey. The fruit is about 4·5-5 cms. long with usually five wings ; exceptionally I have collected and measured fruits up to 9 cms. long with wings up to 2·5 cms. broad ; the wings are strongly nerved with horizontal nerves, *i.e.* nerves that come out at right angles to the main axis of the fruit.

A very common tree all over the district ; on Behran's Plateau it is one of the commonest, and on large tracts about the only tree to be seen. Insects seem to be especially attracted to this tree, which in consequence of their attacks produces numerous and very unsightly galls on branches, leaves and inflorescence. No use is made locally of this tree except for fuel. On Behran's Plateau this tree supports a very large population of epiphytic orchids, *Eria*, *Aerides*, *Dendrobium*, etc.

Local name : Ain.

Flowers.—April to August. *Fruits.*—June onwards.

Blatt. Herb. 27969 ! 28019 ! *Hallberg* in MS. catalogue ; *Santapau* 109/8, 17, 26 ! 460 ! 505 ! 563 ! 2613 ! 4461 ! 5902 !

Calycopteris Lamk.

Calycopteris floribunda Lamk., Tab. Encycl. 2 : 485, 1793 ; FBI. 2 : 449 ; C. 1 : 481 ; Talb. 2 : 21, t. 300.

Getonia floribunda Roxb., Pl. Cor. 1 : 61, t. 87, 1795 ; Gr. 70 ; D. & G. 91.

A very common climber about Khandala ; it is easy to spot either in flower or in fruit over the tops of forest trees even from some distance away ; when the fruit matures, the whole inflorescence becomes brick red, and this colour renders the plant more visible.

Local name : Uksi or Ukshi.

Flowers.—December to March. *Fruits.*—March to May.

Blatt. Herb. 23467 ! 18838 ! 18839 ! *Santapau* 1970 ! 3789 ! 6101 ! 8684 !

Anogeissus Wall.

Anogeissus latifolia Wall., Cat. 4015, 1831 ; Bedd., Fl. Sylv. t. 15, 1869 ; FBI. 2 : 450 ; C. 1 : 482 ; Talb. 2 : 22, t. 301.

Conocarpus latifolia Roxb., Hort. Beng. 34, 1814, & Fl. Ind. 2 : 442, 1832 ; DC., Prodr. 3 : 17, 1828 ; Gr. 70 ; Wight, Icon. t. 994 ; D. & G. 91.

An erect small tree, scarcely passing over 6 m. in height. Rare in Khandala except for two clumps, one on Monkey Hill Plateau near the edge of the ravine, the second at Meroli.

Local name : Dhaura.

Flowers.—October. *Fruits.*—October to May.

Blatt. Herb. 27511 ! 27604 ! 27605 ! *Santapau* 4202 ! 4203 ! 4204 ! 4314 ! 4315 ! 5041 !

Combretum Linn.

Combretum ovalifolium Roxb., Hort. Beng. 28, 1814 & Fl. Ind. 2 : 226, 1832 ; FBI. 2 : 458 ; Gr. 70 ; D. & G. 90 ; C. 1 : 484 ; Talb. 2 : 26, t. 303.

Very common in Khandala ; it is particularly common at about the altitude of Khandala, not so in the ravines.

Flowers.—December to March. *Fruits.*—March to June.

Blatt. Herb. 6433 ! 6435 ! 6432 ! *Santapau* 109/8, 27, 28 ! 1448 ! 1961 ! 1973 ! 3606 ! 3786 ! 3817 ! 3980 ! 6036 !

Combretum extensum Roxb., Hort. Beng. 28, 1814 & Fl. Ind. 2 : 229, 1832 ; FBI. 2 : 458 ; C. 1 : 485 ; Talb. 2 : 27 ; G. 469.

C. wightianum Wall., Cat. 4007, 1831 ; Wight, Icon. t. 227 ; Gr. 70 ; D. & G. 90.

This is the commoner species of *Combretum* in the ravines ; it is very rare elsewhere. The size of the spikes, the scent of the flowers and the size of the leaves distinguish this species from the preceding one ; the structure of the calyx often is difficult to estimate and may not easely serve for the separation of the species.

Local name : Piluki.

Flowers.—January to March. *Fruits.*—January to May.

Graham : " it grows in great abundance in the ravines at Kandalla "; *Cooke ; Woodrow ; Blatt. Herb.* 6439 ! 6434 ! *Santapau* 109/19 ! 1493 ! 1494 ! 1728-1730 ! 1889 ! 1960 ! 3464 ! 4122 ! 4286 ! 4436 ! 5927-5929 ! 6063 ! 8855 ! 8856 !

QUISQUALIS Linn.

Quisqualis indica Linn., Sp. Pl. (ed. 2) 556, 1763 ; FBI. 2 : 459 ; Gr. 70 ; D. & G. Suppl. 33 ; C. 1 : 486 ; Talb. 2 : 27-28, t. 304 ; G. 469.

A large climbing shrub ; young parts pubescent.

The colour of the corolla changes with the age of the flower ; at first it is pure white, then gradually turns pink, finally it is deep red ; the colour outside is usually paler than inside. Fruits not seen in Khandala.

Frequently cultivated in gardens for the showy and large spikes or racemes of brightly coloured flowers ; all the variations in colour mentioned above may be found on one and the same spike at the same time. It thrives well in Khandala, but I have not seen the plant growing in the jungle away from human habitation.

Flowers.—March to May. *Fruits.*—Not seen.

Hallberg in MS. catalogue ; *Blatter* 21280 ! *Santapau* 109/9 ! 1995 ! 6083 ! 6084 ! 8713 !

MYRTACEAE.

SYZYGIUM Gaertn.

Syzygium caryophyllatum (Linn.) Alston in Trim., Hand. Fl. Ceyl. 6 : 116, 1931.

Myrtus caryophyllatus Linn., Sp. Pl. 472, 1753 (non Thunb.).

Eugenia corymbosa Lamk., Encycl. 3 : 199, 1789 ; C. 1 : 491 ; Talb. 2 : 37, t. 309.

Syzygium corymbosum Wight, Icon. t. 540, 1843 (non Gaertn.) ; Gr. 73 ; D. & G. 93 ; G. 480.

Eugenia caryophyllaea Wight, Ill. 2 : 15, 1850 ; FBI. 2 : 490.

The occurrence of this tree is given on the authority of Hallberg's manuscript catalogue ; I have not seen the tree in Khandala ; there are no specimens from the district in any of the herbaria consulted.

Hallberg in MS. catalogue.

Syzygium cumini (Linn.) Skeels, in U. S. Dept. Agric. Bur. Pl. Ind. Bull. 248 : 2, 1912 ; Alston, loc. cit. 116 ; Merrill & Perry in JAA. 19 : 108.

Myrtus Cumini Linn., Sp. Pl. 471, 1753,

Eugenia jambolana Lamk., Encycl. 3 : 198, 1789 ; FBI. 2 : 499 : Wight, Icon. t. 535 ; C. 1 : 492.

Syzygium jambolanum DC., Prodr. 3 : 259, 1828 ; Gr. 73 ; D. & G. 93.

Fairly common especially above Forbay ; the pale green colour of the leaves, their shape and their shining surface make the tree rather conspicuous in the jungle. The fruits of the wild trees are of poor quality and possess a large stone ; once the fruits have reached maturity, they easely fall off the tree.

Local name : Jambul.

Flowers.—March to June. *Fruits.*—April to June.

Blatt. Herb. 19108 ! 19157 ! *Hallberg* in MS. catalogue ; *Santapau* 111/4 ! 256 ! 400 ! 444 ! 1542 ! 1840 ! 1926 ! 4018 ! 4109 ! 4222 ! 8623 ! 8988 !

Syzygium phillyraeoides (Trim.) Santapau in Kew Bull. 1948 : 176, 1948.

Eugenia phillyraeoides Trim. in Journ. Bot. 23 : 207, 1885.

Eugenia Mooniana Wight, Illustr. 2 : 13, 1850 ; FBI. 2 : 505 ; Wight, Icon. t. 551 ; C. 1 : 594 ; Talb. 2 : 44 ; G. 484 (non Gardn. 1843).

Rare in Khandala ; I have found but two shrubs, one just below St. Xavier's Villa in the ravine, the second down the ravine slopes in dense forest.

Flowers.—October & November 1944. *Fruits.*—October and November 1944, February 1945.

Santapau 5153 ! 5154 ! 5155 ! 5156 ! 5502 ! 6059 !

Syzygium jambos (Linn.) Alston, in Trim., Hand. Fl. Ceyl. 6 : 115, 1931 ; Merrill & Perry loc. cit. 114 & 217.

Eugenia Jambos Linn., Sp. Pl. 470, 1753 ; FBI. 2 : 474 ; C. 1 : 495 ; Talb. 2 : 32, t. 305.

Jambosa vulgaris DC., Prodr. 3 : 286, 1828 ; Gr. 74 ; D. & G., Suppl. 35.

A small tree cultivated in gardens. Leaves acuminate ; nerves very faint above, slightly more clear beneath, uniting in an intramarginal nerve 1-3 mm. from the edge of the leaf.

Flowers large, fragrant, showy ; pedicels jointed to the calyx, up to 12 mm. long. Fruits creamy white when ripe, about 4-5 cms. in diam. ; on several occasions I have seen numbers of poor children eating the fruit with relish ; the Katkaris sell them in the railway station, but I have not been able to find out where the fruit comes from ; in the district I have seen but one tree in a garden near the railway station.

Local name : Jamb.

Fruits.—May 1946.

Blatt. Herb. 19109 ! 2562 ! *Santapau* May 1946 !

EUCALYPTUS L'Herit.

In a garden near the railway station there is a tall specimen of *Eucalyptus sp.*; on the way to Lanavla there are several good specimens also in gardens. In spots where there is ample supply of soil and moisture this tree seems to grow well in the district.

Santapau May 1946.

PSIDIUM Linn.

Psidium guayava Linn., Sp. Pl. 470, 1753 ; FBI. 2 : 468 ; C. 1 : 498 ; Talb. 2 : 30 ; G. 472.

P. pyriferum Linn., Sp. Pl. (ed. 2) 672, 1762 ; Gr. 72 ; D. & G., Suppl. 34.

A common tree in Khandala ; it occurs mainly about Forbay and along the stream from Forbay down to the bottom of the ravine, showing clearly how the tree has spread along the water courses. The fruit is of very inferior quality, small and rather hard, though Katkaris seem to eat it. The wood is hard, and young shoots from the base of the stem often come out nearly straight, and on this account are cut by Katkaris for walking sticks. Flowering and fruiting goes on most of the year.

Local name : Piru.

Flowers.—October to June. *Fruits.*—Throughout the year.

Blatt. Herb. 19098 ! 19100 ! *Hallberg* in MS. catalogue ; *Santapau* 111/16 ! 1838 !

MYRTUS Linn.

Myrtus communis Linn., Sp. Pl. 471, 1753 ; FBI. 2 : 462 ; C. 1 : 498.

This shrub is occasionally found in Khandala gardens ; there was one in St. Xavier's Villa in January 1951.

Santapau, in gardens.

LECYTHIDACEAE.

CAREYA Roxb.

Careya arborea Roxb., Pl. Cor. 3 : 14, t. 218, 1819 ; FBI. 2 : 511 ; Gr. 74 ; Wight, Ill. tt. 99 & 100 ; D. & G. 95 ; C. 1 : 497 ; Talb. 2 : 48-49, t. 316 ; Santapau in JBNHS. 46 : 409.

C. coccinea Chev., Cat. Saig. 64, 1919 ; Alston, in Trim., Hand. Fl. Ceyl. 6 : 120 (non *Meteorus coccineus* Lour.).

Middle-sized to large tree ; its presence in the forest either during the flowering or fruiting season is given away by a strong, penetrating and unpleasant odour, which seems to be at its strongest towards the end of the fruiting season.

New leaves come out when the fruits are still on, about the middle of April ; by February leaves become brick red, and gradually fall off ; flowers come out about the beginning of March, when the tree is entirely leafless. For an unusual flowering due to interference, see Santapau, loc. cit.

Corolla and filaments are white ; when old, the upper part of the filaments becomes red. Fruit nearly spherical, up to 9 cms. diam., crowned with the remains of the calyx and style. At the beginning of the rainy season many seeds germinate whilst still on the parent plant.

The fruit is supposed to be strongly poisonous, and this may explain why the fruit is not touched by any animal ; only on one occasion did I find the fruit of a particular tree eaten by red ants.

Careya is one of the commonest trees in Khandala. The flowers are rather fine, but as the tree is entirely leafless at the time, the beauty of the flowers is scarcely appreciated. Moreover, large tracts of the forest seem to be impregnated with the penetrating odour of the flowers and fruits of this tree. The timber is said to be of high quality ; but as far as Khandala is concerned, I have not seen any other use being made of it than for fuel.

Local name : Kumba.

Flowers.—March to May. *Fruits.*—April to August.

Blatt. Herb. 19152 ! *Santapau* 111/10, 33 ! 3878 ! 6919 ! 8895 !

MELASTOMACEAE.

Osbeckia Linn.

Osbeckia truncata Don in Wight & Arn., Prodr. 322, 1834 ; FBI. 2 : 514 ; Wight, Icon. t. 375 ; Cogniaux in DC., Mon. Phan. 7 : 327 ; C. 1 : 499 ; G. 494.

O. zeylanica ? Graham, Cat. 71, 1839 (non Linn.).

O. Leschenaultiana D. & G., Bomb. Fl. 92, 1861 (non DC.).

Fairly common in Khandala during the second part of the rains, occasionally associated with *Burmannia, Drosera indica* and *Exacum pumilum.* This is particularly the case at the north end of Paoli Hill, by the side of the path ; whenever one of these plants is found the rest is surn also to be found among grasses.

Flowers.—October to November. *Fruits.*—October to November, but dry fruits may be seen up to January.

Santapau 2768 ! 2863 ! 2919 ! 3063 ! 3117 ! 5159 ! 5381 ! 5478 ! 7412 ! 7413 !

SONERILA Roxb.

Sonerila scapigera Hook. in Lond. Journ. Bot. 7 : 672, 1848 ; FBI. 2 : 538 ; D. & G. 93 : C [illegible] 513 ; C. 1 : 501.

The following description was written in the field on August 4th 1944, from specimens just collected :

" Leaves are not radical, but come out of a stem, which is 6-12 mm. long, terete, glabrous, whitish with a touch of pink ; below the stem there is a tuber about 6 mm. diam., with hair-like roots coming from all round the tuber ; some of the tubers are elongated, 12 × 6 mm. Petioles, peduncles, pedicels, main nerves on the leaves and calyx reddish purple. Petioles up to 6 cms. long. Leaves up to 5 × 4 cms. ; main nerves 5-7 from the base of the leaf ; leaves green above, paler beneath, or olive green above, purple beneath. Flowering scapes up to 9·5 cms. long, flowers 2-11 in scorpioid cymes ; pedicles up to 12 mm. long, glabrous. Calyx somewhat trigonous, not sulcate in flower ; corolla " Phlox Purple " (Ridg. 65, b) with midrib of petals about " True Purple " (Ridg. 65) ; petals oblique. Anthers sagittate, lemon yellow ; filaments of the same colour as the petals ; stamens 3. Style filiform, recurved ; stigma minute, purple, capitate. Plant generally pendulous from overhanging rocks. On the outerside of the scorpioid cyme, there is a bract for each pedicel. "

The underside of the leaves seems to be covered with minute dark dots, interspersed with whitish scales. Seeds very numerous in each fruit, elongated, cylindrical or nearly so, under a low power microscope (X 40) appearing clearly tuberculate, at maturity brown in colour.

Sonerila is not a common plant in Khandala ; it is found in places where there is plenty of water with good drainage such as the underside of overhanging rocks ; it is a gregarious plant. Both on account of its flowers and of its leaves this is a pretty monsoon plant.

Flowers.—July to September. *Fruits.*—August to September.

Woodrow ; *Cooke* ; *Hallberg* in MS. catalogue ; *Blatt. Herb.* 19863 ! *Santapau* 112/2, 4 ! 621 ! 874 ! 1065 ! 2263 ! 2275 ! 4610 ! 4611 ! 4644 ! 6856 !

MEMECYLON Linn.

Memecylon umbellatum Burm., Fl. Ind. 87, 1768 ; C. 1 : 503 ; G. 504.

M. edule Roxb., Pl. Cor. 1 : 59, t. 82, 1795 ; FBI. 2 : 563 ; D. & G. 93 ; Cogniaux 1175 ; Talb. 2 : 53, t. 318.

M. tinctorium Koenig ex Wight & Arn., Prodr. 319, 1834 ; Wight, Ill. t. 93 ; Gr. 71.

A small tree with pale bark ; stem and branches densely lenticellate. Flowers in umbellate short cymes, from the axils of fallen leaves, on the old wood ; sometimes most of the branch is a mass of flowers. Calyx whitish with a touch of lilac ; petals white outside, deep blue inside ; stamens and stigma blue ; top of ovary purple. Flowering branches show a vivid mottling of colouring ; the predominant colour before the opening of the buds is whitish lilac, after opening of flowers blue or purple. Berry globose, 6-12 mm. in diam., deep purple or black at maturity.

A common tree in Khandala ; especialy common on Behran's Plateau, where it stands out clearly on account of the deep green colour of the leaves and the compactness of the whole tree. During the rainy season this tree supports a dense population of epiphytic orchids, among which *Eria* and *Dendrobium* are the commonest.

For further remarks, see after *M. Talbotianum*.

Local name : Anjan.

Flowers.—December to April. *Fruits*.—March to August.

Graham ; Nene ; Hallberg in MS. catalogue ; *Blatt. Herb.* 25396 ! 19165 ! 19106 ! 19126.! 28021 ! 25431 ! *Santapau* 111/6-14 ! 583 ! 1683 ! 2023 ! 3166 ! 3829 ! 6080 ! 6081 ! 8631 !

Memecylon umbellatum var. **capitellata** Cooke, Fl. Pres. Bomb. 1 : 504, 1903.

M. edule Roxb. var. *capitellata* Clarke in FBI. 2 : 564, 1879.

In every respect, except in the length of the peduncles, this tree is similar to the typical variety. Cooke wrongly attributes the name of the variety to Clarke.

Due to the length of the peduncles and of the " primary rays ", the inflorescence of this tree is clearly distinct from that of the typical variety ; in the present variety the inflorescence is not so compact as in the other. When the two varieties are in fruit, they cannot be distinguished from each other, since most of the peduncles lengthen out considerably in the typical variety.

Local name : Anjan.

Flowers.—March. *Fruits*.—March to the beginning of the rains.

Santapau 1683 ! 1684 ! 6081 !

Memecylon talbotianum Brandis in Talbot, Tr. Bomb., ed. 2, Append., 1902 ; C. 1 : 504 ; Talb. 2 : 54, t. 320 ; G. 503.

The colour of the fruit of this species is yellow when ripe, and this is the main point for the separation of this species from the preceding one, which has black or very deep purple fruits. I have examined

a large number of the two species in the living condition, and, except for the fruit colour, I cannot see any difference between them. It is possible that some of the specimens listed under *M. umbellatum* Burm. belong to the present species but in the absence of the fruit, I find it impossible to distinguish them ; in herbarium specimens, it is not easy to separate the two species from each other even when the fruits are preserved.

In my opinion the present species scarcely deserves even varietal rank.

Local name : Anjan.

Flowers.—Possibly seen, but not identified as belonging to this species. *Fruits*.—June to August

Talbot loc. cit. ; *Santapau* June 1942, 1943, August 1944.

LYTHRACEAE.

Ammannia Linn.

Ammannia multiflora Roxb., Fl. Ind. 1 : 447, 1820 ; FBI. 2 : 570 ; D. & G. 97 ; Koehne in Pfreich. 17 : 48, 1903 ; C 1 : 509 ; Blatter & Hallberg in JBNHS. 26 : 212.

Flowers solitary or in peduncled cymes ; both peduncles and pedicels very slender, variable in length. The presence of peduncles and pedicels distinguish this species from *A. baccifera* Linn., which it otherwise much resembles. *A. multiflora* grows commonly in fairly dry spots, as in rice fields during the winter months. Fruits purple.

Flowers —October to November. *Fruits*.—October to December.

Blatt. and *Hall.* 3356 ! *Santapau* 3003 ! 5465 !

Ammannia baccifera Linn., Sp. Pl. (ed. 2) 175, 1762 ; FBI. 2 : 569 ; D. & G. 97 ; C. 1 : 509 ; Koehne 53 ; Blatter & Hallberg 215.

A. vesicatoria Roxb. : Gr. 67.

A. salicifolia Hiern, in Oliv. Fl. Trop. Afr. 2 : 278, 1871 (excl. syn. ; non Monti) ; FBI. 2 : 569 ; D. & G. 97 ; C. 1 : 509.

Following Blatter and Hallberg, loc. cit., I have united *A. baccifera* Linn., with *A. salicifolia* Hiern (non Monti,' as Cooke et al. put it). Blatter and Hallberg remark : " We have united *A. salicifolia* as understood by Hiern and Clarke (not of Monti) with *A. baccifera* Linn. not even retaining them as subspecies as was done before by Koehne. Clarke says : ' The only character by which *A. baccifera* can be distinguished from *A. salicifolia* are the attenuated leaves'. We have examined hundreds of specimens and found that this distinction does not hold good ".

A common plant in Khandala in moist spots ; under favourable conditions this plant easely reaches 1·2 m. and more in height. The stem is often tinged with purple ; fruits are purple.

Blatt. and Hallb. 6031 ! 6032 ! 6052 ! 3445 ! 3446 ! 6047 ! 6051 ! 6054 ! 6090 ! 6056 ! 6091 ! *Santapau* 105/10 ! 325 ! 345 ! 1213 ! 1668 ! 1846 ! 3121 ! 3752 ! 4220 ! 5467 ! 5481 ! 5825 !

Ammannia senegalensis Lamk., Ill. 1 : 312, t. 77 f. 2, 1791 ; Koehne in Engl. Bot. Jahrb. 1 : 255, 1880 & loc. cit. 52 ; Blatter & Hallberg 214.

" Erect or suberect, up to 20 cms., simple or sparingly branched near the base. Leaves up to 30 mm. long and 4 mm. broad, subacute. Calyx 8-ribbed. Petals present, 1 mm. long, rotund-ovate. (In formalin the mucilage of the ovaries comes out in large masses and the formalin is stained bluish purple). " (Blatt. and Hallb. loc. cit.)

This species with all its forms approaches *A. multiflora* and *A. baccifera* ; from the first it differs by the absence of style and petals ; if they are present, *i.e.* style and petals, both are very minute. From *A. baccifera* it differs by its cymes being distinctly pedunculed.

As Blatt. and Hallb. remark, the presence of *A. senegalensis* Lamk. had not been noted in India before; the localities mentioned by these two authors, besides being the type localities for the new form (forma *indica* Blatt. & Hallberg), they are new records for the species in Western India.

Blatt. and Hallb. 3350 ! *Santapau* 4364 !

Rotala Linn.

Rotala indica (Willd.) Koehne in Engl. Bot. Jahrb. 1 : 172, 1880, & in Pfreich. 40 ; Blatt. & Hallb. 711 ; G. 508.

Peplis indica Willd., Sp. Pl. 2 : 244, 1799.

Ammannia peploides Spreng., Syst. 1 : 444, 1825 ; FBI. 2 : 566 ; C. 1 : 506.

Ameletia indica DC. : D. & G. 96.

Blatter and Hallberg have united the two species *R. indica* and *R. subrotunda* of Koehne, the reason being that " the distinction which Koehne pointed out in order to establish his two species...,*viz.* included and excluded anthers does not hold good. " The common form in Western India is the one which Blatt. and Hallb. called " *Forma a. spicata*". Their description of the new form is as follows : " Stem stout, 10-20 cms. high, quadrangular, not much branched, erect or ascending, rooting at the lower nodes. Leaves large, up to 15 × 8 mm., broadly obovate, attenuate at the base, penninerved, nerves prominent beneath, tip obtuse or rounded. Flowers densely crowded in axillary spikes which generally are of the length of the leaves. Bracts elliptic-lanceolate, up to 5 × 2 mm..... "

Flowers and *Fruits*.—December to March.
Blatt. and Hallb. 3265 ! 3266 ! 3448 ! *Santapau* 3448 !

Rotala ocultiflora Koehne in Engl. Bot. Jahrb. 1 : 152, 1880 & Pfreich. loc. cit. 30 & 25 t. 2B ; G. 508 ; Blatt. & Hallb. 705.

Erect or ascending or prostrate herb, growing in wet ground ; at first the plant is green, later it turns brownish. Blatter and Hallberg remark about this plant : " This is a very distinct species and it is strange that it should have been overlooked both by C. B. Clarke and T. Cooke."

This plant is common about Khandala near the station, the village tank and at the edge of pools in St. Xavier's Villa. Flowers are not visible without dissection, as the supporting leaf covers them entirely.
Flowers and *Fruits*.—October to November.
Blatter and *Hallberg* 3279 ! *Santapau* 5137 ! 7477 !

Rotala densiflora (Roth) Koehne in Engl. Bot. Jahrb. 1 : 164, 1880 & 4 : 388, 1883 & in Pfreich. loc. cit. 35 & 33 t. 3C.
Ammannia densiflora Roth in R. & S., Syst. 3 : 304, 1818.
A. pentandra Roxb. (pro parte ?) Fl. Ind. 1 : 448, 1820 ; FBI. 2 : 568 ; C. 1 : 507.
Rotala roxburgiana Wight, Icon. t. 260 B, 1840 ; id. in Ill. 1 : 206.
R. pentandra (Roxb.) Blatter & Hallberg, loc. cit. 707, 1918.

A very typical species and one of the most beautiful of the *Ammannias* or *Rotalas*. Stem erect or creeping at the base and rooting at the lower nodes ; stem and branches of a delicate green colour. Leaves spreading, almost horizontal, supporting a number of minute sessile flowers in their axils. Corolla pink or reddish with a touch of purple. Capsule generally 3-valved ; calyx with accessory teeth between the primary ones ; accessory teeth may be altogether absent or if present may vary considerably in their shape and size.
Flowers and *Fruits*.—August to November.
Meebold 8909 ! *Blatt.* and *Hallb.* 3315 ! 19876 ! *Santapau* 650 ! 944 ! 1079 ! 1139 ! 2501 ! 2020 ! 6850 ! 6851 ! 7399 ! 7400 ! 7401 !

Rotala tenuis (Wight) Koehne in Engl. Bot. Jahrb. 1 : 177, 1880 ; id. in Pfreich. loc. cit. 42 & 35, t. 4C ; Blatt. & Hallb. 720.
Ameletia tenuis Wight, Icon. t. 257, 1840 ; D. & G. 96.
Ammannia tenuis Clarke in FBI. 2 : 567, 1879 ; C. 1 : 506.

A small herb common on rocks in streams with running water ; the lower part of the plant may be submerged, and in such a case leaves become linear lanceolate or almost filiform. The colour of the whole plant is purple ; flowers are however of a lighter shade of purple than the rest of the plant. It is a gregarious herb, at times large areas on rocks in midstream are wholly covered with this delicate plant.

No. 1165 collected on 21 October 1942 was found growing on sand near the running stream at the bottom of St. Mary's Ravine ; the stems

are purely green or whitish, not purple ; all the flowers were white without any trace of pink or purple ; all the specimens in a large patch were of the same colour.

Stems are often decumbent at the base, rooting at the lower nodes ; the upper parts of the plant are erect and do not show any adventitious roots.

Flowers and *Fruits*.—October to January.

Santapau 105/13 ! 1165 ! 5811 !

WOODFORDIA Salisb.

Woodfordia fruticosa (Linn.) Kurz in JASB. 40 : 56, 1871 ; Koehne in Pfreich. 79, t. 12A ; G. 511.

Lythrum fruticosum Linn., Sp. Pl. (ed. 2) 641, 1762.

Woodfordia floribunda Salisb., Parad. Lond. t. 42, 1806 ; FBI. 2 : 572 (excl. syn. *Grislea unifl.* & *G. micropet.*) ; C. 1 : 510 ; Talb. 2 : 58, t. 322.

Grislea tomentosa Roxb. : Gr. 67 ; D. & G. 97 ; Bot. Mag. t. 1906.

A very common plant in Khandala ; it occurs almost everywhere except in dense jungle ; occasionally it is found also in ravines and jungles, but then it is only in jungle clearings or by the sides of the path. When the plant is in full bloom, it is one of the finest and most showy plants about Khandala. I have not heard of the plant being used medicinally or otherwise in the district.

Flowers.—January to June. *Fruits*.—March to June.

Blatt. Herb. 6123 ! 6128 ! *Hallberg* in MS. catalogue ; *Santapau* 1636 ! 1951 ! 2726 ! 8613 !

LAWSONIA Linn.

Lawsonia inermis Linn. Sp. Pl. 349, 1753 ; Koehne in Engl. Bot. Jahrb. 4 : 36, 1883 ; id. in Pfreich, loc. cit. 270, t. 59 ; C. 1 : 511 ; G. 514.

L. alba Lamk., Encycl. 3 : 106, 1789 ; FBI. 2 : 573 ; Gr. 67 ; D. & G. 97 ; Wight, Ill. t. 87 ; Talb. 2 : 60.

Cultivated in gardens as a hedge plant ; an extract of the plant is used as a hair dye. I have not seen the plant growing wild in Khandala.

Local name : Mendhi.

Blatt and *Hallb.* 6131 ! 6132 !

LAGERSTROEMIA Linn.

Lagerstroemia parviflora Roxb., Pl. Cor. 1 : 47 t. 66, 1795 ; Wight, Icon. t. 69 ; FBI. 2 : 575 ; Koehne loc. ult. cit. 258 ; C. 1 : 512 ; Talb 2 : 61, t. 323 ; G. 512.

L. lanceolata Dalz. & Gibs., Bomb. Fl. 98, 1861 (non Wall.).

In Khandala this is a small tree scarcely ever reaching 6 m. in height, often about 4 m. high. Leaves smaller than in the following species, pale green above, whitish or glaucous beneath, sessile or nearly so.

Calyx accrescent in fruit. Corolla white, inodorous (or at least I have failed to find any trace of scent in the flowers). Fruit persisting on the tree even after the next flowering season ; dehiscence takes place very late, some time immediately before or during the following flowering season.

When the tree is in flower it is a fine sight ; flowers are very numerous and the whole tree seems to be covered with masses of them. In Khandala I have only seen this tree growing on Behran's Plateau.

Local name : Bondara.

Flowers.—March to June. *Fruits.*—May to December.

Blatt. Herb. 28353 ! 6135 ! *Santapau* 105/7, 14 ! 301 ! 403 ! 404 ! 2001 2002 ! 2004 ! 2054 ! 2055 ! 4180 ! 8704 ! 8705 ! 9006 !

Lagerstroemia lanceolata Wall., Cat. 2120, 1829 ; Wight & Arn, Prodr. 309, 1834 pro parte ; FBI. 2 : 576 ; C. 1 : 513 ; Koehne 257 ; Talb. 2 : 62, t. 324.

L. parviflora D. & G., Bomb. Fl. 98, 1861 (non Roxb.).

A large tree, in dense jungle reaching 18 m. in height ; bark pale in colour, peeling off in large irregular broad strips. Young branches square in section. Leaves up to 11·5 × 6·5 cms., pale green above, hoary tomentose beneath.

When in flower this is a very fine tree ; flowers are very numerous and seem to cover the whole tree. The colour of the leaves makes this tree very conspicuous even at some distance.

There is a fine set of these trees along the main road in front of St. Xavier's Villa ; elsewhere in the district this tree is found scattered throughout the jungle singly or in pairs.

Local name : Nana.

Flowers.—April to June. *Fruits.*—Throughout the year, from May.

Blatt. Herb. 17951 ! 19197 ! 28259 ! *Santapau* 105/8 ! 379 ! 443 ! 595 ! 1876 ! 1919 ! 2077 ! 4488 ! *Hugel* 1569 ex Koehne, loc. cit.

ONAGRACEAE.

JUSSIAEA Linn.

Jussiaea suffruticosa Linn., Sp. Pl. 388, 1753 ; FBI 2 : 587 ; C. 1 : 516 ; G. 516 (" Jussieua ").

J. villosa Lamk., Encycl. 3 : 331, 1789 ; Gr. 75 ; D. & G. 98

The generic name is sometimes spelt " Jussieua " as being more correct according to etymology (see Gamble, loc. cit.). Linne in his Sp. Pl. 388 gave the name as " Jussiaea " and this spelling must be retained under the Rules. See Sprague in Kew Bull. 1928 : 355

A very variable plant as regards size, etc. On October 18th, 1943, I found a number of plants scarcely 15 cms. high, with all their parts proportionately reduced in size ; on the other hand, on November 8th, 1942, I found other plants over 2 m. in height, with a strong woody stem 5 cms. thick near the ground ; the branches in these large specimens were woody. Leaves in Khandala rather narrow for their length, up to 10·8 × 1·2 cms.

Calyx at first green, later on accrescent to the fruit and turning purplish red and finally brown ; corolla always yellow, in size from 6 to 30 mm. diam. Stamens, variable in number ; on April 13th, 1946, I examined 16 flowers and counted their floral parts, all had 4 sepals, 4 petals, as for the stamens 1 flower had only 4, 2 had 5, 6 had 7, 7 had 8 ; all these flowers came from only 2 plants, and in most cases unopened buds were selected for these counts.

Capsules up to 3·8 cms. long ; seeds are liberated by the lateral splitting of the capsule whilst the " ribs " still remain in position.

Common in Khandala in moist spots ; also found in dry localities, and in this case the plant assumes a shrubby habit.

Flowers and *Fruits*.—September to June.

Graham : " grows in moist places at Kandalla" ; *Blatt. Herb.* 27594 ! *Santapau* 113/1, 2 4 ! 871 ! 1214 ! 1665 ! 2857 ! 2992 ! 2995(2) ! 3615 !

Ludwigia Linn.

Ludwigia parviflora Roxb., Hort. Beng. 11, 1814 & Fl. Ind. 1 : 440, 1820 ; FBI. 2 : 588 ; Gr. 75 ; Wight Ill. t. 101 ; D. & G. 99 ; C. 1 : 517 ; G. 517.

Stem and capsules reddish ; corolla yellow, small ; stamens 4 ; capsule up to 12 mm. long, 3 mm. thick.

Rare in Khandala ; it is found in rice fields after the harvest or generally in moist spots. It can easely be distinguished from *Jussiaea* by the smaller size of the flowers and capsule ; otherwise in general appearance it is very similar to the preceding species.

Flowers and *Fruits*.—September to December.

Santapau 2994 ! 2995 ! 2996 !

SAMYDACEAE.

Casearia Jacq.

Casearia graveolens Dalz. in Hook. Journ. Bot. 4 : 107, 1852 ; FBI 2 : 592 ; C. 1 : 520 ; G. 520.

Casearia...? Graham, Cat. 40, 1839.
C. glomerata Talbot, For. Fl. 2 : 69, 1911 (non Roxb.).

In open country this is a shrub about 2 m. high ; in dense forest I have examined specimens well over 9 m. high. Leaves in young seedlings are very large, the largest measured being 32 × 17 cms. with petioles up to 17 cms. long ; stipules subulate, narrowing from a fairly broad base, up to 15 mm. long.

A very common shrub about Khandala and a pretty one when in fruit. Masses of yellow orange fruits hang from the leafless branches. Neither monkeys nor insects seem to touch the fruit, which in consequence remains on the parent plant for a long time.

Local name : Bokara.

Flowers.—March to May, occasional in December. *Fruits.*—April to August.

Blatt. Herb. 19259 ! 25302 ! 17983 ! 25402 ! *Santapau* 53/3, 10 ! 362 ! 446 ! 514(2) ! 1637 ! 1638 ! 1918 ! 2046 ! 2047 ! 2087 ! 2088 ! 2198 ! 2199 ! 3892 ! 3893 ! 3965 ! 4104 ! 6122 ! 8731 ! 8732 ! 8801 ! 8802 ! 9118 ! 9119 !

TURNERACEAE.

Turnera Linn.

Turnera ulmifolia Linn., Sp. Pl. 271, 1753 ; Gilg. in Pfam. 3(6A) 64, t. 23 J ; G. 523.

A rare Central American plant introduced in the district ; in Blatt. Herb. there is but one specimen from Khandala on which Blatter remarks " Flowers yellow ; 3 styles, stigma globose ". I have seen no other specimen from Khandala either in the field or in the herbarium

Flowers.—October 1918.

Blatt. Herb. 27520 !

CARICACEAE.

Carica Linn.

Carica papaya Linn., Sp. Pl. 1036, 1753 ; FBI. 2 : 599 ; Gr. 80 ; D. & G., Suppl. 37 ; C. 1 : 524 ; Harms, in Pfam. (ed. 2) 21 : 512 t. 235, p. 513 t. 236, p. 517 t. 237 A, C.

A small tree of rapid growth, commonly cultivated in gardens for its fruit ; throughout the greater part of the year it can be seen in fruit,

and the heavy rainfall of Khandala does not seem to upset the tree to any considerable extent.

Local name : Papaya, Popai.

Santapau 2nd March and 28th November 1945, 11th April 1946 !

CUCURBITACEAE.

Trichosanthes Linn.

Trichosanthes bracteata (Lamk.) Voigt, Hort. Sub. Calc. 58, 1845 ; Cogniaux, in DC., Mon. Phaner. 3 : 375.

Modeca bracteata Lamk., Encycl. 4 : 210, 1797 ; DC., Prodr. 3 : 337, 1828.

Trichosanthes palmata Roxb., Fl. Ind. 3 : 704, 1832 ; FBI. 2 : 606 ; Gr. 79 ; Wight, Ill. tt. 104-105 ; D. & G. 103 ; C. 1 : 527 ; G. 529.

This plant is particularly common about St. Xavier's Villa and on the slopes below Reversing Station. A conspicuous plant on account of the size and colour of the leaves and flowers and fruits.

Local name : Kaundal.

Flowers.—May to August. *Fruits.*—June to December.

Santapau 488 ! 522 ! 2435-2439 ! 2761-2763 ! 3434 ! 4450-4452 ! 4487 ! 5134 ! 6809-6811 ! 6823-6826 ! 8773 ! 8774 !

Momordica Linn.

Momordica dioica Roxb., ex Willd., Sp. Pl. 4 : 605, 1805 ; FBI. 2 : 617 (excl. syns.) ; Wight, Icon. tt. 505-506 ; Cogniaux in Pfreich. 66 : 32 ; C. 1 : 529 ; G. 432.

A common plant in Khandala ; it is seldom found in the ravines or in dense jungle. The fruit is typical, and the sculpturing of the seeds is distinctive. This plant is not cultivated locally.

Flowers.—June to August. *Fruits.*—July to September.

Blatt. Herb. 28600 ! 19405 ! *Santapau* 596 ! 2155 ! 2192 ! 4763 ! 4764 ! 4819 ! 6798-6801 ! 6849 ! 6881 ! 6882 ! 6985 !

Luffa Cav.

Luffa acutangula (Linn.) Roxb., var. **amara** (Roxb.) C. B. Clarke, in FBI. 2 : 615, 1879 ; C. 1 : 533 ; Cogniaux & Harms in Pfreich. 88 : 69.

Luffa amara Roxb., Hort. Beng. 70, 1814 & Fl. Ind. 3 : 715, 1832 ; Gr. 74 ; D. & G. 102.

A fairly large climber; flowers yellow; fruit strongly ribbed and sharply angled, at first green, at length straw-coloured or yellowish, the apex coming off at dehiscence. Seeds numerous, black, embedded in very fibrous tissue. The dry fruits remain hanging from hedges, etc., for the greater part of the year; in shape and structure these fruits are like those of *L. aegyptiaca* but much smaller in size. Not common in Khandala.

Flowers.—November 1941. *Fruits*.—November till the rains.

Blatt. Herb. 27504 ! 28511 ! *Santapau* 4277 ! 5495 ! 5496 !

Cucumis Linn.

Cucumis callosus (Rottl.) Cogn. in Pfreich 88 : 129, 1924.

Bryonia callosa Rottl. in Neue Schrift. Ges. Nat. Freund. Berl. 4 : 210, 1803 (" collosa ").

Cucumis trigonus Roxb., Hort. Beng. 70, 1814 & Fl. Ind. 2 : 619, 1824 & 3 : 722, 1832; FBI. 2 : 619 (excl. syn.); D. & G. 103, ; Wight, Icon. t. 497 & Ill. t. 105 (bis); Cogniaux in DC., Mon. Phaner. 3 : 485; C. 1 : 535; G. 535.

Very common in Khandala from the end of the rains up to the end of October ; the dry plant with fresh fruits can be seen almost in every part of the district throughout the year. Not common in dense jungle. In the last stages the fruit turns pale brownish and the pulp becomes almost liquid. This fruit is the most intensely bitter one which I have tasted in the district, and the bitterness seems to act by a sort of " delayed action ".

Local name : Chiratu.

Flowers.—August to October. *Fruits*.—October to June.

Santapau 1057 ! 1116 ! 2563 ! 3641 ! 4960 ! 5361 ! 9143 !

Cucumis melo Linn. var. **agrestis** Naud., in Ann. Sci. Nat. (4) 11 : 73, 1859; Cogniaux in DC., Mon. Phaner. 3 : 483, 1881; C. 1 : 535.

C. pubescens Willd., Sp. Pl. 4 : 614, 1805; Wight, Icon. t. 496; D. & G. 103.

Ovary densely hairy with long, silky hairs; as the fruit ripens, the hairs gradually fall off, but they remain on the fruit practically till maturity. The fruit is green with ten longitudinal stripes which are white or yellow in colour; these fade away at maturity so that the fruit is then almost uniformly yellowish.

In Khandala I have not seen the fruit growing to more than 2·5 cms. in length, 1·8 cms. in diam. Children eat it with apparent relish; I have tasted the fruit and found it refreshing and juicy, but not remarkable for its taste.

The general appearance of the plant is very similar to that of *C. callosus* Cogn.; the fruit, however, is quite different, more hairy. and with a totally different taste.

Flowers and *Fruits*.—September to October.

Bhiva; *Blatt. Herb.* 19345 ! *Santapau* 408 ! 1056 ! 2918 ! 5373 !

MELOTHRIA Linn.

Melothria maderaspatana (Linn.) Cogniaux in DC., Mon. Phaner. 3 : 623, 1881 ; C. 1 : 539 ; G. 539.

Cucumis maderaspatanus Linn., Sp. Pl. 1012, 1753.

Bryonia scabrella Linn. f., Suppl. 424, 1781 ; Gr. 78 ; Wight, Icon. t. 501.

Mukia scabrella Arn. in Hook. Journ. Bot. 3 : 276, 1841 ; FBI. 2 : 623 ; D. & G. 100.

Stems scandent or in the absence of support, at first erect, then prostrate. Corolla yellow.

The occurrence of this plant in Khandala is given on the authority of Blatter ; specimen no. 28572, cited below, is rather doubtful, as it has neither flowers nor fruits. I have not seen this plant in the district ; it is often confused with *Dicoelospermum* from which only the fruits distinguish it clearly. The plant in common about Bombay.

Blatt. Herb. 28572 ?

Melothria heterophylla (Lour.) Cogn. in DC., Mon. Phaner. 3 : 618, 1881 & in Pfreich. 66 : 121-124, t. 28 ; C. 1 : 540 ; G. 539.

Solena heterophylla Lour., Flor. Cochinch. 2 : 629, 1793.

Bryonia umbellata Klein in Willd., Sp. Pl. 4 : 618, 1805 ; Gr. 78 ; D. & G. 101.

Zehneria umbellata Thwait., Enum. 125, 1858 ; FBI. 2 : 625 pro parte.

A dioecious, slender climber with tuberous roots and very variable leaves. The following are the commoner types of leaves seen in Khandala : a. Ovate, not lobed, subacute or acute or acuminate. b. Ovate, 3- (or occasionally 5-) lobed, the lobes being very shallow. c. Hastate oblong, the lower lobes being very small. d. Hastate, lobes 3-5 ; the central lobe the largest, the others decreasing in size ; the cutting of the lobes is very deep so that at times there is but the central nerve with a very narrow portion of lamina on either side. All these types intermix rather freely on one and the same plant, especially a. with b., c. with d. All leaves are cordate at the base with a large sinus, the lobes on either side of the sinus overlapping ; the margin of the leaves is often revolute, and distinctly denticulate ; the apex may be acute, subacute or acuminate ; in size the leaf may reach up to 15×15 cms. in the hastate types, and up to 19×11·8 cms. in the ovate types.

Common in Khandala, generally found on hedges or in open fields, rare in the forest. Flowers begin to come out before the leaves, and may continue coming out even when some of the fruits have reached maturity. Fruits are very conspicuous on account of their colour changes ; they seldom reach beyond 5 cms. in length.

Local name : Gometi.

Flowers.—April to October. *Fruits.*—April to January.

Blatt. Herb. 19353 ! 19365 ! 19361 ! 27212 ; *Santapau* 56/1, 2, 15 ! 565 ! 654 ! 862 ! 1843 ! 1948 ! 2535 ! 2760 ! 3197 ! 3598 ! 3969 ! 4219 ! 4587 ! 6818 ! 8931 !

Dicoelospermum Clarke.

Dicoelospermum ritchiei Clarke in FBI. 2 : 630, 1879 ; C. 1 : 545.

Dicoelosperma Ritchiei Cogniaux in Pfreich. 66 : 252, 1916.

This plant is labelled by Cooke as " rare "; in fact, it is a very common plant all over Khandala ; often it has been taken for *Melothria maderaspatana*, which it much resembles.

Fruit nearly spherical ; at first green with yellowish or creamy white striae running from apex to base ; at maturity it is wholly and uniformly red.

The seeds are typical ; of the three cells of each seed, the middle one contains the embryo, the two lateral cells are said to be empty, hence the name of the plant, but in fact they are filled with a mucilaginous, hyaline substance, that in the dry seed seems to disappear leaving an empty cavity ; the surface of the seeds is finely sculptured with raised points and a band that goes from apex to base and is about 1/5 as broad as the whole seed. In the dry fruits occasionally the side cavities become caved in, and then the resemblance to *Melothria* is very great.

This plant seems to be endemic in Western India, particularly on the Ghats ; I have not seen it below the Ghats.

Flowers.—June to October. *Fruits.*—August to November.

Blatt. Herb. 28288 ! *Santapau* 56/21 ! 721 ! 847 ! 886 ! 1058 ! 1175 ! 4762 ! 5035 ! 5098 ! 9524-9526 !

Cucurbita Linn.

Cucurbita maxima Duch., in Lamk., Encycl. 2 : 151, 1786 ; FBI. 2 : 622 ; C. 1 : 547.

The occurrence of this plant in Khandala is given on the authority of Blatter, who collected and indentified it in 1918. I have not seen the plant growing in the district ; it is, however, sold in the Khandala bazaar and this shows that the plant is grown locally.

Blatt. Herb. 27499 !

BEGONIACEAE.

Begonia Linn.

Begonia crenata Dryand. in TLS. 1 : 164, t. 14, 1791 ; FBI. 2 : 561 ; Gr. 172 ; D. & G. 104 ; C. 1 : 549 ; G. 546.

Flowers vary from pure white to deep pink or rose, with all the intermediate colours. In dense forest white flowers seem to predominate; in open spaces, on old walls, etc. pink flowers are the ordinary ones.

This is one of the commonest and most abundant plants during the first half of the monsoon in Khandala. There is an old wall behind Khandala Hotel near the Soldiers' Cricket Field which supports so many of these plants that the wall is practically hidden from view in many places. It is a beautiful plant, not unworthy of being grown in gardens.

Flowers and *Fruits*.—July to October.

Bhiva; *Hallberg* in MS. catalogue; *Blatt. Herb.* 19461 ! 19457 ! 27411 ! 29665 ! *Santapau* 57/1-3 ! 620 ! 561 ! 737 ! 757 ! 876 ! 1068 ! 2587 ! 4581 ! 6789 ! 9234 !

Begonia concanensis DC., Prodr. 13(1): 314, 1864; FBI. 2: 653; D. & G. 104; C. 1: 550.

Only found on the northern slopes of Bhoma Hill, about half way up at a spot of difficult access; it is a gregarious plant.

Flowers.—July to September. *Fruits*.—August to September.

Santapau 806 (1-6) ! 2482-2489 ! 4646 ! 4891-4893 ! 10126-10129 !

DATISCACEAE.

Tetrameles R. Br.

Tetrameles nudiflora R. Br. in Benn., Pl. Jav. Rar. 79, 1838; FBI. 2: 657; C. 1: 551; Talb. 2: 74; G. 544; Gilg, in Pfam. (ed. 2) 21: 546, t. 249A.

Anictoclea Grahamiana Nimmo, in Graham, Cat. 252, 1839.

Tetrameles — — — Dalz. & Gibs., Bomb. Fl. 311, 1861.

Tetrameles Grahamiana Wight, Icon. t. 1956, 1853.

One of the largest trees in Khandala, reaching in open situations 30 m. and more; trunk straight, buttressed at the base, often branching only 12 m. from the ground.

This is the giant of the forest about Khandala; it is very common below Elphinstone Point at an altit. of approx. 400 m. Flowers come out when the tree is bare of leaves, about the middle of March; leaves come on about the middle of May, when the fruiting season is over.

Seeds seem to germinate rather freely; on several occasions I have seen the floor of the forest beneath one of these trees covered with small seedlings. Some of these trees often produce numerous aerial roots near their bases up to 3 m. from the ground; these roots come out in large bundles, but I have not observed them reaching the ground and anchoring the trees.

Local name : Bhend.
Flowers and *Fruits.*—March to June.
Santapau 182 ! 409 ! 1334 ! 1765 ! 1916 ! 2589 ! 4070 ! 4171 !

CACTACEAE.

Opuntia Haw.

Opuntia elatior Mill., Gard. Dict., ed. 8, no. 4, 1768 ; Voigt, Hort. Sub. Calc. 63 ; G. 548.

O. Dillenii Graham, Cat. 546, 1839 ; D. & G., Suppl. 39 ; FBI. 2 : 657 pro parte.

O. [illegible] Woodrow, in RBSI. 1 : 89, 1895 ; C. 1 : 552.

When the branches are young, they bear leaves which soon fall off ; leaves are green, from deltoid to oblong-lanceolate, acute, straight or slightly curved backwards, 2·5-8×1-2 mm. in size ; each leaf with two stipule-like cushions of hairs, one on each side of the leaf base ; in the axil of the leaf there are 20 or more spine initials, which may in time develop into regular spines ; spines are all straight, about 5-6 in each leaf-axil or cushion, straw-yellow to brownish in colour (not black), 0·6-3·5 cms. long.

Flowers generally on the upper edge of the flattened branch ; occasionally I have seen them on the flat surface of the branch in leaf axils. Flowers at first are yellow or very pale flesh colour, then they turn pink, at length they are bright red or reddish purple ; the fruit is at first green, at maturity bright red or reddish purple.

Rare in Khandala ; I have only seen a large shrub near Khandala Cemetery, where flowering and fruiting goes on for the best part of the year. The fruit is edible.

Blatter and *Hallberg* in MS. catalogues ; *Santapau* 116/1, 9068 ! 9167 !

MOLLUGINACEAE.

Mollugo Linn.

Mollugo lotoides (Linn.) O. Kuntze, Rev. Gen. Pl. 264, 1891 ; Merrill, Enum. 2 : 135 ; G. 552.

Glinus lotiodes Linn., Sp. Pl. 463, 1753 ; Gr. 82 ; D. & G. 16 & 311.

Mollugo hirta Thunb., Prodr. Fl. Cap. 24, 1794 ; FBI. 2 : 662 ; C. 1 : 557.

A very common plant about Khandala, in rice fields, along the bottom of dry streams and in dried-up pools. It is also fairly frequent along the railway line.

Flowers and *Fruits*.—November to June.

Woodrow ; Blatt. Herb. 19474 ! *Santapau* 424(2) ! 1691 ! 1748 ! 2013 ! 2080 ! 8607 ! 9091 ! 9092 ! 9104 ! 9129 ! 9162 !

Mollugo oppositifolia Linn., Sp. Pl. 89, 1753 ; C. 1 : 558 ; G. 552.
M. Spergula Linn., Syst. (ed. 10) 881, 1759 ; FBI. 2 : 662 ; Gr. 12.

A slender, graceful herb, common especially along the railway line. On June 16th, 1946, I observed a large patch of this plant on waste ground near the station ; at 4 p.m. heavy clouds obscured the sky and rain was falling occasionally ; many of the flowers in the large patch were then fully opened, white in colour and about 6 mm. in diam. ; this is the only occasion when I have observed the plant growing gregariously and showing such a large number of open flowers at one time. Possibly flowers open during twilight hours or during the night.

Flowers and *Fruits*.—April to June.

Santapau 4258 ! 8792 ! 9176 ! 10025 !

Mollugo pentaphylla Linn., Sp. Pl. 89, 1753 ; Gr. 12 ; D. & G. 16 ; C. 1 : 558 ; G. 553.
M. stricta Linn., Sp. Pl. (ed. 2) 131, 1762 ; D. & G. 16 ; FBI. 2 : 663.
M. triphylla Lour. (non Burm.) : Gr. 12.

Common on rocky patches on Behran's Plateau, also common in rice fields during the cold season. In general appearance the plant is very similar to some of the Rubiaceae (*Anotis, Oldenlandia*, etc.) with which it associates in rice fields ; it is easily distinguishable from such plants by the absence of petals, the whorling of the leaves and the peculiar structure of the seeds ; the typical rubiaceous stipules are not found on the present species.

Flowers and *Fruits*.—March to November.

Blatt. Herb. 19489 ! 17735 ! 17733 ! 17734 ! 20186 ! 17740 ! 20086 !
Santapau 2126 ! 2127 ! 2234 ! 4744 ! 5042 ! 10026 !

UMBELLIFERAE.

CENTELLA Linn.

Centella asiatica (Linn.) Urban, in Mart., Fl. Bras. 11 : 287, 1879 ; Domin, Mon. Gat. Centella in Engl. Bot. Jahrb. 41 : 158, 1908 ; G. 556.
Hydrocotile asiatica Linn., Sp. Pl. 234, 1753 ; FBI. 2 : 669 ; Wight, Icon. t. 565 ; C. 1 : 562.

The fruit is together with the colour of the flower the distinguishing

feature between *Centella* and *Hydrocotile* ; in the latter the flowers are white, and the ridges on the fruit are only 3.

All along the western coast of India, where the plant is common, *Centella*, known locally under the name of Brahmi, has a great reputation as a remedy against skin diseases. I have not seen the real *Hydrocotyle* from these parts of India.

Flowers and *Fruits*.—October to July.

Blatt. Herb. 19548 ! 19549 ! *Santapau* 118/1, 8, 10, 11 ! 423 ! 1841 ! 3062 ! 3349 ! 3742 ! 4146 ! 4377 ! 8740 ! 8849 !

TRACHISPERMUM Link.

Trachispermum stictocarpum (Clarke) Wolff, var. **typicum** Wolff, in Pfreich. 43 : 89, 1927.

Carum stictocarpum Clarke in FBI. 2 : 681, 1879 ; C. 1 : 564.

An erect herb, with finely divided leaves and white flowers.

The specimens listed below may belong to *Pimpinella lateriflora* Dalz. & Gibs. ; the descriptions of both plants seem to fit my specimens ; except that the fruit is 1-vittate in the furrows, and the colour of the flowers is white or white with a touch of lilac, not reddish, nor red ; the fruits are brown, not yellow or yellowish.

In Sedgwick's copy of Cooke's Flora there is a marginal note against *Pimp. lateriflora* Dalz. & Gibs. : " Hallberg says there is no such plant. This is *Carum stictocarpum* ". Wolff, however, retains *P. lateriflora* but has to confess with Clarke that he has not seen the original or any other well authenticated specimen of *P. lateriflora*.

Hallberg in MS. Catalague ; *Santapau* 118/5 ! 3075 ! 3456 ! 3465 !

Trachispermum stictocarpum var. **hebecarpum** (Clarke) Wolff, loc. cit. 89, 1927.

Carum stictocarpum Clarke, var. *hebecarpum* Clarke in FBI. 2 : 681, 1879 ; C. 1 : 564.

A slender, elegant herb, common on hill slopes. Flowers white, occasionally with a touch of pink. Fruit small, densely hispidulous.

The genus *Carum*, as distinct from *Trachispermum*, is not found in Bombay.

Flowers and *Fruits*.—October to November.

Blatt. Herb. 27966 ! 28198 ! *Sedgwick* 7885 ! *Santapau* 118/6 ! 5262 ! 5390 ! 5445 !

PIMPINELLA Linn.

Pimpinella heyneana Wall., Cat. 566, 1829 ; Kurz in JASB. 46 : 115, 1877 ; FBI. 2 : 684 ; C. 1 : 565 ; G. 560 ; Wolff, loc. cit. 277.

Holosciadium heyneanum DC., Prodr. 4 : 106, 1830 ; D. & G. 106.

Sium triternatum Moon, Cat. 22, 1824, nom. nud.

The oldest specific name for this plant is that of Moon, but being a *nomen nudum*, it has no validity according to the Rules ; the next name, that of Wallich, is also *nomen nudum*, but it has acquired validity through the description of DC. in the Prodromus ; the combination *P. heyneana* must be attributed to Kurz, or to Wall. ex Kurz.

Stem erect ; flowers white ; fruit subglobose, glabrous without hairs or granular tubercles of any sort. A rare plant in Khandala.

Flowers.—Nov. 1945. *Fruits.*—Nov. 1945, Dec. 1942.

Santapau 1968 (1-2) ! 8053 ! 8054 !

Pimpinella adscendens Dalz., in Hook. Journ. Bot. 2 : 261, 1850 ; D. & G. 106 ; FBI. 2 : 689 ; C. 1 : 567 ; Wolff, loc. cit. 272.

A prostrate, ascending or erect herb. In the specimens from Khandala the leaflets diminish in size from the apex of the leaf to the base, the terminal leaflet being at times more than double the size of any of the others.

Flowers white ; branches bearing the inflorescence are generally erect ; when, however, the branch is very long, it may become prostrate, and then it is only the inflorescence itself that is erect.

Common in dry grassy fields ; conspicuous during the dry season as it is often the only plant in flower at the time. Under dry conditions the plant is scarcely 5-10 cms. high, the leaves being prostrate on the ground and the inflorescence itself very close to the leaves.

Flowers.—November to May. *Fruits.*—January to May.

Blatt. Herb. 19975 ! 19956 ! 19958 ! 20020 ! 19959 ! *Hallberg* in MS. catalogue ; *Santapau* 118/7, 9 ! 1737 ! 1746 ! 3480 ! 4041 ! 5810 ! 5918 ! 6089 !

Pimpinella multiradiata Santapau in Kew Bull. 1948 : 485, 1949.

An erect herb, up to 2 m. high. Stem terete, slightly striate, simple or nearly so below, branched above with long and remote branches ; the stem is hollow in the internodes. Lower leaves ternate ; leaflets acuminate, cordate or rounded or cuneate at the base, the terminal one regular, the lateral leaflets distinctly unequal at the base, all setose dentate or serrate ; blade sparsely hirsute, especially on the nerves beneath. The leaflets of the lower leaves reach up to 15×10 cms. ; petioles 10 cms. long or even longer, nearly flat ; petiolules 2-6 cms. long. Upper leaves ternate or trifid, the segments gradually passing from broadly ovate to lanceolate and finally to linear or filiform ; none of the upper leaves is reduced to sheaths.

Primary umbels terminal, axillary or leaf-opposed and slender ; bracts 0 or rarely 1 ; radii 10-37, slender, filiform, distinctly unequal in length, 8-38 mm. long. Secondary umbels 7-12-flowered ; bracteoles 1-3, narrow, ciliate at the margins ; the pedicels in fruit are 3-10 mm. long. Petals glabrous or at times somewhat puberulous on the outside, the hairs being almost microscopic. Flowers white.

Fruit orbicular, laterally somewhat compressed, rounded at the apex, subdidymous, more or less smooth, 1-1·5 mm. long; mericarps similar to the letter D; ridges 5, distinct in each mericarp; furrows 2-vittate; stylopods not eminent, each stylopod flattened on the inner surface against the opposite stylopod.

This new species in many respects is similar to *P. monoica* Dalz.; from which it differs in the larger number and the unequal length of the primary rays, the smaller number of secondary rays, the form and structure of the fruits and the structure of the upper leaves.

Habitat: on earth banks behind Khandala Hotel, near Tata's Pipes, at an altit. of about 600 m., in Khandala; the type was collected on 25 November 1945 (Santapau 8054); another sheet, 8053, which is an iso- and para-type has been placed in Kew Herbarium.

This is a very elegant plant, usually found growing gregariously.

PEUCEDANUM Linn.

Peucedanum grande Clarke in FBI. 2 : 710, 1879; C. 1 : 569.

Glabrous, succulent plant, about 90 cms. high, strongly scented when the stem is crushed; stems, branches and petioles hollow. Leaves pinnate or bipinnate, mostly radical; cauline leaves ternate or trifid, stiff and thick and very succulent.

Common in Khandala during the second half of the monsoon, and generally gregarious; it is especially abundant on Behran's Plateau and Bhoma Hill. On several occasioons I have seen this plant highly infected with fungi; the inflorescence and part of the upper branches are greatly disfigured as a result of this infection.

Flowers.—July to October. *Fruits.*—August to October.

Cooke; Blatt. Herb. 20022 ! 27581 ! 27582 ! 27420 ! *Santapau* 635 ! 711 ! 719 ! 4680 ! 4681 ! 5054 ! 6933 ! 6934 ! 6935 !

HERACLEUM Linn.

Heracleum sprengelianum Wight & Arn., Prodr. 372, 1834; FBI. 2 : 716; D. & G. 108; C. 1 : 571; G. 565.

Pastinaca Sprengeliana Wight, Icon. t. 1008, 1845.

The occurrence of this plant is given on the authority of Woodrow as mentioned by Cooke; I have not seen the plant in Khandala; there are no specimens in any of the herbaria consulted.

Woodrow, teste Cooke.

Heracleum concanense Dalz. in Hook. Journ. Bot. 2 : 26, 1850; FBI. 2 : 716; D. & G. 107; C. 1 : 571.

H. grandiflorum Dalz. & Gibs., Bomb. Fl. 108, 1861.

Ptychotis montana Graham, Cat. 84, 1839 ?

An erect herb, in favourable situations reaching 1·20 m. high; stem soft, striate, succulent. Flowers white; the outer flowers in each umbel radiant; anthers purplish. The number of vittae on the fruit seems to vary considerably; commissural vittae generally 6, but 2 of them are so short that if the fruit be examined near its base, only 2-4 vittae are apparent; dorsal vittae 8-10.

Very common at Khandala during the second half of the rainy season. It is particularly abundant on the slopes of Behran's Plateau.

Graham in his Catalogue, no. 655, p. 84, speaks of a plant under the name of *Ptychotis montana* Grah., which seems to be *Heracleum concanense* Dalz. " Bhaphallee. An herbaceous plant, with a strong and rather pleasant smell; flowers white; appears towards the close of the rains.—Common at Kandalla.... ". The colour of the flowers, the time of their appearance and the strong scent of the plant all seem to point to the present species. In view of the meagre description of Graham, I have not ventured to make the corresponding change in the name of the plant.

Flowers and *Fruits*.—August to October.

Woodrow; Cooke; *Blatt. Herb.* 20000 ! 28060 ! 26061; *Santapau* 118/2 ! 667 ! 738 ! 755 ! 4676-4679 ! 5194 ! 6858 ! 6859 ! 6918 !

RUBIACEAE.

ADINA Salisb.

Adina cordifolia (Roxb.) Hook. in Benth. & Hook., Gen. Pl. 2 : 30, 1873; FBI. 3 : 24; Schumann in Pfam. 4(4) : 56, t. 21 F-H; C. 1 : 581; Talb. 2 : 85, t. 334; G. 584; Blatt. & McCann. in JBNHS. 36 : 781.

Nauclea cordifolia Roxb., Pl. Cor. 1 : 40, t. 53, 1795; Gr. 87; D. & G. 118; Bedd., Fl. Syl. t. 33.

A large tree with spreading branches. Stipules large, deciduous, up to 18 mm. long, 12 mm. broad. Floral heads about 2·5 cms. diam. Flowers yellowish when fresh, turning reddish with age. Seeds very minute, about 1-1·5 mm. long. Leaves slightly cordate at the base; margins entire; lamina glabrous or nearly so above, generally densely pubescent beneath; petioles up to 10 cms. long, pubescent, channelled above.

Rare in Khandala; the leaf scars on the young branches are distinctive.

Local name : Hedi.

Flowers.—Not seen in Khandala. *Fruits*.—October to March.

Blatt. Herb. 7643 ! 27946 ! 28367 ! McCann ex Blatt. & McC., loc. cit.; *Santapau* March 1942 !

MITRAGYNA Korth.

Mitragyna parvifolia (Roxb.) Korth, Obs. Naucl. Ind. 19, 1839, C. 1 : 581 ; G. 585 ; Blatt. & McC. 782.

Stephegyne parvifolia Korth, Verh. Nat. Ges. Bot. 161, 1840 ; FBI. 3 : 25 ; Talb. 2 : 86-87 , t. 335.

Nauclea parvifolia Roxb., Pl. Cor. 1 : 40, t. 52, 1795 ; Gr. 87.

N. parviflora Dalz. & Gibs., Bomb. Fl. 118.

Not common in Khandala. Leaves fall off during the cold season, but fruits remain up to and including the next flowering season. On the plateau below Echo Point there was for many years a tree very well known locally for the large population of epiphytic orchids it supported ; the tree was cut down about 1945. There are some large specimens in the forest below Duke's Nose.

Local name : Kadam.

Flowers.—May to June. *Fruits.*—The whole year.

Blatter ex Blatt. & McCann, loc. cit. ; *Blatt. Herb.* 7663 ! 7659 ! 20222 ! 28008 ; *Santapau* 154/43 ! 433 ! 489 ! 513 ! 2346 ! 4283 !

HYMENODICTYON Wall.

Hymenodictyon excelsum (Roxb.) Wall., in Roxb., Fl. Ind. 2 : 149, 1824 ; FBI. 3 : 35 ; Gr. 87 ; Wight, Icon. t. 79 ; D. & G. 117 ; C. 1 : 582 ; Talb. 2 : 90 ; Blatt. & McC. 782.

Cinchona excelsa Roxb., Pl. Cor. 2 : t. 106, 1798.

A fairly large tree, in general habit very similar to the following species, from which it differs on account of its pedicelled flowers and recurved fruits. I have only seen it on two occasions, but as the tree was growing at the very edge of a precipice, it was not possible to collect the fruit.

McCann, ex Blatt. & McC. loc. cit ; *Santapau* Dec. 1942, March 1943.

Hymenodictyon obovatum Wall., in Roxb., Fl. Ind. 2 : 153, 1824 ; FBI. 3 : 36 ; Gr. 88 ; D. & G. 117 ; C. 1 : 583 ; Talb. 2 : 91, t. 337 ; G. 589 ; Blatt. & McC. 782.

Leaves up to 16×12 cms., elliptic, ovate, obovate or orbicular, abruptly acuminate, base rounded or acute or long-tapering into the petiole ; petioles up to 10 cms. long.

Flowers at first greenish, later creamy white ; on some occasions the odour of the flowers was strongly offensive, on other occasions the whole tree with inflorescence in full bloom was strongly and sweetly honey-scented. Flowers are pedicelled, but the pedicel is only 1-1·5 mm. long and about as thick ; floral leaves paler green that the other leaves, up to 10×3·5 cms., the petiole being about 6 cms. long ; the bullate shape of these leaves makes them vibrate rapidly in the breeze, so that the presence of this tree can often be detected by the rustling sound of the

floral leaves. Fruits up to 12 mm. long, shortly pedicelled, erect, persisting on the tree even after the beginning of the next flowering season.

Common in Khandala especially on Behran's, Monkey Hill and Kune Plateaus.

Local name : Rac Pairi or Sherod.

Flowers.—July to September. *Fruits.*—September till the next monsoon.

Blatt. Herb. 17980 ! 28209; *Santapau* 154/46 ! 740 ! 935 ! 2619 ! 2817 ! 3453 ! 4318 ! 4566 ! 4675 ! 4736 ! 4945 ! 6999 ! 9014 !

On September 6th, 1942, I observed a seedling of this tree growing epiphytically on *Salmalia insignis*; the trunk of the latter tree was erect and unbranched for about 6 m. from the ground ; *Hymenodictyon* was seen growing on the underside of one of the main branches of *Salmalia*. I have not observed this phenomenon on any other occasion.

WENDLANDIA Bart.

Wendlandia thyrsoidea (R. & S.) Steud., Nom. (ed. 2) 2 : 786, 1841 ; Blatt. & McC. 782.

Canthium thyrsoideum R. & S., Syst. 6 : 207, 1820.

Wendlandia Notoniana Wall., Cat. 6273, 1832 ; FBI. 3 : 40 ; Gr. 89 ; Wight, Icon t. 1033 ; D. & G. 117 ; C. 1 : 584 ; Talb. 2 : 93, t. 338 ; G. 588.

The occurrence of this plant is given on the authority of Hallberg ; neither in the Blatter Herb. nor in Sedgwick or any other herbarium consulted have I seen specimens of this tree from Khandala.

Hallberg in MS. catalogue.

Wendlandia exserta (Roxb.) DC., Prodr. 4 : 411, 1830 ; FBI. 3 : 37 ; C. 1 : 584 ; G. 587 ; Parkinson & Raizada in Ind. For. 59 : 257, t. 19, f. 5.

Rondeletia exserta Roxb., Hort. Beng. 14, 1814, & Fl. Ind. 1 : 523, 1832.

"The chief characters of this species are the short corolla tube, only slightly exceeded by the reflexed corolla lobes, the exserted stamens with linear anthers, the reflexed stipules and the tomentose under side of the leaves. The flowers are generally densely fascicled. Like several light-loving Rubiaceous plants it is frequently one of the first to appear on land slips and in abandoned *jhumed* areas where it may be often seen growing. It is therefore useful in afforestation work. It is also worth cultivating for its ornamental flowers." (Parkinson and Raizada, loc. cit.).

This is a new record for Khandala. A large shrub or a small tree, up to 3 m. high ; my Khandala plant seems o have been repeatedly coppiced, as the lower part of the stem was about 30 cms. diam., the branches only 8-10 cms. diam. Leaves mainly near the ends of the

branches, opposite and decussate, with fairly large, recurved interpeticlar stipules; leaves lanceolate, acute or acuminate at the apex, acute at the base, upper surface dull but glabrous, lower one densely greyish tomentose.

Flowers in terminal panicles, white, sweetly scented with a scent like that of the European *Sambucus*; rachis and branches of the inflorescence white and densely tomentose.

Calyx minutely pubescent outside, about half as long as the corolla tube; lobes triangular or deltoid. Corolla about 5-6 mm. diam. when fully open; tube 2-2·5 mm. long; lobes recurved, 0·7-1 mm. broad. Anthers white, 1-1·3 mm. long, about twice longe than broad; filaments exserted for about 0·5-0·8 mm. Stigma bifid, exserted, about as long as or a little shorter than the stamens. At the base of the corolla tube on the inside, there is a bright green spot, the rest is white.

The only specimen seen in Khandala was growing on a steep slope over tunnel no. 25 of the old or disused railway line in front of St. Xavier's Villa.

Flowers.—15 March 1950. *Fruits*.—Not seen in Khandala.

Santapau 10730-10734 !

Dentella Forst.

Dentella repens (Linn.) Forst., Charact. 26, t. 13, 1776; FBI. 3 : 42; Gr. 90; D. & G. 115; C. 1 : 585; G. 590; Blatt. & McC. 782.

Oldenlandia repens Linn., Mant. 1 : 40, 1767 (non Burm.).

A fairly common plant in moist conditions throughout the year; it is conspicuous on account of the pale green colour of its leaves. The fruits are generally on the underside of prostrate branches and cannot be seen from above.

Flowers and *fruits*.—In moist situations it seems to flower and fruit throughout the year, with the exception of the monsoon months.

Santapau 418 ! 2130 ! 4039 ! 9105 ! 9174 ! 9175! 10022-10023 !

Oldenlandia Linn.

Oldenlandia corymbosa Linn., Sp. Pl. 119, 1753; FBI. 3: 64; C. 1 : 588; G. 600; Blatt. & McC. 784.

Hedyotis Burmanniana R. Br. in Wall., Cat. 868 pro parte, 1829; Gr. 90; D. & G. 116.

An erect herb. Flowers white, 2 or more, pedicelled, on an axillary peduncle. Capsules globose, the valves flat or nearly so, scarcely or not at all raised above the bases of the sepals.

In rice and other cultivated fields, fairly common after the rains and harvest.

Flowers and *Fruits*.—September to April.

Cooke; *Blatter* ex Blatt. & McC., loc. cit.; *Blatt Herb.* 6471 ! 7519 ! 7513 ! 6472 ! *Santapau* 2764 ! 5368 !

Oldenlandia herbacea (Linn.) Roxb., Hort. Beng. 11, 1814 & Fl. Ind. 1 : 424, 1820; C. 1 : 589; G. 601; Blatt. & McC. 784.

Hedyotis herbacea Linn., Sp. Pl. 102, 1753.

Oldenlandia Heynii R. Br. in Wall., Cat. 867, 1829; Gr. 90.

Hedyotis Heynei R. Br.: D. & G., 116.

Stems tetragonous, almost winged; flowers white, small. Capsules subglobose, valves protruding beyond the base of the calyx teeth.

An erect herb, very common in Khandala, especially in cultivated fields.

Flowers and *fruits*.—October to July.

Blatter ex Blatt. & McC., loc. cit.; *Blatt Herb.* 6497 ! 7515 ! 6470 ! 6499 ! 7524 ! 6475 ! 6476 ! 7506 ! 27415 ! *Santapau* 154/35 ! 3017 ! 3035 ! 3480 ! 3461 ! 3483 ! 5415 ! 8096 ! 8097 !

ANOTIS DC.

Anotis lancifolia (Dalz.) Hook. f. in FBI. 3 : 73, 1880; C. 1 : 593; G. 604; Blatt. & McC. 786.

Hedyotis lancifolia Dalz. in Hook. Journ. Bot. 2 : 135, 1850; D. & G. 116.

The general habit of the plant very closely resembles that of *A. Montholoni* Hook. f. Blatter remarks on *A. lancifolia*: "Forming pure formations on Tableland of Panchgani and other places; likes a variety of habitats: rocks, gravel, meadows, pools, dry slopes,..." With these observations I am in complete agreement from my observations in Khandala. The bright colour of the flowers and their abundance makes this plant very conspicuous wherever it occurs. In Khandala it is particularly abundant on the slopes from Forbay to the top of Echo Point.

Flowers and *fruits*.—August to November.

Blatt. Herb. 29560 ! 27588; *Santapau* 154/29 ! 789 ! 1072 ! 2581 ! 2834 ! 2835 ! 4886 ! 5019 ! 5020 ! 7441 ! 7442 !

Anotis foetida (Dalz.) Benth. & Hook., Gen. Pl. 2 : 59, 1873; FBI. 3 : 74; C. 1 : 595; G. 605; Blatt. & McC. 786.

Hedyotis foetida Dalz. in Hook. Journ. Bot. 2 : 134, 1850; D. & G. 116.

The colour of the flowers is generally pink, rose or purple; occasionally, on Behran's Plateau, it is pure white; when white flowers appear, all the flowers on the same plant are white. I have not noticed the white-flowered plants elsewhere.

Common on rocks or rocky ground especially during the first half of the monsoon; wherever it occurs, it is very abundant, though not in pure formations; it is often associated with *Exacum*, *Cyperus*, *Murdannia*, *Utricularia*, etc.

Flowers and *fruits*.—July to October.

Bhiva; *Blatter* in MS. catalague; *Blatt. Herb.* 20182 ! 20183 ! 20185 ! 28179 ! *Santapau* 154/22 ! 628 ! 731 ! 2235 ! 2236 ! 2237 ! 2434 ! 2930 ! 4737 ! 6873 ! 10143 !

Mussaenda Linn.

Mussaenda glabrata (Hook. f.) Hutchin. in Gamble, Fl. Madr. 610, 1921; Blatt. & McC. 786.

M. frondosa var. *glabrata* Hook. f. in FBI. 3 : 90, 1880.

M. frondosa Linn., Sp. Pl. 177, 1753 pro parte; Gr. 88; D. & G. 121; Talb. 2 : 94, t. 339.

The enlarged calyx segment or floral leaf is up to 10×7·5 cms., creamy white or greenish white, ovate, broadly elliptic or almost orbicular in outline, acute or acuminate, parallel-veined with 5-7 conspicuous basal nerves, sides equal, subequal or distinctly unequal; base rounded or tapering into the petiole, which is up to 2·5 cms. long and hairy.

Common in Khandala in places where the undergrowth is dense, but seldom seen in dense forest. The large floral leaves even from a good distance away show the presence of this tree clearly. The plant, however, is not an attractive one; the enlarged calyx segment remains on the plant even after all the other segments have disappeared, and it persists on the apex of the fruit as long as this remains on the parent plant.

Flowers.—May to October. *Fruits*.—August to March.

Woodrow; *Blatter* & *Hallberg* in MS. catalogues; *Blatt. Herb.* 7649 ! *Santapau* 154/32, 34 ! 877 ! 1164 ! 2279 ! 5483 ! 6819 !

Randia Linn.

Randia brandisii Gamble, Fl. Madr. 616, 1921; Blatt. & McC. 787.

Randia dumetorum Lamk. : FBI. 3 : 110, 1880; C. 1 : 599; Talb. 2 : 98, t. 341, omnes pro parte.

Randia longispina DC., Prodr. 4 : 386, 1830; Gr. 89; D. & G. 119.

A small tree armed with spines, which however, are absent from old branches. Branches are of two kinds : (a) long, normal ones; (b) "short" branches with very short internodes and numerous stipules or stipule scars; flowers and fruits are mostly from such short branches.

Flowers at first pure white, fragrant; gradually becoming yellow with age. Calyx up to 12 mm. long, tube 8 mm., lobes 4 mm. long; occasionally there are deltoid, short teeth in between every two calyx lobes; the whole calyx is densely hairy. Corolla up to 2·5 cms. in diam.; there appear to be two types of trees or at least of flowers : on some trees the corolla is barely 12 mm. in diam., whilst on others it reaches or even goes beyond 2·5 cms.; these two types of flowers generally appear on different trees.

Very common all over the district. The Katkaris use the immature fruits as a paralysing fish-poison; the ripe fruit is also collected, the seeds extracted and after roasting may be eaten with safety; the taste of the roasted fruits is somewhat like that of almonds.

Local name: Ghela or Ghel.

Flowers.—March to June, occasionally to September. *Fruits.*—March to January.

Bhiva; *Blatt. Herb.* 7637 ! 7631 ! 7634 ! *Santapau* 154/7, 63, 65 ! 1738 ! 2273 ! 2274 ! 4525 ! 4526 !

Canthium Lamk.

Canthium dicoccum (Gaertn.) Merrill, in Phil. Jour. Sci. 35 : 8, 1928.

Psydrax dicoccos Gaertn., Fruct. 1 : 125, t. 26, 1788.

Canthium didymum Gaertn., Fruct. 3 : 94, t. 196, 1805 ; Gr. 91.

Plectronia didyma Kurz, For. Fl. 2 : 35, 1877 ; G. 624.

Canthium umbellatum Wight, Icon. t. 1034, 1845 ; FBI. 3 : 132.

Plectronia wightii Cooke, Fl. Pres. Bomb. 1 : 606, 1903.

The whole of the inflorescence and leaves are often covered with black, sooty fungi, which considerably disfigure an otherwise very fine tree.

Rare in Khandala. When in flower it is one of the finest trees in the district, except where sooty fungi or parasites of the family *Loranthaceae* settle on it. The wood is of a fine quality, but the tree is not sufficiently common in the district for industrial purposes.

Local name: Shambara.

Flowers.—August to December. *Fruits.*—November to July.

Woodrow; *Cooke*; *Blatter* in MS. catalogue; *Blatt. Herb.* 20174 ! 28570 ! 28368 ! 27558 ! *Sedgwick* 7771 ! *Santapau* 154/52-55 ! 1125 ! 1205 ! 1436 ! 5861 ! 6013 !

Gardenia Linn.

Gardenia lucida Roxb., Hort. Beng. 15, 1814 & Fl. Ind. 1 : 707, 1832 ; FBI. 3 : 115 ; Gr. 88 ; Wight, Icon. t. 575 ; D. & G. 120 ; C. 1 : 602 ; Talb. 2 : 101 ; G. 618 ; Blatt. & McC. 788.

A very rare tree in Khandala ; I have not seen it in the district ; in the Blatt. Herb. there is but one specimen from Khandala.

McCann, ex Blatt. & McC., loc. cit. ; *Blatt. Herb.* 28178 !

Meyna Link.

Meyna laxiflora Robyns, Tent. Mon. Vang. in Bull. Jard. Bot-Bruxelles 11 : 228,1928.

Vangueria spinosa Hook. f. in FBI. 3 : 136, 1882; C. 1 : 607; G. 626, omnes partim.

Robyns, loc. cit., p. 227 has separated *M. laxiflora* from *M. spinosa* on the following grounds:

Flowers always in lax cymes, which are distinctly pedunculate, the individual flowers being long pedicellate; buds tapering gradually upwards, obtuse at the apex; petioles 1-2 cms..... *laxiflora.*

Flowers mostly gathered in fascicles, rarely arranged in axillary cymes; pedicels short; buds upwards abruptly rounded, distinctly apiculate at the apex; petioles always less than 1 cm. long ..... *spinosa et al.*

From my own observations in Khandala, I do not feel satisfied that the new species of Robyns is very satisfactory; I find a number of trees with characters that seem to be intermediate between the two species of *Meyna.*

A common tree in Khandala; it is not a beautiful tree, especially as is often the case, when it is covered with *Loranthus* parasites. When it is in flower, it is visited by numerous insects. The fruit is eaten by local people, but is of very poor quality.

Local name : Alu.

Flowers.—December to May. *Fruits.*—December to July.

Blatter in Rev.; *Blatt Herb.* 7676 ! 7667 ! *Santapau* 154/9, 12, 51, 62 ! 1714 ! 1743 ! 3463 ! 3719 ! 9144 !

Ixora Linn.

Ixora brachiata Roxb., Hort. Beng. 10, 1814 & Fl. Ind. 1 : 391, 1820; FBI. 3 : 142; C. 1 : 610; Talb. 2 : 112, t. 349; G. 631; Blatt. & McC. 791.

A very common tree in Khandala, in dense forest or in open country. I have found the identification of this tree rather difficult; after consulting the more recent Indian floras, I have based my identification on the following points: (a) Corolla tube is less than 6 mm. long; (b) buds are globose; (c) style is glabrous or with a few spreading white hairs. I have checked my specimens with those in Kew Herb., and they seem to match.

Wight in his Icones, t. 710, has drawn a plant with flowers that are obviously too large for the present species; in the text, Wight notes that the corolla is "3-4 lines" long; the buds in Wight's picture are ellipsoid and not globose. It is my opinion that the plant drawn by Wight is not the same as *Ixora brachiata* Roxb. Talbot, loc. cit., has drawn the present species correctly.

Leaves dark green; this colour together with the presence of sooty fungi on most parts of the tree, give it a rather sombre appearance.

Inflorescence purplish or reddish in colour; corolla pure white, or at times with a touch of pink. Fruit dark purple, finally black.

Flowers and *Fruits*.—December to June.

Woodrow; *Blatter* in MS. catalogue; *Blatt. Herb.* 7694 ! *Santapau* 154/9(2), 44, 47 ! 1434 ! 1443 ! 1726 ! 3527 ! 3528 ! 3586 ! 3668 ! 6090 ! 8610 ! 9141 !

Ixora arborea Roxb. ex Sm. in Rees., Cycl. 19: no. 5, 1811; Bremek. in Bull. Jard. Bot. Buitenz. (ser. 3) 14: 208, 1937.

I. parviflora Vahl, Symb. 3: 11, t. 52, 1794 (non Lamk.); FBI. 3: 142; Gr. 92; Wight, Icon. t. 711; D. & G. 113; C. 1: 611; Talb. 2: 114, t. 350; G. 631; Blatt. & McC. 791.

A shrub or small tree; when in fruit, it is not easy to distinguish from the preceding species; the flowers of *I. arborea* are much larger and the buds are ellipsoid. The style of *I. arborea* is densely hairy when the flower is young, at length some of the hairs may fall off, but the middle portion of the style remains densely hairy.

Fairly common, but considerably less so that the preceding species

Flowers and *Fruits*.—March.

Cooke; *Hallberg* in MS. catalogue; *Blatt. Herb.* 7696 ! 7698 ! 25409 ! *Santapau* 149 ! 1498 !

Ixora nigricans R. Br., ex Wight & Arn., Prodr. 428, 1834; FBI. 3: 148; D. & G. 113; Wight, Icon. t. 318; C. 1: 609; G. 631; Bremek. 282.

I. affinis Wall., Cat. 6144, 1831-1832, nom. nud.; Blatt. & McC. 791.

A small shrub, generally found in the undergrowth of forests, in Khandala it is seldom more than 2 m. high. Flowers are pure white in colour, but they, as well as the leaves, turn black on drying.

Flowers.—April to May. *Fruits*.—Not seen in Khandala.

Woodrow; *Blatter* in MS. catalogue; *Blatt. Herb.* 7693 ! 7695 ! *Santapau* 154/11, 58 ! 1869 !

Pavetta Linn.

Pavetta indica Linn., Sp. Pl. 110, 1753; FBI. 3: 150; Gr. 92; Wight, Icon. t. 148; D. & G. 112; C. 1: 612; Talb. 2: 117, tt. 353, 354; G. 633; Blatt. & McC. 792; Bremekamp in Fedde, Repert. 37: 118.

Very common all over the district, especially in open country. It is not an attractive plant. Fresh flowers are eaten as a vegetable.

Local name: Papti.

Flowers.—October to June. *Fruits*.—The whole year.

Woodrow; *Blatter* and *Hallberg* in MS. catalogues; *Blatt Herb.* 7713 ! 7714 ! 27906 ! 28276 ! *Santapau* 154/4, 6, 56 ! 581 ! 793 ! 2201 ! 2210 ! 3326 ! 3605 ! 4044 ! 5375 ! 8733 ! 8875(2) !

Pavetta siphonantha Dalz. in Hook. Journ. Bot. 2 : 133, 1850 ; Bremek. in Fedde, Repert. 37 : 90.

Pavetta hispidula var. *siphonantha* Hook. f., in FBI. 3 : 151, 1880 ; C. 1 : 613 ; G. 633 ; Blatt. & McC. 792.

A small shrub about 1·2 m. high ; flowers white, about 13 mm. diam., style exserted for about 3·5 cms. The whole plant turns black when dry.

Not common in Khandala. Not an attractive plant.

Local name : Papti.

Flowers.—January to July. *Fruits.*—July 1941.

Blatt. Herb. 20087 ! 20088 ! *Hallberg* in MS. catalogue ; *Santapau* 154/23 ! 2143 ! 4282 ! 8868 !

Hamiltonia Roxb.

Hamiltonia suaveolens Roxb., Hort. Beng. 15, 1814 & Fl. Ind. 1 : 554, 1832 ; FBI. 3 : 197 ; C. 1 : 621 ; Talb. 2 : 134, t. 364 ; G. 650 ; Blatt. & McC. 794.

H. mysorensis Wight & Arn., Prodr. 423, 1834 ; Gr. 91 ; D. & G. 115.

A shrub about 2·5 m. high ; stems woody, up 3·5 cms. thick. Stipules interpetiolar, broad, short, suddenly acuminate with short acumination.

Flowers in Khandala white, inodorous.

For many years I knew of only one plant in the district ; in Dec. 1949 I found about a dozen such plants growing on steep slopes below Paoli Hill facing Elphinstone Point ; not seen elsewhere in the district.

Flowers.—December to April. *Fruits.*- January 1945, February 1946.

Blatter and *Hallberg in* MS. catalogues ; *Blatt. Herb.* 7703 ! 20221 ! *Santapau* 154/41, 45 ! 1465 ! 1516 ! 3459 ! 8680 ! 10664-10667 !

Borreria G. F. W. Mey.

Borreria stricta (Linn. f.) Schum. in Pfam. 4(4) : 143, 1891 ; G. 654 ; Blatt. & McC. 794.

Spermacoce stricta Linn. f., Suppl. 120, 1781 ; FBI. 3 : 200 ; C. 1 : 623.

Common on rocks and in grass fields, especially near the top of the path leading from the railway line to Behran's Plateau.

Flowers.—July to October. *Fruits.*—July to November.

Santapau 154/21 ! 2233 ! 4750 !

Borreria hispida (Linn.) Schum., loc. cit. 144, 1891 ; G. 654 ; Blatt. & McC. 795.

Spermacoce hispida Linn., Sp. Pl. 102, 1753 ; FBI. 3 : 200 ; Gr. 93 ; D. & G. 111 ; C. 1 : 624.

Common in grass fields or near water on moist ground. The plant is prostrate when growing in open ground away from other support; among grasses it is procumbent; in the early stages, when the plant is but 3-6 cms. high, it is erect. Branching is rare, except from the stem at the point where it comes out of the ground.

Flowers.—May to October. *Fruits.*—September to November.

Blatter ex Blatt. & McC. loc. cit.; *Blatt. Herb.* 29652 ! 28266 ! *Santapau* 154/39 ! 5479 ! 7471 !

HAMELIA Jacq.

Hamelia patens Jacq., Enum. Pl. Car. 16, 1760; D. & G., Suppl. 44; C. 1 : 626; Schumann 85, t. 30 L-M.

In the garden in St. Xavier's Villa there is a fine specimen that seems to flower quite readily; fruits not seen.

Blatt. Herb. 7626 ! *Santapau* 10067 ! 10068 ! 11120-11123 !

COMPOSITAE.

CENTRATHERUM Cass.

Centratherum phyllolaenum (DC.) Benth. ex Clarke, Comp. Ind. 4, 1876; FBI. 3 : 228; C. 2 : 7; G. 667.

Decaneurum phyllolaenum DC., Prodr. 7 : 264, 1838.

D. molle Dalz. & Gibs., Bomb. Fl. 122, 1861 (non DC.).

Common in Khandala in all situations. I find in my field diary for 12 Febr. 1946 the following entry: "Very common on the slopes leading from St. Xavier's Ravine to the main road a little below Reversing Station; when walking up, the pappus hairs were disturbed, and came up in clouds, a very painful experience". The most painful part of that experience was that breathing became difficult on account of the dense cloud of pappus hairs in the air.

Flowers.—September to November.

Blatt. Herb. 20450 ! 27640 ! *Sedgwick* 7980 ! *Santapau* 161/34 ! 1093 ! 1113 ! 1118 ! 1311 ! 2798 ! 2941 !

Centratherum tenue (Wight) Clarke, Comp. Ind. 4, 1876; FBI. 3 : 228; C. 2 : 7.

C. molle Benth. var. *tenue* Wight, ex Clarke, loc. cit.

Decaneurum lilacinum Dalz. & Gibs., Bomb. Fl. 314, 1861.

Heads much smaller than the preceding species; outer bracts 1-2, leafy, generally smaller than in *C. phyllolaenum*. Corolla pale purple to purple; pappus hairs white, the reddish hairs mentioned by Cooke have not been observed in Khandala plants. Achenes strongly 10-ribbed.

Fairly common in Khandala especially on the grassy slopes above Forbay. Very similar in general appearance to the preceding species, from which it differs by its smaller heads and bracts, the number of bracts, and the size of the achenes. An attractive plant when in flower.

Flowers.—October to November.

Cooke; *Blatt. Herb.* 27641 ! 27599 ! *Sedgwick* 7986 ! *Acland* 635 ! *Santapau* 161/37 ! 1162 ! 1314 ! 5259 ! 8060 ! 8061 !

VERNONIA Schreb.

Vernonia cinerea (Linn.) Less. in Linnaea 4 : 291, 1829; FBI. 3 : 233 ; Gr. 96 ; D. & G. 121 ; Clarke, Comp. Ind. 20 ; C. 2 : 10 ; G. 676.

Conyza cinerea Linn., Sp. Pl. 862, 1753.

Annual, or more probably perennial, erect, 15-120 cms. high ; stem stiff, cylindric, striate and pubescent. There are two forms of this plant in Khandala, depending on the time of the year and the situation in which the plants grow : (a) Small plants, much branched from near the ground, with short internodes and small leaves ; flowers are deep purple. (b) Tall, erect plants, simple below, more or less extensively branched above, leaves much larger, internodes very long, flowers pale purple. The first form is the common one during the dry season in open fields ; the second is the more common form after the rains or in shaded spots during the dry season.

Leaves up to 7·5×4 cms. obtuse or subacute or acute in form (a), mostly acute in form (b), irregularly serrate, decurrent into the petiole, which is consequently very short or 0 ; base of leaf rounded, acute or cuneate. Floral heads small ; flowers between " Light Amparo Purple " and " Amparo Purple " (Ridgw. 63, d-b). Involucral bracts many-seriate, the inner ones the longest, all ending in a weak spine ; pappus hairs white, 2-seriate.

Very common throughout the year. It is one of the first plants to come into flower on burnt ground during the hot season, and one of the hardiest. It is questionable if the plant is an annual ; when the ground is burnt in the hot season, the aerial shoots perish, but the underground parts survive and come into flower in a very short time ; in consequence the root and other underground parts become very thick and woody. During the month of May this is about the only plant on burnt ground.

Flowers.—The whole year.

Blatt. Herb. 20352 ! 20395 ! 28595 ! *Santapau* 1115 ! 1173 ! 2917 ! 3006 ! 3080 ! 3458 ! 3634 ! 5376 ! 5382 !

Vernonia divergens (Roxb.) Edg. in JASB. 21 : 172, 1853 ; FBI. 3 : 234 ; Benth. ex Clarke, Comp. Ind. 14 ; C. 2 : 11.

Eupatorium divergens Roxb., Hort. Beng. 61, 1814 & Fl. Ind. 3 : 414, 1832 ; D. & G. 123.

Decaneurum divergens DC., Prodr. 5 : 68, 1836 ; Wight, Icon. t. 1084.

Shrubby, 1·5-4 m. high; stem umbranched and often leafless below, more or less branched above, 1·5-5·5 cms. in diam. near the base. Leaves up to 24×10 cms., becoming smaller on the flowering branches and gradually passing into bracts. Flowering heads very numerous in dense rounded corymbs which are terminal on the stem and branches; florets usually purple, occasionally whitish or even white (this perhaps is due to age). Pappus reddish or straw-coloured. Achenes straw-coloured, strongly ribbed, truncate above, tapering to a fine point at the base.

Common on the slopes above Forbay; the large flowering corymbs are rather attractive when in full bloom, the rest of the plant looks rather bare.

Flowers.—January to May.

Cooke; *Gammie* 16132! *Blatt. Herb.* 20456! 20461! 21707! 27463! *Hallberg* in MS. catalogue; *Santapau* 161/6, 40, 43, 44! 1557! 5887! 5888! 8616! 12130-12133!

Elephantopus Linn.

Elephantopus scaber Linn., Sp. Pl. 814, 1753; FBI. 3: 242; Gr. 96; Wight, Icon. t. 1086; Clarke, Comp. Ind. 28; Hoffmann, in Pfam. 4(5): 104, t. 65 E & t. 75; C. 2: 12; G. 676.

The plant seems to be a biennial or a perennial one. New leaves come out towards the middle of June, the inflorescence or its remains from the previous season still being attached to the plant, which, therefore, must be considered at least a biennial.

Common under the shade of trees; often it is the only plant growing under such conditions together with a few ground orchids; conditions are too severe even for grasses, and this may be due to the continuous dripping from the trees and to poor lighting.

Flowers.—August to December.

Gammie 15488! *Blatt. Herb.* 21722! 28296! *Santapau* 161/32! 1112! 2943! 5129! 5130!

Adenostemma Forst.

Adenostemma lavenia (Linn.) Kuntze, Rev. Gen. Pl. 304, 1891; G. 677.

Verbesina Lavenia Linn., Sp. Pl. 902, 1753.

Adenostemma viscosum Forst., Charact. 90, 1776; FBI. 3: 242; Clarke 28; C. 2: 13; Hoffmann 132, t. 77 L-O.

A. latifolium Don: Wight, Icon. t. 1087; D. & G. 122.

Blatter mentions this plant in his catalogue; in his herbarium there is a sheet labelled as such, but the type of pappus indubitably places such a sheet in *Ageratum conyzoides* Linn. *Adenostemma* is an American introduced plant that is spreading rapidly all over India in moist places;

I have not seen the plant in Khandala, nor have I seen any herbarium sheets from the district. The plant is given on Blatter's authority. It is a common plant at Mahableshwar.

Blatter in MS. catalogue.

AGERATUM Linn.

Ageratum conyzoides Linn., Sp. Pl. 839, 1753; FBI. 3: 243 Clarke 30; Hoffmann 99, t. 61C & 134, t. 78E; C. 2: 14; G. 677.

Widely spread and abundant all over the district; especially common in stream beds during the dry season. Large patches of this plant grow on the soil below Tata's pipes all along from Forbay to Battery Hill. The occurrence of this plant along stream beds at once suggests the means of distribution of the plant; at the same time, its occurrence on top of Bhoma Hill proves that it has established itself in the district.

Flowers.—The whole year.

Blatt. Herb. 20385 ! 20408 ! 20464 ! *Santapau* 161/56, 65, 71 ! 413 ! 2478(3) ! 3745 ! 6821 ! 9261 ! 9262 !

CYATHOCLINE Cass.

Cyathocline purpurea (Don) Kuntze, Rev. Gen. Pl. 338, 1891.

Tanacetum purpureum Don, Prodr. 181, 1825.

Cyathocline lyrata Cass. in Ann. Soc. Sci. Nat. (ser. 1) 17: 420, 1829; FBI. 3: 246; Wight, Icon. t. 1098; Clarke, 37; C. 2: 15; G. 679.

C. stricta DC.: D. & G. 124.

A very variable plant, gregarious, erect. Leaves sessile, embracing the stem, up to 13×4·5 cms., the segments irregularly serrate. Floral heads uniformly "Mathew's Purple" (Ridg. 65).

Very common all over the district in moist situations, in stream beds, rice fields after the harvest, etc. Flowering and fruiting goes on during the greater part of the year, with the exception of the monsoon months. The whole plant is strongly aromatic.

Flowers.—Dry months.

Blatt. Herb. 20436 ! 27600 ! 28290 ! *Santapau* 161/35 ! 3054 ! 3493 !

Cyathocline purpurea Kuntze, var. **alba** Santapau in Kew Bull. 1948: 490, 1949.

In most respects this plant is similar to the typical variety, but differs mainly in having pure white florets. There is a set of radical leaves forming a rosette on the ground; these leaves are larger than the cauline ones, but soon decay and disappear. Cauline leaves are more deeply incised than the typical variety, at times the incisions reaching nearly to the midrib. In this respect the present species is similar to the plant which Wight called *C. Lawii*. Finally the Khandala variety has

much smaller leaves with narrower segments than the common plant.

Khandala is the typical locality of this plant, which is fairly common in rice fields after the harvest, often being intermixed with the purple flowered typical variety. It is particularly abundant in rice fields in St. Xavier's Villa.

Flowers.—November to May.

Santapau 8094 (type) ! 8883 (paratype) !

Cyathocline purpurea Kuntze, var. **bicolor** Santapau in Kew Bull. 1948 : 490, 1949.

In this new variety, at first the whole capitulum is purple, but as soon as the buds open, the external row or the two outer rows of florets are pure purple " Mathew's Purple " (Ridg. 65), and remain purple for the life of the florets ; all the rest of the florets in the centre of the capitulum are pure white, and this colour remains for the life of the florets.

Common in rice fields in St. Xavier's Villa, in the same field as the preceding variety.

In many respects this variety approaches the typical and *alba* varieties ; the main differences are the following : (a) Heads are white in the centre, purple in the periphery. (b) The cauline leaves are much smaller than in the two preceding varieties, in fact they seem to be about half way between the leaves of *C. purpurea* and *C. lutea* Law. (c) Plants are much smaller than those of the typical variety, and slightly larger than in *C. lutea*.

As this plant grows in rice fields together with the purple and white varieties, it is quite possible that it is a hybrid between the two. Cytological studies may help to decide this point.

Flowers.—November to March.

Santapau 3421 (type) ! 3422 & 3423 (para- and iso-types) ! 3494 ! 8093 !

Cyathocline lutea Law, ex Wight, in Calc. Journ. Nat. Hist. 7 : 158, 1847 ; FBI. 3 : 246 ; Wight, Icon. t. 1150 ; C. 2 : 16.

C. flava Clarke, Comp. Ind. 37, 1876.

C. Lawii Dalz. & Gibs., 124 (non Wight).

Occasionally found along the main road or in grass fields ; on Behran's Plateau I have observed several large patches about 10×6 m., where this plant seems to grow in almost pure formations to the exclusion of every other plant.

In grass fields about Lanovla this plant is very common, the fields appearing bright yellow for several kilometers along the road.

A very elegant little plant, with deep green leaves and bright yellow flowers ; the rosette of radical leaves seems to persist almost for the whole life of the plant.

Flowers.—October to December.

Blatt. Herb. 27979 ! 28290 ! *Santapau* 1201 ! 3065 ! 3066 ! 3115 ! 5268 ! 5384 ! 5413 ! 5424 ! 5425 ! 8114 !

GRANGEA Adans.

Grangea maderaspatana (Linn.) Poir., Encycl. Suppl. 2: 825, 1811; FBI. 3: 243; D. & G. 124; Wight, Icon. t. 1097; Clarke 37; Hoffmann 153, t. 83 D-F; C. 2: 16; G. 680.

Artemisia maderaspatana Linn., Sp. Pl. 849, 1753.

Common in Khandala. During the winter months it occurs in drying or dried up pools, covering practically the whole ground with a dense mat; it is also found on drier ground, but then the plant is bare of leaves. After the whole plant has dried up, the fruiting heads remain for a long time. It is not an attractive plant.

Local name.: Bambrut or Burari.

Flowers.—December to June.

Blatt. Herb. 20354 ! 20393 ! 50695 ! *Santapau* 161/50, 63 ! 396 ! 3919 ! 8735 !

ERIGERON Linn.

Erigeron karvinskianum DC., Prodr. 5: 285, 1836.

Cultivated in gardens in Khandala; in the last few years I have observed this plant growing on the walls of a house near the main road in front of the post office; the plant is obviously a garden escape. By 1946 it seemed to have established itself in the neighbourhood of the original garden, and was flowering and fruiting profusely.

The outer or ligulate florets are white, the inner or disc florets yellow; the whole plant may grow erect, but more generally its branches are pendulous with the floral heads turned upwards or outwards, *i.e.* away from the wall on which the plant is growing.

Santapau 6103-6107 !

CONYZA Less.

Conyza stricta Willd., Sp. Pl. 3: 1922, 1804; FBI. 3: 258; Hoffmann 169; C. 2: 17; G. 683.

C. absinthifolia DC. in Wight, Contrib. 16, 1834; Gr. 97; D. & G. 124; Clarke, 64.

Herbaceous, but with a thick subwoody rootstock, up to 120 cms. high; stems erect, greyish green, generally simple in the lower part, corymbosely branched above, at first leafy all over, at length more or less leafless in the lower half; stem and branches pubescent and striate.

Leaves various: upper ones entire, filiform, broad at the base, gradually becoming larger downwards; the lowest leaves up to $6 \times 1{\cdot}5$ cms., entire or more or less toothed, narrowed at the base; leaves on the middle of the stem more or less deeply and irregularly toothed or even sublobed. All leaves pubescent or hairy and sessile.

Flowers pale sulphur yellow; bracts at the forks indistinguishable from the upper leaves; pedicels hairy; involucral bracts greenish along the midnerve, scarious at the edges, hairy or pubescent. Pappus white, occasionally reddish. Achenes minutely hairy or papillose, greenish yellow at maturity.

A somewhat gregarious plant; fairly common in open, sloping grass fields. The erect, unbranched habit, the greyish colour of stem and leaves, and the pale sulphur yellow colour of its flowers render this plant rather conspicuous. Cooke gives Oct.—Nov. as the flowering time of the plant; in Khandala flowering begins about the end of September and goes on till the middle of June; on the last slopes near the top of Bhoma Hill I have observed large numbers of this plant in flower in the middle of June.

Flowers.—During the dry season.

Blatt. Herb. 20390 ! 20451 ! 28027 ! 50691 *Hallberg* in MS. catalogue; *Acland* 576 ! *Santapau* 1091 ! 1261 ! 3136 ! 3137 ! 3372 ! 3593 ! 4250 !

BLUMEA DC.

Blumea amplectens DC., var. **tenella** Hook. f. in FBI. 3 : 260, 1881; C. 2 : 19.

In Kew Herb. there is one specimen from Khandala; there are no specimens in Blatter, Sedgwick or Acland herbaria; I have not seen the plant growing in the district. The plant must be considered a very rate one.

Stocks in Kew Herb !

Blumea wightiana DC. in Wight, Contrib. 14, 1834; FBI. 3 : 261; Clarke 74; C. 2 : 20; G. 686.

Stem erect, more or less extensively branched, branches terete, striate, villous. Flowers purple. Occasional in Khandala in dense jungle under the shade of forest trees or by the side of forest paths.

Flowers.—December to January.

Santapau 3337 ! 5812 ! 5899 !

Blumea lacera DC. in Wight, Contrib. 14, 1834; FBI. 3 : 263; Gr. 97; Clarke 76; C. 2 : 20.

Blumea leptoclada Dalz. & Gibs., Bomb. Fl. 126, 1861 (non DC.).

This is a difficult species to identify in the field; in general it bears a particularly close resemblance to *B. wightiana*, from which it differs clearly by the yellow colour of its flowers.

In the dense jungle below St. Xavier's Villa, along the paths in the undergrowth there is a small *Blumea*, that seems to be the present species; none of my specimens is in flower, and so identification is rather difficult, but I checked them with those in Kew Herb., and the plants seem to match.

Stocks in Herb. Kew. ! *Hallberg* in MS. catalogue.

Blumea virens DC., in Wight, Contrib. 14, 1834; FBI. 3 : 264; Clarke 79 pro parte; C. 2 : 21; G. 687.

Erect, slender, up to 1·5 m. high, extensively branched in the upper part; stem and branches terete, striate, glabrous; lower leaves with a petiole up to 4 cms. long; upper leaves much smaller, petiole much shorter but still distinct; all the leaves glabrous, variously runcinate or lyrate. Flowers yellow; peduncles wiry, glabrous.

A very distinct species among the Blumeas; this is the only species of the genus found in Khandala that is entirely glabrous. A rare plant in the district.

Flowers.—June.

Hallberg in MS. catalogue; *Santapau* 9067 !

Blumea membranacea DC., Prodr. 5 : 440, 1836; FBI. 3 : 265; C. 2 : 21; G. 687.

Annual, erect, up to 1 m. high, more or less pubescent, at times densely so; flowers yellow; heads on slender, glandular-pubescent peduncles.

It is not easy to separate this species from *B. eriantha*: both have glandular-pubescent peduncles and are highly aromatic; the present species seems to have thinner leaves and be of a much stouter character.

Common in forest clearings, especially on the slopes below Elphinstone Point.

Flowers.—November to January.

Woodrow; *Cooke*; *Blatt. Herb.* 20358 ! 20462 ! *Santapau* 161/29 ! 1305 ! 1454 ! 3196 ! 3208 ! 3295 ! 3296 ! 3534 ! 4397 ! 4398 ! 8666 !

Blumea membranacea DC., var. **muralis** (DC.) Hook. f. in FBI. 3 : 265, 1881; C. 2 : 21.

B. muralis DC., Prodr. 5 : 440, 1836; D. & G. 125.

The differences between this and the typical variety are not very conspicuous; in general this plant is not so hairy as, and more glandular than *B. membranacea*; often the involucral bracts on the present var. are purple or reddish and remain so even on dry specimens.

Not quite so common as the typical variety; growing on old walls or on the ground in the higher parts of the district, from Khandala Hotel upwards.

Flowers.—November to January.

Blatt. Herb. 20404 ! 20435 ! 20448 ! *Santapau* 5868 ! 5869 ! 8057 !

Blumea oxyodonta DC., in Wight, Contrib. 15, 1834; FBI. 3 : 266; Clarke 85; C. 2 : 21; G. 686.

Herbaceous, prostrate, annual plant; branches wiry, numerous, striate, up to 50 cms. long. Leaves generally small (I have not observed the large leaves mentioned by Cooke), silky-pubescent especially the lower ones. The buds at the crown of the root mentioned by Cooke as

typical of *B. Malcolmii* are also found on this species. Flor ets yellow The whole plant emits a strongly aromatic odour when crushed.

Very common in open fields, especially during the winter and beginning of the hot season; it is often found together with *Nanothamnus sericeus* which it much resembles. This is about the poorest looking *Blumea* in Khandala.

Flowers.—November to April.

Blatt. Herb. 20353 ! 20447 ! 20454 ! *Santapau* 269-271 ! 3640 ! 6070 ! 6126(2) ! 8099 !

Blumea eriantha DC., in Wight, Contrib. 15, 1834; FBI. 3 : 26; C. 2 : 22; G. 686.

A very variable herb; it is very similar to *B. oxyodonta*, from which it differs by its erect habit; it is also at times rather similar to *B. Malcolmii*; under favourable circumstances it grows to 1 m. in height.

Common in Khandala, but difficult to distinguish from related species.

Flowers.—Throughout the dry season.

Cooke; *Blatt. Herb.* 20453 ! *Santapau* 293-295 ! 3704 ! 3865 ! 5432 ! 6126 (3-4) ! 8098 ! 8817 ! 9098 ! 9099 !

Blumea belangeriana DC., Prodr. 4 : 444, 1836; FBI. 3: 266; C. 2 : 22; G. 686.

Erect, annual, 20-95 cms. high; stem usually unbranched below, more or less branched above, silky hairy in the upper part. Among the species of the genus, this is a very clear one. The floral heads are sessile in the axils of the upper leaves, and the involucral bracts are woolly outside, glabrous, shining and straw-coloured on the inside; at maturity the involucral bracts spread out until they are completely reflexed, the flora heads then appearing yellowish or straw-coloured and shining.

Common along the sides of paths in the forest; this is about the commonest species of *Blumea* growing under such conditions.

Flowers.—December to May.

Blatt Herb. 20405 ! 20449 ! 20763 ! 20919 ! *Santapau* 161/42 ! 276 ! 1452 ! 1453 ! 8665 !

Blumea malcolmii (Clarke) Hook. f. in FBI. 3 : 266, 1881; C. 2 : 23; G. 686.

Pluchea Malcolmii Clarke, Comp. Ind. 95, 1876.

A species that is very conspicuous on account of its dense hairiness; in the young stages the silky covering of the whole plant is often white, later it turns yellowish, the whole plant having a yellowish or straw-coloured appearance. The silky buds at the crown of the root are not exclusively typical of this species, but the dense woolliness of the whole plant is typical.

Fairly common in Khandala, growing generally in open country.

Flowers.—More or less throughout the dry season.

Cooke; *Blatt. Herb.* 20398 ! 20407 ! 20453(2) ! *Santapau* 23 & 27 December 1943, 16 January and 29 October 1944, 28 January and 25 November 1945.

LAGGERA Sch.-Bip.

Laggera alata (Don) Sch.-Bip., ex Olivier, in TLS. 29 : 94, 1873 ; FBI. 3 : 271 ; Clarke 91 ; C. 2 : 24.

Erigeron alatum Don, Prodr. 171, 1825.

Blumea alata DC., Prodr. 5 : 448, 1836 ; D. & G. 125 ; Wight, Icon. t. 1101.

Blatter's mention in his manuscript catalogue is my only authority for the inclusion of this plant ; there are no specimens in Blatt. Herb. from Khandala ; I have not seen the plant in the district.

Blatter in MS. catalogue.

Laggera aurita (Wild.) Sch.-Bip., in Schweinf., Beitr. Fl. Aeth. 151, 1867 ; FBI. 3 : 271 ; Clarke 92 ; C. 2 : 24 ; G. 689.

Conyza aurita Willd., Sp. Pl. 3 : 1929, 1804.

Blumea aurita DC., Prodr. 5 : 449, 1836.

Hallberg's mention in his catalogue is my only authority for the inclusion of this plant ; I have not seen any specimen from Khandala. Hallberg in his catalogue mentions that he has seen four varieties of this plant in Khandala, but he gives no further data besides the bare mention of this fact, and does not name the varieties.

Hallberg in MS. catalogue.

NANOTHAMNUS T. Thoms.

Nanothamnus sericeus Thoms. in JLS. 9 : 342, t. 2, 1867 ; FBI. 3 : 273 ; Clarke 96 ; Hoffmann 176, t. 91 M ; C. 2 : 27.

" A monotypic genus found only near Bombay, in the mountains " (Clarke, loc. cit. p. 337). A prostrate or erect herb ; branches spreading radially from the root, pubescent and finely striate. Lower leaves forming a rosette on the ground, and larger than cauline leaves, petiolate ; all leaves densely woolly when young, strongly reticulately nerved and aromatic. Heads in dense axillary and terminal clusters. Florets yellow ; ray florets ligulate, but the ligule is inconspicuous ; disc florets tubular ; corolla tube hairy outside. Pappus O.

Common in Khandala, on the ground or on old walls. In general structure it much resembles *Blumea oxyodonta*, for which it is often mistaken ; absence of pappus is typical of this plant.

Flowers.—March to May.

Blatt. Herb. 20334(2) ! 20452 ! *Santapau* 3921 ! 3922 ! 4058 ! 8835 ! 8872 ! 8878 ! 10047-10048 !

EPALTES Cass.

Epaltes divaricata Cass., in Bull. Soc. Philom. 139, 1818 ; FBI ; 3 : 274 ; D. & G. 126 ; Clarke 96 (exclud. syn. *E. pygmaea*) ; C. 2 : 27 . G. 690.

One evening in October 1944, the mali or caretaker of St. Xavier's

Villa, Khandala, brought this plant to me with the remark that we had not found the plant previously. He had found it in one of the rice fields in the grounds of St. Xavier's Villa. I made an intense search for this plant in the same grounds the following morning, and failed to find another specimen ; for the rest of the season I looked for *Epaltes* in rice fields all over the district, but again failed to find another specimen.

Flowers.—October 1944.

Santapau 5360(2) !

Sphaeranthus Linn.

Sphaeranthus indicus Linn., Sp. Pl. 927, 1753 ; FBI. 3 : 275 ; C. 2 : 28.

S. mollis Roxb., Hort. Beng. 62, 1814 ; Gr. 96 ; D. & G. 123.

S. hirtus Willd., Sp. Pl. 3 : 2395, 1804 ; Clarke 97.

Heads up to 1·5 cms. diam., when in bud ; up to 2 cms. when the flowers are out, globose or ovoid, on fairly stout, terminal, winged peduncles. At first the whole head is green, then it turns purple, but when the florets open out, it is white, this being the colour of the corollas and anthers. The corollas seem to decay rather early, so that the predominant colour of the heads is purple.

Common on moist ground all over the district ; it is especially common in rice fields after the harvest. When growing in crowded conditions the stems may be erect or suberect, elsewhere they are prostrate.

Flowers.—October to March.

Santapau 2998 ! 3747 ! 3857 !

Gnaphalium Linn.

Gnaphalium luteo-album Linn., Sp. Pl. 851, 1753 ; FBI. 3 : 288 ; Clarke 114 ; C. 2 : 30.

In general appearance this plant is very similar to *G. indicum* Linn. but its leaves are sessile and more or less amplexicaul, the lower ones attenuate near the base then enlarged to a broad base embracing the stem ; heads in dense, leafless, more or less spherical clusters up to 1·4 cms. diam., straw-coloured.

Growing in ditches or moist soil, together with *G. indicum* L. Not common in Khandala.

Flowers.—February to March.

Santapau 3745 ! 6048 !

Gnaphalium indicum Linn., Sp. Pl. 852, 1753 ; FBI. 3 : 289 ; Gr. 97 ; D. & G. 130 ; Clarke 114 ; C. 2 : 30 ; G. 697.

Erect or prostrate herbs, the former when growing in moist, the latter when in drier situations. The whole plant is densely white-woolly, glaucous more often than green. Upper leaves sessile, lower ones narrowed at the base into the petiole, which is up to 1·5 cms. long. Floral heads

in spikes up to 4 cms. long, straw coloured (this colour being due to the shining inner bracts of the involucre).

Common about the talao and station; gregarious and growing in dense patches in moist soil; during the dry season it may be found growing on dry ground, but it is not so abundant as during the moister seasons.

Flowers.—December to June.

Blatt. Herb. 20357 ! 20389 ! 27436 ! 28529 ! 50693 ! *Hallberg* in MS. catalogue; *Santapau* 161/64 ! 3475 ! 3767 ! 8739 !

Gnaphalium purpureum Linn., Sp. Pl. 854, 1753; DC., Prodr. 6 : 232.

An erect, unbranched herb, up to 42 cms. high; stem striate, woolly; leaves up to 7×1·5 cms., spathulate, obtuse, attenuated at the base into an obscure petiole, then suddenly enlarged near the stem and amplexicaul; upper leaves not attenuated, more conspicuously enlarged at the base.

Floral heads in globose clusters in the axils of the upper leaves, about 1-1·5 cms. in diam., the whole inflorescence 12 cms. long.

A Central American plant, naturalized in several parts of India. I have only seen one specimen from Khandala.

Santapau 161/65 ! in flower, near the railway station, on 21 April 1942.

Vicoa Cass.

Vicoa indica (Willd.) DC. in Wight, Contrib. 10, 1834; Gr. 97; D. & G. 126; Wight, Icon. t. 1148; Clarke 127; G. 701.

Inula indica Willd., Sp. Pl. 3 : 2092, 1804.

Vicoa auriculata Cass., in Ann. Sc. Nat. (ser. 1), 17 : 418, 1829; FBI. 3 : 297; C. 2 : 32.

Fairly common on the upper slopes leading the Behran's Plateau; it is conspicuous on account of its erect unbranched habit, the colour and structure of the leaves and the bright colour of the florets. Grows best on rocky soil where grasses are not too dense.

Flowers.—Throughout the dry season.

Santapau 161/27, 35 ! 3084 ! 3450 !

Vicoa cernua Dalz. in D. & G., Bomb. Fl. 126 & 314, 1861; FBI. 3 : 297; C. 2 : 32; G. 701.

Fairly common all over the district, especially on the higher parts.

Flowers.—October to January.

Blatt. Herb. 20327 ! *Acland* 583 ! 591 ! *Santapau* 161/36 ! 1217 ! 1275 ! 2854 ! 3032 ! 5394 ! 5891 ! 8058 !

Caesulia Roxb.

Caesulia axillaris Roxb., Pl. Cor. 1 : 64, t. 93, 1785; FBI. 3 : 291;

Gr. 96 ; D. & G. 126 ; Wight, Icon. t. 1102 ; Clarke 116 ; Hoffmann 193 ; C. 2 : 35 ; G. 702.

Very common. After the rains it is frequent in most rice fields and is then suberect or prostrate ; during the dry season it is still common in moist situations, *e.g.* the ditch near the railway station, etc.

Flowers.—Throughout the dry season.

Blatt. Herb. 27456 ! 28286 ! 28551 ! *Santapau* 161/67 ! 481 ! 2997 ! 3031 !

Lagascea Cav.

Lagascea mollis Cav., in Anal. Cienc. Nat. 6 : 332, t. 44, 1803 ; FBI. 3 : 302 ; Gr. 96 ; D. & G., Suppl. 16 ; Clarke 131 ; C. 2 : 36.

The whole plant has a glaucous look, especially the leaves, floral heads and young stems. Flowers white.

Rare in Khandala ; in Blatt. Herb. there is but one specimen from the district ; it is a common plant further in the Deccan, or down in the Konkan plains along the main road.

Blatt. Herb. 27943 !

Xanthium Linn.

Xanthium strumarium Linn., Sp. Pl. 987, 1753 ; FBI. 3 : 303 ; Clarke 132 ; C. 2 : 37 ; G. 703.

X. indicum Koen. ex Roxb., Hort. Beng. 67, 1814 & Fl. Ind. 3 : 601, 1832 ; Gr. 101 ; D. & G. 127 ; Wight, Icon. t. 1104.

Rare in Khandala ; I have only found it on two occasions near the main road ; the plant is too scarce in the district for any use to be made of it medicinally or otherwise.

Flowers.—October 1944, February 1946.

Santapau 5362 ! 8639 !

Eclipta Linn.

Eclipta alba (Linn.) Hask., Pl. Jav. Rar. 528, 1848 ; FBI. 3 : 304 ; Clarke 134 ; Hoffmann 227, t. 115 E-H ; G. 705.

Verbesina alba Linn., Sp. Pl. 902, 1753.

Eclipta erecta Linn., Mant. 2 : 286, 1771 ; D. & G. 127 ; C. 2 : 38.

E. prostrata Linn., Mant. 2 : 286 , 1771 ; Gr. 99 ; D. & G. 127.

Very common, in almost every part of the district and under diverse conditions ; it thrives best, however, in moist ground. When crushed, the plant is strongly and not pleasantly scented.

Flowers.—Throughout the year.

Blatt. Herb. 20439 ! 20459 ! 21589 ! 27459 ! *Sedgwick* 2613 ! *Hallberg* in MS. catalogue ; *Santapau* 161/52, 58 ! 2477(1-2) ! 6822 ! 9252 !

WEDELIA Jacq.

Wedelia urticaefolia DC. in Wight, Contrib. 18, 1834; FBI. 3 : 306; Wight, Icon. t. 1106; C. 2 : 41; G. 707.

Wollastonia biflora D. & G., Bomb. Fl. 128, 1861 (excl. syn.; non DC.).

Verbesina biflora Wall., Cat. 3207 B, pro parte; Gr. 100.

This plant is included on the authority of Blatter and Hallborg, who mention it in their MS. catalogues; I have seen no specimens from Khandala.

Blatter & Hallberg in MS. catalogues.

BIDENS Linn.

Bidens biternata (Lour.) Merr. & Sherff, in Bot. Gaz. 88 : 293, 1929; Sherff, Gen. Bid. 389, 1937.

Coreopsis biternata Lour., Fl. Cochinch. 508, 1790.

Bidens Wallichii DC., Prodr. 5 : 598, 1836; Gr. 101; D. & G. 128.

B. pilosa auctor., non Linn.; C. 2 : 44; G. 709.

This is the plant that is commonly known to the writers of Indian floras as *Bidens pilosa* Linn. Sherff in his recent monograph on the genus *Bidens* has shown that the common Indian plant is not the Linnean plant.

Not common in Khandala; the leaves and floral heads appear very small in relation to the size of the plant, and for this reason *B. biternata* in the field always looks rather bare.

Flowers.—September to November.

Blatt. Herb. 28074 ! *Santapau* 2667 ! 5021 ! 5022 ! 5504 !

TRIDAX Linn.

Tridax procumbens Linn., Sp. Pl. 900, 1753; FBI. 3 : 311; Clarke 142; Hoffmann 246, t. 120 E; C. 2 : 45; G. 711.

Common in Khandala, especially along the railway line or the main road, and this shows the means by which this American plant has been introduced into the district.

Flowers.—Throughout the year.

Santapau 2609 ! 5378 !

ARTEMISIA Linn.

Artemisia parviflora Buch.-Ham. ex Roxb., Hort. Beng. 61, 1814 & Fl. Ind. 3 : 420, 1832; FBI. 3 : 322; D. & G. 314; Wight, Contrib. 20; Clarke 159; C. 2 : 47; G. 713.

A. glabrata DC. in Wight, Contrib. 20, 1834; Wight, Icon. t. 1111.

This is a very typical plant, with leaves which distinguish it at once from all the rest of the Compositae of Western India; it is quite common at Purandhar, but I have not found it in Khandala; I include it on the authority of Hallberg.

Hallberg in MS. catalogue.

Artemisia nilagirica (Clarke) Pamp. in Nuov. Giorn. Bot. Ital. 33 : 452, 1926.

A. vulgaris Linn. var. ***nilagirica*** Clarke, Comp. Ind. 162, 1876.

A. vulgaris auct., non Linn ; FBI. 3 : 325 ; Clarke 161 ; C. 2 : 47 ; G. 713.

A. indica Wight, Icon. t. 418 (non Willd.).

Perennial, about 1·5 m. high, at times up to 2 m.

A gregarious plant growing in dense clumps ; not common in Khandala. It is found at the outskirts of dense forest but growing by itself ; the best clumps of this plant in Khandala are at the edge of St. Xavier's Ravine just where the railway line crosses over Tata's Pipes and also at the other end of the same ravine just below Duke's Nose.

Pampanini, loc. cit., has demonstrated that none of the Indian species of *Artemisia* corresponds to the European *A. vulgaris* of the Linnean herbarium, and in this case the oldest valid name for the plant is that of Clarke, which is therefore raised to specific rank.

Flowers.—October to January.

Blatt. Herb. 20446 ! 20455 ! *Hallberg* in MS. catalogue ; *Santapau* 3778 ! 3779 ! 5930-5933 ! 8667 !

Gynura Cass.

Gynura angulosa DC., Prodr. 6 : 298, 1837 ; FBI. 3 : 334 ; Clarke 170 ; C. 2 : 49.

G. simplex D. & G., Bomb. Fl. 130, 1861.

Common all over the district, but nowhere abundant. The colour of the florets renders this plant unique among the Compositae of Khandala. Found on grassy slopes, especially towards the edges ; very rare in the ravines. An elegant plant.

Flowers.—September to November.

Blatt. Herb. 28017 ! 28342 ! *Santapau* 800 ! 1108 !

Emilia Cass.

Emilia sonchifolia (Linn.) DC. in Wight, Contrib. 24, 1834 ; & Prodr. 6 : 302 ; FBI. 3 : 336 ; Clarke 174 ; C. 2 : 49 ; G. 715 ; Garabedian in Kew Bull. 1924 : 141.

Cachalia sonchifolia Linn., Sp. Pl. 835, 1753 ; Gr. 98.

Heads similar to those of *Gynura*, but much smaller and without the free bracts below the involucre ; flowers reddish light purple to deep purple. The whole plant at times has a glaucous or bluish appearance.

Common and gregarious in shaded moist spots. It is particularly abundant under the shade of Tata's Pipes from Forbay to Campoli Power Station.

Flowers.—Throughout the year in shaded moist spots ; July to October everywhere in the district.

Blatt. Herb. 20381 ! 27401 ! *Sedgwick* 2566 ! *Santapau* 161/70 ! 412 ! 479 ! 1218 ! 2461-2463 ! 2519-2521 ! 2664 ! 3081 ! 3823 ! 3863 ! 4079 ! 4387 ! 4388 ! 9259 ! 9260 !

NOTONIA DC.

Notonia grandiflora DC. in Guill. Arch. Bot. 2 : 518, 1833 ; FBI. 3 : 337 ; D. & G. 132 ; Clarke 176 ; C. 2 : 50 ; G. 717.

N. corymbosa DC., Prodr. 6 : 442, 1837 ; Wight, Icon. t. 484.

N. balsamina D. in D. & G., Bomb. Fl. 133, 1861.

This plant is very common at Purandhar, where it attains large proportions ; but in Khandala it is rare, the only authority for its inclusion in this flora being Blatter, who mentions it in his MS. catalogue. There are no specimens in Blatt., Sedgw., or Acland herbaria from Khandala.

After examining the type of Dalzell's *N. balsamina* in Kew, I cannot see the difference between the pappus of *N. balsamina* and that of *N. grandiflora*.

Blatter in MS. catalogue.

SENECIO Linn.

Senecio tenuifolius Burm. f., Fl. Ind. 181, t. 60, f. 4, 1768 ; FBI. 3 : 345 ; C. 2 : 51 ; G. 722.

S. multifidus Willd., Sp. Pl. 3 : 1986, 1804 ; Clarke 198.

Doronicum tenuifolium Wight, Icon. t. 1129, 1846.

This plant has not been seen by me in Khandala ; there are no specimens from that district in any of the herbaria examined.

Blatter in MS. catalogue.

Senecio dalzellii Clarke, Comp. Ind. 201, 1876 ; FBI. 3 : 346 ; C. 2 : 52 ; G. 723.

S. Lawii Clarke, loc. cit. 201, 1876 ; FBI. 3 : 347.

This is a conspicuous plant ; it begins to appear towards the end of October and persists in places until the following rainy season. It is much less abundant that *S. Grahami*, from which it is easily distinguished by the structure of the leaves, by the flowering times, and by its pappus, which is hairy and not paleaceous. *S. Dalzellii* is nowhere abundant, but it occurs practically all over the district.

Flowers.—October to June.

Cooke ; *Blatt. Herb.* 20382 ! 20406 ! *Santapau* 141/36 ! 161/45 ! 1551 ! 3076 ! 3189 ! 3448 ! 3472 ! 4239 ! 5489 ! 5490 ! 5893 ! 8055 ! 8709 !

Senecio grahami Hook. f. in FBI. 3 : 347, 1881 ; C. 2 : 52.

S. reticulatus Clarke, Comp. Ind. 199, 1876 (non DC.).

Doronicum reticulatum Wight, in Calc. Journ. Nat. Hist. 7 : 156, 1847 ; Wight, Icon. t. 1151 B ; D. & G. 130.

This is one of the commonest and most abundant plants in the whole district ; during the second half of September and early October, most of Behran's Plateau is a mass of vivid yellow colour, and this is due to

the great abundance of this plant on the Plateau. At the end of the rains many of the old roofs in Khandala support a large population of *Senecios*; it occurs also on tree trunks, but this only happens where debris have accumulated at the forks. During the dry season it is occasionally seen in flower in moist spots.

Flowers.—September to November, occasionally throughout the dry season.

Woodrow; *Cooke*; *Gammie* 15371 ! *Blatt. Herb.* 20355 ! 20459 ! 21728 ! *Santapau* 161/31, 66 ! 666 ! 861 ! 1089 ! 1090 ! 2403 ! 4438 ! 6887 ! 6970 ! 8869 !

Tricholepis DC.

Tricholepis radicans DC., Prodr. 6 : 564, 1837; FBI. 3 : 380; D. & G. 131; Clarke 239; C. 2 : 56; G. 726.

There are no specimens from Khandala in Blatter Herbarium; this plant is included on the authority of Hallberg.

Hallberg in MS. catalogue.

Tricholepis glaberrima DC., Prodr. 6 : 754, 1837; FBI. 3 : 381; D. & G. 131; Clarke 240; Hoffmann 325, t. 128 D; C. 2 : 56; G. 722.

Serratula indica Willd.? Sp. Pl. 3 : 1642, 1804; Gr. 95.

Not as common as the following species, from which it can be distinguished by the smaller heads and leaves; in general it is a much smaller plant.

Flowers.—October to January.

Blatt. Herb. 20384 ! 50690 ! *Hallberg* in MS. catalogue; *Santapau* 161/33(1-2) ! 2856 ! 3464 ! 5263 ! 5809 ! 8062 !

Tricholepis amplexicaulis Clarke, Comp. Ind. 240, 1876; FBI. 3 : 381; C. 2 : 57; G. 727.

Erect, annual, 90-200 cms. high; stem up to 2·5 cms. diam. below, unbranched and more or less leafless in the lower part, corymbosely branched and leafy above; leaves sessile; lower leaves obovate to elliptic oblong, attenuated at the base; higher leaves elliptic oblong, up to 22×8·5 cms., acute, irregularly spinous-serrate, base dilated and auricled, half-amplexicaul, conspicuously punctate; highest leaves very narrow and long, broadest at the base.

Heads up to 4·5 cms. diam.; corollas light purple or pinkish purple; each head is furnished with several narrow, leafy bracts much longer than the floral head itself. Pappus 0 or of a few deciduous hairs; achenes very dark brown or black, smooth, with small apical mucro, large.

A very common plant in Khandala; in St. Xavier's Villa a clump of very stout plants has been growing near the house for several years. When the plant is covered with leaves and is in full bloom during the rainy

season, it is a fine sight ; but generally it looks rather bare especially when all the lower leaves have disappeared, in which condition it lasts for months.

Flowers.—October to December, occasionally to February.

Woodrow ; *Cooke* ; *Hallberg* in MS. catalogue ; *Blatt. Herb.* 28239 ! *Santapau* 1106 ! 1179 ! 1455 ! 2946 ! 2947 ! 5491 !

SONCHUS Linn.

Sonchus oleraceus Linn., Sp. Pl. 794, 1753 ; FBI. 3 : 414 ; Gr. 94 ; Clarke 275 ; Hoffmann 114, t. 71C ; C. 2 : 61.

S. ciliatus Lamk. : Wight, Icon. t. 1141.

Not common in Khandala ; only found near the main road and along the railway line.

Flowers.—October to April.

Blatt. Herb. 20433 ! *Santapau* 4067 ! 4068 ! 5075 !

Sonchus asper (Linn.) Hill, Brit. Herb. 1 : 47, t. 34, f. 2, 1769 ; FBI. 3 : 414 ; Clarke 275 ; C. 2 : 62.

Sonchus oleraceus asper Linn., Sp. Pl. 794, 1753.

Annual, erect herb ; stems with occasional glands all along, terete, coarsely striate. Radical leaves considerably attenuated at the base, then somewhat enlarged near the stem ; cauline leaves with large, rounded appressed auricles. Flowers pale yellow, all ligulate but ligules very small ; achenes much compressed, about one and a half times as long as they are broad, ribbed, but not transversely muriculate ; of the Indian species of *Sonchus*, this has the most typical achenes, on account of which this plant can easily be distinguished from all species of *Sonchus*, *Lactuca* and *Launaea*. Pappus abundant, white.

Rare in Khandala.

Blatt. Herb. 28292 !

LAUNAEA Cass.

Launaea nudicaulis Hook. f., in FBI. 3 : 416, 1881 ; C. 2 : 62.

L. obtusa Clarke, Comp. Ind. 261, 1876 (excl. plur. syn. ; non Benth.).

A prostrate or suberect annual herb ; flowering branches not rooting at the nodes. Radical leaves forming a rosette on the ground ; sessile or nearly so, attenuated at the base into a short petiole. Heads much narrower than in *Sonchus* and very similar to *Lactuca runcinata*, from which it can be distinguished by the absence of any beak on the achenes. Flowers very pale, whitish yellow, all ligulate. Inner achenes very strongly ribbed, sharply truncate at both ends.

Tolerably common in Khandala especially in Kune stream bed. The leaves are used locally in curries.

Local name : Pathari.

Flowers.—March.

Santapau 1711 ! 3923 !

CARTHAMUS Linn.

Carthamus tinctorius Linn., Sp. Pl. 830, 1753 ; FBI. 3 : 386 ; Gr. 95 ; D. & G., Suppl. 45 ; Clarke 244 ; Hoffmann 325, t. 148G. & 331, t. 150 ; C. 2 : 68.

Cultivated in several parts of the Deccan for the dye that is extracted from the flowers ; cultivation, however, seems to have been given up in Khandala, as I have not seen a single field of *Carthamus* from 1940 to 1949. Blatter in his MS. catalogue mentions having seen it in cultivation in the district.

Blatt. Herb. 28221 !

FLAVERIA Juss.

Flaveria repanda Lag., Gen. & Spec. Nov. 33, 1816 ; Hoffmann 258.

My only authority for the inclusion of this plant is Hallberg ; there are no specimens from Khandala in any of the herbaria consulted.

Hallberg in MS. catalogue.

GUIZOTIA Cass.

Guizotia abyssinica Cass. in Dict. Sc. Nat. 59 : 248, 1829 ; FBI. 3 : 308 ; C. 2 : 66.

G. oleifera DC., Prodr. 5 : 551, 1836 ; D. & G. 128 ; Clarke 139.

This plant is cultivated for the sake of the oil that is extracted from the seeds. It is an annual, erect herb, 0·5-1 m. high ; flowers bright yellow, outer florets ligulate, inner ones tubular.

A rare plant in the district ; I have only seen it in cultivated fields, on the one occasion mentioned.

Santapau 1204 ! In flower during October 1942.

HELIANTHUS Linn.

Helianthus annuus Linn., Sp. Pl. 904, 1753 ; Gr. 100 ; Hoffmann 88, t. 55 & 102 t. 63 A, & 104, t. 65 G, & 109, t. 67 A, & 230, t. 116 F ; C. 2 : 66.

A garden plant flowering profusely in Khandala ; generally it is the variety with the smaller capitula that is seen in Khandala gardens. This plant has not been seen outside gardens.

Flowers.—March to April.

Santapau March and April 1946 !

TITHONIA Desf.

Tithonia tagetiflora Desf., in Ann. Mus. Par. 1 : 49, t. 4, 1802; Woodrow, Gard. Ind. (ed. 5) 366 ; Hoffmann 230, t. 116 E ; C. 2 : 66.

An American plant that has become naturalized in Khandala. It grows to 2 m. in height and flowers profusely during most of the year. In Khandala there is a large clump along a ditch near the railway station ; there is a second larger clump along the path leading to Kune village on Kune Plateau. In both places it flowers and seeds abundantly particularly during the cold season of the year.

Flowers.—October to February.

Blatt. Herb. 50694 ! *Acland* 618 ! *Santapau* 5238 !

ACANTHESPERMUM Schrank.

Acanthospermum hispidum DC., Prodr. 5 : 522, 1836 ; G. 704 ; Santapau in JBNHS. 54 : 445.

For a full description of this plant, see Santapau, loc. cit.

This is a recent introduction in Khandala ; it was only found for the first time on Dec. 29, 1948, in waste land in one of the streets of the village. Florets are minute, pale yellow ; the plant is a stiff, erect herb, dichotomously branching. Previous to Khandala I had found it along the railway line at Karjat, and along the main road near Mumbra ; it seems to be spreading very rapidly, but in Bombay it seems to be still a rare plant.

Flowers and *Fruits*.—December 1948.

Santapau 9765-9767 !

LOBELIACEAE.

LOBELIA Linn.

Lobelia nicotianaefolia Heyne in Roth, Nov. Pl. Sp. 143, 1821 ; FBI. 3 : 327 ; Gr. 102 ; D. & G. 133 ; Wight, Icon. t. 135 ; C. 2 : 72 ; G. 736.

Stems stout, up to 5 cms. thick below, hollow, simple all through or simple below and profusely branched above ; generally up to 2 m. high, occasionally up to 4·5 m. high.

Abundant on Bhoma Hill, especially just above Forbay ; also common on slopes near railway line about 1 km. above Khandala station. It is a gregarious plant, and a fine sight when in leaf or in flower, especially when the stem is extensively branched. The sap is thick and yellowish, and is said to be strongly poisonous. The odour of the plant is rather unpleasant.

Flowers.—October to March. *Fruits*.—November to March.

Woodrow; *Blatt. Herb.* 21127 ! 21136 ! 21137 ! *Sedgwick* 2611 ! *Santapau* 159/1 ! 1419 ! 1420 ! 1564 ! 3383 ! 3384 ! 3385 !

Lobelia heyneana Roem. & Sch., Syst. 5 : 50, 1819 ; Wimmer in Ann. Nat. Mus. Wien 56 : 344.

L. trialata Buch.-Ham., in Don, Prodr. 157, 1825, et auct. plur.

I have only found this plant in Khandala on one occasion ; at Purandhar it is the commonest species of the genus. It is separated from *L. alsinoides* by its erect habit, larger and petiolate leaves, structure of anthers, 3 being naked, 2 penicillate, and the shape of the seeds.

Blatt. Herb. 21859 ! *Santapau* 2797 !

Lobelia alsinoides Lamk., Encycl. 3 : 588, 1791 ; Wimmer, loc. cit. 360.

L. trigona Roxb., Hort. Beng. 85, 1814 & Fl. Ind. 2 : 111, 1824 ; DC., Prodr. 7 : 359, 1839, excl. *L. Heyneana* ; FBI. 3 : 423 ; D. & G. 133 ; Wight, Icon. t. 1170 ; C. 2 : 72 ; G. 736.

A common weed in rice fields after the harvest ; common also in moist situations during the rest of the year.

Flowers and *fruits*.—September to March in moist places.

Blatt. Herb. 21859 ! 28393 ! *Santapau* 2769 ! 3092 ! 3446 ! 3616 ! 3852 ! 4826 ! 5057 ! 5136 ! 5385 ! 5405 ! 5466 ! 5823 ! 5824 ! 7420 ! 8123 !

CAMPANULACEAE.

Wahlenbergia Schrad.

Wahlenbergia gracillis Schrad., Blumenb. 38, in obs., 1827 ; DC., Monogr. Campanul. 142, 1830 ; FBI. 3 : 429 ; C. 2 : 74 ; G. 738.

W. agrestis DC., Prodr. 7 : 434 , 1839 ; Wight, Icon. t. 1175 ; D. & G. 134.

Campanula dehiscens Graham, Cat. Bomb. Pl. 103, 1839 (non Roxb., nec Wallich).

Fairly common along the stream bed near Kune Plateau, and on the old railway line near the village tank ; elsewhere in the district rare. After the disappearance of the radical leaves, the plant looks rather bare.

Flowers and *Fruits*.—December to May.

Kanitkar ; *Hallberg* ; *Blatt. Herb.* 21138 ! 21860 ! *Santapau* 3478 ! 3479 ! 3754 ! 3755 ! 3820 ! 3821 ! 3913 ! 4084 ! 4085 ! 4164 ! 4380 ! 5903-5905 ! 6001 ! 6044 ! 6071 ! 8637 ! 8841 !

PLUMBAGINACEAE.

Plumbago Linn.

Plumbago zeylanica Linn., Sp. Pl. 151, 1753 ; FBI. 3 : 480 ; Gr. 166 ; D. & G. 220 ; Wight, Ill. 179 ; Pax in Pfam. 4(1) : 120, t. 66E ; C. 2 : 78 ; G. 744.

A common plant about Khandala, growing mainly in the undergrowth of the forest or in forest clearings, or in open country.

Flowers.—October to March. *Fruits.*—December to March.

Cooke; *Blatter & Hallberg* in MS. catalogues; *Santapau* 128/1; 2531-2533 ! 2758 ! 2970 ! 3275 ! 3276 ! 5101 !

PRIMULACEAE.

Anagallis Linn.

Anagallis pumila Swartz, Prodr. Veg. Ind. Occid. 1 : 40, 1788; Pax & Knuth, in Pfreich. 22 : 331, t. 71, 1905; G. 747.

Centunculus pentandrus R. Br., Prodr. 427, 1810; FBI. 3 : 506.

C. tenellus Duby in DC., Prodr. 8 : 72, 1844; C. 2 : 80.

Micropyxis tenella Wight, Icon. t. 1585.

A fairly common herb, but difficult to spot on account of its small size. It grows abundantly in rice fields after the harvest, and the dry plants can be seen till before the rains.

Flowers.—September to October. *Fruits.*—October to December, very rarely to January.

Santapau 1034 ! 3419 ! 3420 ! 3470 ! 3471 ! 3547 ! 5052 ! 5176 ! 5365 ! 7419 ! 7444 ! 7458 ! 7459 !

MYRSINACEAE.

Embelia Burm.

Embelia tsjariam-cottam A. DC. in TLS. 17 : 131, 1834; Gr. 104; Wight, Icon. t. 1209; Mez in Pfreich. 9 : 319, t. 52, 1902; G. 753.

E. robusta Clarke in FBI. 3 : 515 (non Roxb.), 1882; C. 2 : 85.

E. Bassal Graham, Cat. Bomb. Pl. 104, 1839.

Very common especially from St. Xavier's Villa to the top of Bhoma Hill; the strong odour of the flowers seems to attract numerous flies at the time of flowering. Locally no use is made of the plant.

Local name : Yellangi; Yarengi; Waurung.

Flowers.—June to September. *Fruits.*—August to May.

Graham; *Blatt. Herb.* 28225 ! *Santapau* 126/3 ! 448 ! 461 ! 658 ! 766 ! 1171 ! 1278 ! 1472 ! 2852 ! 2853 ! 3389 ! 3390 ! 4409 ! 4410 ! 4468 ! 4528 ! 4697 ! 5486 ! 6806-6808 ! 9053 !

Maesa Forsk.

Maesa indica Wall. in Roxb., Fl. Ind. 2 : 230, in nota, 1824; FBI. 3 : 509; Gr. 105; D. & G. 136; Mez 29.

Baeobotrya indica Roxb., Hort. Beng. 16, 1814, & Fl. Ind. 1 : 557, 1832.

A shrub about 1-1·5 m. high; stem and branches woody; leaves serrate- or crenate-dentate, somewhat unequal-sided at the base. Flowers minute, white, 5-merous.

Recently this plant has been collected by me probably about the same spot where Arbuckle found it as reported in Graham's Catalogue. It is a place between Echo Point and Duke's Nose, at the top of the ravine path, about 1·5 kms. from Korinda village. At that spot the plant was fairly common.

Fruit.—April 1943.

Graham: "One or two plants grow at Corinda, near Kandalla. (Dr. Arbuckle)." *Blatter* in MS. catalogue; *Santapau* 1865-1867 ! 1872 ! 10601-10604 !

SAPOTACEAE.

Madhuca Ham.

Madhuca indica Gmel., Syst. Nat. 2 : 799, 1791; Merrill, in JAA. 29 : 190, 1948.

Bassia latifolia Roxb., Pl. Cor. 1 : 20, t. 19, 1795; FBI. 3 : 544; Gr. 107; D. & G. 139; C. 2 : 92.

Madhuca latifolia (Roxb.) Macbride, in Contrib. Gray. Herb. (N.S.) 3(53) : 17, 1918.

In ten years I have only found two trees in Khandala, in St. Xavier's Villa, where they were possibly planted; the tree is fairly common lower down on the Ghats. Sometime during 1948, both trees in Khandala were almost completely decorticated by Katkaris, who use the bark for the production of alcohol after fermentation; fortunately both trees seem to have survived.

Local name: Mawa.

Flowers.—April. *Fruits.*—May to June.

Woodrow; *Blatt. Herb.* 21883 ! *Santapau* 129/1 ! 1994 ! 3976 ! 8935 !

Mimusops Linn.

Mimusops elengi Linn., Sp. Pl. 349, 1753; FBI. 3 : 548; Gr. 106; D. & G. 140; Wight, Icon. t. 1586; C. 2 : 95.

Occasionally found about Khandala in ravines; there are several fine specimens in St. Xavier's Villa, probably planted. The fruit, when ripe, is edible but of poor quality; it is seldom collected except by local children.

Local name: Waoli.

Flowers.—February to July. *Fruits.*—The whole year.

Graham; *Blatter* in MS. catalogue; *Santapau* 129/6, 9 ! 1567 ! 1992 ! 4064 ! 4128 ! 4129 ! 8635 !

POUTERIA Aubl.

Pouteria tomentosa (Roxb.) Baehni, in Mem. Sap. 2 ; 368, 1942.

Sideroxylon tomentosum Roxb., Pl. Cor. 1 : 28, 1795 ; FBI. 3 : 538 Gr. 105 ; C. 2 : 90.

Sapota tomentosa DC. : D. & G. 139.

S. elongoides DC. : Wight, Icon. t. 1218.

A small tree with about the hardest wood in the district. Generally unarmed. Flowers " dirty " white, not conspicuous ; fruit exuding milky juice when bruised before maturity ; persistent for a long time on the tree even after the appearance of the flowers of the following season.

No use is made of the wood locally except for fuel, the tree being too small for any other useful purpose. The fruit is not eaten even by monkeys, and therefore is left to rot on the tree. Very common all over the district especially in the ravines and their slopes. Often it is parasitised by one or more species of the family *Loranthaceae*.

Local name : Katkumbar, Kumbar.

Flowers.—November to May. *Fruits*.—Most of the year.

Cooke ; Hallberg in MS. catalogue ; *Blatt. Herb.* 21204 ! 21208 ! 24270 (2) ! 24271 (2) ! 28046 ! *Santapau* 149/7, 8 ! 1208 !

EBENACEAE.

DIOSPYROS Linn.

Diospyros montana Roxb., Pl. Cor. 1 : 37, t. 48, 1795 ; FBI 3 : 555, *pro parte* ; Gr. 107 ; D. & G. 142 ; Wight, Icon. t. 1215 ; C. 2 : 105.

D. Goindu Dalz. in Kew Journ. Bot. 49 : 111, 1852 ; D. & C. 142.

Common all over the district. Graham remarks that the tree " flowers in March and April, when Bees resort in great numbers to the bloesomo, which seem to possess peculiar favour with them "; this I have also observed, but it is only the male tree that is so favoured by bees.

Local name : Goindu.

Flowers.—March to April. *Fruits*.—April to December.

Graham ; Blatt. Herb. 27596 ! *Santapau* 130/2, 4 ! 746 ! 1693 ! 1693 ! 3533 ! 4042 ! 4043 ! 6091 ! 6098-6100 !

Diospyros sylvatica Roxb., Pl. Cor. 1 : 37, t. 47, 1795 ! FBI 559 ; Hiern, Monogr. Eben. 161 ; C. 2 : 100.

A sombre tree with dark green leaves ; not as common as the preceding species.

Local name : Goindu.

Fruits.—October 1942, April 1943.

Santapau 1206 ! 1877 !

Diospyros candolleana Wight, Icon. t. 1221, 1848; FBI. 3 : 566 ; D. & G. 142 ; C. 2 : 100.

A very rare tree in the district ; I have not seen any specimen from Khandala either alive or in any of the herbaria consulted. The type sheets in Wight's Herb., at present in Kew Herb., show this to be a very characteristic plant, mainly on account of the globose clusters of male flowers in the axils of the leaves at the ends of the branches.

Blatter in MS. catalogue.

SYMPLOCACEAE.

Symplocos Jacq.

Symplocos laurina (Retz.) Wall., Cat. 4416, 1830 ; Rehd. & Wills. in Sargent, Pl. Wills. 2 : 594, 1916 ; Merrill, in Trans. Am. Phil. Soc. (N.S.) 24 : 305, 1925.

Myrtus laurina Retz., Obs. 4 : 26, 1786.

Symplocos spicata Roxb., Hort. Beng. 40, 1814 & Fl. Ind. 2 : 541, 1832 ; FBI. 3 : 573 ; Wight, Ill. t. 150 ; C. 2 : 108.

The occurrence of this plant is given on the authority of Blatter. who mentions it in his MS. catalogue. In the Blatt. Herb. there are no specimens from Khandala. As regards nomenclature I have followed Merrill, although Wallich did not definitely base his name on that of Retz. ; for further details on the subject, see Merrill, loc. cit.

Blatter, in MS. catalogue.

OLEACEAE.

Jasminum Linn.

Jasminum malabaricum Wight, Icon. t. 1250, 1850 ; FBI. 3 : 594 ; C. 2 : 111 ; Santapau in JBNHS. 46 : 563.

J. latifolium Graham, Cat. 110, 1839 (non Roxb.) ; D. & G. 138.

A very common plant all over the district ; very conspicuous when in flower on account of the large numbers of flowers ; the plant, however, cannot be said to be beautiful, as it has a rather wild look.

Local names : Mogra, Ran Mogra.

Flowers.—February to May, occasionally to June. *Fruits.*—April to September.

Blatt. Herb. 21276 ! *Santapau* 133/7 ! 503 ! 1687 ! 3617 ! 3717 ! 5806 ! 5807 ! 6078 ! 6915 ! 8789 ! 8790 !

Jasminum pubescens (Retz.) Willd., Sp. Pl. 1 : 37, 1797 ; FBI. 3 : 592 ; Gr. 110 ; D. & G. 138 ; C. 2 : 112.

J. hirsutum Willd., loc. cit. 36, 1797 ; Wight, Icon. t. 702 ; Smith, Ex. Bot. t. 118 ; Bot. Mag. t. 1991.

Nyctanthes pubescens Retz., Obs. 5 : 9, 1789.

During December 1949 and 1950 a large specimen of this plant was observed on the station platform ; the plant flowered the two winters during which it has been kept under observation.

Flowers.—December 1949, December 1950, January and February 1951.

Santapau, cultivated !

NYCTANTHES Linn.

Nyctanthes arbor-tristis Linn., Sp. Pl. 6, 1753 ; FBI. 3 : 603 ; Gr. 111 ; D. & G. Suppl. 51 ; C. 2 : 115.

Occasionally planted in gardens.

Hallberg in MS. catalogue.

LINOCIERA Swartz.

Linociera malabarica Wall., Cat. 2828, 1831, nom. nud. ; Don, Syst. 4 : 53, 1838 ; FBI. 3 : 607 ; Gr. 109 ; D. & G. 159 ; Wight, Icon. t. 1246 ; C. 2 : 117.

A small tree. Leaves pale green, coriaceous, with a very distinct midnerve. Flowers pure white, the " odour of ripe apples " occasionally very strong ; peduncles fascicled in the axils of present or past leaves. Calyx reddish or greyish, pubescent. Corolla at first pure white, turning yellowish with age ; petals cohering in pairs but only at the base. Anthers sessile or nearly so ; ovary velvety, stigma bifid, sessile. Fruit very similar to that of *Olea dioica*, but slightly smaller ; black when ripe, and persistent on the parent tree for a fairly long time.

When the tree is in full bloom, it is a fine sight, as the flowers are massed together towards the ends of the branches, and the tree is practically covered with them. The odour of ripe apples seems to be very fugacious, for it is only on one occasion that I noticed it, although I did search for it for several years. This tree is widely spread over the district, but it is nowhere abundant.

Local name : Kumli, Parjamb.

Flowers.—October to January. *Fruits.*—November to June.

Graham ; D. & G. ; Blatt. Herb. 18771 ! 27602 ! *Santapau* 133/11! 437 ! 538 ! 1167 ! 1496 ! 1497 ! 3058-3060 ! 3871 ! 5450 ! 5458 ! 6067 ! 4068 !

OLEA Linn.

Olea dioica Roxb., Hort. Beng. 3, 1814 & Fl. Ind. 1 : 106, 1832 ; FBI. 3 : 612 ; Gr. 109 ; D. & G. 159 ; Wight, Ill. 151 ; C. 2 : 118 ; G. 796.

Drupe up to 16×13 mm.; the fleshy epicarp is intensely bitter to taste. The fruits seem to be eaten by some animals, the stones passing indigested. By the middle of the rainy season many seeds germinate on the ground below the parent trees ; large numbers of seedlings may be seen in such conditions.

A fine evergreen tree, often planted as a shade tree. It is attacked by numerous parasites : *Cystopsora Oleae* Butler causes much damage in Khandala ; several plants of the *Loranthaceae* are also found on *Olea*. A very common tree in the whole district.

Local name : Parjamb.

Flowers.—November to January. *Fruits.*—January to May.

Woodrow ; Chibber ; Blatter and *Hallberg* in MS. catalogues ; *Blatt. Herb.* 19096 ! 19116 ! 21271 ! *Santapau* 133/5, 9, 10 ! 1437 ! 1441 ! 1539-1541 ! 1565 ! 1837 ! 1953 ! 2119 (2) ! 2208 ! 3190 ! 3632 ! 4294 ! 4295 ! 4723 ! 5849 ! 5850 ! 8784 ! 8785 ! 9062 !

APOCYNACEAE.

CARISSA Linn.

Carissa congesta Wight, Icon. 1289, 1848 ; Haines in Ind. For. 45 : 385, 1919 ; G. 803.

C. Carandas Graham, Cat. 116, 1839 ; D. & G. 143 ; FBI. 3 : 630 (pro parte) ; C. 2 : 124 (non Linn.).

All the specimens in Kew Herb. mentioned by Cooke in his Flora as *Carissa Carandas*, have been corrected by O. Stapf as *C. congesta*. These two species seem to have been confused by most of the authors of Indian Floras. The basic differences between these two species are the following : in *C. Carandas* Linn. the leaves are elliptic or elliptic oblong and rounded at both ends, the number of seeds being normally 8 ; in *C. congesta* Wt. the leaves are broadly ovate, subacute or obtuse, occasionally slightly emarginate at the apex, and acute, cuneate or subtruncate, or occasionally rounded at the base, the number of seeds being normally 4.

A very variable plant. Leaves 3-8×2-7 cms. Spines simple above, compound below, 2-6 cms. long, straight or curved ; all the spines are supported by a sort of a minute bract, which is repeated for every branch spine in the case of compound spines ; the angle between two spines of a pair varies between 110 and 180 degrees.

Fruit very variable, 8-25 mm. long, spherical or ellipsoid, sweet to taste ; there seem to be two forms of plants depending on the size of the fruit : the smaller fruits when over-ripe improve in sweetness, the

larger fruits deteriorate very considerably when old, their taste then being that of fermenting sugar. The colour of the fruit is at first green, then purple, at length deep purple or black.

A large shrub, erect, suberect or scandent; occasionally climbing over high trees in the forest. It is one of the commonest plants in Khandala; in open country it is erect or suberect; in dense forest it becomes a climber or the branches may be seen trailing along the ground.

The fruit is collected and sold in the bazaars; it has a pleasant taste and is mildly laxative. Good jam is made of the fruit.

Local name : Karvanda.

Flowers.—December to March. *Fruits.*—March to June.

Woodrow ; Kanitkar ; Cooke ; Santapau 136/2 ! 1667 ! 4050-4052 ; 4185 ! 4186 ! 4213 ! 4263 ! 4264 ! 4695 !

Carissa congesta Wight, var. **albida** Santapau in Kew Bull. 1948 ; 490, 1949.

The main differences between this variety and the typical plant can be summarized thus : (1) This variety is an erect shrub or small tree ; I have not seen any specimen with scandent or subscandent habit. (2) The flowers and fruits come considerably later than those of the typical plant. (3) The colour of the fruits is at first green, at length very pale greenish yellow or creamy white, the pulp of the fruit being of the same colour. In shape the fruit is almost spherical, often 20×19 mm., seeds usually four, occasionally only three develop, but the remains of the fourth seed are clearly visible. (4) In taste, this fruit is considerably sweeter than that of the common variety.

This new variety is not common ; so far I have only seen three specimens in the whole district ; the Katkaris sell the white carvanda fruits in the railway station, and charge higher prices for the better size and quality of these fruits.

Local name : Safed Karvanda.

Flowers.—February to April. *Fruits.*—May to June.

Santapau 4401 ! 4402 ! 4407 ! 4408 ! 8890 ! 8984 ! 8985 !

Rauwolfia Linn.

Rauwolfia densiflora (Wall.) Benth. ex Hook. f., FBI. 3 ; 633, 1882 ; O. 2 : 127 ; G. 808.

Tabernaemontana densiflora Wall. in Edw. Bot. Reg. 15 ; t. 1273, 1829.

Ophioxylon zeylanicum Wight, Icon. t. 1292, 1848.

An erect shrub, 1·5-3 m. high ; stem and branches distinctly marked with abundant lenticels ; sap milky white, thick. Leaves with numerous nerves, conspicuous beneath, coming out almost at right angles to the midrib and opposite or alternate with each other, meeting in an intramarginal nerve ; petioles often obscure on account of the

decurrent blade. Branches with a ring of minute, finger-like, purplish glands going round the branch at the node, the ring just passing inside the axil of the leaf; these glands are only visible on young branches.

Flowers not seen in Khandala. Fruit a drupe, single or paired, at first reddish, then purplish, at maturity purplish black.

A rare plant in the district; there are some good specimens at the edges of dense forest near Forbay. The arrangement of the leaves in whorls of 3 or 4 seems to be very characteristic.

Fruits.—June to October.

Blatter in MS. catalogue; *Santapau* 136/14 ! 2084-2086 ! 2466 ! 2669 ! 4471 ! 13381-13386 !

Rauwolfia serpentina (Linn.) Benth. ex Kurz, For. Fl. Burm. 2 : 171, 1877; FBI. 3 : 632; C. 2 : 127.

Ophioxylon serpentinum Linn., Sp. Pl. 1043, 1753; Gr. 116; D. & G. 143, Wight, Icon. t. 849.

A small shrub, 30-50 cms. high, with white flowers and scarlet peduncles; the fruits are also scarlet.

During the monsoon of 1950 several specimens were collected on Monkey Hill Plateau; they were growing more or less in the open, or under the shade of trees, but not in dense jungle. The plant is reputed of high medicinal value in the district.

Blatt. Herb. 28588 ! *Santapau* 11138-11141 !

LOCHNERA Reichb.

Lochnera rosea (Linn.) Reichb. in Consp. Reg. Veg. 134, 1828; C. 2 : 129; G. 809.

Vinca rosea Linn., Syst. (ed. 10) 944, 1759; FBI. 3 : 640.

Catharanthus roseus G. Don, Syst. 4 : 95, 1837; Gr. 115; D. & G. Suppl. 53.

A garden plant, very often cultivated in Khandala, especially in St. Xavier's Villa and Convalescent Home. Flowers are rose coloured or pure white, but the colours are not mixed on the same plant. I have observed these plants in flower almost throughout the year for several years.

Santapau, passim !

ALSTONIA R. Br.

Alstonia scholaris (Linn.) R. Br. in Mem. Wern. Soc. 1 : 76, 1811; FBI. 3 : 642; Gr. 115; Wight, Icon. t. 422; D. & G. 145; C. 2 : 132; G. 810.

Echites scholaris Linn., Mant. 1 : 53, 1767.

As Graham remarks, the local inhabitants are in fear of this tree, hence the local name; the milky white sap of the tree is said to be very

poisonous. No local use is made of any part of the tree. Common all over Khandala ; an elegant tree on account of its regular branches and whorls of leaves.

Local name : Shaitan.

Flowers.—December to February. *Fruits.*—January to June.

Santapau 136/3, 4, 17 ! 656 ! 1657 ! 1991 ! 2185 ! 3356 ! 8646 ! 8649 !

HOLARRHENA R. Br.

Holarrhena antidysenterica (Linn.) Wall., Cat. 1672, 1829 ; G. Don, Syst. 4 : 78, 1837 ; FBI. 3 : 644 ; D. & G. 145 ; C. 2 : 133 ; G. 811.

Nerium antidysentericum Linn., Sp. Pl. 209, 1753.

Echites antidysenterica Roxb. : Gr. 249.

Holarrhena Codaga G. Don : Wight, Icon. t. 1297.

A very common shrub all over Khandala ; the largest specimen measured 5 m. in height. The scent of the flowers is almost unnoticeable after April-May.

Local name : Kuda, Kala Kuda.

Blatt. Herb. 21297 ! *Hallberg* in MS. catalogue ; *Santapau* 136/7, 12 ! 454 ! 908 ! 2186 ! 4331 ! 4961 ! 6916 ! 8827 ! 8950 ! 8986 ! 9026 ! 8184 !

TABERNAEMONTANA Linn.

Tabernaemontana divaricata (Linn.) R. Br. in R. & S., Syst. 4 : 427, 1819 ; Merrill in Contr. Arn. Arb. 8 : 140, 1934.

Nerium divaricatum Linn., Sp. Pl. 209, 1753 (quoad syn. Fl. Zeyl. excl. syn. Hermann).

N. coronarium Jacq., Coll. 1 : 138, 1786 ; Bot. Mag. t. 1865.

Tabernaemontana coronaria Willd., Enum. Hort. Berol. 275, 1809 ; FBI. 3 : 646 ; Gr. 115 ; D. & G. 144 ; Wight, Icon. t. 477.

Ervatamia coronaria Stapf, in This.-Dyer, Fl. Trop. Afr. 4 : 127, 1902 ; C. 2 : 134 ; G. 813.

A shrub about 1-1·5 m. high. Leaves appearing either shortly before or at about the same time as the flowers ; petioles often obscure on account of the decurrent blade of the leaf. Flowers at first creamy white, later pure white with a small yellow spot in the centre, strongly and sweetly scented, more so in the evening or early morning. Corolla up to 4·5 cms. diam. Fruits not seen in Khandala.

There is but one clump of several plants growing together near the old railway line below Elphinstone Point. A garden escape. Cultivated in St. Xavier's Villa.

Flowers.—During the dry season.

Santapau 2120 ! 3278 ! 8791 ! 9100 !

WRIGHTIA R. Br.

Wrightia tinctoria R. Br., in Mem. Wern. Soc. 1 : 47, 1811 ; FBI. 3 : 653 ; Gr. 114 ; D. & G. 145 ; Wight, Icon. 5. 444 ; C. 2 : 137 ; G. 815.

Common in Khandala, especially from Thakurwadi up to Behran's Plateau. Flowers appear generally when the tree is leafless and they are very abundant ; fruits persist even when the young fruits of the following season have appeared ; the large bunches of pendulous fruits are very noticeable during the cold and dry seasons.

This tree is easely confused with *Holarrhena ;* locally both plants bear the same name. The presence of exserted anthers and of the corona clearly separate this tree from *Holarrhena.* No use is made of this tree locally except for firewood.

Local names : Dhudkar, Kala Kuda.

Flowers.—March to June. *Fruits.*—April to December.

Cooke ; Blatt. Herb. 21337 ! 21340 ! 27606 ! *Santapau* 536 ! 1913 ! 1914 ! 2142 ! 3963 ! 4072 ! 4301 ! 4302 ! 4666 !

BEAUMONTIA Wall.

Beaumontia grandiflora (Roxb.) Wall., Tent. Fl. Nepal. t. 7, 1824 ; FBI. 3 : 660 ; Gr. 113 ; D. & G. Suppl. 52 ; C. 2 : 139.

Echites grandiflora Roxb., Hort. Beng. 20, 1814 ; Fl. Ind. 2 : 14, 1832 (excl. fruct.).

There was only one specimen in the whole district, just behind Khandala Hotel ; unfortunately the tree supporting it died and was cut down for firewood, and with the support *Beaumontia* was also cut. Thus perished one of the finest plants in Khandala.

Flowers.—December to March.

Santapau 1633 ! 1634 ! 1635 !

On 27 December 1949 the plant was observed to have survived in its former habitat ; at that date it seemed to be thriving, but was only in leaf.

CHONEMORPHA G. Don.

Chonemorpha fragrans (Moon) Alston in Ann. Perad. 11 : 203, 1929.

Echites fragrass Moon, Cat. 20, 1821.

E. macrophylla Roxb., Hort. Beng. 20, nom. nud., 1814 ; Fl. Ind. 2 : 13, 1832 (non H.B.K., 1819).

Chonemorpha macrophylla G. Don, Gen. Syst. 4 : 76, 1837 ; FBI. 3 · 661 ; Gr. 113 ; D. & G. 146 ; Wight, Icon. t. 432 ; C. 2 : 139.

A very large and beautiful climber, going over high trees in dense forest ; the sap is milky white and thick. Both in flower and merely in leaf, this is a very showy plant. It does not seem to produce much

fruit in proportion to the large number of flowers. Common below Elphinstone Point; there is a another large specimen below Duke's Nose, about half way between the village path and the bottom of the ravine.

Flowers.—September 1942. *Fruits.*—November 1942, 1945.

Santapau 810 ! 1332 ! 8090 ! 12874-12879 !

Anodendron DC.

Anodendron paniculatum DC., Prodr. 8 : 444, 1844; FBI. 3 : 668; D. & G. 147; C. 2 : 141.

Echites paniculata Roxb., Fl. Ind. 2 : 17, 1832; Wight, Icon. t. 396 (non Poir.).

Gymnema nepaulense Graham, Cat. 120, 1839 (non Wight).

This is one of the commonest plants about Khandala. When it grows near a support, it climbs very high; in the open, it is an erect or suberect shrub with very long branches. All parts of the plant possess abundant latex. At dehiscence, seeds with their comas are very often seen floating in the air.

Locally the branches are used as ready-made ropes for grass or firewood bundles; young branches are flexible and very fibrous.

Local name : Kauli.

Flowers.—January to May. *Fruits.*—The whole year.

Graham; Thurston; Blatter and *Hallberg* in MS. catalogues; *Sedgwick* 7772 ! *Santapau* 136/6, 19 ! 566 ! 1126 ! 1646 ! 1647 ! 1945 ! 1958 ! 2090 ! 3611 ! 3612 ! 5805 ! 8615 ! 8989 ! 14044 !

Plumeria Linn.

Plumeria acuminata Ait., Hort. Kew. (ed. 2) 2 : 70, 1811; Gr. 119; G. 821; Merrill, Enum. 3 : 321.

P. acutifolia Poir., Encycl. Meth., Suppl. 2 : 667, 1811; FBI. 3 : 641; D. & G., Suppl. 52; C. 2 : 142; Blatt. in JBNHS 34 : 271 & Beaut. Ind. Tr. 83, 1937.

Cultivated in gardens; there is a good specimen on Monkey Hill Plateau in fairly dense forest away from any habitation.

Local name : Champa.

Flowers.—December to June. *Fruits.*—Not seen in Khandala.

Santapau 9025 !

NERIUM Linn.

Nerium indicum Mill., Gard. Dict. (ed. 8) no. 2, 1786 ; Merrill, Enum. 3 : 336, 1923.

N. odorum Ait., Hort. Kew. 1 : 297, 1789 ; FBI. 3 : 655 ; Gr. 114 ; C. 2 : 143 ; G. 821.

A garden plant often seen in Khandala gardens. There is a good specimen in St. Xavier's Villa, which I have kept under observation for a number of years ; it seems to flower and fruit regularly.

Merrill, loc. cit., writes " A native of tropical or subtropical Asia now pantropic ; not satisfactorily distinguished from the oleander, *Nerium oleander* Linn.".

Santapau, passim in gardens.

ALLAMANDA Linn.

Allamanda cathartica Linn., Mant. 2 : 214, 1771 ; C. 2 : 144; Bor & Raizada, in JBNHS. 45 : 270, f. 3.

A. Aubletii Pohl, Pl. Bras. 1 : 75, 1827 ; Gr. 116 ; D. & G. Suppl. 53.

A shrub about 1·5 m. high, erect or suberect, growing on old walls in St. Xavier's Villa garden. Flowers bright yellow. Fruit not seen in Khandala. The leaves are in whorls of 4, occasionally towards the end of the branches they are opposite, subopposite or even alternate.

Flowers.—October to January.

Hallberg in MS. catalogue ; *Santapau* 5264 ! 8091 ! 8092 !

ASCLEPIADACEAE.

HEMIDESMUS R. Br.

Hemidesmus indicus (Linn.) Br. in Mem. Wern. Soc. 1 : 57, 1811 ; FBI. 4 : 5 ; C. 2 : 147 ; G. 825 ; Blatt. & McCann, Revis., in JBNHS. 36 : 524, 1922.

Periploca indica Linn., Sp. Pl. 211, 1753.

Prostrate, semierect or climbing shrub, one of the most variable plants in the district. Stems purplish or vinaceous. Leaves up to 11·4 cms. long, varying in width from 6 to 51 mm., dark green above, whitish beneath, often with white veins above, especially when the plant grows in open fields.

A very common plant about Khandala, in flower practically throughout the year. The leaves are sometimes chewed as " Pan Sopari" and are said to be very refreshing. In general the narrow-leaved forms grow in open country and are the ones preferred for chewing ; the broader leaved forms are the commoner during the cold season.

Local names : Dudurli, Pan Sopari.

Flowers.—Throughout the year. *Fruits.*—Only seen on 21st April 1943 and 3rd September 1949.

Blatt. Herb. 21408 ! 27635 ! 28048 ! 28463 ! *Santapau* 137/32, 46 ! 778 ! 1180 ! 1231 ! 1924 ! 2978 ! 3051 ! 4963 !

CRYPTOLEPIS R. Br.

Cryptolepis buchanani Roem. & Sch., Syst. 4 : 409, 1819 ; FBI. 4 : 5 ; Gr. 113 ; D. & G. 148 ; Wight, Icon. t. 194 ; C. 2 : 147 ; G. 826 ; Blatt. & McC. 524.

Fairly common in the district, and easily confused with *Anodendron* when in leaf or flower ; the fruit of either plant is, however, very typical. The stems and branches are used as ready-made ropes for grass or firewood bundles. The excorticating bark is typical of this plant, and on this character alone *Cryptolepis* may be identified.

Flowers.—April to June. *Fruits.*—September to January.

Blatt. Herb. 28012 ! 28215 ! 28305 ! *Blatter* in Revis., loc. cit. ; *Santapau* 137/7 ! 273 ! 524 ! 1099 ! 1350 ! 1469 ! 1927 ! 2056 ! 2576 ! 2577 ! 3101 ! 4300 ! 5222 ! 8920 ! 9155 !

CALOTROPIS R. Br.

Calotropis gigantea (Linn.) R. Br. in Ait., Hort. Kew. (ed. 2) 2 : 78, 1811 ; FBI. 4 : 17 ; Gr. 120 ; D. & G. 149 ; Wight, Ill. t. 155, 156A ; C. 2 : 151 ; G. 832 ; Blatt. & McC. 526.

Asclepias gigantea Linn., Sp. Pl. 214, 1753.

In open country, this shrub is about 1-1·5 m. high ; below St. Xavier's it attains a height of 4 m. with a stem 15 cms. in diam.

The whole plant is intensely "milky" ; any bruise produces abundant latex that soon solidifies and seals the bruise. Locally the latex is used for sterilising and sealing of wounds on men and cattle, and seems to be very effective in preventing wound infection.

Common in waste places ; it is also common along the sides of stream beds. Often these plants are covered with aphids.

Local name : Ak.

Flowers.—The whole year. *Fruits.*—January to June.

Blatt. & McC., in Revis. ; *Hallberg* in MS. catalogue ; *Blatt. Herb.* 21995 ! *Santapau* 1996 ! 2096 ! 3597 ! 3970 ! 5856 !

HOLOSTEMA R. Br.

Holostemma annularis (Roxb.) K. Schum. in Pfam. 4 (2) : 250, & 247, t. 71 J-K, 1895 ; G. 834 ; Blatt. & McC. 529.

Asclepias annularia Roxb., Hort. Beng. 20, 1814 & Fl. Ind. 2 : 37, 1832.

Holostemma Rheedei Wall., Cat. 4469, 1828; FBI. 4: 21; Gr. 121; D. & G. 148; Wight, Icon. t. 597.

H. Rheedianum C. 2: 156, 1904 (non Spreng.).

The whole plant contains abundant latex, which when drying yields an elastic residue. Rare in Khandala. The flowers are eaten by local people and this may account for the relative scarcity of the plant in the district.

Flowers.—5th July 1942. *Fruits.*—19th October 1943.

Santapau 579 ! 2988 ! 2989 ! 2990 !

CYNANCHUM Linn.

Cynanchum callialata Ham. in Wight, Contr. 56, 1834; FBI. 4: 24; Wight, Icon. t. 1279; C. 2: 157; G. 836; Blatt. & McC. 529.

Fairly common at the elevation of Khandala, rare below; the colour of the corona and the shape of the fruit is distinctive among the Asclepiads of the district.

Flowers.—September to December. *Fruits.*—October to May.

Cooke; Blatt. Herb. 27917 ! *Santapau* 1227 ! 1238 ! 1292 ! 1986 ! 2544 ! 2836 ! 2911 ! 3015 ! 3488 ! 3601 ! 4983 ! 5844 !

GYMNEMA R. Br.

Gymnema sylvestre (Retz.) R. Br., in Mem. Wern. Soc. 1: 33, 1811; FBI. 4: 29; Gr. 120; D. & G. 151; Wight, Icon. t. 349; C. 2: 160.

Periploca sylvestris Retz., Obs. 2: 15, 1781.

Generally a woody climber, but in Khandala seldom going over 6 m. in height; if it meets no support, it may grow as a prostrate, trailing shrub.

Abundant about St. Xavier's Villa and on the slopes of Echo Point. When in leaf it is an elegant plant. Chewing the leaves of this plant has the effect of destroying all taste for sweet things, and this effect may last for nearly half a day; the plant is reputed a good remedy against diabetes.

Flowers.—April to June. *Fruits.*—October to March.

Santapau 137/30, 40 ! 1222 ! 1445 ! 1988-1990 ! 2064 ! 3515 ! 3967 ! 3968 ! 4216-4218 ! 4466 ! 6777 ! 8674 ! 8873 ! 8874 ! 9049 !

Gymnema khandalense Santapau in Kew Bull. 1948: 486, Jan. 1949.

A powerful climber going over the tops of high trees in dense forest; stem in the lower part 12 cms. diam., and marked with wing-like ridges of cork; young branches yellowish green, densely pubescent, terete, older ones lenticellate. Stem and branches with plenty of latex.

Leaves up to 15×11 cms., broadly ovate, acute or acuminate ; young ones densely pubescent above, rufous pubescent beneath, at length glabrous or nearly so above except for the nerves, pubescent or rufous pubescent beneath especially on the nerves ; margins entire ; base rounded, truncate, or subacute ; petioles up to 4 cms. long, densely pubescent.

Flowers in pedunculate cymes ; peduncles shorter than the petioles, up to 12 mm. long, pubescent, interpetiolar but arising near the petiole ; pedicels up to 8 mm. long, densely pubescent, supported by minute, pubescent bracts. In general the flower is remarkably like that of *G. sylvestre.*

Calyx densely pubescent, divided nearly to the base ; lobes 1-1·5 mm., orbicular, obtuse, ciliolate, shorter than the corolla tube. Corolla yellow, 4·5-5 mm. diam. ; tube 1·5 mm. long, about equalling the lobes. Lobes thick, deltoid, acute, recurved, pubescent on both sides, more densely so on the inner side, margins ciliolate ; corona of 5 processes inserted on the corolla tube and alternate with its lobes, the ridges of the corona not protruding beyond the mouth of the corolla. The lower adnate portion of the corona decurrent, channelled and with ciliolate margins. Staminal column arising from the base of the corolla tube, anther tips obtuse ; pollen masses erect, oblong, subsessile on the pollen carriers; style apex exserted beyond the anther tips, conical, bifid.

Follicles 8-9 cms. long, 5 mm. diam., gradually tapering to the apex, which is often recurved or beaked ; young follicles densely pubescent, yellowish green ; older ones brown, pubescent, straight or slightly falcately curved. Seeds about 12 in number, 10-12 mm. long, 3-4 mm. broad (including a 0·5 mm. broad wing), flat. Comma silky, white or reddish white, up to 4 cms. long.

The type of this new species (Santapau 5434) was collected in flower in Khandala on the slopes below Duke's Nose, at an altit. of about 550 m., on the 1st November 1944 ; and in fruit (Santapau 5795) in the same place on the 20th January 1945.

Tylophora R. Br.

Tylophora fasciculata Ham. in Wight, Contr. 50, 1834 ; FBI. 4 : 40 ; D. & G. 151 ; Wight, Icon. t. 848 ; C. 2 : 162 ; G. 842 ; Blatt. & McC. 530.

There is a large rootstock or rhizome-like underground structure giving off a number of aerial shoots at one end and more numerous fibrous roots at the other ; this rootstock is perennial or at least biennial, for new shoots have been observed towards the end of the dry season coming out from a rootstock which was still supporting one or more of the previous season's dry aerial shoots.

Abundant on Behran's Plateau, especially along the south spur by the path leading to the Plateau ; abundant also on the plateau itself in

patches. Elsewhere I have only seen it on one occasion on the slopes of St. Xavier's Ravine. The erect habit of this plant makes it a conspicuous plant among the Asclepiads of Khandala.

Flowers.—June to September. *Fruits.*—September to December.

Blatt. Herb. 28250 ! 29596 ! *Santapau* 137/14 ! 744 ! 1029 ! 1189 ! 2212 ! 2231 ! 2433 ! 2800-2804 ! 3452 ! 4601 ! 4602 ! 4745 ! 4746 ! 5060 ! 5061 ! 9013 ! 9124 ! 9125 !

Tylophora dalzellii Hook. f. in FBI. 4 : 43, 1883 ; C. 2 : 163 ; Blatt. & McC. 531.

T. carnosa Dalz. & Gibs., Bomb. Fl. 150, 1861 (non Wight).

A very common plant all over the district, and flowering most of the year ; it is not easy to distinguish from *T. indica* Merr., except by the shape of the membranous appendage above the anthers, which in the present species is rounded, whilst in *T. indica* it is rounded with a free, more or less subulate structure above.

Flowers.—More or less throughout the year. *Fruits.*—September to January.

Blatt. Herb. 21355 ! *Santapau* 137/27, 25, 33 ! 561 ! 833 ! 1223 ! 1229 ! 2061 ! 2280 ! 2837 ! 3603 ! 4225 ! 6958 ! 8727 ! 9051 ! 9134 !

Tylophora indica (Burm.) Merr. in Phil. Journ. Sci. 19 : 373, 1921.

Cynanchum indicum Burm. f. Fl. Ind. 70, 1768.

Asclepias asthmatica Linn. f., Suppl. 171, 1781.

Tylophora asthmatica Wight & Arn., in Wight, Contr. 51, 1834 ; FBI. 4 : 44 ; D. & G. 150 ; Wight, Icon. t. 1277 ; C. 2 : 164 ; G. 843.

Blatter in his MS. catalogue states that this plant is " fairly common in Khandala ". For nearly ten years I have searched for it in vain ; it is possible that Blatter mistook *T. dalzellii* for the other species, for dissection of numerous specimens from Khandala has failed to show the distinctive appendiculate corona which is the typical character of *T. indica*. This plant is, therefore, included here only on Blatter's authority.

Blatter in MS. catalogue.

Marsdenia R. Br.

Marsdenia volubilis (Linn. f.) Cooke, in Fl. Pres. Bomb. 2 : 166, 1904 ; G. 846 ; Blatt. & McC. 531.

Asclepias volubilis Linn. f., Suppl. 170, 1781.

Dregea volubilis Benth. ex Hook. f., FBI. 4 : 46, 1883 ; Merrill, Enum. 3 : 354.

Hoya viridiflora R. Br., in Mem. Wern. Soc. 1 : 27, 1811 ; Gr. 119 ; D. & G. 153.

There is only one group of such plants observed near St. Xavier's Villa ; these plants possess abundant latex, which is watery or colourless. On June 14th, 1946, I collected a branch in bud ; on dipping the branch in a saturated solution of mercuric chloride in alcohol, most of the buds opened fully at once.

Local name : Shendri, Gharphul.

Flowers.—April to June. *Fruits.*—August to October.

Santapau 137/6 ! 523 ! 2062 ! 2063 ! 2991 ! 3972 ! 4682 ! 9154 !

COSMOSTIGMA Wight.

Cosmostigma racemosum Wight, Contr. 42, 1834 ; FBI. 4 : 46 ; Gr. 119 ; D. & G. 151 ; Wight, Icon. t. 591 ; C. 2 : 167.

Only one specimen has been seen in the district. It is a large climber, particularly attractive when in leaf. The fruit is the largest among the Asclepiads of Khandala.

Flowers.—August 1944. *Fruits.*—December to March.

Santapau 1476 ! 1487 ! 1491 ! 1754 ! 2646 ! 2647 ! 3847 ! 4622-4625 ! 12838-12841 ! 12848 !

HOYA R. Br.

Hoya wightii Hook. f. in FBI. 4 : 59, 1883 ; C. 2 : 169 ; Blatt. & McC. 532.

H. pendula Wight & Arn., in Wight, Contr. 36 (excl. syn. ; non Wight, Icon. t. 575).

H. pallida Dalz. & Gibs., Bomb. Fl. 152, 1861.

H. parasitica Graham, Cat. 119, 1839, (non Wall.).

In habit this plant shows considerable vatiation ; on June 16, 1944, I found a number of young seedlings each with one or two leaves growing on the bark of several trees, and the seedlings had no connection with the ground. In August, 1944, another large plant had numerous adventitious roots from most of the upper nodes, especially those near the ends of the branches. On several occasions I have noticed plants in the ravines growing on rocks. This plant, then, may be considered as a geophyte that on occasions may also live as an epiphyte ; is it also a parasite ?

Very abundant on trees on Behran's Plateau and Bhoma Hill ; also abundant on rocks in Echo Point Ravine. When in full bloom, there is no finer plant in Khandala. Plants growing on rocks often have their leaves infected with *Phyllosticta Hoyae* Died.

Flowers.—June to August. *Fruits.*—August to November.

McCann, ex Blatt. & McC., Revis. ; *Santapau* 137/15, 23, 31, 34 ! 499 ! 578 ! 636 ! 926 ! 1284 ! 1438 ! 1537 ! 1538 ! 2153 ! 2154 ! 2245 ! 2248 ! 2595 ! 2813 ! 4116 ! 4479 ! 4513 ! 4882 ! 9007 ! 9171-9173 !

CEROPEGIA Linn.

Ceropegia attenuata Hook., Icon. Pl. 9 : t. 867, 1852 ; FBI. 4 : 67 ; D. &.G. 154 ; C. 2 : 174 ; McCann, in JBNHS. 45 : 211.

C. angustifolia Dalz. in Kew Journ. Bot. 2 : 259, 1850, & in D. & G. 154 (non Wight).

An erect herb, 15-72·5 cms. high ; root tuberous, spherical or somewhat flattened, up to 47 × 25 mm. ; stems generally one, occasionally two, very rarely three from the same tuber, simple or very exceptionally branched. Leaves up to 10 cms. long, 5-10 mm. broad, tapering at both ends ; the smallest leaves are near the base, the largest about the middle of the stem.

Peduncles up to 18 mm. long, one-flowered, with a small bract in the lower halfor third. Calyx green, sepals hirsute along the middle of the back. Corolla up to 7·7 cms. long, straight or occasionally slightly curved ; tube up to 4 cms. long, 6 mm. diam. near the base, 2·6 mm. in the middle, greenish ; lobes up to 3·7 cms. long, purplish in upper, greenish in lower half, more or less pubescent on both sides ; the inside of the tube is striated with purple striae, glabrous, the lower inflated part dark purple. Outer corona lobes purple, subclavate. Pollinia yellow. Follicles single or paired(when paired, they diverge but slightly), straight, up to 7·5 cms. long, 3-4·5 mm. diam., tapering to a fine point.

A gregarious plant, relatively common in patches on rocky ground among grasses ; this plant is particularly abundant on Behran's Plateau. It is a pretty plant, easy to spot among grasses on account of the habit of its leaves which are opposite and decussate and rather close together.

Local name : Tilori.

Flowers.—July to October. *Fruits.*—September to October.

Santapau 137/16 ! 850 ! 2258 ! 2430 ! 2431 ! 2432 ! 2502 ! 2573 ! 2599 ! 2636 ! 2795 ! 4605 ! 4730 ! 4833 ! 6928 !

Ceropegia lawii Hook. f. in FBI. 4 : 67, 1883 ; C. 2 : 175 ; McCann 211.

C. panchganiensis Blatt. & McC., in JBNHS 36 : 534, 1933.

This is a very rare plant in Khandala ; in the company of Mr. C. McCann and alone I have carefully searched for it for a number of years without success ; this plant is common on Purandhar Hill.

Flowers.—July 1919.

Woodrow ; *Blatt. Herb.* 27398 ! 27424 !

Ceropegia oculata Hook., Bot. Mag. t. 4093, 1844 ; FBI. 4 : 72 ; C. 2 : 177 ; McCann 211.

C. ophiocephala Dalz. in Kew Journ. Bot. 2 : 259, 1850 ; D. & G. 154.

Root tuberous, up to 48 × 25 mm., compressed perpendicularly to the axis. Stem herbaceous, branched, twining, up to 4·62 m. long ; petioles up to 4·9 cms. long, with a few dark glands at the point of insertion into the leaf.

Flowers up to 9 in a cyme ; peduncles clothed with many-jointed, spreading, hyaline hairs ; pedicels glabrous. Calyx divided to the base or nearly so ; sepals green, subulate ; calyx as well as corolla hairy with spreading hairs when young, at length glabrous. Corolla up to 7·25 cms. long, base of the tube green for 6-8 mm., higher up purple, the depth of colour increasing from below upwards ; segments of the corolla with recurved margins and united tips, greenish yellow in colour with purple spots on the lower third, the rest green ; the inside of the tube is yellowish green with purple longitudinal striae ; the lower part of the tube is inflated, up to 7·8 mm. diam., the widest part of the corolla being near the base of the free segments and reaching 11 mm. Outer corona lobes shortly bifid, the teeth acute or subacute. Follicles not seen in Khandala.

Rare in Khandala. Conspicuous on account of the dark colour of the whole plant. The tubers are eaten by local people.

Flowers.—July to October. *Fruits.*—Not seen.

Blatt. Herb. 28203 ! *Santapau* 2264 ! 2265 ! 4828-4833 ! 4942-4948 !

Ceropegia hirsuta Wight & Arn., in Wight, Contr. 30, 1834 ; FBI. 4 : 71 ; C. 2 : 177 ; McCann 211.

C. Jacquemontiana Dalz. & Gibs., Bomb. Fl. 153, 1861 (non Decne.).

C. hispida Blatt. & McC. in JBNHS. 35 : 409, 1931.

The following notes were written by Blatter in the presence of a fresh specimen from Khandala : " Flowers cymose, about 5 flowers, peduncles 6 mm. long, with spreading hairs ; pedicels 5 mm. long, lanceolate, almost subulate, glabrous, purplish. Corolla 2 cms. long, lower part depressed globose, greenish, upper part of tube beneath the lobes 1 cm. cream tinged with purple with the veins distinct, enlarged near the mouth, lobes about half the length of the tube (tips connate), fiddle-shaped (i.e. folded on back a little above the middle), cream, margins of lobes and about the upper third of lobes purplish. Inside lower part purplish, the purple veins running up to the lobes, the upper part light green. Outer corona 10-toothed, purple. Inner corona lobes white, slender, erect, hooked at the tip."

The specimen in Blatt. Herb. 28422 consists of but a few scraps including several complete leaves and two fruits. Judging from the leaves alone, this specimen seems to belong to *C. intermedia* Wight, the hairiness of the whole specimen being almost negligible as compared with that of *C. hirsuta* Wt. & Arn. ; the leaves and fruit match those of the type of *C. intermedia* in Kew Herb. Mr. C. McCann, whilst writing his hitherto unpublished monograph on the Indian Ceropegias has examined the present specimen and pronounced it to be *C. hirsuta* Wt.

Hallberg 28422 in Blatt. Herb.!

Ceropegia evansii McCann in JBNHS. 45 : 209, 1945.

Ceropegia Graham. Cat. 117. 1839.

Climbing or twining herb, up to 2·74 m. long or a little longer ; root tuberous, spherical or compressed, up to 6 cms. diam., 2 cms. thick. Internodes very long, thin, striate, somewhat twisted. Leaves thin, green above, paler beneath, glabrous on either side, ovate, margins ciliate, entire or subcrenate, base acute or subacute ; the lower leaves up to 20·5×15 cms., becoming smaller upwards.

Flowers in many- to few-flowered umbellate cymes ; peduncle hispid when young, at length hispid or glabrous, green or purplish, up to 4·5 cms. long, usually interpetiolar ; pedicels up to 1 cm. long, slender, more or less hispid ; bracts up to 6 mm. long, subulate, from a somewhat broad base, more or less hairy.

Calyx tube very short, almost 0 ; lobes subulate, glabrous, green. Corolla variable in colour ; usually purple or greenish purple below, gradually becoming paler upwards, lobes yellow or pale yellow, the margins of the lobes occasionally tinged with red ; the inside of the tube purple with a yellow circle at the base of the expanded tube ; the tube, itself is glabrous, the lobes pubescent on the inside, the whole corolla glabrous on the outside. Outer corona lobes deeply bifid, deltoid, the margins ciliolate with short hairs directed towards the central axis. Pollinia yellowish, caudicle tinged with red in its upper quarter. Follicles divaricate, up to 15·5 cms. long and 5 mm. thick, gradually tapering at both ends, glabrous, straight or slightly falcately curved. Seeds up to 8×3 mm., compressed, brown ; coma up to 20 mm. long, white or very slightly brownish, shining.

This is the commonest of the Ceropegias in Khandala. It is abundant on the lower slopes below Duke's Nose, twining on *Carvia callosa* Bremek. (=*Strobilanthus callosus* Nees). Locally the tuberous roots are eaten.

Flowers.—July to September. *Fruits.*—August to October.

McCann 4647 (type) ! 4644 ! 4645 ! 4646 ! 4648 ! 4649 ! 4650 ! *Santapau* 137/24 ! 137/21, 22 (cotypes) ! 637 ! 821 ! 830 ! 919-922 (cotypes) ! 4553-4559 ! 4582 ! 6803-6805 ! 6879 ! 6908 ! 6909 ! 6922-6927 ! 7438 ! 9201-9203 !

ASCLEPIAS Linn.

Asclepias curassavica Linn., Sp. Pl. 215, 1753 ; FBI. 4 : 18 ; Gr. 120 ; D. & G., Suppl. 54 ; C. 2 : 180.

Common along the stream from Forbay to Soldiers' Cricket Field ; common also along the stream beds in ravines. It is in flower most of the year.

Flowers.—Dry months of the year, occasionally during the rains.

Fruits.—Dry months of the year.

Santapau 137/3 ! 466 ! 1154 ! 1839 ! 3204 ! 8756 ! 8757 !

LOGANIACEAE.

MITREOLA Linn.

Mitreola petiolata (Walt.) Torr. & Gray, Fl. N. Amer. 2 : 45, 1846 ; Solereder in Pfam. 4 (2) : 34, f. 18 G-H ; Merrill, Enum. 3 : 311, 1923.

Ophiorhiza Mitreola Linn., Sp. Pl. 150, 1753.

Anonymos petiolata Walt., Fl. Carol. 108, 1788.

Mitreola oldenlandioides Wall., Cat. 4350, 1831 ; DC., Prodr. 9 : 9, 1845 ; FBI. 4 : 79 ; D. & G. 155 ; Hook., Icon. t. 827 ; C. 2 : 181.

A very rare plant in Khandala ; I have only found it on the occasion mentioned below ; it was growing under the shade of *Carvia callosa* Bremek., and was in fruit. All the fruits from Khandala are of the straight variety, i.e. var. *orthocarpa* Hochreut. Blatter and Hallberg do not mention this plant in their MS. catalogues.

Fruits.—November 1944.

Santapau 5444 !

STRYCHNOS Linn.

Strychnos colubrina Linn., Sp. Pl. 189, 1753, descr. emend. A. Hill in Kew Bull. 1917 : 121-210 ; FBI. 4 : 87 ; C. 2 : 184 (excl. syn. *S. bicirrhosa* Leach et var. *zeylanica*) ; D. & G. 155 dubie (syn. et cit. excl.).

S. bicirrhosa Graham, Cat. 112, 1839 (non Leach).

A fine climber going over the tops of trees, with long pendulous branches ; the shape and texture of the leaves and the circinnate tendrils are very typical. Common in St. Xavier's Ravine ; not seen at the altit. of Khandala or above. Locally no use is made of any part of the plant.

Flowers.—October 1943. *Fruits.*—December to June.

Graham ; Blatter in MS. catalogue. *Santapau* 1533! 2870-2873 ! 3227-3229 ! 3578 ! 3869 ! 3870 ! 4130 ! 8857 ! 8858 !

GENTIANACEAE.

EXACUM Linn.

Exacum bicolor Roxb., Hort. Beng. 83, 1814 & El. Ind. 1 : 413, 1820 ; FBI. 4 : 96 ; Gr. 123 ; D. & G. 156 ; Grisebach in DC. Prodr. 9 : 45 ; Wight, Icon. t. 1321 ; C. 2 : 187 ; G. k73.

Sebaea carinata Graham, Cat. 124, 1839 (non Spreng.).

The root is perennial, or at least biennial : on several occasions I have found fresh leaves coming out from a rootstock still bearing the previous season's inflorescence or remains of it. Stem about 60 cms.

high, occasionally reaching 110 cms.; root fairly thick, somewhat tuberous or enlarged; stems sharply quadrangular, at times winged down to the root, generally unbranched. Leaves acute above, subacute or obtuse lower down, 3-7-nerved, glabrous, shining green; main veins parallel. The largest leaves are those about the middle of the stem.

Flowers very showy, in dense terminal cymes; on September 2nd 1949 I counted 28 open flowers with at least as many buds on a large plant. Calyx green. Corolla up to 6·5 cms. diam.; at first pure white, then white with purple tips, at a later stage the whole petal is pale lilac, and finally it turns dirty white; fresh petals have "Amethyst Violet" (Ridg. 61) tips. Anthers "Primuline Yellow" (Ridg. 19'), up to 16 mm. long, curved; filaments short, greenish yellow; style filiform, stigma minute, globose; both style and stigma yellowish.

Very abundant on the western slopes of Monkey Hill among grasses. A very elegant and attractive plant.

On March 24th, 1949, I found a very large number of small plants on Monkey Hill; the ground was totally bare of vegetation except for this plant, a few specimens were collected in flower at the time.

Flowers.—August to October, exceptionally in March 1949.

Fruits.—August to October.

Graham; Blatt. Herb. 27638 ! 27954 ! 28563 ! *Santapau* 135/3, 5 ! 917 ! 939 ! 2427-2429 ! 2960 ! 2961 ! 5077-5082 ! 7395-7397 ! 9238 ! 9974 ! 10059 ! 10185 ! 10241-10243 !

Exacum pumilum Griseb. in DC., Prodr. 9 : 46, 1845; FBI. 4 : 68; Wight, Icon. t. 1324; D. & G. 157; C. 2 : 188.

Herbaceous, erect, up to 26 cms. high; stem at the beginning of the season simple, from October onwards extensively branched, four-angled, occasionally winged. Leaves up to 25×6 mm., those about the middle of the stem the largest. Flowers of varying shades of blue-purple, usually "Rosslyn Blue" to "Dark Violet" (Ridg. 57 to 59k), sometimes pure white; pedicels slender, up to 25 mm. long. Calyx wings about 1 mm. broad; corolla up to 22 mm. diam.; anthers bright yellow; capsules about 5 mm. diam., subglobose.

One of the commonest and brightest of the herbs growing in grass fields. Locally this plant is used against malaria and other fevers.

Flowers.—August to November. *Fruits.*—October to November.

Blatt. Herb. 21460 ! 28069 ! 28070 ! 28075 ! *Santapau* 135/4, 7 ! 723 ! 765 ! 860 ! 1010 ! 2415 ! 2465 ! 2511 ! 2748 ! 4738 ! 4889 ! 4958 ! 5017 ! 5018 ! 7398 ! 7454 ! 9339 ! 10225 !

Exacum petiolare Griseb. in DC., Prodr. 9 : 46, 1845; FBI. 4 : 96; Wight, Icon. t. 1324; D. & G. 157; G. 874.

E. pedunculatum var. *petiolare* Trim., Hand. Fl. Ceyl. 3 : 182, 1893; C. 2 : 188.

Fairly widespread in the district, but nowhere abundant; on earth banks in shaded spots. When fresh, the whole plant is somewhat succulent and pale green in colour; on wilting, the leaves become very difficult to handle on account of their thinness.

Flowers.—September to October. *Fruits.*—October to January.

Blatt. Herb. 28188 ! *Sedgwick* 7475 ! *Santapau* 1052 ! 2767 ! 2845 ! 2860 ! 2861 ! 2967 ! 4968 ! 5016 ! 5160 ! 5406 ! 7403 ! 7460 !

Exacum lawii Clarke, in FBI. 4 : 98, 1883 ; C. 2 : 189 ; G. 874.

An erect annual herb, reaching 24 cms. high, but generally much smaller ; stems simple at the beginning of the rainy season, somewhat, though not extensively, branched at the later part of the rains. Leaves sessile, up 10 mm. long and nearly as broad, subobtuse.

Pedicels up to 45 mm. long. Calyx 4-partite, the nerves very prominent. Corolla up to 15 mm. diam., but generally much smaller, " Spectrum Voilet " to " Dark Voilet " (Ridg. 59 *a-k*), occasionally pure white ; capsule 2-celled, globose to subglobose ; style about as long as the capsule.

A very slender herb often found associated with *Drosera indica* Linn. and *Burmannia pusilla* Thw. among grasses. The habit of the inflorescence is quite different from that of *E. sessile*, which it otherwise much resembles.

Flowers.—September to November. *Fruits.*—October to November.

Santapau 964 ! 1011 ! 1012 ! 2661 ! 2816 ! 5033 !

CENTAURIUM Hill.

Centaurium roxburghii (Don) Druce in Rep. Bot. Exoq. Club Brit. Isl. 4 : 614, 1916.

Erythraea roxburghii D. Don, Syst. 4 : 206, 1837 ; FBI. 4 : 102 ; Wight, Icon. t. 1325 ; D. & G. 157 ; C. 2 : 190 ; G. 876.

Common and very abundant in rice fields after the hasvest from November to the end of May ; common also on the old railway line near the village tank. One of the prettiest plants in Khandala ; it is often found associated with *Anagallis pumila* Swartz and *Wahlenbergia gracilis* Schrad.

Flowers.—October to May. *Fruits.*—January to May.

Blatt. Herb. 21476 ! 28190 ! *Hallberg* in MS. catalogue ; *Santapau* 3089 ! 3425-3427 ! 3469 ! 3756 ! 3757 ! 3914 ! 3915 ! 4163 ! 4371 ! 5877 ! 5916 ! 8764 !

CANSCORA Lamk.

Canscora diffusa R. Br., Prodr. 451, in Obserze., 1810 ; FBI. 4 : 103 ; Gr. 123 ; D. & G. 158 ; C. 2 : 191 ; G. 878.

C. Lawii Wight, Icon. t. 1327, 1848 (non Clarke).

Plants growing under moist conditions show very large leaves at the base and middle of the stem ; such leaves soon fall off, and this may be the reason why in herbaria one very seldom sees them ; all the specimens in Kew Herbarium have only small leaves, and this shows that the specimens have been collected during the dry season.

Common in Khandala, in shaded spots.

Flowers.—October to June, occasionally also during the rains.
Fruits.—About the same time, and often together with flowers.

Blatt. Herb. 18659 ! 18663 ! 21528 ! 27591 ! 28023 ! 28289 ! 28444 ! *Hallberg* in MS. catalogue ; *Santapau* 135/1 ! 757A ! 1313 ! 3069 ! 3113 ! 4378 ! 5484 ! 6069 ! 8765 !

Canscora decurrens Dalz. in Kew Journ. Bot. 2 : 136, 1850 ; FBI. 4 : 103 ; D. & G. 157 ; C. 2 : 192 ; G. 878.

The wings of the stem are very clear when the stem is green and the wings fresh ; at a later stage, they become rather obscure. Leaves sessile or very shortly petiolate. Flowers rosy purple or very occasionally white.

A common herb in rice fields after the harvest and during the winter season ; it grows together with the preceding species, from which it is at once distinguished by the winged stem and the more restricted branching.

Flowers.—September to January. *Fruits.*—November to January.

Santapau 2757 ! 3482 ! 5463 ! 5826 ! 5917 ! 8095 !

Canscora pauciflora Dalz. in Kew Journ. Bot. 2 : 136, 1850 ; C. 2 : 192 ; G. 878.

Both in the field and in the herbarium, I have always found this plant very difficult of identification ; it is very closely allied to, if not identicalwith , *C. decurrens* Dalz. Examination of the type specimen in Kew Herb. has, if anything, increased my difficulties.

Flowers seem to be in dichotomous cymes ; pedicels more or less clearly winged, up to 3 cms. long, somewhat thickened at the apex just under the flower. Calyx strongly nerved but not keeled ; corolla paler in colour than *C. diffusa.*

Seems to be fairly common in Khandala in rice fields during the winter and early part of the hot seasons ; it grows in the same fields as and together with all the other species of *Canscora* of Khandala.

Flowers and *Fruits.*—October to November.
Blatt. Herb. 27537 ! 28187 ! *Santapau* 5418 ! 5464 ! 7446 !

Canscora khandalensis Santapau in Kew Bull. 1948 : 485, 1949.

The following is the translation of the specific characters of this plant : " Similar to *C. pauciflora* and *C. decurrens*, from both of which it dsffers moinly by its larger flowers and capsules and by its sepals which are strongly keeled ; it differs also in the flowering time, which in this

new species is much earlier than in the other species of *Canscora*. It seems to be an intermediate species between Sect. I and Sect. II of Clarke's Gentianaceae in Fl. Brit. Ind.

" An erect herb, slender, 10-25 cms. high ; stem 4-winged or very strongly and acutely quadrangular ; branches opposite or alternate. Leaves sessile or subsessile, those about the middle of the stem the largest, up to 6×2·5 cms., ovate, elliptic or lanceolate, subacute or obtuse, attenuated towards the base, decurrent into an obscure petiole ; upper leaves much smaller, acute or subacute, sessile. Flowers in dichotomous cymes ; pedicels quadrangular, obscurely winged, 1·5-10 mm. long ; bracts minute, ovate, acute. Calyx not winged, but sharply quadrangular, 4-keeled, 9-10 mm. long ; teeth 1·5 mm. long, triangular, acute. Corolla pale rose in colour, 10-13 mm. long ; tube 6-7 mm. long, lobes obtuse. Ovary oblong ; stigma 2-lobed, the lobes obtuse, recurved ; style 4-4·5mm. long. Capsule 7×3 mm.

The type, Santapau 5015, was collected in Khandala on October 2nd, 1944 and is kept in Blatter Herb., Bombay ; paratypes, 2663, 2756, 2779, 5044, 4045, 5073, 5423 are kept in Blatter Herb. ; other paratypes 2880 and 1969 are kept, the former in Kew Herb., the latter in Arnold Arbor., U.S.A."

Swertia Linn.

Swertia minor (Griseb.) Knobl. in Bot. Centralbl. 60 : 321, 1894 ; C. 2 : 193 ; G. 880.

Ophelia minor Griseb. in DC., Prodr. 9 : 126, 1845 ; Wight, Icon. t. 1332 ; D. & G. 156 ; Clarke in JLS. 14 : 446.

Pleurogyne minor Clarke in Hook. f., FBI. 4 : 120, 1883.

Common in grass fields ; the flowers open only when the light is fairly strong ; they close for the night, and in cloudy days they may fail to open altogether. This plant locally is used as a substitute for Chiretta in the treatment of malaria and other fevers ; it seems to give satisfactory results.

Local name : Chirata.

Flowers.—July to October. *Fruits.*—August to October.

Bhiva ex Cooke ; *Blatt. Herb.* 21196 ! *Santapau* 135/2, 6 ! 631 ! 724 ! 763 ! 2238 ! 2414 ! 4612 ! 4683 ! 4729 ! 6875 ! 6906 ! 9244 !

Limnanthemum Gmel.

Limnanthemum indicum (Linn.) Griseb., emend. Thw., Enum. Pl. Zeyl. 205, 1860 ; FBI. 4 : 131 ; C. 2 : 195 ; G. 883.

Menyanthes indica Linn., Sp. Pl. 145, 1753.

Villarsia indica Vent. : Gr. 123, 1839.

O. Kuntze in Rev. Gen. Pl. 429, 1891, gives *Nymphodes* in place of *Limnanthemum* ; Merrill and Perry in JAA. 30 : 45, 1949 list two species under *Nymphoides*, thereby indicating that they accept the publication

of the generic name in Hill's British Herbal, 1766, as valid ; on the other hand, Hill did not consistently employ the Linnean system of binary nomenclature in his book, and in consequence names therein published must be considered illegitimate in accordance with Art. 68 (4) of the Rules.

Abundant in deep water in the village tank ; roots, stems and petioles are used as a vegetable in Khandala.

Flowers and *Fruits*.—October to March.

Santapau 1143 ! 3026 ! 3028 ! 7474 !

Limnanthemum cristatum (Roxb.) Griseb., Gen. & Spec. Gent. 342, 1839 ; FBI. 4 : 131 ; D. & G. 158 ; Wight, Ill. t. 157 bis, f. 4 ; C. 2 : 195.

Menyanthes cristata Roxb., Pl. Cor. 2 : 3, t. 105, 1798.

Villarsia cristata Spreng., Syst. 1 : 582, 1825 ; Gr. 123.

Generally a much smaller plant than the preceding species, growing in shallow water towards the edges of the tank. Leaves up to 15 cms. diam., in structure and colour like those of the other species.

Flowers much smaller, white, erect above the surface of the water or of the muddy soil at the edges of the tank. Seeds few, 6-10, considerably larger and much more strongly muriculate than in the other species, straw-coloured and dull when dry.

Locally this plant is not collected, and this is on account of its shorter stems and branches ; it is fairly abundant over the whole surface of the village tank at Khandala, but it is more abundant at the edges ; under such circumstances it is often damaged by birds or animals.

Flowers and *Fruits*.—Hot season before the rains.

Cooke ; Blatter in MS. catalogue ; *Blatt. Herb.* 21436 ! 27445 ! *Santapau*, passim !

HYDROPHYLLACEAE.

Hydrolea Linn.

Hydrolea zeylanica (Linn.) Vahl, Symb. Bot. 2 : 46, 1791 ; FBI. 4 : 133 ; Wight, Icon. t. 601 ; Brand, in Pfreich. 59 : 174-175 ; C 2 : 197 ; G. 884.

Nama zeylanica Linn., Sp. Pl. 226, 1753.

A gregarious annual herb, suberect, decumbent and often rooting at the nodes all along the stem or branches ; when the plant grows in moist soil, the stem is succulent ; when growing elsewhere, the stem is thinner, tougher and somewhat hairy.

A common plant in rice fields after the harvest, along the margins of tanks, in ditches and other moist situations. It is a fine plant, but the odour of stagnant water seems to permeate the whole plant.

Flowers and *Fruits*.—October to May.

Blatt. Herb. 21555 ! 28006 ! 28535 ! *Santapau* 318 ! 319 ! 1135 ! 3091 ! 3492 ! 3856 ! 5503 ! 8629 !

BORAGINACEAE.

CORDIA Linn.

Cordia dichotoma Forst. f., Prodr. 18, 1786; Merrill, Enum. 3 : 373.

C. obliqua Willd., Phytogr. 4, t. 4, 1794; FBI. 4 : 137 excl. vars.; G. 887; Hutchinson in Kew Bull. 1918 : 217.

C. latifolia Roxb., Fl. Ind. 2 : 330, 1824; Gr. 136; D. & G. 173.

C. myxa auct. plur.; C. 2 : 199; Wight, Ill. t. 169 (non Linn.).

Not common in Khandala, but found both in open country and in dense forest. The unripe fruit is pickled; the ripe fruit is eaten and has a sweet flavour, but is very mucilaginous. Both monkeys and birds seem to be attracted by the young fruits and in consequence such fruits are seldom found on trees.

Local name : Bhókar.

Flowers.—March to May. *Fruits.*—April to June.

Blatt. Herb. 21599 ! 21667 ! 21668 ! 21683 ! 28469 ! *Santapau* 182 (2) ! 1/26, 29 ! 432 ! 1658 ! 1742 ! 3991 ! 4230 ! 4231 ! 4232 !

COLDENIA Linn.

Coldenia procumbens Linn., Sp. Pl. 125, 1753; FBI. 4 : 144; Gr. 135; D. & G. 171; C. 2 : 205.

A procumbent herb; branches radially spreading up to 25 cms. long; stems, branches and leaves greyish or ashy green, very hairy. Flowers white, inconspicuous. Fruit brown when ripe, usually hidden by the surrounding leaves.

Common on the dry sides of the village tank during the hot season; common also in rice fields after the harvest.

Flowers.—May 1942, June 1946. *Fruits.*—March 1944, April 1946, May 1944.

Blatt. Herb. 19514 ! 19515 ! 23633 ! 21635 ! *Santapau* 482 ! 3768 ! 4157 ! 8750 !

ROTULA Lour.

Rotula aquatica Lour., Fl. Coch. 121, 1790; Robinson in Phil. Journ. Sci. 4 : 693; Merrill, Enum. 3 : 376; G. 893.

Rhabdia lycioides Mart., Nov. Gen. & Spec. 2 : 137, 1826; FBI. 4 : 145; C. 2 : 205.

R. viminea Dalz. in Hook. Icon. t. 823; D. & G. 170.

Ehretia cuneata Wight, Icon. t. 1385, 1848.

Fairly common in the stream bed in Kune Plateau and along St. Mary's Ravine ; not seen elsewhere in the district.

Local name : Sherni.

Flowers.—September to November. *Fruits.*—October to December.

Blatt. Herb. 25221 ! 28474 ! 28640 ! 28103 ! 28104 ! 29559 ! *Santapau* 141/16 ! 1168 ! 2807 !

HELIOTROPIUM Linn.

Heliotropium indicum Linn., Sp. Pl. 130, 1753 ; FBI. 4 : 152 ; C. 2 : 207 ; G. 896.

Tiaridium indicum Lehm., Asperif. 14, 118 ; Wight, Ill. t. 171 ; Gr. 135 ; D. & G. 172.

Common and abundant in waste places especially near the village tank and the railway station. The main road and the stream passing along Kune Plateau into St. Mary's Ravine seem to be the main lines of distribution of this plant in the district. An unattractive and ill-smelling plant.

Flowers.—March to November. *Fruits.*—April to November.

Blatt. Herb. 21636 ! 21639 ! 21693 ! 27455 ! 28549 ! *Santapau* 141/18 ! 415 ! 420 ! 436 ! 2113 ! 4376 ! 8763 ! 8963 ! 8965 ! 9085 ! 9086 !

Heliotropium supinum Linn., Sp. Pl. 130, 1753 ; FBI. 4 : 149 ; D. & G. 171 ; Wight, Icon. t. 1387 ; C. 2 : 209 ; G. 896.

Piptoclaina malabarica G. Don : Gr. 135.

A prostrate, softly and densely villous herb. Nutlets 2-3 ; when the fruit consists of 2 nutlets, these are plano-convex ; when of three, one nutlet is plano-convex, the other two sharply right-angled on the inner side.

A rare plant in Khandala.

Flowers and *Fruits.*—June 1946.

Blatt. Herb. 21674 ! 21676 ! *Santapau* 9085 ! 9086 !

Heliotropium ovalifolium Forsk., Fl. Aegypt.-Arab. 38, 1775 ; FBI. 4 : 150 ; C. 2 : 211 ; G. 896-897.

H. coromandelianum Retz., Obs. 2 : 9, 1781 ; Gr. 135 ; D. & G. 171 ; Wight, Icon. t. 1388.

There seem to be two forms of this plant, according to the situation in which it grows. In dry ground the plant is small, at times only 6 cms. in diam., and prostrate with erect inflorescence ; under more favourable conditions, it grows erect or suberect, and branches reach up to 25 cms. (including the inflorescence). Under the latter form, the plant is gregarious and forms dense clumps ; on dry ground, it is an inconspicuous small herb.

Flowers.—February to June. *Fruits.*—February to June.

Santapau 4152-4155 ! 4201 ! 4296 ! 3270 ! 4385 ! 8603 ! 8747 !

TRICHODESMA R. Br.

Trichodesma amplexicaule Roth, Nov. Pl. Sp. 104, 1821; FBI. 4 : 153; D. & G. 173; Brand, in Pfreich. 72 : 39.

T. indicum var. *amplexicaule* Cooke, Fl. Bomb. Pres. 2 : 215, 1904.

Common in waste ground about the railway station and village tank, and along the roadsides near the Reversing Station. When in full bloom it is a pretty plant.

In a large number of specimens examined at Kew, it was found that the most typical part of the plant are the auricles at the base of the calyx segments, which in the present species are curved inwards; in *T. indicum* they curve and spread outwards and upwards.

Flowers.—August to November. *Fruits.*—September to November.

Blatt. Herb. 21671 ! 21608 ! 21685 ! 27587 ! *Sedgwick* 2570 ! *Andrews* A 304 in Kew Herb. ! *Santapau* 141/13 ! 904 ! 2478 (4) ! 9263 ! 9264 !

CYNOGLOSSUM Linn.

Cynoglossum glochidiatum Wall., Cat. 922, 1828; Lindley in Bot. Reg. 27 : t. 15, 1841; FBI. 4 : 156; Brand 133.

C. denticulatum DC., Prodr. 10 : 150, 1846; FBI. 4 : 156.

Annual, erect, more or less extensively branched, up to 1·2 m. high; stem and branches terete, striate, hairy, sometimes strigose. Lower leaves up to 17×6·5 cms., oblong or lanceolate; apex acute; margins sub-denticulate or entire; the whole surface of the leaf is scabrous above with stiff hairs from minute bulbous bases. Petioles up to 5 cms. long. Higher leaves smaller, lanceolate, shortly petioled, the highest leaves being sessile or subsessile.

Flowers in terminal racemes, which are up to 50 cms. long with an occasional leaf among the flowers along the axis of inflorescence; pedicels 2-7 mm. long, filiform; rachis and pedicels appressedly hairy. Calyx green, about 3 mm. long, hairy, divided to about the middle, lobes acute, subacute or obtuse; the whole calyx persistent in fruit and somewhat enlarged; nerves very obscure. Corolla 2·5-5 mm. long, about 4 mm. diam., pale blue or lilac with deeper blue centre. Nutlets up to 3×2 mm., ovoid, strongly margined with a few glochidia on the outer surface and more densely glochidiate over the rest of their surface except for the small basal scar.

Fairly common in Khandala especially about St. Xavier's Villa; an unattractive herb with a wild appearance.

Flowers and *Fruits.*—June to November.

Blatt. Herb. 21692 ! 21638 ! 21640 ! 21641 ! 28191 ! *Santapau* 141/15, 18 ! 905 ! 1123 ! 2272 ! 2400 ! 2651 ! 5133 ! 6974 ! 8105 ! 9142 ! 9237 !

Cynoglossum meeboldii Brand in Fedde, Repert. 14 : 323, 1916 ; & in Pfreich. 72 : 134, 1921.

C. denticulatum var. *zeylanica* Clarke in FBI. 4 : 157, 1883 ; C. 2 : 217.

C. canescens Graham, Cat. 135, 1839 (non Willd.).

C. glochidiatum Dalz. & Gibs., Bomb. Fl. 172, 1861 (non Wall.).

The following is Brand's description supplemented with my own field notes.

Stems erect, thick, extensively branched, up to 1·30 m. high, hispid or glabrate. Basal leaves up to 20×7 cms., petioles up to 6 cms. long ; these leaves soon fall off. Leaves about the middle of the stem petiolate, obovate, 12-18 cms. long (including the petiole), 5-6 cms. broad, setose on both sides, shortly cuspidate at the apex, base gradually passing into the petiole, lateral nerves very clear. Higher leaves sessile, smaller.

Inflorescence terminal, at first capitate-paniculate, later on elongated into a panicle ; pedicels in fruit shorter than the calyx. Sepals ovate, obtuse, pilose, 1-nerved, 3 mm. long. Corolla shortly and broadly hypocrateriform, 6 mm. long, 9 mm. diam., limb divided up to the base, lobes ovate obtuse, longer than the tube ; scales at the mouth of the tube subquadrate, emarginate, attached to the middle of the tube by a filament ; the whole corolla pale blue, with deeper centre ; anthers ovate, not going beyond the scales ; style shorter than the calyx. Nutlets cohering with the style, ovoid, 2 mm. long, equally glochidiate all over except on the small basal scar, marginate with a margin which is at times very clear and at other times scarcely distinguishable.

It is somewhat difficult to distinguish this species from *C. glochidiatum* Wall., and the difficulty has not been removed after examination of all the specimens from India in Kew Herb. ; the distinguishing features seem to be the length of the pedicels, the size of the corolla and the even distribution of the glochidia all over the nutlet.

Flowers and *Fruits*.—July to August 1945.

Meebold 8815 in Kew Herb. ! *Blatt. Herb.* 21684 ! 21585 ! 21584 ! *Santapau* 6830 ! 6831 ! 6848 ! 6910 ! 6911 !

ADELOCARYUM Brand.

Adelocaryum coelestinum (Lindl.) Brand, in Fedde. Rept. 13 : 549, 1915 & in Pfreich. 78, f. 8.

Cynoglossum coelestinum Lindl., in Bot. Reg. 25 : t. 36, 1839 ; D. & G. 173.

Echinospermum coelestinum Wight, Icon. t. 1394, 1850.

Paracaryum coelestinum Benth. & Hook. f., Gen. Pl. 2 : 850, 1876; FBI. 4 : 160 ; C. 2 : 218.

A tall, gregarious and very conspicuous plant, common during the second half of the monsoon; very abundant near trees on the high slopes and on top of Bhoma Hill; the dry stems remain standing for a long time after the plant has withered. When abundant, it is a fine sight.

Flowers.—August to November. *Fruits.*—September to November.

Cooke; Hallberg in MS. catalogue; *Blatt. Herb.* 21672 ! 26645 ! 21582 ! 28318 ! *Santapau* 141/14 ! 799 ! 1103 ! 3497-3499 ! 4715 ! 5132 !

CONVOLVULACEAE.

CUSCUTA Linn.

Cuscuta reflexa Roxb., Pl. Cor. 2 : 3, t. 104, 1798; FBI. 4 : 225; Choisy in Mem. Soc. Phys. Hist. Nat. Genève 9 : 273; Englomann, in Trans. Acad. Sci. St. Louis 1 : 518; C. 2 : 224; Hall. f. in Engl. Bot. Jahrb. 49 : 375; Yuncker in Mem. Torr. Bot. Club, 18 : 259, f. 130 A-F; Santapau in JBNHS. 47 : 338 (non Decaisne).

In the Blatt. Herb. there is but one specimen labelled in Blatter's hand "Bombay-Khandala" without date or more precise locality. I have not seen the plant growing in the district, and hence consider its occurrence in Khandala as rather doubtful.

Blatt. Herb. 22177 !

ERYCIBE Roxb.

Erycibe wightiana Graham, Cat. 137, no. 1024, 1839; D. & G. 170; Hall. f. in Bull. Herb. Boiss. 5 : 737; G. 930; Santapau 339.

E. paniculata Roxb., var. *wightiana* C. B. Clarke in FBI. 4 : 181, 1883; C. 2 : 226.

A very rare plant in Khandala; I have not found it growing in the district. My only authority for the inclusion of the plant is the statement of Graham, which in all probability was also the reason for the inclusion in Blatter's catalogue. There are no specimens from Khandala in Blatt. Herb.

Graham; Blatter in MS. catalogue.

PORANA Burm.

Porana malabarica Clarke in FBI. 4 : 223, 1883; C. 2 : 226; G. 921; Santapau 339.

P. racemosa Graham, Cat. 133, 1839; D. & G. 162 (non Roxb.).

When comparing the specimens of my Khandala collections with the types in Kew Herb., I found that in my plants the sepals in fruit are much narrower and the mucro-like apiculation more distinct than in Dalzell's plants from Parr, the type of the species.

A very elegant plant, particularly attractive towards the end of October when it is in full bloom, and when it covers large patches of the slopes below St. Xavier's Villa. For the rest it is not a common plant in the district.

Flowers.—October to November. *Fruits.*—November to January.

Blatt. Herb. 22310 ! 28341 ! 27502 ! 28428 ! *Santapau* 138/42, 43 ! 1150 ! 2958 ! 3105-3107 ! 5083-5085 ! 5178 !

EVOLVULUS Linn.

Evolvulus alsinoides Linn., Sp. Pl. (ed. 2) 392, 1762; FBI. 4 : 220; Wight, Ill. t. 168 bis; Hall. f. in Engl. Bot. Jahrb. 18 : 85; C. 2 : 229; G. 923; Ooststroom, Mon. Gen. Evolv. 26 ; Santapau 340.

Convolvulus alsinoides Linn., Sp. Pl. 157, 1753.

Evolvulus hirsutus Lamk. : Gr. 133; D. & G. 162.

A small prostrate or suberect herb with branches spreading radially from a woody roostock; the whole plant is densely hairy. Leaves distichous and closely arranged on prostrate branches. Flowers light blue, solitary or in pairs from an axillary peduncle. Seeds glabrous, very dark brown.

A rare plant in Khandala. Grows on very dry, open ground.

Flowers and *Fruits.*—May 1944, June 1946.

Santapau 4336-4338 ! 9084 !

CONVOLVULUS Linn.

Convolvulus arvensis Linn., Sp. Pl. 153, 1753; FBI. 4 : 219; Choisy in Mem. Soc. Phys. Hist. Nat. Genève 6 : 479; Gr. 132; D. & G. 163; Hall. f., in loc. ult. cit. 108; C. 2 : 234; G. 925; Ooststroom in Blumea 3 : 283; Santapau 343.

A very typical trailing or climbing plant with hastate leaves. Rare in the district; on the only occasion when I have seen the plant in Khandala, it was growing along the railway line among ballast stones, there were about 20 plants in a short distance.

Blatt. Herb. 22312 ! *Santapau* 15 June 1946 !

MERREMIA Dennst.

Merremia umbellata (Linn.) Hall. f. in Engl. Bot. Jahrb. 16 : 552, 1893; C. 2 : 237; G. 928; Ooststroom 333; Santapau 344.

Convolvulus umbellatus Linn., Sp. Pl. 155, 1753.

Ipomoea cymosa R. & S., Syst. 4 : 241, 1819; Choisy in Mem. Soc. Phys. Hist. Nat. Genève 6 : 461, 1833; FBI. 4 : 211.

One of the commonest plants of the family growing in the district; it is often found on hedges in open country, or towards the edges of dense forest. The whole plant is rather variable, and on this account it is not an easy one to identify in the field.

Flowers.—January to March. *Fruits.*—January to May.

Blatt. Herb. 22306 ! 22313 ! 22323 ! 22346 ! *Gammie* 16127 ! *Santapau* 138/58 ! 1648 ! 1755 ! 3570-3572 ! 3619 ! 3620 ! 3845 ! 4028 ! 4026 ! 5801 ! 5802 ! 6005 ! 6006 ! 8617 ! 8618 ! 8962 ! 8963 !

Merremia vitifolia (Burm. f.) Hall. in Engl. Bot. Jahrb. 16 : 552, 1893 ; C. 2 : 239 ; G. 928 ; Ooststroom 329 ; Santapau 344.

Convolvulus vitifolius Burm. f., Fl. Ind. 45, t. 18, f. 1, 1768.

Ipomoea vitifolia Blume, Bijdr. 709, 1825 ; FBI. 4 : 213 ; Gr. 132 ; D. & G. 165.

A rare plant in Khandala, except on Battery Hill Plateau, where it is fairly abundant in dense forest. Its leaves are very similar to those of several species of *Vitis*, but the spreading hairs on the stem and the absence of tendrils readily identify this plant. Graham, loc. cit., quoting Dr. Lush calls this plant " The Prince of Convolvuli "; it is indeed a very fine plant when in bloom.

Flowers.—January 1945, February 1946. *Fruits.*—March 1943.

Blatt. Herb. 22314 ! 28477 ! *Santapau* 714 ! 1479 ! 1756 ! 5818-5821 ! 8679 !

Ipomoea Linn.

Ipomoea clarkei Hook. f. in FBI. 4 : 734, 1885 ; C. 2 : 245 ; Santapau 346.

I. Stocksii Clarke in FBI. 4 : 207, 1883 (non Clarke, ibid. 204).

Rare in the district. Only seen once on the upper slopes behind Khandala Cemetery, twining among grasses. An elegant plant.

Flowers.—15 October 1944.

Santapau 5148 !

Ipomoea muricata (Linn.) Jacq., Hort. Schoenbr. 3 : 40, t. 323, 1794 (non Cav. 1799) ; FBI. 4 : 197 ; Ooststroom 551 ; Santapau 349.

Convolvulus muricatus Linn., Mant. 44, 1767.

Calonyction muricatum Don, Gen. Syst. 4 : 264, 1838 ; Hall. f. in Engl. Bot. Jahrb. 18 : 154 ; Gr. 130 ; G. 920 ; C. 2 : 253.

A rare plant in Khandala, easily distinguished by the muricate stems. It occurs only in open country or in clearings in the forest.

Flowers.—September to October. *Fruits.*—October to December.

Blatt. Herb. 28272 ! *Gammie* 15410 ! *Santapau* 854 ! 2653 ! 3338 ! 7408 ! 7409 ! 7410 !

Ipomoea quamoclit Linn., Sp. Pl. 159, 1753 ; FBI. 4 : 199 Ooststroom 555 ; Santapau 349.

Quamoclit vulgaris Choisy in Mem. Soc. Phys. Hist. Nat. Genève 6 : 434, 1833 ; D. & G. Suppl. 59 ; C. 2 : 261.

This plant is very common on the Konkan plains, ascending up to Thakurwadi station along the G. I. P. Railway line; I have not seen it above Thakurwadi, but as this is the limit of the district which I have been exploring, I include the plant here as occurring at the extreme limit of Khandala.

Flowers and *Fruits.*—28 November 1945.

Santapau, Thakurwadi, 28 November 1945 !

Ipomoea angulata Lamk., Tabl. Encycl. 1 : 464, 1791 ; Ooststroom 553 ; Santapau 349.

Quamoclit phoenicea Choisy, in Mem. Soc. Phys. Hist. Nat. Genève, 6 : 433, 1833 ; D. & G. Suppl. 59 ; G. 919.

Ipomoea coccinea Clarke in FBI. 4 : 199, 1883 (non Linn.).

Quamoclit coccinea Cooke, Fl. Bomb. Pres. 2 : 261, 1904 (non Moench.).

A very pretty plant, very abundant on the slopes below St. Xavier's Villa and on Battery Hill Plateau ; very showy when in bloom.

Ooststroom, loc. cit., 555, remarks : " Several authors have confounded this species with the North American *I. coccinea* Linn. Sp. Pl. 160 ; *Quamoclit coccinea* (Linn.) Moench. (1794, p. 453). For a discussion of the differences between the two species see Hall. f. in Bull. Herb. Boiss. 7 : 415, 1899."

Flowers.—October to March. *Fruits.*—November to March.

Santapau 178 ! 1495 ! 1725 ! 3108-3111 ! 3339 ! 5391 ! 5499 ! 5500 !

Ipomoea nil (Linn.) Roth, Cat. Bot. 1 : 36, 1797 ; Hall. f. in Engl. Bot. Jahrb. 18 : 136 ; Ooststroom 497 ; Santapau 348.

Convolvulus Nil Linn., Sp. Pl. 219, 1762.

Ipomoea hederacea Clarke in FBI. 4 : 199, 1883 ; C. 2 : 252 (et al. plur. auct., non Jacq.).

A common plant in the district, in open country by the road or at the edges of dense forest. The colour and size of the corolla render this one of the most showy plants in Khandala. From its distribution in the district, and especially on account of its occurrence on the highest parts of Bhoma Hill, this plant must be considered native in the district ; I have not seen any of the introduced plants spreading upwards towards Bhoma Hill.

Ooststroom remarks : " Several authors have interpreted this species as being identic with the North American *Ipomoea hederacea* (Linn.) Jacq...and have mentioned it under that name...The true *I. hederacea* is probably now and then cultivated in gardens..."

Flowers.—September to November. *Fruits.*—October to November.

Santapau 1092 ! 1232 ! 2915 ! 2966 ! 2993 ! 5023 ! 5024 ! 5177 ! 5369 ! 5494 !

Ipomoea soluta Kerr, in Kew Bull. 1941 : 18, 1941 ; Santapau 346.

I. campanulata Clarke in FBI. 4 : 211 (excl. var. *illustris* Clarke) 1883 ; Gr. 131 ; D. & G. 165 ; C. 2 : 247, et alior. auct., non Linn.

Among the authors of Indian floras, it is customary to include this plant as *I. campanulata* Linn. ; as Kerr has shown, the Linnean plant is not an *Ipomoea* at all, but *Thespesia populnea* Soland.

Abundant on Battery Hill Plateau and on the slopes near Forbay ; the venation of the leaves is so distinctive that it suffices for the identification of the plant. Young seedlings often show trailing branches which may run for several meters along the ground. When in full bloom, this is a showy plant, on account of the colour and size and massing of its flowers.

For the full synonymy of this plant, see Kerr, loc. cit.

Flowers.—January to February. *Fruits.*—March 1952.

Blatt. Herb. 27468 ! *Santapau* 3984 ! 3985 ! 5822 !

Ipomoea diversifolia R. Br., Prodr. 487, 1810 ; Ooststroom 365; Santapau 347.

Pharbitis laciniata Dalz. in Kew Journ. Bot. 3 : 178, 1851 ; D. & G. 167.

Ipomoea laciniata Clarke in FBI. 4 : 200, 1883 ; C. 2 : 250.

A slender, elegant plant growing on grassy slopes, prostrate and closely appressed to the ground, but not climbing or twining. The only spot where this plant has been found is in open grass lands at the highest part of the Saddle.

Flowers.—October 1944. *Fruits.*—December 1943.

Cooke ! Blatt. Herb. 28455 ! *Santapau* 3376 ! 5174 ! 5175 !

Ipomoea pes-tigridis Linn., Sp. Pl. 162, 1753 ; FBI. 4 : 204 ; Gr. 132 ; Wight, Icon. t. 836 ; D. & G. 165 ; C. 2 : 250 ; G. 918 : Ooststroom 504 ; Santapau 348.

I. pes-tigridis var. *hepaticifolia* Clarke in FBI. 4 : 204, 1883.

Common in Bombay, rare in Khandala. The number of lobes in leaves seems to depend on the age of the leaf : near the end of the branches, leaves are 3-lobed, lower down they are mostly 5-7-lobed.

Blatt. Herb. 28267 !

Ipomoea cairica (Linn.) Sweet, Hort. Brit. 287, 1827 ; Hall. f., in Engl. Bot. Jahrb. 18 : 148 ; G. 918 (excl. syn. *I. pulchella* Roth) ; Ooststroom 542 ; Santapau 347.

Convolvulus cairicus Linn., Syst. (ed. 10) 922, 1759.

Ipomoea palmata Forsk., Fl. Aegypt-Arab. 43, 1775 ; FBI. 4 : 214 ; C. 2 : 250.

I. pulchella Wight, Icon. t. 156, 1839 (non Roth).

Stems striate, twisted, often rough with lenticels. Leaves up to 5·5 cms. diam., petioles slender. Peduncles up to 2·2 cms. long, 1-4-flowered. Corolla lilac or pale voilet, tube paler in colour.

Not common in Khandala. I have only seen it growing in a sheltered cutting near water behind the Inspection Bungalow above Khandala.

Flowers.—March 1944. *Fruits.*—Not seen.

Blatt. Herb. 22308 ! *Santapau* 3831 !

Ipomoea batatas (Linn.) Lamk., Tabl. Encycl. 1 : 465, 1791 ; FBI. 4 : 202 ; Hall. f., in Engl. Bot. Jahrb. 18 : 138 ; C. 2 : 251 ; Ooststroom 512 ; Santapau 348.

Convolvulus Batatas Linn., Sp. Pl. 154, 1753.

Batatas edulis Choisy : Gr. 129.

Occasionally but rarely cultivated in Khandala for its tuberous roots. I have seen it only once under cultivation in St. Xavier's Villa.

Santapau 15 March 1945 !

Argyreia Lour.

Argyreia nervosa (Burm. f.) Boj., Hort. Maurit. 224, 1837 ; Ooststroom in Blumea 5 : 364 ; Santapau 350.

Convolvulus nervosus Burm. f., Fl. Ind. 48, t. 20, f. 1, 1768.

Argyreia speciosa Sweet, Hort. Brit. 289, 1827 ; FBI. 4 : 185 ; Wight, Icon. t. 851 ; Gr. 128 ; D. & G. 168 ; C. 2 : 255 ; G. 907.

Blatter's reference in his catalogue is my only authority for the inclusion of this plant ; there are no specimens from Khandala in Blatt. Herb.

Blatter in MS. catalogue.

Argyreia malabarica Choisy in Mem. Soc. Phys. Hist. Nat. Genève 6 : 420, 1834 ; Gr. 128 ; D. & G. 169 ; C. 2 : 258.

The occurrence of this plant is given on the authority of Hallberg ; I have seen no specimens from Bombay Presidency either in the Blatt. or Kew Herb. See Cooke's remarks, loc. cit., on the identity and occurrence of this plant.

Hallberg in MS. catalogue.

Argyreia sericea Dalz. in D. & G. 169, 1861 ; FBI. 4 : 188 ; C. 2 : 256.

Ipomoea bracteata Graham, Cat. 131, 1839 (non Don).

A very showy plant with fine, large silvery leaves and large flowers. There is great variation in the size of the flowers. Only seen in Khandala on the upper slopes and top of Echo Point.

Flowers.—July to September. *Fruits.*—25 July 1943.

Blatt. Herb. 28348 ! *Santapau* 894 ! 943 ! 2269 !

Argyreia pilosa Wight & Arn., in Nov. Act. Nat.Cur. 18 (1) : 356 c, 1836. ; FBI. 4 : 189 ; C. 2 : 257.

The specimen listed below is but a young branch without flowers or fruits ; in my field book I find an entry made at the time of the collection : " Flowers pale pink, deeper in the tube " ; such flowers could not be collected on account of the position in which they grew. I have compared this specimen with the type of *A. pilosa* Wt. & Arn. in Kew Herb., and find that both match perfectly ; hairs arising from bulbous bases seem to be present especially on the upper side of the leaves. I consider my specimen as belonging to *A. pilosa* but in the absence of flowers and fruits, identification cannot be definitely settled.

Santapau 539 !

Argyreia elliptica Choisy in Mem. Soc. Phys. Hist. Nat. Genève 6 : 417, 1833 ; Gr. 128 ; D. & G. 169 ; Santapau 351.

Lettsomia elliptica Wight, Icon. 4 (2) : 12, 1850 ; FBI. 4 : 192 ; C. 2 : 259.

Very common in Khandala and abundant, conspicuous on account of the size of the flowers and the structure of the leaves. The size of the flowers is larger than that of any specimen in Kew Herb.; the leaves are also larger and the angle formed by the lateral nerves with the midrib is much smaller. For these reasons the plant may be considered as a new variety of the species, but in view of the extreme variability of the plant, it is not advisable to complicate matters by the erection of new varieties.

Flowers.—July to October. *Fruits.*—October to January.

Blatt. Herb. 22222 ! 27601 ! 28028 ! 28248 ! *Santapau* 138/22, 53 ! 131/41 ! 575 ! 903 ! 1008 ! 1158 ! 1281 ! 2426 ! 4661 ! 5179 !

SOLANACEAE.

SOLANUM Linn.

Solanum nigrum Linn., Sp. Pl. 186, 1753 ; FBI. 4 : 229 ; Dunal in DC., Prodr. 13 (1) : 50 ; C. 2 : 263 ; G. 936 ; Santapau in JBNHS. 47 : 652.

S. rubrum Mill. : Wight, Icon. t. 344.

S. incertum Dunal : Gr. 137.

Specimens Nos. 9107-9109 are remarkable for their pubescence. Stems, petioles, peduncles and pedicels and calyx are densely pubescent ; the corolla is pubescent on the outside and along the margins ; leaves are more or less hairy on both sides, especially along the nerves. All the hairs are simple, fairly stout, appressed or curving upwards.

Not common in the district ; from the localities where the plant has been found, it would seem that the plant is an introduction with the railway station as the centre of its distribution.

Flowers.—March to June. *Fruits.*—April to June.

Hallberg in MS. catalogue ; *Blatt. Herb.* 2008 ! *Santapau* 303 ! 4087 ! 4088 ! 6072 ! 9107 ! 9108 ! 9109 !

Solanum xanthocarpum Schrad. & Wendl., Sert. 1 : 8, t. 2, 1795 ; FBI. 4 : 236 ; C. 2 : 265 ; G. 938 ; Santapau 653.

S. Jacquini Willd.: Graham, 139.

Diffuse, but not creeping, biennial or perennial, often woody at the base. Prickles compressed, yellow, shining, up to 2 cms. long, very numerous on all the vegetative parts of the plant and also on the pedicels and calyx.

Very common along the roadsides and in waste places.

Flowers.—Throughout the year, except during the rains. *Fruits.*—February to May.

Hallberg in MS. catalogue ; *Blatt. Herb.* 2114 ! *Santapau* 1507 ! 2972 ! 2973 !

Solanum indicum Linn., Sp. Pl. 187, 1753 ; FBI. 4 : 234 ; Gr. 138 ; D. & G. 174 ; Wight, Icon. t. 346 ; C. 2 : 266 ; G. 938 ; Santapau 653.

Very common all over ; in the undergrowth or in small clearings in forest, seldom in open country by itself. During the rainy season, this plant produces plenty of fairly large leaves and flowers of a fine purplish blue ; as the dry season advances, the leaves become smaller and the whole plant assumes a typically xerophytic appearance. Locally immature fruits are curried or even eaten raw.

Local name : Chichardi.

Flowers and *Fruits.*—The whole year.

Graham ; Woodrow ; Cooke ; Hallberg in MS. catalogue ; *Blatt. Herb.* 2002 ! 2093 ! 2094 ! *Santapau* 144/3 ! 589 ! 746 ! 769 ! 1248 ! 4965 ! 6947 ! 8675 ! 8933 !

Solanum tuberosum Linn., Sp. Pl. 185, 1753 ; FBI. 4 : 229 ; Gr. 137 ; D. & G. Suppl. 60 ; C. 2 : 269 ; G. 938 ; Santapau 655.

The Potato, cultivated, though not extensively, in the district. Some good crops were obtained near the Kune Katkari Settlement.

Santapau, 1942 !

Solanum melongena Linn., Sp. Pl. 186, 1753 ; FBI. 4 : 235 ; Gr. 138 ; D. & G. Suppl. 61 ; C. 2 : 269 ; G. 937 ; Santapau 655.

The Brinjal or Egg-plant, cultivated fairly extensively about Khandala ; on several occasions I have seen it under cultivation in St. Xavier's Villa and in vegetable gardens near Khandala. This plant has not been observed wild in the district.

Santapau, passim !

Solanum McCannii Santapau in JBNHS 47 : 654, 1948.

For a full description, see loc. cit.

This is clearly a distinct species approaching *S. xanthocarpum* but differing mainly in the following particulars : its erect or suberect habit, with fairly long internodes ; stem and branches woody or subwoody, not herbaceous ; branches sharply angular and either not at all or only very faintly striate ; prickles not so dense as and generally smaller than in *S. xanthocarpum* ; petioles longer ; corollas larger, calyx smaller ; pedicels both in flower and fruit longer and stouter ; fruits of about the same size or slightly larger ; the whole plant much less pubescent.

Flowers and *Fruits.*—18th October 1943.

Santapau 2972 ! 2973 !

PHYSALIS Linn.

Physalis minima Linn., Sp. Pl. 183, 1753; FBI., 4 : 238; Gr., 140 ; C. 270 ; Santapau 657.

P. pubescens Wight, Ill. t. 166 B, f. 6 (non Linn.).

A rare plant in Khandala ; I have only seen the plant mentioned below from the district. My plant was about 55 cms. high, with small yellow flowers with a purplish dot near the base of each petal, on the inner side.

Flowers and *Fruits.*—14th March 1943

Santapau 1690 !

Physalis peruviana Linn., Sp. Pl. 1670, 1763; FBI., Gr., D. & G., C., Santapau, loc. cit.

Blatter's mention of this plant in his catalogue is my only authority for its inclusion among Khandala plants. There are no specimens in any of the herbaria consulted from Khandala. In general the two species of *Physalis* are rather similar, except for their sizes, the present species being much larger than the preceding one.

Blatter in MS. catalogue.

DATURA Linn.

Datura metel Linn., Sp. Pl. 179, 1753 ; Safford in Journ. Wash. Acad. Sci. 11 : 178, & f. 1 B, 1921 ; id. in Journ. Hered. 12 : 178-190, & ff. 10 & 12 (1-2), 1921 ; id. in Ann. Rep. Smithson. Inst. 1920 : 541-548, ff. 1-3 & 5, t. 1, 1922 ; Santapau 657.

D. fastuosa Linn., Syst. Nat. (ed. 10) 2 : 932, 1759 ; FBI. 4 : 242 ; Gr. 141 ; Wight, Icon. t. 1396 ; C. 2 : 273 ; G. et al. recent. auct. Indici passim.

D. alba Nees in TLS. 17 : 73, 1837 ; Wight, Icon. t. 852 ; Gr. 141 ; D. & G. 174.

D. fastuosa var. *alba* Clarke, in FBI. 4 : 243, 1883 ; C., et al. recent. auct. passim.

For the complex problem of the nomenclature of this plant, see Santapau loc. cit.

The occurrence of this plant in Khandala is given on the authority of Blatter and Hallberg; I have not collected it in the district.

Blatter and *Hallberg* in MS. catalogues.

Datura innoxia Mill., Gard. Dict. (ed. 8) n. 5, 1768; Safford, in. Journ. Wash. Acad. Sci. 11 : 179-180, f. 1C; id. in Journ. Hered. 12 : f. 12 (3-4); id. in Ann. Rep. Smithson. Inst. 1920 : 549-550, ff. 3 (2) & 4-5 & T. 2; Santapau 659.

D. Metel Sims in Curtis Bot. Mag. t. 1440, 1812; FBI. 4 : 243; C. 2 : 273, et al. auct. recent., non Linn.

The pubescence of the whole plant, the 10-toothed corolla and the character of the prickles on the fruit clearly distinguish this plant from *D. Metel* Linn. (*D. fastuosa* Linn. or *D. alba* Nees).

Gregarious, flowering and fruting through the dry parts of the year; common on low lying fields between the railway station and the main road in Khandala; occasionally it is also found on the dry banks of the village tank and fields nearby. This is an American plant, introduced into India and passing up to recently under the name of *D. Metel* Linn.

Local name: Dhatura.

Flowers and *Fruits*.—Throughout the dry season.

Santapau 144/2 ! 1998 ! 1999 ! 8758 !

Capsicum Linn.

For description and figures of the various species of *Capsicum* culivated in India, see F. J. Shaw & A. R. Khan, "The Types of Capsicum" in Mem. Dept. Agric. Ind. (Bot. Ser.) 16 : 59-82, tt. 2-5, 1929.

Capsicum annuum Linn., var. **acuminata** Fingerh. in Mon. Gen. Caps. 13, t. 2, f. c, 1832; Irish, in Rep. Missouri Gard. 9 : 69, 1898; C. 2 : 276.; Santapau 661.

C. frutescens Roxb., Fl. Ind. 1 : 574, 1832; Gr. 139; D. & G. Suppl. 61; FBI. 4 : 239 (non Linn.).

The Chili or Mirchi plant, occasionally seen in gardens or nearhouses in Khandala; I have noticed it on several occasions in St. Xavier's Villa, on the Kune Plateau, and in flower pots in the village. It flowers and fruits readily enough in the district; the fruits are used in curries, but I have seen children eating them raw with apparent relish. The fruits are relatively small and green at first, later they are bright red and extremely spicy.

Santapau, passim, cultivated !

PETUNIA Juss.

Petunia sp. (probably *P. nyctaginiflora* Juss. in Ann. Mus. Par. 2 : 216, t. 47, f. 2, 1803) ; Santapau 661.

A garden plant often seen in the better gardens near some of the Khandala Villas ; it flowers profusely in the district, but the plant has not been observed growing wild.

Santapau, in gardens !

LYCOPERSICON Mill.

Lycopersicon esculentum Mill., Gard. Dict. (ed. 8), n. 2, 1768 ; Luckwill, Gen. Lycop. 20, 1920 ; Muller, Rev. Gen. Lycop. 10, t. 2 A-F, 3 A-G & K, 1940 ; Santapau 660.

Lycopersicum esculentum Mill. : Clarke, in FBI. 4 : 237 ; Gr. 139 ; C. 2 : 275 ; G. 941.

The Love-Apple or Tomato plant. Often cultivated in the district and occasionally found wild about the village streets and in ravines along the stream beds. This clearly shows the means of distribution of the plant in Khandala. Tomatoes can be bought in the local bazar throughout the year, and on inquiry they are found to be grown locally ; the type of plant cultivated seems to be the one that gives fairly small fruits.

One of the main difficulties in the cultivation of tomatoes in Khandala seems to be that the plant produces large numbers of flowers but relatively few fruits, unless pollination is effected artificially. Moreover, locally produced seeds seem soon to lose their vitality, so that very few, if any, do germinate when planted in subsequent seasons.

Local name : Tambatu.

Flowers.—February to April. *Fruits.*—April to May.

Blatt. Herb. 28550 ! *Santapau* 3862 ! 4089 !

NICANDRA Adams.

Nicandra physaloides (Linn.) Gaertn., Fruct. 2 : 237, t. 141, f. 2, 1791 ; FBI. 4 : 240 ; Gr. 140 ; D. & G., Suppl. 62 ; C. 2 : 275 ; Santapau 660.

Atropa physaloides Linn., Sp. Pl. 181, 1753.

Rare ; the only specimens so far seen from Khandala are those mentioned below, they were collected in St. Peter's School Garden.

Flowers.—9th September 1944.

Santapau 4847 ! 4848 !

NICOTIANA Linn.

Nicotiana tabacum Linn., Sp. Pl. 180, 1753 ; FBI. 4 : 245 ; Gr. 140 ; D. & G. Suppl. 62 ; Comes, Mon. Gen. Nicot. 7 ; C. 2 : 276 ; G. 941 ; Santapau 660.

A rare plant in Khandala ; it is found occasionally in gardens, where it is cultivated for the sake of its flowers.

Blatt. Herb. 28284 ! *Santapau* in gardens !

CESTRUM Linn.

Cestrum nocturnum Linn., Sp. Pl. 191, 1753 ; Bor & Raizada in JBNHS. 43 : 8, f. 4, & t. opp. p. 8.

An elegant shrub, occasionally planted in gardens ; it flowers profusely in Khandala.

Local name : Rat-ki-rani.

Flowers.—December 1948.

Santapau 9773 ! 9774 ! 9775 !

SCROPHULARIACEAE

VERBASCUM Linn.

Verbascum coromandelianum (Vahl) Kuntze, Rev. Gen. Pl. 468, 1891 ; Pennell, Scroph. West. Himal. 39, 1943 ; Santapau in JBNHS 49 : 25.

Celsia coromandeliana Vahl, Symb. Bot. 3 : 79, 1794 ; Benth. in DC., Prodr. 10 : 246 ; FBI. 4 : 251 ; D. & G. 176 ; Wight, Icon. t. 1406 ; C. 2 : 281 ; Murbeck, Monogr. Gatt. Celsia, 130.

Common in waste lands about the talao and station, also common along the dry stream beds during the dry season. During the rains this plant disappears almost completely from Khandala, but as soon as the rains come to an end, new seedlings appear. It bears flowers and fruits throughout the dry season. A rank and unattractive plant.

Flowers and *Fruits.*—February to June.

Blatt. Herb. 1660 ! 1661 ! 1662 ! 29659 ! *Santapau* 141/2 ! 145/26, 27, 30 ! 1686 ! 2108 ! 3657 ! 6891 ! 8742 !

SUTERA Roth.

Sutera dissecta (Del.) Walp., Repert 3 : 271, 1844 ; Bruce in Kew Bull. 1940 : 63-64 ; Santapau 28.

Capraria dissecta Del., Fl. Egypte 95, t. 32, f. 2, 1812.

Sutera glandulosa Roth, Nov. Pl. Sp. 291, 1821 ; FBI. 4 : 258 ; Wight Icon. t. 856 ; C. 2 : 285.

It is only along the stream passing through Kune Plateau that this plant is somewhat common ; it grows on moist ground during the dry season. When the plant is fresh, it has a strong scent, similar to that of the common *Pogostemon.*

Flowers and *Fruits.*—January to June.

Blatt. Herb. 1608 ! *Santapau* 3812-3815 ! 3822 ! 4379 ! 4908 ! 4909 ! 6074 ! 6075 !

BACOPA Aubl.

Bacopa monnieri (Linn.) Pennell, in Proc. Acad. Nat. Sci., Philad. 98 : 94, 1946 ; Santapau 30.

Lysimachia Monnieri Linn., Cent. Plant. 2 : 9, 1756.

Moniera cuneifolia Cooke, Fl. Pres. Bomb. 2 : 285, 1904 ; G. 953.

Herpestis Monniera Benth., Scroph. Ind. 30, 1835 ; FBI. 4 : 272 ; Gr. 144.

Herpestes Monnieria Dalz. & Gibs., Bomb. Fl. 178, 1861.

Bramia monnieri Pennell, in Proc. Acad. Nat. Sci. Philad. 71 : 243, 1920.

Common in stagnant water or in damp soil ; abundant in ditches near the railway station and in shallow water in the village tank. It is a gregarious plant, and due to its creeping habit, it soon covers large surfaces in the tank or ditches. Flowers are not showy, but the erect habit of the branches and the colour and shape of the leaves make a clump of these plants rather pleasing.

Local name : Brami.

Flowers and *Fruits*.—Practically the whole year.

Kanitkar ; Blatt. Herb. 1674 ! *Santapau* 145/33 ! 868 ! 1680 ! 3025 ! 3344 ! 4523 !

STEMODIA Linn.

Stemodia viscosa Roxb., Pl. Cor. 2 : 33, t. 163, 1798 ; FBI. 4 : 265 ; Gr. 143 ; D. & G. 176 ; Wight, Icon. t. 1408 ; C. 2 : 288 ; G. 949 ; Santapau 32.

The whole plant with the exception of the corolla is viscidly and glandular pubescent. A rare plant in Khandala.

Flowers and *Fruits*.—April to October.

Santapau 3004 ! 3119 ! 4161 !

LIMNOPHILA R. Br.

Limnophila indica (Linn.) Bruce in Rep. Bot. Exch. Club Brit Is. 3 : 420, 1914 ; Pennell, Scroph. West. Himal. 26 ; Santapau 34.

Hottonia indica Linn., Syst. Nat. (ed. 10) 919, 1759.

Limnophila gratioloides R. Br., Prodr. 442, 1810 ; FBI. 4 : 271 ; Gr. 143 ; D. & G. 177 ; C. 2 : 291 ; G. 952.

L. racemosa Benth., Scroph. Ind. 26, 1835 ; FBI., C., G., 11. cc.

The identification of the two species *L. racemosa* and *L. gratioloides* has always been a source of difficulty ; to me they are identical, neither the pubescence nor the size of the plant nor the strong turpentine odour being constant characters of any species in particular. See Santapau, loc. cit.

Common in Khandala, in the village tank and elsewhere in stagnant water. The more common form is that with aerial entire leaves either opposite or in 3's, the submerged leaves being capillaceo-multifid; when the tank level begins to go down, a number of plants appear which correspond to *L. myriophylloides* Roth (=var. *myriophylloides* of *L. gratioloides*); such forms seem to be due not so much to specific distinctions as to the environment in which they grow.

Flowers and *Fruits*.—October to February.

Blatt. Herb. 1839 ! 1838 ! 22497 ! 22498 ! 22499 ! 28536 ! *Santapau* 1137 ! 1216 ! 3022 ! 3023 ! 3024 ! 3346 ! 3363 ! 5274 ! 5275 ! 5417 ! 5453 ! 6002 ! 6003 ! 6047 !

Dopatrium Buch.-Ham.

Dopatrium junceum (Roxb.) Buch.-Ham. ex Benth., Scroph. Ind. 31, 1835; FBI. 4 : 274; Gr. 142; D. & G. 178; C. 2 : 292; Blatt. & Hallb. in JBNHS. 25 : 425; G. 954; Santapau 35.

Gratiola juncea Roxb., Pl. Cor. 2 : 16, t. 129, 1798.

An elegant, fleshy herb, up to 40 cms. long, simple or much branched from near the base, with long internodes and few and small leaves. Flowers minute, inconspicuous, light purple or violet.

A rare plant in Khandala; for several years this plant was only seen among grasses near the village tank and along the old railway line near the station; in 1949 and 1950 two tanks were discovered in the grounds of St. Xavier's Villa the surface of which was practically covered with the branches of this plant. When growing among grasses this plant is not easy to distinguish.

Flowers and *Fruits*.—August to October.

Santapau 6978-6979 ! 7455-7457 ! 10448-10453 !

Torenia Linn.

Torenia cordifolia Roxb., Pl. Cor. 2 : 32, t. 161, 1798; FBI. 4 : 276; Gr. 144; D. & G. 180; C. 2 : 292; Blatt. & Hallb. 422; G. 956; Pennell, Scroph. West. Himal. 32; Santapau 35.

A rare plant in Khandala; I have found it only on one occasion; there are no other specimens in Blatt. Herb. from the district. In my field book I noted at the time that the flowers are 2-lipped, the corolla tube purple, the lobes whitish and the wings of the calyx so large that the calyx is much broader than long.

A small herb growing on grassy slopes at the foot of Echo Point near the main village path. Not seen elsewhere in Khandala.

Flowers.—October 1943.

Santapau 2874 !

LINDERNIA All.

Lindernia crustacea (Linn.) F. Mueller, Cens. Austr. Pl. 97, 1882; Pennell 29; Mukerjee in JIB. 24 : 130; Santapau 37.

Capraria crustacea Linn., Mant. 87, 1767.

Vandellia crustacea Benth., Scroph. Ind. 35, 1835; FBI. 4 : 279; Gr. 144; D. & G. 180; Wight, Icon. t. 863; C. 2 : 295; Blatt. & Hallb. 420; G. 959.

Common in open grass lands, especially on moist paths during the monsoon and post-monsoon period. A rather elegant plant.

Flowers.—August to October. *Fruits.*—September to October.

Blatt. Herb. 1744 ! 1746 ! 1747 ! 29660 ! *Santapau* 145/9 ! 726 ! 5056 ! 6865 ! 6889 !

Lindernia viscosa (Willd.) Merrill, Enum. 3 : 439, 1923; Santapau 37.

Hornemannia viscosa Willd., Enum. Pl. Berol. 654, 1809.

Vandellia hirsuta Buch.-Ham. ex Benth., Scroph. Ind. 36, 1835; FBI. 4 : 280; D. & G. 179; C. 2 : 295; Blatt. & Hallb. 421.

Lindernia hirsuta Wetstt. in Pfam. 4 (3 b) : 79, 1895; Mukerjee 131.

A rare plant in Khandala; I have found it only on one occasion, and have seen no other specimen from the district in the various herbaria consulted.

Flowers and *Fruits.*—May 1944.

Santapau 4162 !

Lindernia hyssopioides (Linn.) Haines, Bot. Bih. & Or. 635. 1922; Mukerjee 132; Santapau 38.

Gratiola hyssopioides Linn., Mant. 174, 1767.

Ilysanthes hyssopioides Benth. in DC., Prodr. 10 : 419, 1846; FBI. 4 : 283; D. & G. 179; C. 2 : 296; Blatt. & Hallb. 419; G. 961.

Bonnaya hyssopioides Benth., Scroph. Ind. 34, 1835; Gr. 143.

This plant I find difficult of identification; it is very nearly allied to *L. parviflora*, if at all distinct from it; the size of the corolla in relation to the calyx is of little help, as one often finds large and small corollas on one and the same plant. I do not feel confident in assigning the plants listed below to this species, in spite of Blatter's authority for the first two specimens.

See Blatt. & Hallb. for a key to the species of *Ilysanthes* of Bombay. The colour of the corolla may be of help, but then plants belonging to this family are so very variable in their colours that little reliance can be placed on them for the purposes of identification.

Flowers and *Fruits.*—August to October.

Blatt. Herb. 1527 ! 1528 ! *Santapau* 2894 ! 6874 !

Lindernia parviflora (Roxb.) Haines, Bot. Bih. & Or. 635, 1922; Pennell 29; Mukerjee 132; Santapau 38.

Gratiola parviflora Roxb., Pl. Cor. 3 : 3, t. 203, 1819.

Ilysanthes parviflora Benth. in DC., Prodr. 10 : 419, 1846; FBI. 4 : 283; C. 2 : 296; Blatt. & Hallb. 420; G. 961.

Bonnaya hyssopioides Wight, Icon. t. 857 (non Benth.).

Common at all times of the year, on moist ground. Flowers are small and inconspicuous; but the plant seems to be very resistant to drought, as it is able to thrive even in rice fields during the months of April and May, at which time this is one of the few plants alive in such fields.

Flowers and *Fruits*.—August to November everywhere; the whole year in moist spots.

Blatt. Herb. 1537 ! 1538 ! 1539 ! 17732 ! *Santapau* 475 ! 3002 ! 3036 ! 3093 ! 3120! 3347 ! 3473 ! 4367 ! 4368 ! 8766 !

Lindernia ciliata (Colsm.) Pennell, in JAA. 24 : 253, 1943; Mukerjee 133; Santapau 39.

Gratiola ciliata Colsmann, Prodr. Descr. Grat. 14, 1793.

Bonnaya brachiata Link & Otto, Icon. Pl. Sel. 25, t. 11, 1820; FBI. 4 : 418; Gr. 143; D. & G. 178; C. 2 : 297; Blatt. & Hallb. 418.

This is one of the commonest plants of this family in Khandala during the monsoon and post-monsoon periods; on footpaths in St. Xavier's Villa it is one of the earliest and most persistent of the monsoon plants coming into flower when the stem is just above ground. The smallest specimen in my collection measures but 13 mm. long, and it bears one flower and two pairs of leaves; smaller specimens have been observed, but their collection is rather difficult as such small specimens easily get lost in the usual vascula. An attractive and very delicate little plant.

Flowers.—July to November. *Fruits*.—August to November.

Blatt. Herb. 1507 ! 27407 ! *Santapau* 145/14 ! 655 ! 725 ! 2517 ! 2920 ! 4749 ! 5454 ! 6564 ! 6904 ! 6982 !

Lindernia anagallis Pennell, var. **grandiflora** (Retz.) Mukerjee, in JIB. 24 : 133, 1945; Santapau 39.

Gratiola grandiflora Retz., Obs. 4 : 8, 1786.

Bonnaya grandiflora Spreng., Syst. 1 : 41, 1825; Blatt. & Hallb. 418; Gr. 143; D. & G. 179.

B. veronicaefolia var. *grandiflora* Hook. f. in FBI. 4 : 285,1884; C. 2 : 298.

Fairly common in grass lands on paths, etc., during the rains; also fairly common in moist spots at other times of the year. Stems rather stout, somewhat fleshy below. I have found it actually growing in water in rice fields or near slow running streams.

Flowers and *fruits*.—Throughout the year.

Santapau 474 ! 2603 ! 3094 ! 3854 ! 4366 ! 6981 !

Lindernia sessiliflora (Benth.) Wetstt. in Pfam. 4(3b) : 79, 1895 ; Mukerjee 132 ; Santapau 40.

Vandellia sessiliflora Benth., Scroph. Ind. 37 1835 ; FBI. 4 : 282.

Bonnaya micrantha Blatt. & Hallb., loc. cit. 417, 1918.

An erect small herb ; stems 5-10 cms. high, with a few pairs of decussate leaves, occasionally branched from below, but generally simple. Stems and branches sharply quadrangular, almost winged, the angles being hairy with stiff hairs. Leaves subsessile, broadly ovate to sub-orbicular, subacute or obtuse, serrate, glabrous or with a few scattered hairs especially on the nerves beneath and on the edges, nerves 2-3 from the base of the leaf.

Flowers not seen in Khandala. Fruits from most of the axils, even from the lowest, solitary or several from the same axil ; pedicels 0 or very short ; calyx in fruit about 2-3 mm. long, divided to a little below the middle, split down one side to the base. Capsule elongate, ellipsoid, up to 6-7 mm. long, 2-2·5 mm. diam., acutely beaked with the remains of the style, 2-valved, the valves at dehiscence separating in the middle but remaining united at the tip. The capsule is typical, as before dehiscence it shows not only the outline of the seeds but even their sculpturing. Seeds numerous, very minute, brownish, ovoid, longitudinally obscurely ribbed, transversely rugose or punctate.

The above notes were taken on examination of my own specimens and agree very closely with the description of the new species published by Blatter and Hallberg. Dr. S. K. Mukerjee kindly examined the type of Blatt. and Hallb.'s species, and compared it with *Vandellia sessiliflora* Benth. and found that both sheets referred to the same species. Recently I have had occasion to compare the types of both species in Kew Herb. and am satisfied that both are one and the same species ; in consequence Blatter and Hallberg's name must be consigned to the synonymy of Bentham's species.

Fruits.—August to October.

Blatt. Herb. 29680 ! *Santapau* 727 ! 777 ! 2922 ! 5048 ! 5457 !

Buchnera Linn.

Buchnera hispida Buch.-Ham. in D. Don, Prodr. Fl. Nep. 91, 1825 ; FBI. 4 : 298 ; D. & G. 182 ; Wight, Icon. t. 1413 ; C. 2 : 301 ; G. 966 ; Pennell 95 ; Santapau 42.

A fine herb, in Khandala always found growing among grasses ; but I have not been able to prove the parasitic connection between this plant and [illegible] grasses. Normally it is an unbranched herb, erect and keeping pace in its growth with surrounding grasses ; when, however, the main stem has been damaged, most of the buds in the axils of leaves near the seat of damage produce long, simple branches. The whole plant is hispid with stiff hairs. A common plant in Khandala, freely flowering and fruiting from October to March, although the best time for its growth seems to be the end of the monsoon.

Flowers and *Fruits*.—October to March.

Cooke; Blatt. Herb. 27642 ! 28268A ! *Santapau* 1197 ! 2796 ! 2963 ! 3005 ! 3033 ! 3034 ! 3818 ! 5364 ! 8066 !

STRIGA Lour.

Striga gesneroides (Willd.) Vatke ex Engl., Abhandl. Preuss. Akad. Wiss. 28, 1894; Pennell, Scroph. West. Himal. 97; Santapau 42.

Buchnera gesneroides Willd., Sp. Pl. 3 : 338, 1801.

Striga orobanchioides Benth. in Comp. Bot. Mag. 1 : 361, t. 19, 1836; FBI. 4 : 299; D. & G. 181; Wight, Icon. t. 1414; C. 2 : 302; G. 967.

In Khandala (and Purandhar, Poona Dt., where the plant is abundant) I have always found this plant parasitic on *Lepidagathis*, usually on *L. cuspidata*, on one occasion on *L. trinervis*. On drying, all parts of the plant turn black, even those that were green on the fresh plant.

Flowers and *Fruits*.—October to January.

Santapau 2792 ! 2793 ! 5487 ! 5488 ! 5901 !

Striga geaneroides var. **minor** Santapau, in Kew Bull. 1948: 491, 1949 & in JBNHS. 49 : 43.

The following is the translation of the original description : " Similar to *S. gesneroides* Vatke, from which it differs in the following points : This new variety is a parasite on the roots of *Hygrophila serpyllum* Anders. and so affects the host that *Hygrophila* only comes into flower or fruit much later, and the number of flowers or fruits is much smaller; rarely, however, does the parasite entirely cause the suppression of them. At the flowering time this new variety is 1·8-8·5 cms., including the underground parts, so that small specimens scarcely appear above ground. The flowers are much smaller than in the typical species, generally 2·5—3·5 mm. diam. The bracteoles below the flowers are either totally glabrous or only sparsely and minutely ciliolate. Branching of stems is either altogether absent or very rare. The colour of the whole plant is generally purple, and the flowers purplish; not seldom however one finds green plants with white flowers; on drying all the plants turn black or very dark.

The type, Santapau 3072, the isotype 3073, and the paratypes 3416, 3417, 3418, 3438, 3451, 5051, 5462 collected in Khandala are kept in Blatt. Herb., Bombay; other paratypes 3477 and 3545 collected at the same place have been placed in Herb. Kew and in the Arn. Arb., U. S. A."

A common plant in Khandala, but easily missed on account of its small size, often it scarcely appears above ground. The white-flowered plants I have found scattered among numerous purple ones in a rice field near Kune Katkari Settlement. There seem to be no hybrids or intermediate forms between the two plants, to judge from the colour of the flowers.

Flowers and *Fruits*.—October to January.

Striga asiatica (Linn.) Kuntze, Rev. Gen. Pl. 466, 1891; Merrill in Trans. Amer. Phil. Soc., N.S., 24(2) : 353, 1935; Santapau 43.

Buchnera asiatica Linn., Sp. Pl. 630, 1753.

Striga lutea Lour., Fl. Coch. 22, 1790; FBI. 4 : 299; C. 2 : 303; G. 968; Pennell 96.

Striga hirsuta Benth. in DC., Prodr. 10 : 502, 1846; D. & G. 181.

A common plant in grass fields, occasionally also in cultivated fields, but nowhere abundant. The 10-ribbed calyx is a distinguishing feature of this species.

Flowers and *Fruits*.—September to November.

Bhiva; Blatt. Herb. 1701 ! 1702 ! 27418 ! *Santapau* 145/10 ! 837 ! 2551 ! 2794 ! 2923 ! 5205 ! 5416 ! 7473 !

Striga asiatica var. **albiflora** Kuntze, Rev. Gen. Pl. 466, 1891; Santapau 44.

Striga lutea Lour., Hook., Cooke, Gamble, pro parte, *loc. citatis.*

Erect, much more vigorous than the usual yellow variety. Stems 15-30 cms. high, seldom simple, often much branched, more densely strigose than the yellow variety. Lower leaves small, scale-like, those of the middle of the stem much longer, bract-like.

Flowers in lax spikes up to 22 cms. long; bracts up to 31×3 mm., 1-3 nerved, acute; bracteoles 3-5 mm. long, subulate, strigose. Calyx 10-ribbed, 6-7 mm. long in flower and narrow, widening in fruit; corolla pure white, generally slightly larger than that of the yellow variety; tube pubescent with minute stiff hairs; lobes pubescent or puberulous like the tube. Capsules very finely punctate; seeds very numerous, minute, faintly longitudinally or spirally striate or smooth.

As a variety of *S. asiatica* this is quite a distinct plant, as it differs from the typical plant in the colour of the flowers, the size of the whole plant and especially the size of the leaves and bracts.

A common plant in Khandala, usually parasitic on the roots of *Eleusine coracana* Gaertn.; the host plant suffers much from the attacks of the parasite, often failing to come into flower or fruit and the whole plant being much reduced in size. Farmers in Khandala pay little attention to such pests, even when they have been instructed on the methods of dealing with the pest; in consequence some of their fields are so poor, that they scarcely make cultivation a paying proposition.

Flowers and *Fruits*.—October and November, 1944.

Santapau 5201-5204 ! 5456 !

Striga densiflora Benth. in Comp. Bot. Mag. 1 : 363, 1836; FBI. 4 : 299; D. & G. 181; C. 2 : 303; G. 967; Santapau 43.

Buchnera densiflora Benth., Scroph. Ind. 41, 1835.

The occurrence of this plant in Khandala is given on the authority of Cooke and Blatter; I have not seen the plant in the district or in any of the herbaria consulted. The plant looks very similar to *S. asiatica* var. *albiflora*, but is typically distinguished by the number of ribs of the calyx, which in the present species is always 4-5.

Cooke ; Blatter in MS. catalogue.

Striga euphrasioides (Vahl.) Benth. in Comp. Bot. Mag. 1 : 364, 1836 ; FBI. 4 : 299 ; Gr. 145 ; D. & G. 181 ; C. 2 : 303 ; G. 968 ; Pennell 96; Santapau 44.

Buchnera euphrasioides Vahl, Symb. Bot. 3 : 81, 1794 ; Wight, Icon. t. 855.

Hallberg in MS. catalogue.

Striga sulphurea D. & G. 182, 1861 ; FBI. 4 : 300 ; C. 2 : 304 · Santapau 44.

Hallberg in MS. catalogue.

RHAMPHICARPA Benth.

Rhamphicarpa longiflora (Arn.) Benth. in Comp. Bot. Mag. 1 : 368 , 1836 ; FBI. 4 : 300 ; Gr. 145 ; D. & G. 182 ; Wight, Icon. t. 415 ; C. 2 : 304 ; G. 969 ; Santapau 44.

Buchnera longiflora Arnott, in Nov. Act. Nat. Cur. 18 : 356, 1836.

A very elegant plant, always found in grass fields. Flowers open in the evening and remain open throughout the night up to about 9 a.m.; if the day be cloudy, they may remain open till about noon. On numerous occasions I have observed them fully open at about midnight. This plant may be a root parasite living on grasses ; but I am unable to prove or disprove this point from my observations in the field.

Flowers.—August to November. *Fruits*.—September to November.

Kanitkar ; Cooke ; Blatt. Herb. 1802 ! 1803 ! 27631 ! *Santapau* 145/3, 7, 8, 11 ! 911 ! 936 ! 2442 ! 2553 ! 4849 ! 5071 ! 6905 !

SOPUBIA Buch.-Ham.

Sopubia delphinifolia (Roxb.) G. Don., Gen. Syst. 4 : 560, 1837 ; FBI. 4 : 302 ; Gr. 145 ; D. & G. 182 ; C. 2 : 305 ; Blatt. & Hallb. 428 ; G. 970 ; Santapau 45.

Gerardia dephinifolia Roxb., Pl. Cor. 1 : t. 90, 1795.

A very variable plant ; for the various forms, see Blatt. & Hallb. *loc. cit.* In cultivated fields or grassy lands from September to December ; it is possibly a root parasite of grasses. Fairly common and an elegant plant. " This is one of the prettiest of Indian wild annuals." (Graham).

Flowers and *Fruits*.—September to December.

Graham ; Kanitkar ; Blatt. Herb. 1775 ! 27637 ! 28268 B ! 29563 ! *Santapau* 145/12 ! 885 ! 1119 ! 2552 ! 3037 ! 3481 ! 5407 ! 5455 !

CENTRANTHERA R. Br.

Centranthera nepalensis D. Don, Prodr. Fl. Nep. 88, 1825 Pennell 93 ; Santapau 46.

C. hispida Graham, Cat. 145, 1839 ; D. & G. 182 ; FBI. 4 : 301 ; C. 2 : 308.

A variable plant, 12-32 cms. high ; stems simple or sparely branched above, hispid with stiff spreading hairs from bulbous bases. Leaves about the middle of the stem are the largest, those above or below diminishing gradually, all about elliptic-oblong in shape.

Flowers axillary or in terminal spikes ; bracteoles up to 6 mm. long, linear lanceolate. Calyx up to 8-9 mm. long, ovoid, split down one side, the other side entire or with 3-5 short lobes or teeth. Corolla infundibuliform, straight or slightly incurved in the tube ; the following variations have been recorded in Khandala as regards the colour of the corolla : (*a*) The commonest colour is pale red in the limb, deep red with a touch of purple in the tube. (*b*) Uniform deep purplish red. (*c*) Uniform white or creamy white. (*d*) White in the limb, very pale pinkish in the tube. These variations were recorded on one day in October 1944. On drying most of the flowers turn reddish or brick red. Capsules enclosed in the persistent and enlarged calyx, up to 9×8 mm. Seeds numerous, straw-coloured, strongly and spirally reticulate.

A pretty plant, always found in Khandala among grasses ; it may be a root parasite, but I am unable to prove or disprove this point satisfactorily.

Flowers and *Fruits*.—October to November.

Blatt. Herb. 27988 ! 28229 ! 29561 ! *Santapau* 1279 ! 2862 ! 2908 ! 2909 ! 3116 ! 5234 ! 7472 !

MAZUS Lour.

Mazus sp. (an *McCannii* Blatt. & Hallb. ?)

My specimen seems to agree with the description of the plant given by Blatt. & Hallb. in JBNHS. 25 : 423, 1918. The following notes were taken with the fresh specimen in view, soon after collecting it : " Leaves opposite, petiolate, but the blade is decurrent to the base of the petiole ; glabrous but for a few hairs at the edge of the blade ; punctate. Stems and inflorescence hairy. Inflorescence terminal on the main stem and branches. Flowers pedicelled ; ovary superior in relation to calyx. Calyx with 5 segments which are equal in length to the tube. Corolla 2-lipped ; upper lip 3-lobed, lateral lobes twice as large as the midlobe. There are two raised processes or bullae on the midlobe, spotted yellow, hairy. Stamens 2+2, unequal in length by pairs, all included. Fruit seems to be a capsule included in the calyx, compressed. Stems, etc., triangular. General colour of the flower purplish. Filaments without appendages at the base."

This plant has been found only once ; the plant is decidedly one of the Scrophulariaceae, and seems to be a *Mazus*.

Flowers and *Fruits*.—January 1945.

Santapau 5907 !

SCOPARIA Linn.

Scoparia dulcis Linn., Sp. Pl. 116, 1753 ; FBI. 4 : 289 ; C. 2 : 310 ; Blatt. & Hallb. 426 ; G. 964 ; Pennell 22 ; Santapau 47.

An American plant introduced in India and spreading very rapidly ; for the distribution of the plant, see Blatt. & Hallb., *loc. cit.* Flowers white ; stems woody below.

Rare in Khandala, but spreading. It is very common all over Bombay and Salsette Islands ; the railway line and main road seem to be the means of distribution.

Flowers and *Fruits*.—September 1944.

Santapau 4846 !

OROBANCHACEAE.

AEGINETIA Linn.

Aeginetia indica Linn., Sp. Pl. 632, 1753 ; FBI. 4 : 320 ; Gr. 146 ; Wight, Icon. t. 895 ; D. & G. 202 ; C. 2 : 311 ; G. 974 ; Beck-Mannag. in Pfreich. 96 : 17, t. 3 A-D.

Orobanche Aeginetia Linn., Sp. Pl. 883, 1763.

A fairly common parasite in Khandala ; I have found it generally in dense jungle, or under dense clumps of mixed trees or shrubs, and in consequence am unable to state the name of the host plant. It is not an easy plant to find in the jungle, due to the dark colour of the whole plant and to the dim lighting of its favourite habitats.

Flowers.—August to October. *Fruits*.—September to October.

Graham ; Blatt. Herb. 29673 ! *Santapau* 548 A! 902 ! 1028 ! 2412 ! 2631 ! 4813 !

Aeginetia indica Linn. var. **alba** Santapau in Kew Bull. 1948 : 491-492, 1949.

The following is the translation of the original description : " Similar to the typical species, but differing in the colour of the corollas, which is completely white, that of the calyx and scape being yellowish or straw-coloured, and all the parts of the plant being somewhat smaller.

An erect herb, annual (?), small, conspicuous especially on account of the colour of the flowers and scape ; the scape and calyx are pale orange or yellowish green or straw-coloured ; the corolla is uniformly white ; the stamens and stigma yellow or creamy. On drying the whole plant becomes black. In size this new variety is about 2/3 of the typical species.

The type, Santapau 2412, was collected in Khandala on the 21st

August 1943 and placed in Blatt. Herb., Bombay; the paratypes 4812, 4955 and 4956 have been placed in Blatt. Herb., Kew Herb., and Arn. Arbor., U. S. A., respectively."

Flowers and Fruits.—September to October.

Santapau 4812 ! 4955 ! 4956 ! 10272 !

At the beginning of September 1949 I visited the spot where the type had been collected in 1943, and found that the plant had spread to an area of about 20 × 10 m.; there were literally hundreds of specimens in flower and fruit within that area, and nowhere was any of the typical purple plants to be seen.

Aeginetia pedunculata (Roxb.) Wall., Pl. As. Rar. 3 : 13, t. 219, 1832; FBI. 3 : 320 (excl. syns.); Wight, Ill. 1 : 11, t. 158 b, & Icon. t. 1421; G. 974; Beck-Manag. 18, t. 3E; Santapau in JBNHS. 45 : 447.

Orobanche pedunculata Roxb., Hort. Beng. 45, 1814 & Fl. Ind. 3 : 29, 1839.

The occurrence of the plant in Bombay Presidency is not mentioned by Cooke; there are no specimens from Bombay in Kew Herb. I have found it on numerous occasions in Khandala; for a full description of the plant, see Santapau, *loc. cit.*

Generally a root parasite growing on grasses; the hosts on which I have found it are *Themeda* sp. and *Sehima nervosum* Stapf. It is found on the slopes leading to Behran's Plateau, on the grassy slopes near Monkey Hill and near the top of Bhoma Hill.

Flowers.—August to October. *Fruits.*—September to October.

Santapau 1007 ! 2605 ! 2606 ! 2607 ! 2774 ! 2775 ! 2799 ! 5038 ! 7429 ! 10236 !

CHRISTISONIA Gardn.

Christisonia lawii Wight, Icon. t. 1427, 1849; FBI. 4 : 322; D. & G. 202; C. 2 : 312; Beck-Manag. 313.

Parasitic on the roots of *Carvia callosa* Bremek. Not common.

Flowers and Fruits.—August 1945, 1949.

Santapau 6957 ! 10138 !

Christisonia calcarata Wight, Icon. t. 1426, 1849; FBI. 4 : 322; C. 2 : 312; Beck-Manag. 312.

C. Stocksii Hook., Icon. t. 836 (fide Cooke); D. & G. 202.

Common in Khandala, always parasitic on the roots of *Carvia callosa* Bremek.; on the slopes of Echo Point this plant is so common that there is scarcely a specimen of *Carvia* without its parasite. Flowers are rather showy, but the plant as a whole is somewhat inconspicuous due to the fact that it is almost hidden under the ground; when present it occurs in rather dense clumps, 15 or more cms. in diam., and each clump shows flowers or fruits in various stages of development.

Flowers.—July to August. *Fruits.*—August.

Blatt. Herb. 22557 ! 22779 ! *Santapau* 427A ! 622 ! 2271 !

LENTIBULARICEAE.

UTRICULARIA Linn.

Utricularia uliginosa Vahl, Enum. 1 : 203, no. 25, 1804 ; G. 981 ; Santapau in JBNHS. 49 : 218.

U. affinis Wight, Icon. t. 1580, f. 1, 1850 ; Oliver in JLS. 3 : 178 ; FBI. 4 : 330 ; Gobel in Ann. Jard. Bot. Buitenz. 9 : 73, f. 19-21 ; C. 2 : 318.

U. decipiens Dalz. in Kew Journ . Bot. 3 : 279, 1851.

Small, glabrous herbs. Leaves with much fewer bladders than those of *U. arcuata* Wight ; bladders do not turn black on drying. Sepals broadly ovate to suborbicular, the lower sepal occasionally notched at the apex. Corolla purplish blue or violet, occasionally very pale almost white ; the lower lip has a prominent bullate process in the centre near its base and such a process is much paler in colour than the rest of the petal ; spur straight or nearly so, fairly stout.

A rare plant in Khandala ; it occurs in grass fields or on grassy slopes, or in general in places not so exposed to floodding as those frequented by other terrestrial species in Khandala.

Flowers.—July to October. *Fruits.*—September to October.

Gobel, loc. cit. ; *Blatt. Herb.* 22555 ! 22787 ! 28192 ! 28193 ! *Santapau* 499A ! 4816 ! 4857 ! 6863 !

Utricularia arcuata Wight, Icon. t. 1571, f. 1, 1850 ; FBI. 4 : 330 ; D. & G. 136 ; C. 2 : 318 ; G. 981 ; Santapau 218.

A very striking plant, one of the largest-flowered among the *Utricularias* of Khandala and abundant in large patches. On several occasions I have observed the plant growing epiphytically in the same fashion as *U. striatula* does ; as a rule, however, this plant seems to favour rocky ground with plenty of surface water. Very common in Khandala.

Flowers.—August to October. *Fruits.*—September to October.

Blatt. Herb. 29674 ! 29675 ! *Santapau* 500A ! 573(2)A ! 736 ! 873 ! 924 ! 942 ! 1016 ! 2512 ! 2815 ! 4856 ! 5039 ! 9287 !

Utricularia reticulata Smith, Exot. Bot. 2 : t. 119, 1805 ; FBI. 4 : 331 ; D. & G. 135 ; Wight, Ill. t. 143 ; Oliver 180 ; Gobel 79, f. 80-83 & 86 ; C. 2 : 319 ; G. 981 ; Santapau 219.

U. graminifolia Graham, Cat. 165, 1839 (non Spreng.).

A gregarious plant, twining among grasses or other small herbs or in the absence of other support several strands may twine together to form a fairly stout rope-like mass of as many as 12 strands, the resulting structure being erect or suberect. A very elegant herb. The colour of the flowers as illustrated in Smith, Exot. Bot. t. 119, is rather poor and scarcely represents the bright colours of the original.

Flowers.—August to October. *Fruits.*—October.

Graham ; Blatt. Herb. 27562-27566 ! *Santapau* 3112 ! 5419 ! 6420 ! 6421 !

Utricularia reticulata Smith, var. **parviflora** Santapau in Kew Bull. 1948 : 491, 1949, & in JBNHS. 49 : 220, 1950.

The following is the translation of the original description : " Similar to *U. reticulata* Smith, from which it differs by the scapes, flowers and fruits being less than half in size. Scapes 6-12 cms. long, filiform, scandent ; bracts and bracteoles as in the typical species, but much smaller ; pedicels filiform, up to 9 mm. long, in fruit winged for the upper third ; calyx in flower 2-2·5 mm. long, broadly ovate, the upper sepal being a little larger than the lower one, both acute ; sepals accrescent in fruit, up to 6×4 mm. Corolla 6-8 mm. broad, the lower lip bullate, in structure and colour as in the typical species. Capsule 3-3·5 mm.

The type, Santapau 5422, was collected in Khandala on the 31st October 1944, and placed in Blatt. Herb., Bombay ; part of the same sheet was deposited in Kew Herb."

A gregarious little herb, growing in association with small grasses (*Dimeria diandra* Stapf, *Danthoniopsis griffithiana* Bor, etc.) and other small herbaceous plants (*Linum mysorense* Heyne, *Oldenlandia* sp., *Eriocaulon* sp., *Canscora diffusa* R. Br., etc.).

This plant has only been seen once in Khandala, on Behran's Plateau ; it was growing together with *U. reticulata* Smith ; the reduction of all the parts of the plants is very striking, as there were no intermediate forms between the two plants when this new variety was collected. The reduction cannot be said to be due to ecological conditions, as both plants grew on the same sort of soil and had about the same amount of water.

Flowers and *Fruits*.—October 1944.

Santapau 5422, type !

Utricularia striatula Sm. in Rees, Cyclop. 37 : no. 17, 1819 ; C. 2 : 320 ; G. 983 ; Santapau 220.

U. pusilla Graham, Cat. 165, 1839 (non Vahl).

U. orbiculata Wall., Cat. 1500, 1828 ; Oliver 187 ; FBI. 4 : 334 ; D. & G. 146 ; Gobel 53-60, ff. 28-36 & 68-70.

U. glandulifera Wight, Icon. t. 1581, 1850.

The following are the variations observed in the colour of the corolla : (*a*) The commonest colour is blue or bluish purple or rose with a yellow spot at the base of the lower petal ; (*b*) the outer edge of the lower petal lilac or bluish purple ; then there follows a ring of white surrounding a bright yellow spot which is near the base of the petal ; (*c*) the whole corolla is uniformly white with a yellow centre on the lower petal. The spur is slender, very acute, straight or nearly so, sometimes falcately curved, of the same colour as the rest of the corolla. Seeds glochidiate, the glochidia being as long as the seed is thick or a little longer.

This is the first *Utricularia* to appear in flower and the most abundant species in Khandala. On June 19, 1942, I recorded the presence of some flowers on the rocks near the railway station, the first rains of the season having fallen on the 12th in the evening.

Common and very abundant on rocks, tree trunks and old walls. When the plant grows on tree trunks, it grows together with several mosses, and on this account it is very difficult to collect the leaves and bladders; when it occurs on rocks, it covers large patches and is found in almost pure stands. A pretty and attractive little herb.

Flowers.—June to October. *Fruits.*—August to October.

Graham; Gobel; Woodrow; Cooke; Santapau 482A! 544! 782! 829! 836! 2478(2)! 4735! 4815! 6862!

GESNERIACEAE

KLUGIA Schl.

Klugia notoniana (Wall.) A. DC., Prodr. 9: 276, 1845; FBI. 4: 366; Wight, Icon. t. 1353 & Ill. t. 159 bis; Bot. Mag. t. 462; Clarke in DC., Mon. Phan. 5: 159; C. 2: 323; Santapau in JBNHS. 48: 490.

Wulfenia notoniana Wall., Tent. Fl. Nep. 46, 1826.

Klugia scabra Dalz. & Gibs., Bomb. Fl. 134, 1861.

The occurrence of this plant is given on the authority of Cooke; there are no specimens from Khandala in any of the herbaria examined. Externally the plant is rather similar to *Rhynchoglossum obliquum* Blum. and its var. *parviflora* Clarke; from either plant it may be distinguished by the larger flowers and the presence of a fairly large wing in place of one of the calyx ribs. In immature or small specimens it is only by the number of stamens that the two plants can be separated.

At the beginning of my exploration of Khandala I did take *Rhynchoglossum obliquum* var. *parviflora* for *Klugia*, and it seems to me that it is quite possible that other collectors may have also mistaken one plant for the other. For this reason I consider the presence of *Klugia* in Khandala as rather doubtful.

Cooke, loc. cit.

RHYNCHOGLOSSUM Blume.

Rhynchoglossum obliquum Blume, var. **parviflora** Clarke in DC., Mon. Phan. 5: 162, 1883, & in FBI. 4: 367; C. 2: 324; Santapau 491.

R. obliquum DC., Prodr. 9: 274, 1845, pro parte; Wight, Ill. t. 150 bis, f. 7; Clarke, Commel. & Cyrtandr. Beng. t. 88.

Common all over the district, on old walls, on rocks and occasionally on trees; gregarious, in damp, shaded places. An elegant herb, in which leaves and flowers are very pretty.

Flowers.—July to November. *Fruits.*—August to November (exceptionally to January).

Blatt. Herb. 22511! 22560! 22794! 29571! 29662! *Acland* 863! *Santapau* 566A! 776! 884! 1087! 2404! 2514! 2515! 2747! 2864! 2865! 4772! 5157! 5158!

BIGNONIACEAE

Oroxylum Vent.

Oroxylum indicum (Linn.) Vent., Dec. Gen. Nov. 9, 1808; FBI. 4 : 378; C. 2 : 327; G. 994.

Bignonia indica Linn., Sp. Pl. 625, 1753; Gr. 125.

Calosanthes indica Blume, Bijdr. 761, 1825; Wight, Icon. t. 1337, 1338; D. & G. 161.

Not common in Khandala. It is a difficult tree from which to collect flowers or fruits without damaging the whole tree; the inflorescence is terminal and often the stem breaks at the slightest attempt at climbing; the wood is very soft. A strange looking tree with an erect simple stem and very large leaves near the top. "When in flower, this tree has a most singular appearance" (Graham, loc. cit.). Locally no use is made of the wood or of the bark.

Local name : Tetu.

Flowers.—August to October. *Fruits.*—October to May.

Santapau 1081 ! 1476 ! 4628 ! 8686 !

Dolichandrone Seem.

Dolichandrone falcata Seem., var. **Lawii** (Seem.) Haines, in Bot. Bih. & Or. 658, 1922; G. 996.

Dolichandrone Lawii Seem. in Journ. Bot. 8 : 380, 1870; FBI. 4 : 380.

D. falcata Cooke, Fl. Pres. Bomb. 2 : 329, 1904 (non Seem.).

Bignonia spathacea Graham, Cat. 125, 1839 (non Roxb., nec Linn. f.).

Spathodea falcata Dalz. & Gibs., Bomb. Fl. 160, 1861 (non Wall.).

Generally a small and not particularly attractive tree, even when in flower; in the whole district I have seen but about 20 trees on the northern portion of Monkey Hill Plateau and along the railway line at the foot of Behran's Plateau. It grows on poor rocky ground. The ripe fruits usually remain on the tree throughout the winter and hot dry seasons, and may even stay on when the following season's flowers are in bloom. The largest tree in the district was cut down in June 1946, as it seemed to interfere with some electric or telephone lines along the railway line.

All the Khandala specimens belong to the var. *Lawii* (Seem.) Haines, which is the typical variety of the Western Ghats. It differs from the typical species in the glabrousness and shape of its leaflets, those of the typical species being pubescent and generally emarginate.

Flowers.—April to June. *Fruits.*—June onwards.

Graham ; Bhiva ; Santapau 495-497 ! 2000 ! 4460 ! 8703 ! 9096 !

HETEROPHRAGMA DC.

Heterophragma quadriloculare (Roxb.) K. Schum. in Pfam. 4(3*b*) : 243, 1895.

Bignonia quadrilocularis Roxb., Pl. Cor. 2 : 24, t. 145, 1798 ; Gr. 125.

Heterophragma Roxburghii A. DC., Prodr. 9 : 210, 1845 ; D. & G. 160 ; FBI. 4 : 381 ; C. 2 : 330.

A very common tree all over Khandala ; it seems to grow best on rocky ground or on sharp slopes ; it is leafless throughout the rains ; new leaves appear at the beginning of October and remain on the tree till the beginning of the flowering season of the following year, occasionally till the monsoon. The softness of the wood is very deceptive, as branches 15 cms. in diam. are unable to support a man's weight.

During the hot season many of the trees are heavily infected by a rust, *Santapauella Heterophragmae* Mundk. & Thirum., which attacks the leaves. For several years I have observed the development of the fungus and its effect on the infected trees ; the fungus does not extend to the inflorescence, but infected trees generally fail to produce any flowers.

On account of the greyish colour of the leaves, this tree stands out very clearly in dense forests. Graham, loc. cit., calls this " a large timber tree, used for a variety of purposes "; in Khandala, however, the wood is only used for fuel, it being too soft for any other practical purposes. During the rains the tree is leafless and supports a large number of orchids, among which the commonest are *Dendrobium barbatulum* Lindl. and *Aerides* sp.

Local name : Waras.

Flowers.—January to April. *Fruits.*—March to June.

Blatt. Herb. 19465 ! 22587 ! 22612 ! 27574 ! *Santapau* 1671-1674 ! 1943 ! 1944 ! 1955 ! 2195 ! 2196 ! 2207 ! 3245 ! 3246 ! 3678 ! 3679 ! 3680 ! 3905-3908 ! 3966 ! 4716 ! 9168 ! 9169 ! 9170 !

STEREOSPERMUM Cham.

Stereospermum personatum (Hassk.) Chatterjee, in. Bull. Bot. Soc. Beng. 2 : 70, 1948.

Dipterospermum personatum Hassk. in Flora 25(2), Beibl. 28 : 1842.

Stereospermum chelonoides auct., non nisi partim A. DC.

Not common in Khandala ; when growing in the open, it is but a small tree or large shrub ; in dense forest, it attains rather large proportions. The ripe fruits remain on the tree till long after the following year's flowers have come into bloom. After dehiscence the valves of the fruit may twist rather sharply.

For the question of nomenclature affecting this plant, see Chatterjee, loc. cit.

Local name : Padri.

Flowers.—April to June. *Fruits.*—April onwards.

Graham ; Woodrow ; Blatt. Herb. 28207 ! *Santapau* 302 ! 528 ! 1862 ! 1942 ! 4327-4330 ! 4430 !

RADERMACHERA Zoll. & Moritz.

Radermachera xylocarpa (Roxb.) K. Schum. in Pfam. 4(3b): 243, 1895 ; C. 2 : 333 ; G. 999 ; Chatterjee 72.

Bignonia xylocarpa Roxb., Fl. Ind. 3 : 108, 1832 ; Gr. 125 ; Wight, Icon. t. 1335-1336 ; D. & G. 159.

A small to middle-sized tree. Flowers appearing either before or at about the same time as the leaves ; on the only two occasions when I have seen this tree in flower in Khandala, it was in full bloom whilst the leaves were still very young.

The only place in Khandala where this tree has been observed is in the ravine below Echo Point, along the course of which there are several good specimens. Flowering takes place about the beginning of June, when the tree is bare of leaves or with but a few small ones. The tree is too rare in the district for any practical use to be made of its timber, etc. ; for the same reason I have been unable to find any local name.

Flowers.—June 1943 and 1946.

Santapau 2152 !

TECOMA Juss.

Tecoma stans (Linn.) H.B.K., Nov. Gen. & Spec. 3 : 144, 1819 ; Chatterjee 79 ; Bor & Raizada in JBNHS. 41 : 683, f. 1, tt. opp. pp. 683 & 684.

Bignonia stans Linn., Sp. Pl. (ed. 2) 871, 1763.

Stenolobium stans Seem. in Journ. Bot. 1 : 88, 1863 ; C. 2 : 335.

Occasionally seen in Khandala gardens ; not observed wild in the district.

Blatt. Herb. 236 ! *Santapau*, in gardens !

PEDALIACEAE.

SESAMUM Linn.

Sesamum indicum Linn., Sp. Pl. 634, 1753 ; FBI. 4 : 387 ; D. & G. 161 ; C. 2 : 338 ; G. 1002 ; Hiltebrandt, in Bull. Apl. Bot. & Pl. Breed. (ser. ix) 2 : 3-114, 1932.

S. orientale Linn., Sp. Pl. 634, 1753 ; Gr. 126 ; Merrill, Enum. 3 : 448.

A rare plant in Khandala ; it is not cultivated in the district. The only specimens collected in Khandala were found growing along the railway line, showing how the plant is being introduced into the district. Lower down on the Konkan plains this is a common plant during the rains, but it does not seem to climb higher than Thakurwadi, except occasionally. All my specimens are from the railway line at the foot of Behran's Plateau.

Local name : Til.

Flowers.—August to October, occasionally to February. *Fruits.*—November to February.

Santapau 2784 ! 5800 ! 6039 !

ACANTHACEAE.

THUNBERGIA Retz.

Thunbergia fragrans Roxb., Pl. Cor. 1 : 47, t. 67, 1795; FBI. 4 : 390 (excl. syn. Malay.); Gr. 163; D. & G. 183; C. 2 : 342; Bor & Raizada in JBNHS. 42 : 690, t. 4.

Contrary to what the specific name would indicate, the plant is scentless; only on one occasion did I detect any traces of perfume in the flowers of this plant.

Flowers are axillary and solitary; but on several occasions I have observed them coming out not singly but 5-6 in each axil, the pedicels being arranged fan-like in one plane with the stem, and usually one flower being in bloom at a time.

The size of the corolla is usually about 4·5 cms. diam.; some plants show corollas only 2·5 cms. diam., and may prove to be at least a new var., but more observations are required on this point.

Very common and showy during September to November; fruits are relatively rare, and this may be due to insect attack. This plant is particularly abundant about Convalescent Home and on the slopes below St. Xavier's Villla.

Flowers.—July to December. *Fruits.*—September to January.

Blatt. Herb. 22182 ! 24339 ! 17816 ! 28185 ! 28228 ! *Santapau* 408A ! 506A ! 809 ! 1178 ! 2788 !

Thunbergia grandiflora (Roxb. ex Rottl.) Roxb., Hort Beng. 45, 1814 & Fl. Ind. 3 : 34, 1832; FBI. 4 : 392; Gr. 163; Wight, Icon. t. 872; D. & G. Suppl. 70; Bor & Raizada 693, t. 8A.

Flemingia grandiflora Roxb. ex Rottl. in Ges. Naturf. f. Neue Schr. 4 : 202, 1803.

A very showy climber with large purplish blue flowers, with a white tube; cultivated in gardens and possibly run wild on the slopes behind St. Mary's Villa and elsewhere. Not common except in gardens.

Flowers.—September to April. *Fruits.*—October to December.

Blatt. Herb. 22180 ! *Santapau* 692 A !

CARDANTHERA Buch.-Ham.

Cardanthera anomala Blatter in JASB. (N.S.) 26 : 350, 1930.

I have not seen the plant in Khandala or in the Blatt. Herb. The occurrence of this plant is given on the authority of Blatter. From the description of the plant given by Blatter, it is very doubtful if the plant belongs to this genus at all; but in the absence of the actual type specimens it is scarcely possible to settle the position of the plant.

Blatter, loc. cit.

BLEPHARIS Juss.

Blepharis asperrima Nees in DC., Prodr. 11 : 267, 1847 ; FBI. 4 : 478 ; D. & G. 192 ; Wight, Icon. t. 1534 ; C. 2 : 349 ; G. 1013.

A common herb in the undergrowth of the forest, or on grassy banks with showy, though small, flowers ; abundant and gregarious.

Flowers and *Fruits*.—October to January.

Acland 894 ! *Santapau* 693A ! 1182 ! 2910 ! 3052 ! 5951 ! 8120 ! 9618-9620 ! 9800 !

ASTERACANTHA Nees.

Asteracantha longifolia (Linn.) Nees in Wall., Pl. As. Rar. 3 : 40, 1832 ; Wight, Icon. t. 449 ; D. & G. 189 ; C. 2 : 352 ; G. 1015.

Barleria longifolia Linn., Cent. Plant. II : 22, 1755, & Amoen. Acad. 4 : 320, 1759 ; Gr. 161.

Hygrophila spinosa Anders. in Thwait., Enum. 225, 1860, & in JLS. 7 : 22, 1864 ; FBI. 4 : 408.

Not common in Khandala, except in some ditches near the village tank and railway station. When growing under favourable conditions, the plant is rather attractive ; but often it emits an unpleasant odour, which may be due to the soil or stagnant water in which it grows.

Flowers.—October to February. *Fruits*.—November to February.

Hallberg in MS. catalogue ; *Blatt. Herb.* 28110 ! 27446 ! *Santapau* 1144 ! 5270 !

HYGROPHILA R. Br.

Hygrophila polysperma (Roxb.) Anders. in JLS. 9 : 456, 1867 ; FBI. 4 : 406 ; C. 2 : 353 ; G. 1015.

Justicia polysperma Roxb., Hort. Beng. 3, 1814, & Fl. Ind. 1 : 119, 1832.

Hemiadelphis polysperma Nees in Wall., Pl. As. Rar. 3 : 80, 1832 ; Wight, Icon. t. 1492.

Not common in Khandala ; it is one of the first to appear on the sides of the village tank when the level of the water goes down. In general appearance it is almost undistinguishable from *H. serpyllum* Anders. ; the number of seeds in the capsule and the more robust habit together with smaller flowers seem to be constant characters of this species as opposed to those of the following species.

Flowers and *Fruits*.—November to May.

Blatt. Herb. 27597 ! 28433 ! 28547 ! *Santapau* 3366 ! 3771 ! 8125 ! 8640 ! 10045 !

Hygrophila serpyllum (Nees) Anders., in JLS 9 : 456, 1867 ; FBI. 4 : 406 ; C. 2 : 354 ; G. 1016.

Physichilus Serpyllum Nees, in Hook. Comp. Bot. Mag. 2 : 311, 1837 ; D. & G. 184 ; Wight, Icon. t. 1493.

Very common in the whole district and very variable. Occasionally it grows as an erect plant up to 30 cms. high; at times it is found in running water forming dense mats over rocks. It is sometimes parasitized by *Striga gesneroides* var. *minor* Santapau, and under such conditions the plant seems to be prevented from flowering.

On several occasions I have found plants with pure white flowers growing in the same fields as the common purple-flowered plants; the white-flowered Hygrophilas require further study, and may prove to be a new species or at least a new variety.

Flowers and *Fruits*.--Throughout the dry months of the year.

Cooke; Blatt. Herb. 22964 ! 24051 ! 28537 ! *Santapau* 9 ! 150 ! 279 ! 330 ! 471 ! 1193 ! 1739 ! 1842 ! 2413 ! 3070 ! 3205 ! 3279 ! 3401 ! 3402 ! 3440 ! 3487 ! 3546 ! 3920 ! 4040 ! 4192 ! 4193 ! 4194 ! 4699 ! 4700 ! 4701 ! 4702 ! 5051 ! 5954 ! 5955 ! 5956 ! 5957 ! 8738 ! 8760 ! 8761 ! 8762 ! 8833 ! 9102 ! 9103 !

Hygrophila serpyllum var. **hookeriana** Clarke in FBI. 4: 407, 1884; C. 2: 354.

A prostrate or creeping plant with orbicular or reniform leaves, which are cordate at the base and strongly nerved with 5-7 pairs of nerves. Except for the shape of the leaves, the plant is entirely like the typical variety. In the field, however, I have had considerable difficulty in distinguishing this plant; the leaves are very variable and the orbicular and ovate types seem to be found on one and the same plant. I am inclined to consider the orbicular or reniform leaves as a juvenile stage of the normal plant.

Flowers.—November. *Fruits*.—November 1941, June 1946.

Santapau 740(2)A ! 1298 ! 3473 ! 9103 !

Dipteracanthus Nees, emend. Brem.

Dipteracanthus prostratus (Poir.) Nees, in Wall., Pl. As. Rar. 3: 81, 1832; Bremek. in Verh. Nederl. Ak. Wet. (II) 45(1): 16, 1948.

Ruellia prostrata Poir. in Lam., Encycl. 6: 349, 1804; FBI. 4: 411.

R. prostrata var. *dejecta* Clarke in FBI. 4: 412, 1884; C. 2: 355.

Hallberg's mention of this plant in his catalogue is my only authority for its inclusion; I have not seen it in the district nor in any of the herbaria examined.

Hallberg in MS. catalogue.

Hemigraphis Nees.

Hemigraphis latebrosa Nees var. **heyneana** Brem. in Mat. Mon. Strob. 139, 1944.

H. latebrosa Nees in DC., Prodr. 11: 723, 1847; FBI. 4: 423; Wight, Icon. t. 1504; C. 2: 358.

Ruellia elegans Bot. Mag. t. 4489, 1835; Gr. 162; D. & G. 186.

The following colours of the corolla have been noted in Khandala: (*a*) Pure white; rare; (*b*) White with a touch of pink; (*c*) Pale violet; (*d*) Deep purple blue; this is the commonest colour. There does not seem to be any relation between the colour of the corolla and the locality in which the plant grows; younger flowers are brighter in colour, older ones pass from deep blue to dull lilac, but white flowers remain constantly white.

A common plant in the undergrowth or in clearings in the forest, seldom seen in open country. The plant on drying remains bright green.

Flowers.—Throughout the dry season.

Cooke; Woodrow; Blatt. Herb. 22693 ! *Santapau* 15 ! 150 ! 3051 ! 3087 ! 3436 ! 3875 ! 3876 ! 5942 ! 8656 !

PETALIDIUM Nees.

Petalidium barlerioides (Roth) Nees in Wall., Pl. As. Rar. 3: 82, 1832; FBI. 4: 416; D. & G. 185; C. 2: 359; G. 1021.

Ruellia barlerioides Roth, Nov. Pl. Sp. 319, 1821.

R. bracteata Roxb., Fl. Ind. 3: 47, 1832; Gr. 162.

The occurrence of this plant is given on the authority of Blatter in his MS. catalogue; in the Blatt. Herb. there is a specimen, 22655, collected in March, 1917, which has been labelled as belonging to the present species, but the specimen is actually a fruiting, leafless branch of *Barleria Lawii*. I have searched for this plant for several years without success; in view of the evidence I consider its occurrence in Khandala as rather doubtful.

Blatter in MS. catalogue.

PHAULOPSIS Willd., emend. Spr.

Phaulopsis dorsiflora (Retz.) Santapau in Kew Bull. 1948: 276, 1948.

Ruellia dorsiflora Retz., Obs. 6: 31, 1791.

Micranthus oppositifolius Wendl., Bot. Beobacht. 39, 1798; C. 2: 360; G. 1022.

Aetheilema reniforme Nees in Wall., Pl. As. Rar. 3: 94, 1832; Wight, Icon. t. 1533; D. & G. 192.

Ruellia imbricata Forsk., Fl. Aeg.-Arab. 113, 1775; Gr. 162.

Phaulopsis imbricata Cordem., Fl. Ile Reun. 496, 1895 (non Sweet, 1827).

A specimen in Blatt. Herb., No. 22960 of May, 1917, is labelled as *Micranthus oppositifolius*, but is too imperfect a specimen for exact determination, as it has neither flowers nor fruits. The plant is included on the authority of Hallberg.

Hallberg in MS. catalogue.

ERANTHEMUM Linn.

Eranthemum roseum (Vahl) R. Br., Prodr. 477, 1810; D. & G. 195; G. 1024.

Justicia rosea Vahl, Enum. 1 : 165, 1804.

Daedalacanthus roseus Anders. in JLS 9 : 487, 1867; FBI. 4 : 419; C. 2 : 363.

Common on grassy slopes or under the shade of trees towards the edges of the forest, seldom seen in open country; gregarious and rather showy when in full bloom.

Flowers.—November to April. *Fruits.*—December to May.

Cooke; Blatt. Herb. 27538! 28381! *Santapau* 1302! 1303! 1422! 3198! 3498! 3903! 5881!

NILGIRIANTHUS Brem.

Nilgirianthus reticulatus (Stapf) Brem. in Mat. Mon. Strob. 173, 1944.

Strobilanthes reticulatus Stapf in Kew Bull. 1894 : 347, 1894; C. 2 : 366.

Blatter in his MS. catalogue mentions this plant from Khandala; it is probable that he based himself on a specimen kept in Blatt. Herb. 28425, of October 1918. This specimen has no flowers and does not agree too well with Stapf's type sheet in Kew Herb.; I have, however, compared Blatter's specimen with all the species of "*Strobilanthes*" from Western India in Kew, and the present species seems to be the nearest to the Khandala sheet.

Blatter in MS. catalogue; *Blatt. Herb.* 28425 ?

MACKENZIEA NEES.

Mackenziea integrifolia (Dalz.) Brem. loc. cit. 182, 1944.

Endopogon integrifolius Dalz. in Kew Journ. Bot. 2 : 342, 1850; D. & G. 185.

Strobilanthes integrifolius O. Kuntze, Rev. Gen. Pl. 499, 1891; G. 1043.

Leptacanthus alatus Wight, Icon. t. 1527, 1850.

Strobilanthes perfoliatus Anders. in JLS 9 : 471, 1867; FBI. 4 : 458; C. 2 : 371; Santapau in JBNHS. 44 : 605, 1944.

On the 8th June 1946 I found a clump of these plants where new leaves were coming out of the old stems; this seems to suggest that the plants do not die after flowering, that is to say, they are not strictly "plietesials"; the previous year there had been a general flowering, but I could not make certain if the apparently dead stems had flowered previously.

A very gregarious plant, found scattered in clumps over the whole district; the plant has a peculiar "Lavender Blue" (Ridg. 61′ *b*) hue, and this together with the characteristic shape of the leaves is sufficient

for identification even in the absence of flowers or fruits. From the data collected in ten years, I am unable to fix the length of the period between two flowering seasons ; the local forest people cannot given any indication of the frequency of flowering.

Local name : Wáiti.

Flowers.—November to March. *Fruits.*—January to May.

Blatt. Herb. 36149 ! *Santapau* 152/4 ! 3042-3045 ! 3311 ! 3405-3407 ! 3666 ! 3667 ! 4275A ! 5781-5783 ! 5870 ! 5871 ! 5936-5939 !

THELEPAEPALE Brem.

Thelepaepale ixiocephala (Benth.) Brem., loc. cit. 188, 1944.

Strobilanthes ixiocephalus Benth. in Flora 32 : 557, 1849 ; FBI. 4 : 444 ; C. 2 : 372 ; Talb. 2 : 329 ; Santapau 605.

S. Neesiana Wight, Icon. t. 1523, 1850 ; D. & G. 188.

S. glutinosa Graham, Cat. 162, 1839 (non Nees).

Ruellia imbricata Graham, Cat. 162, 1839 (non Roxb.).

This plant has flowered every year from 1941 to 1946, with a peak in 1943-44 and 1944-45. I have not been able to decide whether the plant is truly one of the " plietesials ". Talbot, loc. cit., states that it flowers annually during the cold season, and my findings seem to confirm Talbot's view ; but whether the plant dies after flowering is a point that has yet to be settled in the field.

Very common and abundant in Khandala ; it is gregarious, and is found in large patches about half way down St. Xavier's Ravine, at an altit. of 500 m. ; it is also fairly abundant above Forbay and the Saddle, at an altit. 700-900 m. The scent of the oily substance exuded by the hairs is most penetrating and persistent.

Local name : Wáiti.

Flowers.—October to June. *Fruits.*—December to June.

Hallberg in MS. catalogue ; *Santapau* 185 ! 1324 ! 1744 ! 3209-3213 ! 3236-3239 ! 3548 ! 3549 ! 3787 ! 3788 ! 4275B ! 5250 ! 5388 ! 5389 ! 5784-5786 ! 5872 !

PLEOCAULUS Brem.

Pleocaulus ritchiei (Clarke) Brem., loc. cit. 185, 1944.

Strobilanthes sessilis Nees, var. *Ritchiei* Clarke in FBI. 4 : 452, 1884 ; C. 2 : 366.

S. sessiloides Dalz. & Gibs., 187 (non Wight), 1861.

Sedgwick labelled his specimen " *Strobilanthes sessilis* Nees " but this seems to be a mistake for the var. *Ritchiei*, since the typical species does not occur in Bombay.

Sedgwick 7991 !

CARVIA Brem.

Carvia callosa (Wall.) Brem. loc. cit. 187, 1944.

Strobilanthes callosus Wall., in Pl. As. Rar. 3 : 85, 1832; FBI. 4 : 451 ; D. & G. 188 (excl. descr. semin.); Kirtikar in JBNHS. 7 : 64, t. A ; Constable in Kew Bull. 1896 : 98 ; C. 2 : 368 ; Santapau in JBNHS. 44 : 605, & 49 : 320.

S. Graiana Wight, Icon. t. 1520, 1850 ; D. & G. 188.

S. ciliata Graham, Cat. 162, 1839 (non Nees).

This is the " King " of Khandala slopes covering very large areas almost to the complete exclusion of every other plant ; generally it grows in open country in pure formations, or in the undergrowth of the forest where trees are not too dense. The inflorescence is glabrous during the flowering period, but densely glandular hairy from December onwards. Seeds are shed and the parent plant decays at the beginning of the next rainy season. A very showy plant when in flower, and a great nuisance at all times. There was a general flowering in Khandala in 1943-44, covering the lower slopes ; in the rainy season of 1944 flowering extended to the rest of the district ; the year immediately before and the one after general flowering there was sporadic flowering in several parts of the district. In November 1948 a few plants were seen in flower on Bhoma Hill, in all about 30 plants ; on July 23, 1949 ,most of the plants on top of Bhoma Hill, southern portion, were covered with buds, apparently a more or less general flowering was being introduced.

Local name : Karvi.

Flowers.—August to November 1942, 1943, 1944, 1945, 1948, (1949 ?). (In my absence from India during 1946—1948, I was unable to obtain data for these years.) *Fruits.*—From December onwards till the rains, 1942-1945.

Constable, loc. cit.; *Blatt. Herb.* 28231 ! 28573 ! *Santapau* 791 ! 792 ! 839 ! 873 ! 895 ! 918 ! 1102(2) ! 1440 ! 2277 ! 2424 ! 3143 ! 3373 ! 3839 ! 4573 ! 4598 ! 4599 ! 4637 ! 4710 ! 4711 ! 4712 ! 4869 ! 5011 ! 5165 ! 5948 ! 7411 ! 9255 ! 9516-9520 ! 10146-10149 !

CALACANTHUS T. Anders.

Calacanthus grandiflorus (Dalz.) Radlk. in Sitz. Math.-Phys. Acad. Muench. 13 : 279, 1883.

Lepidagathis grandiflora Dalz. in Kew Journ. Bot. 2 : 138, 1850 ; D. & G. 190 ; Bedd., Icon. Pl. 54, t. 226.

Calacanthus Dalzelliana Anders. ex Benth. & Hook., Gen. Pl. 2 : 1088, 1876 ; FBI. 4 : 478 ; C. 2 : 373 ; G. 1044.

An elegant, shrubby plant, gregarious and growing in fairly dense clumps, with very distinct leaves, up to 1 m. high. Rather rare in the district, except on Behran's Plateau.

Flowers.—October to December. *Fruits.*—November to December.

Blatt. Herb. 28038 ! 28195 ! 28371 ! 29354 ! *Santapau* 3125 ! 3126 ! 3490 ! 3491 ! 9802-9805 ! 11684-11686 ! 11709 !

HAPLANTHUS Nees.

Haplanthus verticillatus (Roxb.) Nees in DC., Prodr. 11 : 513, 1847 ; FBI. 4 : 506 ; D. & G. 197 ; C. 2 : 375 ; G. 1053 (" *verticillaris* ").

Justicia verticillata Roxb., Fl. Ind. 1 : 135, 1832 ; Graham, 165.

Common in Khandala, often seen along the forest paths, or in forest clearings. When young the plant is leafy and rather attractive ; as the leaves fall off, the cladodes develop until the plant has a savage look. During the dry months of the year the plant grows gregariously in large clumps.

Flowers.—December to April. *Fruits.*—December to May.

Arbuckle ex Graham ; *Cooke ! Blatt. Herb.* 22646 ! 22861 ! 27503 ! *Santapau* 761A ! 298 ! 1341 ! 1424 ! 1425 ! 1461 ! 3207 ! 3532 !

Haplanthus neilgherryensis Wight, Icon. t. 1556, 1850 ; G. 1052.

H. tentaculatus var. *neilgherrensis* Clarke, in FBI. 4 : 507, 1884.

H. tentaculatus Nees in DC., Prodr. 11 : 513, 1847 ; C. 2 : 376, pro parte tantum.

This plant has been restored to specific rank by Gamble, and justly so. The inflorescence is not scattered through the plant, but is gathered in fairly dense spikes at the ends of the stem or branches.

Common during the dry months of the year ; when the flowers come out, most of the large original leaves have fallen off, so that the plant is then leafless or nearly leafless. At each node there may be two or more branches spreading out almost horizontally bearing a spike at their end, the spike being erect and nearly at right angles to the branch. Found in the undergrowth of the forest, by the sides of paths or in clearings, occasionally in open country.

Flower and *Fruits.*—February to May.

Blatt. Herb. 22826 ! 22831 ! 29535 ! *Santapau* 4297 ! 8694 !

Haplanthus tentaculatus var. **plumosa** (Anders.) Clarke, in FBI. 4 : 507, 1884.

H. plumosa T. Anders. in JLS 9 : 504, 1867.

H. tentaculatus Cooke, Fl. Bomb. Pres. 2 : 376, 1904, pro parte.

Fairly common during the drier months of the year, in about the same situations as the two preceding species. When it is in leaf, it is scarcely recognizable, and looks rather attractive, but most of the leaves fall off before the flowers appear.

Flowers.—November to May. *Fruits.*—December to May.

Woodrow 28 December 1890 ! *Santapau* 22 ! 1804 ! 1460 ! 1750 ! 3409 ! 3533 ! 3687 ! 5935 ! 6028 ! 8661 ! 8662 ! 8779 ! 8806 ! 9708-9709 !

BARLERIA Linn.

Barleria prionitis Linn., Sp. Pl. 636, 1753; FBI. 4: 482; Gr. 60; Wight, Icon. t. 452; D. & G. 189; C. 2: 379; G. 1056.

There are two kinds of leaves on this plant: during the rains and the first part of winter, they are large, glabrous and membranous; for the rest of the dry season they are much smaller, and densely silky hairy. These two forms correspond to the two varieties *Hystrix* and *Heteroclada* of O. Kuntze (Rev. Gen. Pl. 483); but it is clear that these cannot be maintained as varieties, they are mere forms depending on climatic conditions.

Common in Khandala. During the rains it is a large showy shrub with many large flowers; from February to May the flowers are much smaller and fewer in number. It is found in open situations.

Flowers.—October to June. *Fruits.*—November to June.

Cooke; Blatt. Herb. 22962! 22648! 27531! 28242! 28279! *Acland* 940! *Santapau* 765A! 1160! 1183! 1301! 1338! 1339! 1340! 2157! 2559! 5239! 5943! 5944! 6031! 6066!

Barleria cuspidata Heyne ex Nees in Wall., Pl. As. Rar. 3: 93, 1832; FBI. 4: 483; Wight, Icon. t. 451; C. 2: 380; G. 1059.

This plant is included on the authority of Blatter; I have not seen it in Khandala; there are no specimens from that district in any of the herbaria consulted.

Blatter in MS. catalogue.

Barleria cristata Linn., Sp. Pl. 636, 1753; FBI. 4: 488; Gr. 160; D. & G. 188; C. 2: 382.

This plant is given on the authority of Blatter; I have not seen it in the district.

Blatter in MS. catalogue.

Barleria longiflora Linn. f., Suppl. 239, 1781; FBI. 4: 485; Talb. 2: 336; G. 1056.

This plant is given on the authority of Hallberg. Cooke does not mention it in his Flora; Talbot, however, mentions it from Mahableshwar. There are no specimens from Khandala in Blatt. Herb.

Hallberg in MS. catalogue.

Barleria lawii T. Anders. in JLS. 9: 492, 1867; FBI 4: 486; C. 2: 383; G. 1060.

B. longiflora Graham, Cat. 161, 1839 (non Linn. f., nec Roxb.).

Common in Khandala, growing in open country or at the edge of the forest. The flowers are rather similar to those of *B. grandiflora*, from which it differs by the rounded or obtuse corolla lobes and the strong nerves of the corolla in the dry condition.

Flowers.—October to January. *Fruits.*—November to January.

Graham ; Hallberg in MS. catalogue ; *Blatt. Herb.* 22655 ! 28040 ! 28016 ! 28279 ! 28243 ! 28561 ! *Acland* 959 ! *Santapau* 773A ! 1340 ! 1462 ! 3071 ! 3254 ! 3310 ! 5386 !

Barleria strigosa Willd. var. **terminalis** (Nees) Clarke in FBI. 4 : 490, 1884 ; C. 2 : 384.

B. terminalis Nees in DC., Prodr. 11 : 225, 1847 ; D. & G. 188.

B. cerulea Graham, Cat. 161, 1839 (non Roxb.).

When in full bloom during October, this is a very showy shrub with masses of flowers at the ends of the branches. It is nowhere abundant in the district, but some good specimens have been observed for a number of years along one of the streams that come out of Forbay. " This is a shrub worthy of cultivation, on account of its showy flowers " (Graham, l.c.).

Flowers.—October to December. *Fruits.*—End of October to December.

Graham ; Blatt. Herb. 28095 ! 28096 ! 28097 ! *Sedgwick* 7960 ! *Acland* 941 ! *Santapau* 710A ! 1155 ! 2785 ! 2786 ! 2850 !

Barleria prattensis Santapau in Kew Bull. 1948 : 487, 1949.

The following is the translation of the specific characters of the new species : " Very similar to *B. montana* Nees, from which it differs by its much smaller bracteoles, and the glabrous and smaller seeds ; similar also to *B. Gibsoni*, from which it differs by its smaller seeds, its inflorescence being axillary or only very shortly spicate or racemose, and by the structure of the leaves.

Stems and branches terete or more or less quadrangular, glabrous or subglabrous, with long internodes. Leaves 6-12×2-5 cms., membranous, ovate or elliptic, entire, glabrous or subglabrous, minutely punctate, with very many raphides irregularly scattered on the upper side of the leaf, attenuated at both ends, decurrent into the petiole ; lateral nerves 5-6, making an angle of 60 degrees with the midrib ; petiole 0·5-2 cms. long, often obscure on account of the decurrent blade.

Flowers solitary, axillary, opposite, or forming a very short and few-flowered terminal raceme or spike ; pedicels 0·5 mm. long, each with two bracteoles about the middle. Bracteoles linear or subulate, the lower ones sometimes subspathulate, all acute, more or less arcuate, 6-13 mm. long, rarely longer, pubescent or subglabrous, the midnerve clear, margins ciliate, scarious.

Outer sepals leafy, up to 37×20 mm., subequal or clearly unequal, ovate ; the larger sepal acute or subacute, the smaller one obtuse or subobtuse, generally entire, occasionally shortly 2-fid ; both sepals glabrous or subglabrous, somewhat hairy near the apex. Inner sepals 10-15 mm. long, linear-lanceolate, very acute, pubescent or subglabrous.

Corolla up to 8·5 cms. long, glabrous ; tube 3-4·5 cms. long ; lobes obovate, obtuse, subequal, or one of them suborbicular, the rest obovate, all up to 20 mm. long. The colour of the corolla in Khandala is always rosy purple. Stamens 2, staminodes 2 without anthers. Capsule brownish, glabrous, up to 20 mm. long, attenuated at the apex, 4-seeded in the lower part. Seeds black or blackish, orbicular, much compressed, about 4 mm. diam., 0·5 mm. thick, very rarely slightly thicker.

The type, Santapau 1228 and the isotype 1228 B, were collected in Khandala on the 25 October 1942 and placed in the Blatter Herb., Bombay ; the paratypes, Santapau 7435, 7436, 3055 and Blatter 28274 have been placed in Blatt. Herb., Bombay ; other paratypes, Santapau 1169(1) and 1169(2), have been deposited in Kew Herb. and in the Arn. Arb., U. S. A., respectively."

This new species of *Barleria* is fairly common in Khandala. The general structure of the plant places it near *B. montana* Nees, but the seeds are never silky and the bracteoles are much smaller and shorter. In the structure of the bracteoles and seeds it approaches *B. Gibsoni* Dalz., but the latter is a much stouter plant, its leaves more coriaceous, its terminal spike or raceme longer, and its seeds considerably larger.

Examination of the material in Kew Herbarium shows that the new species is rather common in other parts of India outside Khandala ; of the specimens in Kew from the Concan labelled *B. montana* Nees, the majority belong to the new species. So does also a sheet from the Anamallays collected by Beddome, and on which Gamble has attached this remark " Perhaps the specimen from which Bedd. Ic. t. 257 was drawn. The glabrous seeds prove that it is not *montana* :" both the specimen and the plate of Beddome represent the new species and not *B. montana* Nees. The two right-hand specimens on Wallich 2391 in Kew Herbarium belong also to this new species.

Flowers and *Fruits*.—October to November.

Blatt. Herb. 27570 ! 28058 ! 28066 ! 28274 (paratype) ! 28280 ! *Santapau* 152/78 ! 1169 (paratype) ! 1228 (type) ! 1228B (isotype) ! 2772 ! 2773 ! 3055 (paratype) ! 5046 ! 5163 ! 7435 and 7436 (paratypes) !

NEURACANTHUS Nees.

Neuracanthus trinervius Wight, Icon. t. 1532, 1850 ; FBI. 4 : 491 ; D. & G. 190 ; C. 2 : 387.

N. tetragonostachyus Dalz., MS. in Kew Herb. (non Nees).

An elegant herb found by the sides of paths or in clearings in the forest ; not very common, but generally abundant wherever it occurs. A fine group of these plants has been flowering for years on the slopes near the top of Echo Point Ravine by the village path. When in leaf and flower this is one of the more " refined " wilds plants of Khandala.

Flowers.—December to March. *Fruits*.—December to April.

Woodrow ; Cooke ; Hallberg in MS. catalogue ; *Blatt. Herb.* 23862 ! 22637 ! *Santapau* 32 ! 277 ! 1457 ! 1568 ! 3410-3413 ! 3517-3520 ! 4009 ! 4792 ! 4793 ! 8083 ! 8663 !

Neuracanthus sphaerostachyus (Nees) Dalz. in Kew Journ. Bot. 2 : 140, 1850 ; D. & G. 190 ; FBI. 4 : 491 ; C. 2 : 387 ; Bole & Santapau in JBNHS 50 : 428.

Lepidagathis sphaerostachya Nees in DC., Prodr. 11 : 254, 1847.

Neuracanthus Lawii Wight, Icon. t. 1531, 1850.

On several occasions I have observed new leaves on old stems of the previous season ; some of these plants, therefore, must be considered at least as biennials.

Dalzell and Clarke mention that the plant rarely seeds. This is not so in Khandala ; but it is only from December onwards that the fruits become common and remain on the dead parent plant till the following monsoon, when many of the seeds germinate on the parent plant. Many plants, however, are destroyed when the fields are set on fire shortly before the monsoon.

On Behran's Plateau and on the upper parts of Bhoma Hill this plant grows in very great abundance in large patches ; in the rest of the district it is rather rare. In general this plant thrives well in open situations, and is seldom found under the shade of trees.

Flowers.—August to November. *Fruits.*—October onwards, persisting and often germinating on the parent plant at the coming of the rains.

Woodrow ; Cooke ; Blatt. Herb. 28039 ! 28072 ! *Santapau* 725A ! 710 ! 797 ! 923 ! 932 ! 1019 ! 2597 ! 2598 ! 6038 ! 9265 ! 9994 !

ASYSTASIA Blume.

Asystasia dalzelliana Santapau in Kew Bull. 1948 : 276, 1948.

A. violacea Dalz., MS. ex C.B. Clarke, in FBI. 4 : 494, 1884 (non Dalz. 1850) ; C. 2 : 399 ; G. 1063.

This is a difficult plant to identify in the field ; it is so near *A. gangetica* Anders. and there seem to be so many intermediate stages that in my opinion both species should be considered as one, or at most as varieties of one and the same species.

The following seem to be the characteristics of *A. dalzelliana* : leaves up to 18×9, seldom less than 9×4 cms.; inflorescence terminal in solitary or twin racemes ; calyx up to 10 mm. long, divided nearly to the base ; sepals hairy and ciliate, but in old age they may become glabrous or subglabrous. The colour of the corolla is not characteristic : in Khandala I have found lilac flowers with a deeper spot of the same colour in the centre, or pure white with a purple spot near the throat, or lilac flowers with the lower lip spotted with irregular darker spots in the middle.

In habit this plant is erect and inclined to ramble, at times the total length of the branches reaching up to 2·3 m. A very common plant in the undergrowth all over the district; abundant and persisting in flower from August until December.

Flowers.—July to December. *Fruits.*—August to December.

Cooke! Blatt. Herb. 27431! 28091! *Santapau* 498A! 661! 712! 852! 1230! 2542! 2668! 4756! 4757! 6827!

Asystasia gangetica (Linn.) Anders in Thwait., Enum. 235, 1859-64; G. 1063.

Justicia gangetica Linn., Amoen. Acad. 4 : 299, 1759.

Asystasia coromandeliana Wight ex Nees in Wall., Pl. As. Rar. 3 : 89, 1832; FBI. 4 : 493; Wight, Icon. t. 1506; D. & G. 186; C. 2 : 388.

A. violacea Dalz. in Kew Journ. Bot. 2 : 139, 1850 (non Dalz. ex Clarke).

Ruellia zeylanica Koen.: Gr. 161.

As stated above, it is not easy to separate this plant from the previous species, and it appears that both species have often been confused. Acc. to Gamble, *A. gangetica* is a coastal species, whilst *A. dalzelliana* is a rain-belt species from the hills.

Graham; Blatter in MS. catalogue.

PSEUDERANTHEMUM Radlk.

Pseuderanthemum malabaricum (Clarke) Gamble, Fl. Madr. 1064, 1924.

Eranthemum malabaricum Clarke in FBI. 4 : 497, 1884; C. 2 : 390.

E. crenulatum Wall.: D. & C. 195 (non Lindl.).

A rare plant in Khandala, only seen in the undergrowth in deep jungle on the slopes below Elphinstone Point.

Flowers.—February 1946. *Fruits.*—February and April 1946.

Santapau 8687! 8688! 8689! 8690! 8808!

LEPIDAGATHIS Willd.

Lepidagathis trinervis Wall. ex Nees in Wall., Pl. As. Rar. 3 : 96, 1832; FBI. 4 : 517; C. 2 : 393.

There are two forms of this plant: when growing on rocky soil with little or no competition, the plant is diffuse, much branched from near the root and flat on the ground; when there is much competition, as, *e.g.*, when the plant grows among grasses, it is erect and practically unbranched, with long internodes and with leaves reaching 65·7 mm.

Common on Behran's Plateau. After the decay of the leaves and of the surrounding vegetation, the dry spikes persist for several months on the ground as straw-coloured spinous balls.

Flowers.—October to December. *Fruits.*—November to January.

Blatt. Herb. 28110 ! *Sedgwick* 7974 ! *Acland* 947 ! *Santapau* 34 ! 1117 ! 1188 ! 1244 ! 1251 ! 1346 ! 2805 ! 3077 ! 3447 ! 5198 ! 5920 !

Lepidagathis cuspidata (Wall.) Nees in Wall., Pl. As. Rar. 3 : 97, 1832 ; FBI. 4 : 519 ; C. 2 : 396 ; G. 1067.

Ruellia cuspidata Wall., Cat. 2405, 1830.

An erect or procumbent undershrub, up to 1·5 m. high ; in overcrowded conditions it is erect, in open country with plenty of room, it is procumbent. Stems in large specimens up to 2·5 cms. thick, terete or nearly so below, more or less quadrangular and pubescent or glandular-pubescent above.

Leaves on the main stem large, up to 11·5×4·5 cms., acute or acuminate, base cuneate and decurrent into the long petiole to nearly its base ; petiole up to 6 cms. long ; nerves about 8 pairs, rather regular and conspicuous on both sides. Leaves of the branches much smaller, sessile or subsessile, softly pubescent, spinous-pointed.

Flowers in terminal spikes ; rachis, bracts and bracteoles pubescent and glandular-pubescent ; bracts and bracteoles sharply spinous-pointed. Corolla white or pale brown in colour, remaining on the plant long after drying.

During the rains and the first part of winter this plant grows in large clumps and is erect and covered with large leaves ; at that time it is often parasitized by *Striga gesneroides* Vatke, and is so affected by the parasite that it seldom produces flowers. During the hotter part of the year *Lepidagathis* turns dark or olive green and becomes covered with ordinary and glandular pubescence. The spines on the leaves, bracts, etc., render handling of this plant difficult.

Common in Khandala ; very gregarious and abundant on the upper part of Bhoma Hill.

Flowers.—December to March. *Fruits.*—December to May.

Woodrow ! *Blatt. Herb.* 22830 ! 22835 ! 22697 ! *Santapau* 17 ! 1463 ! 1515 ! 1689 ! 3435 ! 3642 ! 5900 ! 8056 ! 8612 ! 8859 !

Lepidagathis rigida Dalz. in Kew Journ. Bot. 2 : 341, 1850 ; D. & G. 191 ; FBI. 4 : 518 ; C. 2 : 395.

The occurrence of this plant is given on the authority of Blatter ; I have not seen the plant in the district or in any of the herbaria consulted.

Blatter in MS. catalogue.

Lepidagathis fasciculata (Retz.) Nees in Wall., Pl. As. Rar. 3 : 95, 1832 ; id. in Lepid. Illust. Mon. 10 ; FBI. 4 : 522 ; C. 2 : 397 ; G. 1068.

Ruellia fasciculata Retz., Obs. 4 : 28, 1786.

Lepidagathis goensis Dalz. in Kew Journ. Bot. 2 : 340, 1850 ; D. & G. 191.

A diffuse herb, creeping and rooting at some of the nodes. Leaves in unequal pairs, acute, softly hairy, irregularly crenate or dentate. Flowers in paniculate spikes; bracts leafy, acute or subacute; bracteoles linear. Corolla whitish lilac with purplish pink spots or lines.

A rare plant. I have only seen it on the one occasion mentioned below: there are no other specimens from Khandala in Blatt. Herb. I have checked my specimen with the type in Kew Herb., and am satisfied about the correctness of the identification; this is a new record for Khandala.

Flowers and *Fruits.*—April 1944.

Santapau 4103 !

RUNGIA Ness

Rungia pectinata (Linn.) Ness in DC., Prodr. 11 : 469, 1847 ; Wight, Icon. t. 1547 ; Bremek. in Neder. Akad. Wet. Verh. (II) 45(2) : 73.

Justicia pectinata Linn., Amoen. Acad. 4 : 299, 1759 ; Gr. 165.

Rungia parviflora Nees, var. *pectinata* Clarke in FBI 4 : 550, 1885 ; C. 2 : 400 ; G. 1071.

From the evidence gathered in Khandala I am inclined to consider the two varieties *pectinata* and *muralis* as mere forms of the same plant under different climatic conditions, *pectinata* being the form under favourable conditions, *muralis* that of the drier part of the year.

Flowers and *Fruits.*—October to June.

Woodrow: *Blatt. Herb.* 22659 ! 22133 ! 22965 ! 28092 ! *Santapau* 94A ! 258 ! 315 ! 491 ! 1287 ! 1337 ! 1464 ! 2964 ! 2975 ! 2981 ! 3050 ! 3206 ! 3455 ! 3582 ! 3583 ! 3874 ! 4207 ! 4208 ! 5393 ! 5878 ! 5940 ! 5941 ! 6032 ! 6033 ! 6088 ! 8695 ! 8832 ! 8871 !

Rungia repens (Linn.) Nees in Wall., Pl. As. Rar. 3 : 110, 1832 ; FBI. 4 : 549 ; D. & G. 196 ; Wight, Icon. t. 465 ; C. 2 : 401 ; G. 1370.

Justicia repens Linn., Sp. Pl. 15, 1753 ; Gr. 165.

The occurrence of this plant is given on the authorities mentioned below: there are no specimens from Khandala in Blatt. Herb., I have not seen the plant in the field.

Cooke ; Blatter and *Hallberg* in MS. catalogues.

DICLIPTERA JUSS.

Dicliptera zeylanica Nees in DC., Prodr. 11 : 474, 1847 ; FBI. 4 : 552 ; C. 2 : 403 ; G. 1073.

Dicliptera bivalvis Nees. loc. cit. 475, 1847 ; Wight, Icon. t. 1551 ; D. & G. 196 (non Juss.).

Justicia bivalvis Graham, Cat. 164, 1839 (non Linn.).

A rare plant in Khandala ; the only place where it is common in the district is the path along the slopes below Elphinstone Point. It is in flower from December to May, but fruits seem to be rare.

Flowers.—December to May. *Fruits.*—Only seen in April 1946.

Woodrow ; Hallberg in MS. catalogue : *Blatt. Herb.* 22836 ! 23859 ! *Santapau* 1459 ! 1915 ! 3297 !

Diclıptera micranthes Nees in Wall., Pl. As. Rar. 3 : 112, 1832 ; FBI. 4 : 553 ; D. & G. 197 ; C. 2 : 402.

An erect herb, only seen once growing on the dry banks of the village tank. It has not been recorded from Khandala up to now. Flowers in axillary clusters ; bracts distinct in that the lower half of their margins is scarious and ciliate, the upper half may be green, the whole bract is densely covered with raphides. Corolla minute, white in colour. Seeds at first light brown, at length dark brown.

Flowers and *Fruits*.—November 1945.

Santapau 8124 !

ECBOLIUM Kurz.

Ecbolium linneanum Kurz, var. **laetevirens** (Vahl) Clarke in FBI. 4 : 545, 1885 ; C. 2 : 405 ; G. 1074.

Justicia laetevirens Vahl., Enum. 1 : 118, 1804.

J. Ecbolium Linn., Sp. Pl. 15, 1753 pro parte ; Gr. 164 ; D. & G. 194.

Fairly common in Khandala, but not nearly as common as the following variety. Found in dense forest among the undergrowth, very occasionally in open country.

Flowers.—September to May. *Fruits*.—October to May.

Graham ; Blatt. Herb. 28090 ! *Santapau* 556A ! 742A ! 121 ! 1309 ! 3225 ! 3499 ! 3500 ! 5451 !

Ecbolium linneanum var. **dentata** (Klein) Clarke, loc. cit. ; C., G. 11. cc.

Justicia dentata Klein ex Link, Jahrb. 1(3) : 48, 1820 ; Nees in Wall., Pl. As. Rar. 3 : 108, 1832.

Var. *dentata* is the commoner of the two in Khandala. It occurs in large clumps scattered through the forest or in open country ; often it is found on the banks of streams. The flowers are of the same colour as those of the preceding variety, i.e., sea-green. These plants look rather wild especially during the dry season, when most of the leaves have fallen away.

Flowers.—September to March. *Fruits*.—September to May.

Blatt. Herb. 28099 ! 28330 ! *Santapau* 844 ! 859 ! 878 ! 1024 ! 1151 ! 1210 !

JUSTICIA Linn.

Justicia betonica Linn., Sp. Pl. 15, 1753 ; FBI. 4 : 525 ; Talb. 2 : 338 ; G. 1078.

J. ramosissima Roxb., Fl. Ind. 1 : 129, 1832 ; Gr. 165.

J. Betonica var. *ramosissima* Clarke in FBI. 4 : 525 ; C. 2 : 407.

Adhatoda ramosissima Nees. : Dalz. & Gibs. 193.

Widespread in the district but nowhere abundant; it is generally procumbent below, erect in the upper half of the stem or branches. As a rule it grows in open country.

Flowers.—August to December. *Fruits.*—October to January.

Woodrow; Cooke; Blatt. Herb. 28100 ! *Acland* 880 ! *Santapau* 514A ! 845 ! 1224 ! 2549 ! 2673 ! 2952 ! 3124 ! 4879 ! 5027 ! 5131 ! 6907 !

Justicia trinervia Vahl, Enum. 1: 156, 1804; FBI. 4: 526; C. 2: 408; G. 1079.

Adhatoda trinervia Nees in Wall., Pl. As. Rar. 3: 103, 1832; Dalz. & Gibs. 194.

My only authority for the inclusion of this plant is that Hallberg mentions it in his MS. catalogue; I have seen no specimens from Khandala in any of the herbaria consulted.

Hallberg in MS. catalogue.

ROSTELLULARIA Reichenb.

Rostellularia procumbens (Linn.) Nees in DC., Prodr. 11: 371, 1847.

Justicia procumbens Linn., Sp. Pl. 15, 1753; FBI. 4: 539; C. 2: 412; G. 1080.

Rostellaria procumbens Nees in Wall., Pl. As. Rar. 3: 101, 1832; D. & G. 193 (non *Rostellaria* Gaertn.).

A variable plant, the commonest and most abundant of the Acanthaceae of Khandala.

Stem rooting at the lower nodes and then erect and profusely branched; branches from the same node up to 9, not verticillate but arranged fan-like in one plane; internodes usually long. Stems and branches occasionally with retrorsely bent hairs. Leaves 15-65×7-22 mm., narrow- to broadly-elliptic, acute or subacute at both ends, with a few jointed hairs on both faces, raphides numerous arranged transversely to the midrib; margins entire, with a few stout hairs; petioles 4-10 mm. long, hairy.

Flowers in cylindric dense spikes, 1-7 cms. long; the whole spike as regards colour shows the following variations: (*a*) Green, the flowers light purple; the commonest combination of colours: (*b*) Green bracts with pure white flowers; occasional; (*c*) Spikes dark vinaceous in colour, with very dark purple flowers; (*d*) Lower part of the spike green, upper part purple.

Bracts with scarious edges, and ciliate with jointed hairs, up to 1·5 mm. broad; bracteoles much narrower, almost linear, ciliate with jointed hairs. Calyx segments about as long as the bracts and bracteoles, ciliate with jointed hairs. Corolla usually "Phlox Purple" (Ridg. 65*b*) on the lower lip, with white spots at the throat; as mentioned before,

some flowers have a much deeper purple colour. Capsules about the same length as the calyx segments. Seeds suborbicular, slightly compressed, brown when ripe.

A very gregarious plant covering large tracts of ground in open country practically to the exclusion of every other plant. Occasionally it grows on old walls and rocks during the rains. The form with light green bracts and light purple flowers is the commoner one in Khandala.

Flowers and *Fruits.*—July to November.

Blatt. Herb. 22967 ! 25245 ! 27405 ! *Santapau* 412A ! 627 ! 785 ! 856 ! 1073 ! 2240 ! 2555 ! 2621 ! 4571 ! 4732 ! 4733 ! 4734 ! 5392 ! 5396-5404 ! 6856 ! 6857 ! 6901 ! 6967 !

Rostellularia crinita Nees in DC., Prodr. 11 : 373, 1847 ; D. & G. 193.

Rostellaria crinita Nees in Wall., Pl. As. Rar. 3 : 101, 1832.

Justicia micrantha Heyne ex Wall., Cat. 2449, 1830, nom. nud. ; FBI. 4: 536 ; C. 2 : 409 ; G. 1080.

The authority for the inclusion of this plant is Hallberg, who mentions it in his MS. catalogue for Khandala ; I have not seen it either in the field or in any of the herbaria consulted.

As regards the specific epithet, the oldest one is that of Heyne, but this is a *nomen nudum* and therefore an invalid one ; the oldest valid name is that of Nees in Wall., Pl. As. Rar., which has been adopted for the corrected name of the genus in DC., Prodr. by Nees himself.

Hallberg in MS. catalogue.

ADHATODA Nees.

Adhatoda vasica Nees in Wall., Pl. As. Rar. 3 : 103, 1832 ; FBI. 4 : 540 ; D. & G. 194 : C. 2 : 414 ; G. 1082 ; Talb. 2 : 340, t. 448.

Justicia adhatoda Linn., Sp. Pl. 15, 1753 ; Gr. 164 ; Bot. Mag. t. 861.

Not common. Apparently planted, not truly wild in the district. When in full bloom it is a fine shrub, but generally it looks rather ragged and bare with flowers and leaves only near the ends of the branches. It is often used as hedge shrub.

Flowers.—December to March. *Fruits.*—February to May, but rare.

Blatter and *Hallberg* in MS. catalogues ; *Santapau* 165 ! 1471 ! 1503 ! 1969 ! 3329 ! 3330 ! 3798 !

RHINACANTHUS Nees.

Rhinacanthus nasuta (Linn.) Kurz in JASB 39 : 79, 1870 ; Merrill, Enum. 3 : 488.

Justicia nasuta Linn., Sp. Pl. 16, 1753 ; Gr. 164.

Rhinacanthus communis Nees in Wall., Pl. As. Rar. 3 : 109, 1832 ; FBI. 4 : 541 ; Wight, Icon. t. 464 ; D. & G. 194 ; C. 2 : 415 ; G. 1083.

A gregarious shrubby plant, up to 2 m. high, usually about 1 m. Stems erect leafless except near the ends of the branches. Leaves in Khandala seem to be much larger than in most specimens kept in Kew Herb., up to 26×9 cms., the average being about 18×6 cms., the smaller sizes are the exception in Khandala. Leaves entire or irregularly subcrenate; petioles up to 4·5 cms. long.

Flowers inconspicuous in a very large panicle; bracts and bracteoles and calyx segments very small, persistent. Corolla white or very often pale pink; tube narrow, about 10-15 mm. long, slender; limb 2-lipped, upper lip narrow, in straight line with the tube or nearly so; lower lip sharply bent at right angles to the tube. Capsules rather rare, or perhaps caducous.

From the localities where this plant has been seen in Khandala, it is obviously a wild plant in the district. It is found along the ravines in forest clearings or towards the edges of the forest; it is fairly common at lower altitudes. At its best, it is a poor looking plant.

Flowers.—November to April. *Fruits.*—December to May.

Cooke; Blatt. Herb. 28216 ! *Santapau* 6 ! 1247 ! 1458 ! 3298 ! 3299 ! 3300 ! 3315 ! 3688 ! 3873 ! 8805 !

PERISTROPHE Nees.

Peristrophe bicalyculata (Retz.) Nees in Wall., Pl. As. Rar. 3 : 113, 1832; FBI. 4 : 554; D. & G. 197; C. 2 : 415; G. 1084.

Dianthera bicalyculata Retz. in Act. Holm. 297, t. 9, 1775.

Justicia bicalyculata Vahl, Symb. 2 : 13, 1791; Gr. 164.

A rare plant in Khandala except on the lower slopes below St. Xavier's Villa. The flowers are distinct in structure and very brightly coloured.

Flowers and *Fruits.*—November 1945.

Santapau Nov. 1945 !

VERBENACEAE.

LANTANA Linn.

Lantana camara Linn., var. **aculeata** (Linn.) Moldenke, in Torreya 34 : 9, 1934.

L. aculeata Linn., Sp. Pl. 627, 1753; Bot. Mag. t. 96; Gr. 156; D. & G. Suppl. 68.

L. camara auct. (non Linn.) : FBI. 4 : 562; C. 2 : 419.

Very common about Khandala village in waste ground, and scattered towards the edges of the forest throughout the district.

The dominant colour of the flowers is red; occasionally some plants are found with yellow flowers in the centre of the corymbose spike and

red ones towards the periphery. The typical *L. camara* Linn. has not been observed in the district; the spines of the var. *aculeata* cause very painful scratches which if left unattended seem to fester easily.

This is an introduced plant, by now thoroughly well established in the district. It has already spread to the tops of the highest hills in the country round Khandala, and is now forming almost impenetrable thickets in some of the ravines. The fruits are occasionally eaten by children.

Local name : Tantani.

Flowers.—Throughout the year. *Fruits.*—During the dry months.

Blatt. Herb. 23382 ! *Hallberg* in MS. catalogue ; *Santapau* passim !

PHYLA Lour.

Phyla nodiflora (Linn.) Green in Pittonia 4 : 46, 1899 ; Moldenke in Lilloa 4 : 296 ; Meeuse in Blumea 5 : 69.

Verbena nodiflora Linn., Sp. Pl. 20, 1753.

Lippia nodiflora A. Rich. in Michx., Fl. Bor. Amer. 2 : 15, 1803 ; FBI. 4 : 563 ; D. & G. 198 ; Wight, Icon. t. 1463 ; C. 2 : 420.

In open places the internodes are short, the leaves small and the peduncles up to 2·5 cms. long ; in shaded spots, the whole plant seems to be more robust with longer internodes and peduncles and with larger leaves.

Abundant on the old railway line near the village tank, on stony ground ; elsewhere in the district rare.

Flowers and *Fruits.*—Throughout the year, less abundant during the rains, probably because the spot mentioned is usually under water.

Santapau 3759 ! 3760 ! 3761 ! 3762 ! 4166 ! 4842 !

STACHYTARPHETA Vahl.

Stachytarpheta urticaefolia (Salisb.) Sims in Bot. Mag. t. 1848, 1816 ; D. & G. Suppl. 68 ; Moldenke, Geogr. Distr. 55.

Cymburus urticaefolius Salisb., Parad. Lond. 53, 1805-1807.

Stachytarpheta indica auct. (non *Verb. indica* Linn.) ; Gr. 154 (probabilit.) ; FBI. 4 : 564 ; C. 2 : 421.

Rare in Khandala ; only seen on the lower slopes below Forbay. My specimens from Khandala agree well with the diagram in Bot. Mag. t. 1848.

Flowers and *Fruits.*—August to February.

Santapau 1236 ! 2464 ! 2846 ! 3388 ! 4822 ! 4971 ! 5469 !

CALLICARPA Linn.

Callicarpa tomentosa (Linn.) Murray, Syst. Veg. (ed. 13) 130, 1774 ; Moldenke in Fedde, Repert. 40 : 106 ; Meeuse in Blumea 5 : 71.

Tomex tomentosa Linn., Sp. Pl. 118, 1753.

Callicarpa lanata Linn., Mant. 2 : 331, 1771 ; FBI. 4 : 567 ; Gr. 156 ; C. 2 : 423.

C. cana D. & G. 200, 1861.

A common shrub in dense forest especially towards the edges of secondary forest, i.e., where the original forest has been removed and regeneration is taking place. The flowers are inconspicuous, but the plant itself is noticeable on account of the shape and size of the leaves and of the dense stellate tomentum covering all the young plants.

Local name : Patkuri.

Flowers.—December to May. *Fruits.*—January to June.

Graham ; Cooke ! Blatt. Herb. 23428 ! 25347 ! 25388 ! 25389 ! 25533 ! 28007 ! *Santapau* 142(2)A ! 265 ! 463 ! 1554 ! 4249 ! 4279 ! 5884 !

TECTONA Linn. f.

Tectona grandis Linn. f., Suppl. 151, 1781 ; FBI. 4 : 570 ; Gr. 158 ; D. & G. 199 ; C. 2 : 424.

The Teák tree does not thrive in the district from Bombay to Khandala ; I have not observed any trees over 10 m. high. In Khandala itself it is a rare tree, only seen on the slopes of Monkey Hill. Local people have often complained that growing teak trees for timber does not pay, as the Government claims not only control but ownership of all such trees even those grown on private lands ; the result is that private owners try to get rid of these unwelcome guests from their fields.

Local name : Sag.

Flowers.—May to October. *Fruits.*—September to November.

Blatter in MS. catalogue ; *Herb. Cooke,* Bhore Ghaut ! *Bhide* 864 ! *Santapau* 2626 ! 4754 ! 4755 !

GMELINA Linn.

Gmelina arborea Roxb., Hort. Beng. 46, 1814, & Pl. Cor. 3 : 42, t. 246, 1819 ; FBI. 4 : 581 ; Gr. 158 ; D. & G. 201 ; Wight, Icon. t. 1470 ; C. 2 : 424.

Not common in Khandala ; found occasionally in open country and seldom more than 5 m. high ; the trees are too small and too scarce in the district for economic purposes.

Local name : Shíwan, Sívan.

Flowers.—March to May. *Fruits.*—March to June.

Hallberg in MS. catalogue ; *Blatt. Herb.* 28466 ! 28468 ! 28471 ! *Garade* 6116 ! *Santapau* 1678 ! 1679 ! 1932 ! 1933 ! 2204 ! 2206 ! 3927 ! 4057 ! 4299 !

PREMNA Linn.

Premna coriacea Clarke in FBI. 4 : 573 , 1885 ; C. 2 : 426.

P. scandens Graham, Cat. 155, 1839 ; D. & G. 199 (non Roxb.).

Tolerably common in Khandala, abundant especially behind Khandala Hotel, and on the slopes below Elphinstone Point. The fresh leaves when crushed emit a strong odour, very similar to that of some of the *Piper* plants. On several occasions I have noticed this plant living epiphytically on *Ficus* sp., there being no connection between the plant and the ground, the upper branches giving off numerous adventitious roots. A very fine climber, deserving a place in gardens even for the sake of the leaves alone.

Local name : Káran Páiri.

Flowers.—Marèh to June. *Fruits*.—April to May.

Bhiva ! Santapau 465 ! 540 ! 854(2) ! 1829-1834 ! 1949 ! 4019-4025 ! 6108 ! 6109 ! 8743 ! 8744 ! 8772 !

VITEX Linn.

Vitex negundo Linn., Sp. Pl. 638, 1735 ; FBI. 4 : 583 ; Wight, Icon. t. 519 ; C. 2 : 428.

V. bicolor Willd. : D. & G. 201.

V. trifolia Graham, Cat. 155, 1839 (non Linn.).

Common in open country ; at times the branches become rather long and assume a subscandent habit. It is not found on the higher hills, nor in the ravines except along the water courses.

This plant is held in high repute for medicinal purposes in Western India ; but I have been unable to find any medicinal use made of it in Khandala.

Local name : Nirgúndi.

Flowers and *Fruits*.—More or less throughout the year.

Blatter & Hallberg in MS. catalogues ; *Bhide* 881 ! *Santapau* passim !

Vitex leucoxylon Linn. f., Suppl. 293, 1781 ; FBI. 4 : 587 ; Gr. 156 ; D. & G. 201 ; C. 2 : 430.

Wallrothia [illegible] Roth : Wight, Icon. t. 1467.

There are several fine specimens along Kune Stream and a few along the same water course near " Bettles Home ", ; not seen elsewhere in the district. It is a fine looking small tree ; locally no use is made for medicinal or commercial purposes of any part of the tree.

Local name : Pádri.

Flowers.—March to June. *Fruits*.—April to October.

Graham ; Blatt. Herb. 27442 ! 27443 ! 27444 ! *Bhide* 25 May 1909 ! *Gammie* 16252 ! *Santapau* 528A ! 174 ! 388 ! 486 ! 1984 ! 1985 ! 2106 ! 2107 ! 3824 ! 4083 ! 4379 ! 4390 ! 8842 !

CLERODENDRUM Linn.

Clerodendrum inerme (Linn.) Gaertn., Fruct. 1 : 271, t. 75, 1788 ; FBI. 4 : 589 ; Gr. 157 ; D. & G. 200 ; C. 2 : 431.

Volkameria inermis Linn., Sp. Pl. 889, 1753.

This is an introduction which has not yet spread in the district; it is only found in a few gardens. It makes a very fine fence, much like the Privet of English gardens, but locally it does not seem to be much favoured.

Flowers.—November to May.

Santapau, In garden on station platform !

Clerodendrum viscosum Vent., Jard. Malm. t. 25, 1803 ; Moldenke, Geogr. Distr. 54, & in litter.

C. infortunatum auct. (non Linn.) : Gr. 157 ; D. & G. 200 ; FBI. 4 : 594 ; C. 2 : 432.

A gregarious shrubby plant, 0·75-3 m. high. Young branches densely pubescent, older ones glabrous or nearly so. Leaves large, broadly ovate, acute or shortly acuminate, more or less irregularly serrate or denticulate.

Panicles at first all green except for the white corolla ; in the fruiting stage the calyx becomes bright red, the pedicels and branches of the inflorescence purplish red ; on several occasions I have observed a strong scent emitted by the flowers during the night, in the daytime they were scentless. Calyx green and fairly densely pubescent in flower, accrescent and nearly glabrous in fruit, lepidote with round, saucer-shaped scales, which are also seen occasionally at the base of the leaves. Corolla white with a pinkish tinge near the mouth of the tube on the inside ; filaments up to 36 mm. long, glabrous, pure white ; anthers deep purple ; stamens exserted. Drupe at first reddish, finally black ; pyrenes strongly reticulate on the outer surface.

Not common in Khandala, where it seems to be an introduction. A fine plant deserving of a place in gardens.

Flowers.—February to April. *Fruits.*—March to May.

Blatt. Herb. 23464 ! *Santapau* 1708 ! 1709 ! 3624-3625 ! 6094-6097 ! 8641 ! 8642 !

Clerodendrum serratum (Linn.) Moon, Cat. 46, no. 382, 1824 ; Spreng., Syst. 2 : 758, 1825 ; FBI. 4 : 592 ; Gr. 157 ; D. & G. 200 ; Wight, Icon. t. 1472 ; C. 2 : 432 ; Moldenke, Geogr. Dist. 54.

Volkameria serrata Linn., Mant. 90, 1767.

A shrub usually about 1 m. high ; on September 3, 1942, I measured a specimen on Bhoma Hill, the stem of which was 5 cms. diam., at 30 cms. from the ground, and the total height was 3 m.

Common all over the district, especially so on rocky ground. At its best the plant looks rather wild and unattractive.

Graham, loc. cit., mentions that the leaves are eaten as greens; I have been unable to confirm this point, even though I was in the district in times of great scarcity when a number of plants from the jungle were being collected and eaten by the Kaṭkaris.

Flowers and *Fruits*.—June to November, occasionally later.

Graham; Dalzell & Gibson: *Bhiva; Blatt. Herb.* 27963 ! 28041 ! *Santapau* 409A ! 410A ! 729A ! 500 ! 639 ! 713 ! 851 ! 1018 ! 4181 ! 4896(2) ! 4964 !

Clerodendrum thomsonae Balf. in Edinb. New Phil. Journ. (N.S.) 15 : 233, t. 2, 1862 ; C. 2 : 434 ; Moldenke, Geogr. Distr. 47 ; Bor & Raizada in JBNHS. 43 : 543, f. 2.

Blatter mentions this plant in his MS. catalogue, but until recently I had not seen it in Khandala. Commonly cultivated in gardens. Calyx inflated, creamy white and rather showy; corolla exserted, scarlet; filaments whitish below, greenish above. The whole plant is erect and reaching 90 cms. high ; it is said to be a climber.

Blatter in MS. catalogue ; *Santapau* 10579 !

Clerodendrum fragrans (Vent.) R. Br. in Ait., Hort. Kew. 4 : 65, 1812 ; C. 2 : 433 ; Bor & Raizada, l.c., 546, f. 5.

Volkameria fragrans Vent., Jard. Malm. t. 70, 1803.

A gregarious plant, up to 2 m. high. Flowers of the " polyantha " type, i.e., petals indefinite in number, pale pinkish white ; flowers sweetly but not strongly scented. Stamens petaloid.

In flower on 13th August 1950, near the station.

Santapau 11110-11112 !

Symphorema Roxb.

Symphorema involucratum Roxb., Pl. Cor. 2 : 46, t. 186, 1798 ; FBI. 4 : 599 ; D. & G. 199 ; Wight, Icon. t. 362 ; C. 2 : 434 ; Moldenke, Geogr. Distr. 55.

An elegant climber, noticeable on account of the star-shaped involucre and of the thin, long branches. Leaves appear after the flowers and are rather variable in the structure of their margins. Common near Convalescent Home.

Flowers.—March. *Fruits*.—March to May.

Blatt. Herb. 23466 ! *Santapau* 169(2) ! 172 ! 344 ! 1706 ! 1763 ! 3846 ! 3982 ! 3983 ! 6110-6112 ! 8751 ! 8752 ! 8753 !

DURANTA Linn.

Duranta repens Linn., Sp. Pl. 637, 1753; Merill, Enum. 3: 381; Moldenke, Geogr. Distr. 54.

D. Plumieri Jacq., Select. Stirp. Amer. Hist. 186, 1763; Linn., Sp. pl. (ed. 3) 888, 1764 & (ed. 4, Willd.) 3(1): 380; FBI. 4: 560; D. & G. Suppl. 70; C. 2: 437.

An introduced South American plant, often planted in gardens as a hedge plant in Khandala. Flowers are bright blue, occasionally white, fruits orange or yellow. The name *D. repens* Linn., however correct it may be taxonomically, is a very inappropriate one, as the plant at least in the Western parts of India is always an erect shrub.

Flowers.—Dry season. *Fruits.*—Whole year.

Blatt. Herb. 23462 ! *Santapau* 6102 !

HOLMSKIOLDIA Retz.

Holmskioldia sanguinea Retz., Obs. 6: 31, 1791; FBI. 4: 596; C. 2: 437; Moldenke in Lilloa 4: 333; Bor & Raizada, 540, t. 13.

A cultivated plant, occasionally seen in Khandala gardens. The large red calyx is conspicuous even after the fading of the corolla. Only on one occasion did I find the plant run wild along the main road, but it was near a garden where the plant was under cultivation.

Flowers.—October to January.

Blatt. Herb. 28202 ! *Santapau* 3523 !

LABIATAE.

OCIMUM Linn.

Ocimum sanctum Linn., Mant. 1: 85, 1767; FBI. 4: 609; Gr. 147; D. & G. 204; C. 2: 440; Mukerjee, Lab. Ind. Emp. 19.

The Tulsi plant, cultivated in many Hindu homes in Khandala.

Blatt. Herb. 23573 ! *Santapau*, cultivated !

Ocimum americanum Linn., in Cent. Pl. 1: 15, 1755; Epling, in Fedde, Repert., Beih. 95: 100.

A. canum Sims, in Bot. Mag. t. 2452, 1824; FBI. 4: 607; Gr. 147; D. & G. 203; C. 2: 441; Mukerjee 17.

Occasionally cultivated in gardens and at times run wild in Khandala; it is a rare plant in the district.

Local name: Ran Tulsi.

Blatt. Herb. 23569 !

ACROCEPHALUS Benth.

Acrocephalus indicus (Burm.) O. Kuntze, Rev. Gen. Pl. 511, 1891 ; G. 1115 ; Mukerjee 29.

Prunella indica Burm., Fl. Ind. 139, 1768.

Acrocephalus capitatus Benth., in Bot. Reg. tt. 1282, 1300, & in Wall., Pl. As. Rar. 2 : 18, 1831 ; FBI. 4 : 611 ; Gr. 158 ; D. & G. 204 ; C. 2 : 443.

An elegant slender herb, found very occasionally in cultivated fields ; the dry stems persist for some time and are very characteristic. It is a rare plant in Khandala.

Flowers.—October. *Fruits.*—October to November.

Blatt. Herb. 28221 ! *Santapau* 3064 ! 5379 ! 5380 ! 5409 ! 5410 ! 7045 ! 7406 ! 7407 ! 7428 ! 7469 ! 8064 ! 8065 !

PLECTRANTHUS L'Herit.

Plectranthus mollis (Ait.) Spreng., Syst. 2 : 690, 1825.

Ocimum molle Aiton, Hort. Kew 2 : 322, 1789.

Plectranthus incanus Link, Enum. Hort. Berol. 2 : 120, 1822 ; FBI. 4 : 621 ; C. 2 : 447 ; G. 1121 ; Mukerjee 47.

P. cordifolius Don : Gr. 148 ; D. & G. 205.

A gregarious shrubby herb, often found in very large numbers forming dense banks of vegetation near walls, roads, etc. A large clumps of these plants in leaf and flower is a fine sight.

Flowers.—August to October, occasionally to the end of November. *Fruits.*—September to November.

Graham ; Dalzell and *Gibson ; Woodrow ; Hallberg* in MS. catalogue ; *Blatt. Herb.* 24044 ! *Santapau* 143/10 ! 754 ! 881 ! 1070 ! 1142 ! 2408 ! 2407 ! 2478(2) ! 5096 ! 5363 ! 5395 !

POGOSTEMON Desf.

Pogostemon purpurascens Dalz. in Kew Journ. Bot. 2 : 337, 1850 ; FBI. 4 : 632 ; D. & G. 207 ; C. 2 : 455 ; G. 1133 ; Mukerjee 71.

When crushed this plant emits a strong and unpleasant odour. Common in the undergrowth of the forest or by the sides of paths. Often the plant looks hoary on account of the white woolly hairs on stem and branches and of the pale green colour of the leaves.

Flowers.—November to January. *Fruits.*—December to May.

Woodrow ; *Blatter* in MS. catalogue ; *Santapau* 10 ! 1510 ! 3219 ! 3220 ! 3240 ! 3241 ! 3242 ! 3408 ! 3449 ! 5790 ! 5950 ! 8655 !

Pogostemon plectranthoides Desf. in Mem. Mus. Hist. Nat. Par. 2 : 155, t. 6, 1815 ; FBI. 4 : 632 ; D. &. G. 207 ; C. 2 : 454 ; G. 1133 ; Mukerjee 69 (excl. cit. Desf.).

A very common plant, found in open places especially on rocky ground ; often seen by the road sides. The whole plant has a penetrating and persistent odour, which in some respects is similar to that of *P. Heyneanus*, but in general the scent of the present species is not pleasant.

Flowers.—December to April, occasionally to May. *Fruits.*—January to June.

Blatt. Herb. 23507! 23430 ! 23532 ! 23538 ! 23539 ! 24043 ! 27448 ! *Santapau* 816A ! 360 ! 1504 ! 1427 ! 3336 ! 5787 ! 8620 ! 8771 !

Pogostemon plectranthoides Desf., var. **glaberrima** Santapau in Kew Bull. 1948 : 492, 1949.

" Similar to *P. plectranthoides*, from which it differs by its completely glabrous inflorescence ; the bracts, bracteoles and calyx segments are entirely glabrous. The type of this variety is Blatter 24055, collected in Khandala in the month of April, probably in the year 1918, and is kept in the Blatter Herb., Bombay.

There is only one sheet of this variety in Blatter Herb., collected in Khandala in April ; the year of the collection is not mentioned on the sheet, but in all probability it was the year 1918. In all respects the new variety agrees with the typical species except that the whole inflorescence is entirely glabrous." (Santapau, loc. cit.)

Pogostemon parviflorus Benth. in Wall., Pl. As. Rar. 1 : 31, 1829 ; FBI. 4 : 632 ; C. 2 : 453 ; Mukerjee 68.

P. frutescens Graham, Cat. 149, 1839.

P. purpuricaulis Dalz. in Kew Journ. Bot. 2 : 336, 1850 ; Dalz. & Gibs. 207.

The occurrence of this plant is given on the authority of Cooke ; I have not found any specimens that could for certain be ascribed to this species. It is very similar to the preceding species ; the relative amount of pubescence on stems and leaves cannot separate these two species.

The bracts of *P. parviflorus* are ovate, those of *P. plectranthoides* broadly ovate ; Mukerjee gives for the present species the following characters : a herb, leaves 10 cms. or more long, calyx 1·5 mm. long, whilst *P. plectranthoides* is a shrub, leaves 5-10 cms. only in length, clayx about 5 mm. long.

In Blatt. Herb. there are many specimens labelled by Blatter as *P. parviflorus* ; I have checked these sheets with the types or with authentic material in Kew Herb. and found them all to belong to the other species.

Cocke.

Dysophylla Blume.

Dysophylla stellata Benth in Wall., Pl. As. Rar. 1 : 30, 1829 ; FBI. 4 : 640 ; Gr. 150 ; D. & G. 209 ; C. 2 : 457 ; G. 1137 ; Mukerjee 80.

A very pretty, slender herb, growing gregariously in pools of stagnant water, covering large areas. In November 1948 one of the sides of Khandala talao was almost entirely covered with these plants.

Most of my specimens from Khandala seem to belong to the var. *gracilis* Cooke, but after examination of large numbers of sheets, including the types of the varieties in Kew Herb. I am still in doubt about the limits of the two varieties. When the Kew specimens are arranged carefully, one finds but a long series of plants with the so-called var. *tomentosa* at one end, and var. *gracilis* at the other, with every intermediate form in between. Until the boundaries between these two varieties are better defined, I am inclined to leave my plants merely as specimens of *D. stellata* Benth.

Flowers.—September to December. *Fruits.*—October to December.

Blatt. Herb. 28022 ! *Santapau* 1014 ! 1140 ! 1190 ! 2604 ! 2806 ! 2807 ! 3067 ! 3068 ! 5058 ! 5423 ! 5429 ! 5430 ! 8048 ! 8049 ! 8100 ! 9596-9599 !

COLEBROOKEA Sm.

Colebrookea oppositifolia Smith, Exot. Bot. 2 : 111, t. 115, 1895 ; FBI. 4 : 612 ; C. 2 : 459 ; G. 1138 ; Mukerjee 84 (*Colebrookia*).

Very common all over the district, and very conspicuous especially when in fruit ; found in open country or in clearings in the forest.

Flowers.—December to January. *Fruits.*—February to May.

Graham ; Cooke ; Blatt. Herb. 23514 ! 24060 ! 25329 ! 25483 ! 28473 ! *Santapau* 22A ! 112 ! 113 ! 1543 ! 3554 ! 3555 ! 3621 ! 5843 ! 8621 !

ANISOMELES R. Br.

Anisomeles heyneana Benth. in Wall., Pl. As. Rar. 1 : 59, 1830 ; FBI. 4 : 672 ; D. & G. 210 ; C. 460 ; G. 1140 ; Mukerjee 152.

A tall, rank herb, often seen in open country along hedges or at the edges of the forest.

Flowers.—October to January, occasionally till May. *Fruits.*—October to March.

Blatt. Herb. 23540 ! 24045 ! 27540 ! 28182 ! *Santapau* 735(2)A ! 1130 ! 1192 ! 1250 ! 2940 ! 3462 ! 5093 !

LEUCAS R. Br.

Leucas stelligera Wall. ex Benth. in Wall., Pl. As. Rar. 1 : 61, 1829 : FBI. 4 : 686 ; D. & G. 211 ; C. 2 : 470 ; G. 1154 ; Mukerjee 177.

A common and rather unattractive weed, found generally in the forest. The star-like structure of the calyx easily distinguishes this species.

Flowers.—October to January, occasionally to April. *Fruits.*—December to April.

Hallberg in MS. catalogue; *Blatt. Herb.* 23515! 23533! 24046! 24053! *Santapau* 759A! 1282! 1426! 3007! 3199! 3735! 8102!

Leucas lavandulaefolia Rees, Cycl. 20(2).1819; Mukerjee 167. *L. linifolia* Spreng., Syst. 2: 743, 1825; FBI. 4: 690; C. 2: 465; G. 1149.

A common plant in the district, in rice fields (very prominent after the harvest), and in waste lands. It is a rank and unattractive plant; but when growing luxuriously it is a fair plant.

Flowers.—Throughout the year, not common during the rains. *Fruits.*—About the same time as the flowers.

Hallberg in MS. catalogue; *Blatt. Herb.* 23506! 23526! 23528! 23529! 23531! 23534! 23535! 27406! 28055! *Santapau* 430A! 314! 417! 3345! 8767!

Leucas ciliata Benth. in Wall., Pl. As. Rar. 1: 61, 1829; FBI. 4: 687; D. & G. 211; C. 2: 471; G. 1153; Mukerjee 174.

Not common in Khandala; it grows in open grass lands, especially on rocky ground.

Flowers.—November to March. *Fruits.*—December to May.

Hallberg in MS. catalogue; *Blatt. Herb.* 23508! 23518! 23532! *Santapau* 3391! 3392! 5885! 5886! 8067!

Leucas stricta Benth. in Wall., Pl. As. Rar. 1: 61, 1829; FBI. 4: 688; C. 2: 467; G. 1150; Mukerjee 170.

There is but one specimen in Blatt. Herb.; a rare plant in Khandala. Stem 16 cms. high. Flowers in small globose whorls, which are about 10-12 flowered, fewer-flowered and smaller than the rest of the *Leucas* of Khandala. Bracts linear, hairy with short hairs and ciliate with long stiff hairs. Calyx densely pubescent with short hairs and with a few, long ones scattered on the outside. Corolla white, upper lip densely white-villous; lower lip slightly pubescent outside.

Blatt. Herb. 28399!

Salvia Linn.

Salvia plebeia R. Br., Prodr. 501, 1810; FBI. 4: 655; D. & G. 209: C. 2: 474; G. 1155; Peter-Stibal in Fedd., Repert. 39: 181; Mukerjee 111.

Very common near the talao, both on stony ground along the old railway line and on the talao itself as soon as the level of the water has gone down; it is also common in the stream beds along the lower parts of most of the ravines in the district, usually on moist soil or sand; in the early part of the hot season, it is also common in cultivated fields.

In all these places the plant grows in great abundance in almost pure stands, and its long racemes of small flowers or fruits are very prominent.

Flowers and *Fruits*.—December to June.

Dalzell and *Gibson*; *Hallberg* in MS. catalogue; *Blatt. Herb.* 23527 ! 23537 ! 23710 ! 24047 ! 24052 ! 24054 ! 28539 ! *Santapau* 425 ! 1710 ! 3445 ! 3758 ! 3916 ! 8623 ! 8741 !

HYPTIS Jacq.

Hyptis suaveolens (Linn.) Poit., in Ann. Mus. Par. 7 : 472, t. 29, f. 2, 1806; Epling in Fedde, Repert. Beih. 95 : 115; FBI. 4 : 630; C. 2 : 476; G. 1129; Mukerjee 63.

Ballota suaveolens Linn., Syst. (ed. 10) 1100, 1759.

A shrubby, scented plant, up to 1·5 m. high. An American introduced herb which has become naturalized on the slopes below St. Xavier's Villa and in other parts of the district. The corollas are purple, 2-lipped; anthers purple, filaments hairy with whitish hairs. The calyx with its 9-10 strong nerves and its long spinous teeth distinguish this plant from all the native members of the same family. The whole plant is strongly and not unpleasantly aromatic, with large numbers of short glandular hairs scattered through the leaves and inflorescence. It is still rather rare in Khandala.

Santapau 3327 ! 5506 ! 5507 !

COLEUS Lour.

Coleus sp.

Several species of *Coleus* are regularly cultivated in Khandala gardens, but I have not observed any of them running wild in the district. In the absence of specimens, which could not be collected from gardens. I have not been able to identify the species.

Santapau, cultivated in gardens !

NYCTAGINACEAE.

BOERHAVIA Linn.

Boerhavia diffusa Linn., Sp. Pl. 3, 1753; D. & G. 213; C. 22 : 480.

B. repens Linn., Sp. Pl. 3, 1753; FBI. 4 : 709; D. & G. 213.

B. procumbens Roxb., Fl. Ind. 1 : 146, 1820; Gr. 167; Wight, Icon. t. 874.

A variable herb, diffuse, procumbent or scandent with stout roats and long branches; internodes long, slender, terete, green or purple. Leaves distinctly unequal in each pair. Flowers pale pink to pink, at times purplish pink.

Common in waste lands near Khandala station and talao. Not an attractive plant.

Flowers and *Fruits*.—October to June.

Santapau 2122 !

BOUGAINVILLEA Comm.

Bougainvillea spectabilis Willd., Sp. Pl. 2 : 348, 1799 ; D. & G. Suppl. 72 ; Woodrow, Gard. Trop. 450 ; C. 2 : 483 ; Merrill, Pl. Life Pac. World 161, t. 223.

A large climbing shrub commonly cultivated in gardens. The large coloured bracts are very prominent. The commonest colour of the bracts is pink to red. Occasional in Khandala gardens, not seen wild.

Flowers.—Hot season.

Blatt. Herb. 24143 ! *Santapau*, cultivated in gardens !

About the spelling of the generic name, see Harms in Engl. and Prantl, Pflanzenfam. (ed. 2) 16 C : 122 ; see also Sprague in Kew Bull. 1928 : 349.

MIRABILIS Linn.

Mirabilis jalapa Linn., Sp. Pl. 177, 1753 ; Gr. 167 ; D. & G. Suppl. 72 ; Woodrow, Gard. Trop. 451 ; C. 2 : 483.

An erect herbaceous plant, sometimes seen in Khandala gardens ; not found wild in the district.

Blatter : "Cultivated in gardens ".

AMARANTHACEAE.

CELOSIA Linn.

Celosia argentea Linn., Sp. Pl. 205, 1753 ; FBI. 4 : 714 ; Gr. 167 ; D. & G. 215 ; Wight, Icon. t. 1767 ; C. 2 : 485.

An annual, erect herb ; root stout, almost tuberous ; stems simple in young specimens, branched in older ones, but branches simple or nearly so, at least in the Khandala specimens ; the whole plant reaches 2·44 m., though usually it is about 1 m. high.

A common plant about Khandala, found all over the district in open fields or on the slopes and along the stream beds in the ravines.

Flowers.—August to November ; in moist spots up to June.
Fruits.—October to June.

Santapau 889 ! 931 ! 1098 ! 1105 ! 2253 !

AMARANTHUS Linn.

Amaranthus spinosus Linn., Sp. Pl. 991, 1753 ; FBI. 4 : 718 ; Willd., Hist. Amarant. 18, t. 4, f. 8 ; Gr. 169 ; Wight, Icon. t. 513 ; D. & G. 216 ; C. 2 : 489.

Rare in Khandala, except in waste land near the railway station and village tank. Locally no use is made of the leaves or roots of this plant.

Flowers and *Fruits*.—Dry season, October to June.

Blatt. Herb. 24206 ! 24210 ! *Santapau* 410 ! 3001 !

Amaranthus viridis Linn., Sp. Pl. (ed. 2) 1405, 1763; FBI. 4: 720; Gr. 169; C. 2: 490.

An erect herb with deeply grooved stems. Leaves variable, with a slender petiole about as long as the blade itself. The most typical part of the plant is the densely rugose capsule; it is the only species of the genus in Khandala with such a capsule.

Not common in Khandala; it is found in waste lands near the village tank and station, and occasionally along the stream bed in St. Xavier's Ravine. Cooke remarks that he has seen no specimens from Bombay: the specimens here listed have been checked with those in Kew Herb. and there is no doubt that the Khandala plants belong to this species.

Flowers and *Fruits*.—Dry season, from November onwards.

Blatt. Herb. 24215 ! *Santapau* 4435 ! 8126 ! 8975 !

Amaranthus blitum Linn., var. **oleracea** Hook. f. in FBI. 4: 721, 1885; C. 2: 490.

A. oleraceus Linn., Sp. Pl. (ed. 2) 1403, 1763.

Euxolus oleraceus Moq.: D. & G. 216.

An erect, suberect or prostrate herb. The capsule is the typical part of this species: it is smooth or nearly so, at least not at all or only very slightly rugose, about 1/3 longer than the perianth. Sepals obtuse or subobtuse and often apiculate and scarious near the margins. Leaves nearly as broad as they are long, with petioles up to three times as long as the blade.

Fairly common in waste land near the talao and station, occasional elsewhere. It is not cultivated in Khandala.

Flowers and *Fruits*.—Throughout the year.

Blatt. Herb. 24969 ! *Santapau* 23/23, 24 ! 3000 ! 3348 ! 3757 ! 4156 ! 5271 ! 5914 !

Amaranthus tricolor Linn., Sp. Pl. 989, 1753; Merrill, Enum. 2: 128.

A. gangeticus Linn., Syst. (ed. 10) 1268, 1759; FBI. 4: 719; C. 2: 489.

A. oleraceus Willd., Sp. Pl. 4: 386, 1805 (non Linn.); Gr. 169; Wight, Icon. t. 715.

A herb very similar to *A. paniculatus*, from which it differs mainly by its trimerous flowers. Sepals usually longer than the capsule with an awn which is at least as long as the leafy part of the sepal.

Rare in Khandala. Found near a stream in April 1941.

Flowers and *Fruits*—April 1941.

Santapau 23/66 !

Amaranthus hybridus Linn., subsp. **cruentus** Thell. var. **paniculatus** Thell. in Asch. & Graebn., Syn. 5(1): 247, 1914; Fl. Males. I, 4(2): 79.

A. paniculatus Linn., Sp. Pl. 1406, 1763; FBI. 4: 718; D. & G. 215; C. 2: 489.

A. frumentaceus Buch.-Ham.: Wight, Icon. t. 720.

An erect herb, growing in moist ground. Flowers are pentamerous; for the rest this plant is very similar to *A. tricolor* Linn.

Rare in Khandala; not seen in cultivation.

Flowers and *Fruits*.—April 1942.

Santapau 262 !

Amaranthus retroflexus Linn., Sp. Pl. 991, 1753.

The specimens mentioned below have been identified by Mr. M. B. Raizada of Dehra Dun. The plant was noticed growing gregariously near human habitation on Monkey Hill during the rains; it is clearly an introduction, a much stouter plant than any of the local species.

Flowers and *Fruits*.—July 1949.

Santapau 10187-10190 !

AERVA Forsk.

For the spelling of the generic name, see Sprague in Kew Bull. 1928: 342.

Aerva sanguinolenta (Linn.) Blume, Bijdr. 547, 1825; Backer in Fl. Males. I, 4(2): 85.

Achyranthes sanguinolenta Linn., Sp. Pl. 294, 1762.

Ach. scandens Roxb., Hort. Beng. 19, 1814 & Fl. Ind. 1: 676, 1832.

Aerva scandens Wall., Cat. 6911, 1829; Moq. in DC., Prodr. 13(2): 302, 1849; FBI. 4: 727; D. & G. 217; Wight, Icon. t. 724 (excl. sem. & utr.); C. 2: 493; G. 1178.

A subscandent to scandent shrubby herb, reaching 2 m. in length. Stem and branches striate, from densely pubescent (at times almost woolly) in young parts to glabrous in older ones. Leaves alternate and opposite on the same plant, up to 9·5×3 cms., acute, entire, base tapering into a short petiole; the two sides of the leaf are fairly densely hairy with stout hairs from broad bases.

A very common plant in Khandala; in dense forest, in clearings in the forest, and on grassy banks.

Flowers and *Fruits*.—October to June.

Blatt. Herb. 24202 ! 24203 ! 24207 ! 24211 ! 24212 ! 24213 ! 24857 ! 27946 ! 27948 ! 28032 ! 28236 ! *Santapau* 180 ! 1327 ! 1500 ! 1782 ! 3561 ! 4191 ! 5097 ! 8078 ! 8079 ! 8870 !

Aerva persica (Burm.) Merrill, in Phil. Journ. Sci. 10 : 348, 1921 ; Schinz in Pfam. (ed. 2) 16 C : 51.

Iresine persica Burm., Fl. Ind. 212 (err. typ. 312), 1768.

Aerva javanica Juss. in Ann. Muss. Par. 2 : 131, 1803 ; FBI. 4 : 727 ; D. & G. 216 ; Wight, Icon 876 ; C. 2 : 492.

Both Blatter and Hallberg have recorded the presence of this plant in Khandala ; I have not seen it in the district, there are no specimens in the Blatt. Herb.

Blatter and *Hallberg* in MS. catloagues.

Aerva lanata (Linn.) Juss., loc. cit. ; FBI. 4 : 728 ; Gr. 168 ; D. & G. 217 ; C. 2 : 493 ; Schinz, loc. cit. 52.

Achyranthes lanata Linn., Sp. Pl. 204, 1753 (non *Celosia lanata* Linn., ibid. 205, quae est *Aerva persica* Merr.).

Aerva floribunda Wight, Icon. t. 1776 pro parte, & 1776 bis A, 1852.

The occurrence of this plant is also given on the authority of Blatter and Hallberg. In the Blatt. Herb. there are no specimens from Khandala.

Blatter and *Hallberg* in MS. catalogues.

Aerva monsoniae (Linn. f.) Mart., in Nov. Act. Acad. Caes. Leop.-Carol. 13 : 291, 1826 ; FBI. 4 : 728 ; D. & G. 217 ; Wight, Icon. t. 725 ; C. 2 : 493.

Illecebrum monsoniae Linn. f., Suppl. 161, 1781.

Celosia monsoniae Retz., Obs. 2 : 13, 1781 ; Gr. 168.

There are no specimens of this plant from Khandala in any of the herbaria consulted ; it is given on the authority of Hallberg.

Hallberg in MS. catalogue.

Achyranthes Linn.

Achyranthes aspera Linn., var. **porphyristachya** Hook. f., FBI. 4 : 730, 1885 ; Boerlage, in Ned. Kruid. Arch. (2) 5 : 425.

A. porphyristachya Wall., Cat. 6925, 1832.

A. aspera Cooke, Fl. Bomb. Pres. 2 : 495, 1906, pro parte.

The typical *A. aspera* Linn. has not been found in Khandala ; the broadly ovate to orbicular leaves are characteristic of Linne's plant. The present variety has larger leaves, which are acute, elliptic or lanceolate ; spikes are longer with a slender rachis ; flowers and fruits are about the same in structure but slightly larger. The whole plant, even

at first sight, looks quite different from Linne's species. My specimen No. 4158 well represents the form peculiar to the variety; its leaves measure up to 13×6·5 cms. and are thin and nearly glabrous.

Common all over the district especially in clearings in the forest and on grassy slopes.

Flowers and *Fruits*.—September to May.

Blatt. Herb. 24217 ! 24902 ! 28089 ! *Santapau* 42A ! 352 ! 1845 ! 2536 ! 4158 ! 8862 !

Achyranthes coynei Santapau in Kew Bull. 1948 : 488, 1949.

The following is the translation of the specific description : " Similar to *A. aspera* var. *porphyristachya* Hook. f., from which it differs in the following details : it is a perennial plant ; in habit it is shrubby and profusely branched ; in size it far exceeds all the species of the genus described from India ; the inflorescence is much longer, the flowers and fruits at least twice as large as those of the typical species.

"A perennial shrub, erect, up to 3-3·5 m. high. Stem terete, woody, up to 5 cms. diam. below, thinner above ; branches many, woody, patent, the younger ones pubescent, older ones glabrous or glabrescent ; the whole plant including the inflorescence extends up to 3·5 m. in diameter. Leaves many, deciduous ; the lower ones 23·5×9 cms., or even larger ; higher leaves gradually decrease in size, all elliptic or lanceolate, acute or acuminate, glabrous or subglabrous above, pubescent or subpubescent beneath especially on the primary nerves, which are about 10-12 on either side of the midrib ; margins entire ; base cuneate or acute, decurrent into the petiole ; petiole up to 3 cms. long, pubescent, more or less channelled.

"Sepals at first green or pale, at length straw-coloured ; flowers when freshly opened, rosy or purplish on account of the colour of the staminal tube ; flowers at first erect, later patent, finally deflexed and appressed to the rachis. Rachis rather thick, up to 56 cms. long, densely pubescent, greyish or whitish ; the spikes with spreading flowers up to 20 mm. diam. Bracts persistent, ovate, acuminate, membranous, about 6 mm. long ; bracteoles aristate, deciduous, about as long as the bracts. Sepals up to 10 mm. long, 1·5-2·5 mm. broad, glabrous, green or greenish, margins scarious. Stamens 5 ; staminodes fimbriate, rose-coloured, only half as long as the filaments of the anthers, and about as long as the capsule. Capsule about 5 mm. long, style persisting on the capsule and 6 mm. long, the capsule included in the persistent and hardened sepals, brownish, truncate at the apex ; seed one, slightly brownish, nearly as large as the capsule itself, truncate at the apex cylindric, smooth.

The type, Santapau 8074, was collected in Khandala on the Western Ghats of India on the 26 November 1945 and was placed in the Blatt. Herb., Bombay; the iso- and para-types, Santapau 8069, 8070, 8073 have also been placed in the Blatt. Herb., 8071 in Kew Herb., 8072 in Arnold Arbor., U. S. A.; the paratypes, Santapau 5945, 5946, 5947, 8649 and Blatter 27553, 27554, 27555 have been placed in the Blatt. Herb."

At the time my specimens were collected, the plant was growing about half way down St. Xavier's Ravine, near the path; at that spot there were about ten different large plants; in 1949 I found that all those plants had disappeared from the spot, probably on account of a land-slide.

Flowers and *Fruits*.—October to February.

ALTERNANTHERA Forsk.

Alternanthera sessilis (Linn.) R. Br., Prodr. 417, 1810; FBI. 4: 731; Gr. 168; D. & G. 220; Wight, Icon. t. 727; Aschers. & Graebn., Syn. 5: 361.

Gomphrena sessilis Linn., Sp. Pl. 225, 1753.

Alternanthera triandra Lamk., Encycl. 1: 95, 1783; C. 2: 499.

A common plant in moist places throughout the year, often forming dense mats on damp ground.

Flowers and *Fruits*.—The whole year.

Blatt. Herb. 24202! 24934! 28532! *Santapau* 94(2)A! 416! 870! 1136! 3743! 5477! 6045! 6046! 7001!

GOMPHRENA Linn.

Gomphrena globosa Linn., Sp. Pl. 326, 1753; FBI. 4: 732; Gr. 169; D. & G. Suppl. 72; C. 2: 499; Aschers. & Graebn., Syn. 5: 367.

On several occasions I have noticed this plant cultivated in Khandala gardens; the colour of the flowers is deep red or crimson, I have not noticed any other colour in Khandala.

Santapau, cultivated in gardens.

CHENOPODIACEAE.

CHENOPODIUM Linn.

Chenopodium album Linn., Sp. Pl. 219, 1753; FBI. 5: 3; C. 2: 501; Ulbrich in Pfam. (ed. 2) 16 C: 487, f. 1-2.

C. viride Linn., Sp. Pl. 219, 1753; Gr. 171.

The occurrence of this plant is mentioned on the authority of Hallberg. According to Cooke it is often cultivated or found as an escape on cultivated ground in the Deccan. I have not seen the plant wild or otherwise in Khandala.

Hallberg in MS. catalogue.

POLYGONACEAE

POLYGONUM Linn.

Polygonum plebeium R. Br., Prodr. 420, 1810; FBI. 5: 27; C. 2: 512; Danser in Bull. Jard. Bot. Buitenz. (3) 8: 140; Steward, Polyg. East. As. 24.

A very variable plant, the forms and varieties apparently depending on the amount of moisture and shade. As far as Khandala is concerned, the early plants seem to belong to the var. *indica* Hook. f.; as the season advances and the ground becomes drier, they assume the foliage of var. *brevifolia* Hook. f. Many of my Khandala specimens show large leaves on the stem together with the smaller leaves on the branches.

A very common plant in rice fields after the harvest, along the beds of streams during the dry season, on the edges of the village tank and in open dry fields.

Flowers and *Fruits*.—December to May.

Blatt. Herb. 24297 ! 24298 ! 24299 ! 24300 ! 24301 ! 24302 ! **24303** ! 24305 ! 24306 ! *Santapau* 411 ! 424 ! 1723 ! 3438 ! 3439 ! 3457 ! 3544 ! 3750 ! 3825 ! 3826 ! 3918 ! 4086 ! 4200 ! 8602 !

Polygonum glabrum Willd., Sp. Pl. 2: 447, 1799; FBI. 5: 34; Gr. 172; D. & G. 214; Wight, Icon. t. 1799; C. 2: 514; Gage, Cens. Ind. Pol. in RBSI. 2: 393; Steward 43.

Not common in Khandala. There is a good clump near the Khandala Hotel Swimming Bath, which has been in flower and fruit for several years. During the dry season there are a few plants along the stream bed behind Khandala Hotel and along the bed of the stream along the bottom of St. Xavier's Ravine; it is also occasional near the village tank.

Local name: Parel.

Flowers and *Fruits*.—The whole year.

Blatt. Herb. 24293 ! *Santapau* 1220(2) ! 4823 !

Polygonum barbatum Linn., var. **gracile** Steward, in Polyg. East. As., in Contr. Gray Herb. 88: 55, 1930.

P. serrulatum Hook. f. in FBI. 5: 38, 1886 (excl. var. *Donii*); Gage 349; C. 2: 515 (non Lagasca, nec Meisn., nec Miq.).

P. rivulare Graham, Cat. 172, 1839 (an Koenigii ?); D. & G. 214

Rare in Khandala, only seen in the stream near Kune Plateau.

Flowers and *Fruits*.—January to September.

Hallberg in MS. catalogue; *Blatt. Herb.* 29558 ! *Santapau* 1707 ! 4091 ! 4092 ! 4399 ! 4400 ! 5913 !

Polygonum fagopyrum Linn., Sp. Pl. 364, 1753; Steward 116.

Fagopyrum esculentum Moench., Meth. 290, 1794; FBI. 5: 55; C. 2: 518.

An erect, stiff herb, glabrous all over, deep green. Leaves alternate below with a long petiole (petiole up to 5 cms. long); passing gradually into sessile leaves above, all deltoid, stiff when fresh, membranous when dry; margins entire; base subcordate to truncate; apex obtuse or subobtuse; the whole leaf more or less angular.

Inflorescence terminal on the stem and branches, secund or nearly so, racemose; pedicels filiform, varying in length. Perianth of 5 segments, which are united near the base, the segments ovate, obtuse, white. Stamens 5 alternating with the perianth segments; 10 glands or staminodes forming a disc round the base of the ovary; then 3 stamens with filaments twice as long as the outer five; the connective between the anther cells horizontal, very distinct. Ovary triangular in section; styles 3, recurved; stigmas capitate, small. Ovules seem to be one in each ovary.

Only seen once near human habitation, clearly an introduction.

Flowers and *Fruits*.—24 July 1949.

Santapau 10179 ! 10180 ! 10181 !

RUMEX Linn.

Rumex dentatus Linn., Mant. 2: 226, 1771; FBI. 5: 59; C. 2: 518; Pfam. 3 (1a): 19 & 17, t. 8, O.

A rare plant in Khandala, only seen in 1949 and 1950; on the last occasion it was found growing gregariously on the old railway line near the village talao.

Flowers and *Fruits*.—March 1949 and 1950.

Santapau 9999 ! 10769-10772 !

ANTIGONON Endl.

Antigonon leptopus Hook. & Arn., Bot. Beech. Voy. 308, t. 69, 1841; C. 2: 519; Danser in Bull. Jard. Bot. Buitenz. (3) 8: 242, f. 17.

An American plant cultivated in gardens and occasionally found as an escape in Khandala. On hedges along the main road from Khandala to Lanavla.

Flowers.—May 1944; Oct. 1945; April 1946.

Santapau, in gardens or roadsides.

MUEHLENBECKIA Meisn.

Muehlenbeckia platyclada (Muell.) Meisn., in Bot. Zeit. 23: 313, 1865 ("platyclados"); C. 2: 519; Danser 239.

Coccoloba platyclada Muell., in Bot. Mag. t. 5282, 1863.

In Blatt. Herb. there is one sheet of this plant in flower; the locality is given as "Bombay-Khandala". I have not seen the plant in Khandala either in gardens or as an escape.

Blatt. Herb. 24733 !

PODOSTEMACEAE.

TERNIOLA Tul.

Terniola zeylanica Tul., var. **konkanica** (Willis) Santapau, comb. nov.

Lawia zeylanica var. *konkanica* Willis, Rev. Pod. in Ann. Roy. Bot. Gard. Perad. 1 : 216, 1902 ; C. 2 : 521.

Willis, loc. cit., writes : " Khandala and Lanauli, in the Bhor Ghat, 1500-2500 feet, common, Willis ! Sakarpathar, near Lanauli, Woodrow ! Tiger Leap, near Khandala, Woodrow !... " In a footnote Willis adds : " Enormous quantities in the stream below the Hamilton Hotel on the left going from Khandala to Lanauli ; also in stream on the right after crossing the railway from the Hamilton Hotel, and in nearly all streams in the district and on far side of Sakarpathar."

ZEYLANIDIUM Engl.

Zeylanidium lichenoides Engler, var. **khandalensis** (Willis) Santapau, comb. nov.

Hydrobryum lichenoides Kurz, var. *khandalensis* Willis, loc. cit. 245, 1902. C. 2 : 522.

Willis 14 ! 65 ! in Kew Herb.

Zeylanidium lichenoides Engler, var. **bhorensis** (Willis) Santapau, comb. nov.

Hydrobryum lichenoides Kurz, var. *bhorensis* Willis, loc. cit.

Willis 17 ! in Kew Herb.

PIPERACEAE.

PIPER Linn.

Piper nigrum Linn., Sp. Pl. 28, 1753 ; FBI. 5 : 90 ; Gr. 198 ; D. & G. Suppl. 84 ; C. 2 : 527 ; C. DC., Clavis in Candollea 1 : 217 ; G. 1203.

P. Trioicum Roxb. : Gr. 199 ; Wight, Icon. t. 1935.

A common climber in practically all the ravines about Khandala. It grows under the shade of trees in deep forests, at times suberect, more often climbing over rocks or trees, but seldom going over 1·5 m. up the tree trunks. This plant is often taken for *P. trichostachyon* Cass., from which it clearly differs by its glabrous inflorescence. From the localities where this plant has been found in Khandala and its relative abundance, I consider it as indigenous in the district.

Local name : Mirvel.

Flowers.—July to September. *Fruits.*—January to August.

Blatt. Herb. 24342 ! 24345 ! 24347 ! 24348 ! 27970 ! *Santapau* 81(2)A ! 318A ! 382A ! 383A ! 170 ! 813 ! 1863 ! 1890 ! 1976 ! 1977 ! 3535 ! 3536 ! 4118 ! 4694 ! 8775 ! 8776 !

Piper trichostachyon (Miq.) C. DC. in Prodr. 16(1) : 242, 1869 ; FBI. 5 : 80 ; C. 2 : 526 ; C. DC., Clavis 70 & 282.

Muldera trichostachya Miq. : Wight, Icon. t. 1944.

In general appearance there is little difference between this species and *P. nigrum*. The spikes of this species are pubescent, at times densely so ; the stamens appear like two eyes in the opening of the globose bracts.

Dalzell and *Woodrow*, ex Cooke.

PEPEROMIA R. & P.

Peperomia wightiana Miq., in Hook. Lond. Journ. Bot. 5 : 548, 1846 ; FBI. 5 : 98 ; C. 2 : 529 ; DC., Clavis 344.

P. portulacoides D. & G. 225, 1861 (non Miq.).

Blatter mentions this plant among his Khandala plants ; there are no specimens in Blatt. Herb. from Khandala.

Blatter in MS. catalogue.

Peperomia pellucida (Linn.) H. B. K., Nov. Gen. 1 : 64, 1815 ; C. 2 : 529 ; C. DC., Clavis 329 & 341 ; Yuncker in Occ. Pap. Bishop Mus. 14 : 9.

Piper pellucidum Linn., Sp. Pl. 30, 1753.

An American plant naturalized in Western India ; it is common in Bombay Island. It is occasionally planted in Khandala gardens.

Blatt. Herb. 28285 ! *Santapau*, in gardens !

MYRISTICACEAE.

KNEMA Lour.

Knema attenuata (Wall.) Warb., Mon. Myrist. 590, 1897.

Myristica attenuata Wall., Cat. 6791, 1832, nom. nud. ; Hook. f. & Thoms., Fl. Ind. 157, 1855 ; DC., Prodr. 14(1) : 205, 1856 ; D. & G. 4 ; FBI. 5 : 110 ; King in ARBGC. 3(3) : 316, t. 152 ; C. 2 : 531.

M. attenuata G. 175, 1839 (non Wall.).

An evergreen, fine looking tree, somewhat rare in the district ; there are several trees together on the slopes below Duke's Nose not far from the village path ; it is also found scattered on Meroli Plateau in deep forest.

Local name : Ragtrorar.

Flowers.—November to December. • *Fruits.*—March to June.

Hallberg in MS. catalogue ; *Santapau* 1316 ! 1978 ! 1979 ! 1980 ! 2173 ! 2174 2175 ! 3221 ! 3222 ! 3223 ! 3224 ! 3880 ! 3881 ! 5449 !

LAURACEAE.

BEILSCHMIEDIA Nees.

Beilschmiedia fagifolia Nees, var. **dalzellii** Meisn., in DC., Prodr. 15(1) : 64, 1864 ; FBI. 5 : 122 ; C. 2 : 534.

B. roxburghiana D. & G. 222, 1861 (non Nees).

B. roxburghiana Nees, var. *Dalzellii* Haines; Bot. Bih. & Or. 798, 1924.

This is one of the largest and finest trees of Khandala. Leaves entire, somewhat broader than the types in Kew Herb., up to 15·5×7 cms., elliptic to broadly elliptic, acute, subacute or obtuse, glabrous and shining above, glabrous but dull and paler beneath, coriaceous to subcoriaceous ; base rounded, subacute and very shortly decurrent ; apex occasionally tapering to an obtuse point ; petioles up to 2 cms. long.

Pedicels conspicuously thickened in fruit, at first green, finally bright red. Flowers dull yellow, small and inconspicuous. Fruit smooth, at first green, gradually turning purple, at maturity black, generally covered with a whitish bloom that easily comes off, up to 44×26 mm. ; the red pedicel of the mature fruit is about as long as or a little longer than the fruit itself.

This is a difficult plant to identify, and I do not feel confident that my identification is correct ; one of the sheets in Kew Herb. from Stocks Herb. bears a note from Gamble : " In my opinion this is *B. Bourdilloni* Brandis ". On account of the structure of the leaves my Khandala plants are more similar to *B. Bourdilloni* than to *B. fagifolia*.

Local name. : Kásuri, Kájuri.

Flowers.—February to March. *Fruits.*—February to June.

Blatter in MS. catalogue ; *Santapau* 340 ! 340(2) ! 1733 ! 1735 ! 1868 ! 2136 ! 3858-3861 ! 3290 ! 6011 ! 6012 ! 8851-8853 ! 9069 !

CINNAMOMUM Bl.

Cinnamomum zeylanicum Blume, Bijdr. 568, 1825 ; FBI. 5 : 131 ; Wight, Icon. t. 123 ; C. 2 : 525 ; G. 1224 ; Kostermans in H. Humb., Not. Syst. 8(2) : 120.

C. aromaticum Gr. 173, 1839 ; D. & G. Suppl. 74.

Kostermans, loc. cit., following Meisner in DC., Prodr. 15 : 13, erroneously attributes the specific name to Breyne, who described the tree in Ephem. Nat. Cur. dec. 1, ann. 4 : 139, 1676 ; but according to the Rules, Breyne's name is not legitimate as it is prior to 1753. The first author after 1753 to use the binomial name was Blume.

Graham states that "a few trees grow in the ravines about Kandalla, but it is not common on that part of the Ghauts". For ten years I failed to find the tree about Khandala; finally in 1950 and again in 1951 I found two groups of such trees in St. Xavier's Ravine just below St. Xavier's Villa.

Flowers.—Not seen in Khandala. *Fruits.*—May 1950.

Blatt. Herb. 24389 ! 27473 ! 27475 ! 27506 ! 27595 ! *Santapau* 10958-10960 ! 10961-10970 ! 12239-12243 !

MACHILUS Nees.

Machilus macrantha Nees in Wall., Pl. As. Rar. 2 : 70, 1831 : FBI. 5 : 140 ; D. & G. 221 ; Wight, Icon. t. 1824 ; C. 2 : 536 ; Talb. 2 : 291 ; G. 1227.

M. [illegible] Wight, Icon. t. 1825, 1852 (excl. syns.) ; D. & G. 221.

Following Gamble, I have united these two species under one ; the material of these two species available in Kew Herb. supports this view. It is possible, however, that when more material becomes available, the two trees will prove to be different.

One of the largest trees in Khandala. Leaves coriaceous, up to 17×7 cms., acute at the apex, rounded or subacute and slightly unequal sided at the base. Inflorescence consisting of several puberulous panicles at or near the ends of the branches ; flowers inconspicuous, dull yellow. Fruits at first green with white dots, at maturity uniformly black with bluish bloom, subglobose, smooth, up to 27×19 mm.

Not common in Khandala. I have only seen two large clumps, one near Forbay, the other in the ravine just below St. Xavier's Villa.

Local name : Pishia ; Pisára.

Flowers.—December. *Fruits.*—January to April.

Blatter and *Hallberg* in MS. catalogues ; *Santapau* 3834-3838 ! 5897 ! 5898 ! 8716 ! 8717 !

ALSEODAPHNE Nees.

Alseodaphne semecarpifolia Nees in Wall., Pl. As. Rar. 2 : 72, 1829 ; FBI. 5 : 144 ; D. & G. 222 ; C. 2 : 526 ; Wight, Icon. t. 1226 ; C. 1226.

The occurrence of this tree in Khandala is given on the authority of Blatter and Hallberg, both of whom affirm that they have seen it in the district. There are no specimens from Khandala in any of the herbaria consulted.

Blatter and *Hallberg* in MS. catalogues.

ACTINODAPHNE Nees.

Actinodaphne angustifolia Nees in Wall., Pl. As. Rar. 3: 31, 1832; Wight, Icon. t. 1841; Haines, Bot. Bih. & Oris. 792.

A. Hookeri Meisn. in DC., Prodr. 15(1): 218, 1864 (excl. var. *longifolia* & incl. vars. *dassypoda* & *glabrata*); FBI. 5: 149; C. 2: 537.

A. lanceolata D. & G. 213, 1861.

Tetranthera lanceaefolia ? G. 174, 1839 (non Roxb.).

A small to medium-sized tree with a sombre aspect. Leaves near the ends of the branches, whorled, dark bluish green, up to 18×7 cms.; young leaves densely silky on both sides, mature leaves generally glabrous. Meisner has two varieties, *dassypoda* and *glabrata*: these cannot be maintained as varieties, since the pubescence or glabrousness of the leaves depends on the age of the leaves. Petioles silky pubescent when young, glabrous when old.

Flowers dioecious, yellow, on leafless branches near the end; buds rusty tomentose. Fruits at first green with a few white dots, at maturity bright orange red without dots, seated in the cup-shaped calyx.

This is one of the most prominent and abundant trees on Bhoma Hill; the shape of the tree and the deep bluish green colour of its foliage make it stand out rather strongly against the surrounding vegetation.

Fruits are produced in great abundance, and at maturity can be seen in large numbers on the floor of the forest under the tree.

Local name : Pishia.

Flowers.—October to December. *Fruits.*—January to June.

Blatt. Herb. 21212 ! 24349 ! 24670 ! 24671 ! *Santapau* 191 ! 191(*a*) ! 453 ! 1421 ! 1931 ! 2072 ! 2073 ! 2670 ! 2761 ! 3396-3399 ! 4111 ! 4112 ! 5895 ! 8929 !

LITSEA Lamk.

Litsea deccanensis Gamble, Fl. Madr. 1235, 1925.

L. tomentosa Heyne ex Wall., Cat. sub no. 2550, 1830; FBI. 5: 157; C. 2: 539 (non Blume).

Tetranthera tomentosa Roxb.: Wight, Icon. t. 1834.

T. apetala G. 174, 1839; D. & G. 222 (non Roxb.).

Widely scattered over the whole district, but nowhere abundant.

Local name : Kúrak.

Flowers.—October to January. *Fruits.*—December to January.

Blatt. Herb. 27467 ! 28273 ! 28421 ! 28440 ! *Santapau* 760(2)A ! 1422 ! 1561 ! 2838 ! 2839 ! 2881 ! 3264 ! 4248 ! 4724 ! 4990 ! 4891 ! 5896B !

Litsea wightiana (Nees) Hook. f. in Gen. Pl. 3 : 162, 1880 ; FBI. 5 : 177 pro parte ; C. 2 : 540 ; G. 1238.

Cylicodaphne wightiana Nees in Wall., Pl. As. Rar. 2 : 68, 1829 ; D. & G. 222 ; Wight, Icon. t. 1883.

Blatter mentions this tree among those of Khandala ; I have seen no specimen from the district. In Blatt. Herb. there is a specimen, no. 24388, collected on June 2, 1899, which has been labelled in Blatter's hand as *L. wightiana* ; the specimen does not seem to be a *Litsea* at all, as it does not match with any of the plants of this genus in Kew Herb.

Another specimen in Blatt. Herb., no. 27546, has been identified at Dehra Dun as "*Litsea fuscata* Thw." ; in my opinion the specimen belongs to *Actinodaphne angustifolia*.

Blatter in MS. catalogue.

PROTEACEAE.

Grevillea R. Br.

Grevillea robusta Cunn. in R. Br., Suppl. Pr. 24, 1830.

A large tree often planted in gardens. In Khandala I have never seen the tree in flower ; further in the Deccan it seems to flower quite readily. Planted in St. Xavier's Villa.

Santapau, in gardens.

THYMELEACEAE.

Lasiosiphon Fresen.

Lasiosiphon eriocephalus Decne. in Jacq., Voy. Bot. 148, 1844 ; FBI. 5 : 197 ; C. 2 : 542.

L. speciosus Decne. loc. cit. 147, t. 150 ; D. & G. 221.

Gnidia eriocephala Gr. 176, 1839 ; Wight, Icon. t. 1859.

One of the commonest shrubs about St. Xavier's Villa and Convalescent Home ; usually it is found in open country or towards the edges of forest. The stem and leaves are used locally for poisoning fish in local streams ; the fish so poisoned do not die, but float along the stream in a stunned condition.

Local name : Rámeta.

Flowers.—November to January. *Fruits.*—March to May.

Graham ; Jacquemont "Frequens in fruticetis montium inter Carli et Candalah" ; *Dalzell* and *Gibson ; Cooke* ! *Hallberg* in MS catalogue ; *Blatt. Herb.* 21278 ! 21279 ! 24402 ! 24403 ! 24406 ! 24407 ! *Santapau* 811A ! 3194 ! 3195 ! 8671 !

ELAEAGNACEAE.

ELAEAGNUS Linn.

Elaeagnus conferta Roxb., Fl. Ind. 1 : 440, 1832 ; Schlecht. in DC., Prodr. 14 : 612, 1857 ; Servettaz in Bull. Herb. Boiss. (ser. 2) 8 · 389, & Monogr. Elaeagn. 90 ; G. 1246.

E. latifolia Linn., Sp. Pl. 121, 1753 ; FBI. 5 : 202 ; C. 2 : 543 ; omnes pro parte tantum.

According to Servettaz, loc. cit., the Linnean species *E. latifolia* is a complex group consisting of at least three species : *E. conferta* Roxb., *E. latifolia* Linn. and *E. Kolaga* Schlecht. The structure of the perianth is the distinguishing feature of these species : *E. conferta* has a perianth with a short conical base, and a tube which is cylindrical, more or less equally thick throughout the whole of its length. This is definitely the common Khandala plant.

A scandent or subscandent shrub with long branches. Leaves greyish green above, silvery white and shining beneath. Flowers creamy-white, shining with silvery scales. Perianth tube short, cylindric ; lobes ovate or more or less triangular or deltoid, spreading. Fruit at first greyish green, at maturity pale pink with a transparent, white-dotted skin.

The fruit when ripe is edible, and has a slightly acid taste.

Common at the edges of the forest, or in fairly dense forest where trees are not too high. The leaves are among the most elegant ones in Khandala.

Local name : Amgúli.

Flowers.—December to January. *Fruits.*—January to May.

Graham ; Gammie 16114 ! *Blatt. Herb.* 24410 ! 24411 ! 24414 ! *Santapau* 54A ! 21 ! 1417 ! 1556 ! 1643 ! 1644 ! 3495 ! 3496 ! 3497 ! 3974 ! 5863 ! 5864 !

LORANTHACEAE.

" The only genus bearing rightly the name *Loranthus* is nowadays called *Psittacanthus* and is restricted to tropical America." (Danser, New Syst. Loranth. and Nomencl., p. 65).

DENDROPHTHOE Mart.

Dendrophthoe falcata (Linn. f.) Ettingsch. in Denkschr. Akad. Wissen. Math.-Naturw. Cl. 32 : 52, 53, 58, t. 13, f. 14, 1872 ; Danser in Bull. Jard. Bot. Buitenz. (ser. 3) 11 : 403, 1931 ; id. ibid. in 14 : 96, 1936 ; Merrill in Contr. Arn. Arb. 8 : 53, 1934.

Loranthus falcatus Linn. f., Suppl. 211, 1781.

L. longiflorus Desr. in Lamk., Encycl. 3 : 598, 1789 ; FBI 5 : 214 ; Gr. 86 ; Wight, Icon. t. 302 ; C. 2 : 548 ; G. 1250.

This species is less common than most other Loranthaceae in Khandala. The host plants noted in the district are the following: *Pongamia pinnata* (Linn.) Pierre, *Meyna laxiflora* Robyns, *Mangifera indica* Linn., *Careya arborea* Roxb., *Carissa congesta* Wight, *Salmalia malabarica* Schott & Endl., *Syzygium cumini* (L.) Skeels, *Casearia graveolens* Dalz., *Woodfordia fruticosa* (L.) Kurz, *Vitex negundo* Linn., *Holoptelea integrifolia* Planch., etc. The commonest host plants are *Mangifera* and *Careya*.

Flowers.—December to May. *Fruits.*—March to May.

Graham; Hallberg in MS. catalogue; *Blatt. Herb.* 24534 ! 28366 ! *Santapau* 175 ! 1544 ! 3531 ! 3602 ! 4013 ! 4014 ! 4356 ! 8611 ! 8734 ! 8947 ! 8948 ! 8949 !

Dendrophthoe falcata Etting., var. **coccinea** (Talb.) Santapau, comb. nov.

Loranthus longiflorus Desr. var. *coccinea* Talb., Trees, ed. 1, 172, 1894; C. 2 : 549.

This parasite was first recorded from Khandala on December 28, 1949; the host was covered with branches of the parasite, but collection of specimens was made difficult by the many spinous climbers on the trunk and the multitude of red ants on the branches of the host (*Terminalia crenulata* Roth). Flowers: calyx green; corolla scarlet in the tube, green on the outside of the lobes; as the flower ages, the whole of the corolla becomes uniformly scarlet. Filaments slightly deeper red than the corolla tube.

On *Terminalia crenulata* Roth, at the point where Monkey Hill Plateau joins Battery Hill Plateau, in dense jungle.

Flowers.—December 28, 1949.

Santapau 10652 ! 10653 !

Dendrophthoe trigona (Wt. & Arn.) Danser, MS. in Kew Herb. Ined.

Loranthus trigonus Wight & Arn., Prodr. 386, 1834; FBI. 5 : 219; C. 2 : 549.

Macrosolen trigonus Van Tiegh., in Bull. Soc. Bot. France 42 : 442, 1895.

A stout woody parasite; young branches acutely 3-angled, gradually becoming rounded with age. Leaves thick, leathery and rather variable in shape and size, up to 15×12 cms., opposite or in whorls of 3, reddish when young, at length greyish green. Flowers in short axillary racemes, often from the old wood away from the actual leaves; the whole inflorescence is glabrous. Peduncle up to 2 cms. long, green or reddish; corolla slightly inflated about the middle of the tube; tube salmon pink below, greenish in the upper half; corolla lobes salmon-pink, becoming red with age. Anthers yellow with a touch of pink,

about 4 mm. long; filaments greenish; stigma "Carmine" (Ridg.), style greenish. The edges of the corolla lobes are papillose with minute carmine papillae, which are very clear on the fresh flower. Fruit ellipsoid, about 10×8 mm., light red in colour when ripe.

Not a common parasite in Khandala. The most frequent hosts are *Ficus arnottiana* Miq., *F. glomerata* Roxb.; occasional hosts *Heterophragma quadriloculare* K. Schum., and *Pouteria tomentosa* Baehni.

Flowers.—January to February. *Fruits.*—February to June.

Blatt. Herb. 24523 ! 24537 ! 24544 ! *Santapau* 131 ! 899 ! 1518 ! 1519 ! 4139-4142 ! 5837-5841 ! 8632 ! 9165 !

HELICANTHES Dans.

Helicanthes elastica (Desr.) Dans. in Verhand. K. Akad. Wetensch. Amsterd. (sect. 2) 29(6): 55, 1933.

Loranthus elasticus Desr. in Lamk., Encycl. 3: 599, 1789; FBI. 5: 216; Gr. 86; D. & G. 109; Wight, Icon. t. 343; C. 2: 547.

A woody parasite, with much swollen joints; young branches green and smooth, older ones greyish and rough. Leaves opposite, sessile, leathery, up to 7×3·5 cms., ovate, obtuse or subacute; nerves obscure. Flowers in axillary or lateral fascicles at the nodes; calyx green with a touch of purple; corolla tube whitish, lobes reddish, the whole flower up to 3·5 cms. long. The corolla lobes open explosively and remain spirally coiled. Style and stigma scarlet, not coiled. Fruit green.

A rare parasite, seen mainly about half way down the slopes of Duke's Nose Ravine at about 500 m. altit. Hosts: *Pouteria tomentosa* Baehni, *Terminalia bellerica* Roxb., *Memecylon umbellatum* Burm., *Mallotus philippensis* Muell., *Careya arbora* Roxb., *Syzygium cumini* Skeels, etc.

The dichotomous arrangement of the branches and the shape of the leaves distinguish this plant among the Loranthaceae.

Flowers.—October to January. *Fruits.*—November to January.

Blatt. Herb. 27549 ! *Santapau* 819(2)A ! 1512 ! 1577 ! 2877 ! 2878 ! 4132 ! 5438-5444 ! 8084 !

HELIXANTHERA Lour.

Helixanthera obtusata (Schult.) Danzer, in Bull. Jard. Bot. Buitenz. (ser. 3) 10: 317, 1929.

Loranthus obtusatus Schult., Syst. 7(2): 1650, 1830; FBI. 5: 205; Gr. 86; D. & G. 109; C. 2: 546.

This plant is included on the authority of Hallberg; there are no specimens in Blatt. Herb.; I have not seen it in Khandala.

Hallberg in MS. catalogue.

MACROSOLEN Blume.

Macrosolen capitellatus (Wt. & Arn.) Danser in Blumea 2: 36, 1936.

Loranthus capitellatus Wt. & Arn., Prodr. 382, 1834; FBI. 5: 221; Wight, Icon. t. 304; D. & G. 109; C. 2: 550.

A bushy parasite. Leaves opposite or subopposite, base acute or subacute. Peduncles up to 1 cm. long, usually shorter; pedicels 0. Calyx truncate, about 2-3 mm. long. Corolla usually curved, up to 22 mm. long, tube pink or reddish below, creamy white above, lobes green becoming purplish with age. In bud the whole flower, bract, bracteoles, calyx and corolla is green.

A common parasite, forming dense bushy clumps on the host; often the point of insertion of the parasite is marked by a prominent swelling, cancer-like, on the host. The commoner hosts are: *Flacourtia latifolia* Cooke, *Terminalia crenulata* Roth, *Careya arborea* Roxb., *Mangifera indica* Linn., *Terminalia chebula* Retz., *Mallotus philippensis* Muell., *Macaranga peltata* Muell. Arg., *Acacia* sp., *Pouteria tomentosa* Baehni, etc.

Flowers.—March to July. *Fruits.*—May to July.

Blatt. Herb. 24545 ! 24547 ! 24548 ! *Santapau* 70A ! 300 ! 397 ! 501 ! 1716-1718 ! 1923 ! 4055 ! 4056 ! 4123 ! 4124 ! 4174-4179 ! 4357 ! 4462 ! 6778 ! 6779 ! 6780 ! 8901-8903 ! 8912-8915 ! 9180-9183 !

SCURRULA Linn.

Scurrula philippensis (Cham. & Schlecht.) G. Don, Gen. Hist. 3: 442, 1834; Danser in Bull. Jard. Bot. Buitenz. (ser. 3) 10: 352, 1929.

Loranthus philippensis Cham. & Schlecht. in Linnaea 3: 204, 1828.

L. Scurrula Hook. f. in FBI. 208; C. 2: 546; ambo pro parte.

L. buddleoides Desr.: G. 86, 1839; D. & G. 110, pro parte.

The differences between this plant and *S. parasitica* Linn., with which it is often confused, are given by Danser in Phil. Journ. Sci. 58(1): 117, 1935.

"Large-leaved, long-flowered, with light-coloured tomentum; leaves usually 4 to 9 cm. long, 2·5 to 6 cm. broad, roundly-elliptical to oblong; corolla and style 15 to 25 mm. long. *S. philippensis.*

Small-leaved, small-flowered; leaves usually round to lanceolate obovate, 1·5 to 6 cm. long, 1 to 3 cm. broad; corolla and style usually 9 to 15 mm. long, rarely longer. *S. parasitica.*"

A shrubby tree-parasite. Leaves opposite, subopposite and alternate on the same plant, up to 11·5×6 cms., obtuse to subacute; petioles up to 1·8 cms. long. Flowers (calyx and corolla included) about 2·2 cms. long. Corolla slender, straight or curved, grey-tomentose outside. Berry grey tomentose.

Hosts: *Vitex negundo* Linn., *Butea monosperma* Kuntze, *Bridelia squamosa* Gehrm., etc.

Flowers.—December to June. *Fruits.*—December onwards.

Blatt. Herb. 28358 ! 28359 ! *Santapau* 1481-1484 ! 4418-4423 !

TAXILLUS Van Tiegh.

Taxillus cuneatus (Roth) Danser, in Bull. Jard. Bot. Buitenz. (ser. 3) 10 : 354, 1929.

Loranthus cuneatus Roth, Nov. Pl. Sp. 193, 1821; FBI. 5 : 214; D. & G. 110; C. 2 : 548.

A shrubby parasite; young branches green, older ones greyish and rough. Leaves alternate (the fascicles mentioned by Cooke, seem to be leaves belonging to short axillary branches), up to 5·2×3·8 cms. (includ. the petiole).

Flowers in pedunculate umbels with generally 3 shortly pedicellate flowers in each umbel; peduncles up to 8 mm. long, slender; each flower is supported by a bracteole. Calyx tomentose outside. Corolla up to 3 cms. long, straight or slightly curved, reddish outside.

This is one of the commonest of parasites in Khandala, and the only one truly abundant; often the parasite is so abundant that the host is killed.

Hosts: *Mangifera indica* Linn., *Olea dioica* Roxb., *Glochidion hohenackeri* Bedd., *Meyna laxiflora* Rob., *Syzygium cumini* Skeels, *Canthium dicoccum* Merr., *Flacourtia latifolia* Cooke, *Grewia* sp., *Lannea grandis* Engl., *Vitex negundo* Linn., *Randia brandisii* Gamble, *Pavetta indica* Linn., *Emblica officinalis* Gaertn., etc.

Flowers.—January to August. *Fruits.*—January to November.

Blatt. Herb. 24469 ! 24542 ! *Santapau* 720A ! 441 ! 445 ! 559 ! 660 ! 1215 ! 1571 ! 1572 ! 4215 ! 4305 ! 4306 ! 4495 ! 4658 ! 4714 ! 6960 ! 8916 ! 9090 !

TOLYPANTHUS Blume.

Tolypanthus lageniferus (Wight) v. Tiegh. in Bull. Soc. Bot. France 42 : 249, 1895 ("lageniferus"); Danser in Bull. Jard. Bot. Buitenz. (ser. 3) 10 : 355 & Verhand. K. Akad. Wetensch. Amsterd. (sect. 2) 29(6) : 127.

Loranthus lageniferus Wight, Icon. t. 306, 1840; FBI. 5 : 218; Gr. 86; D. & G. 110; C. 2 : 550.

A rough-looking parasite; branches stout, conspicuously lenticellate. Leaves leathery, up to 13×10·5 cms., generally suborbicular, green or reddish, or red-spotted mainly along the petioles and nerves.

Flowers fasciculate on the old wood; peduncle about 3-4 mm. long. Involucre generally red, very seldom red at the rim, green below, cup-shaped, up to 33 mm. long; teeth unequal, about 5 in number, deltoid, 3-8 mm. long; flowers 3-6, often 5 in an involucre. Calyx minute. Corolla up to 4 cms. long, green or red, lobes green. Stamens about as long as the corolla tube, anthers just exserted in the open flowers; style as long as the corolla, exserted 4-6 mm. from the open flower, stigma minute, both style and stigma red. Fruit yellow to orange, with red or purplish top, up to 11×6·5 mm., ovate-oblong; when in fruit, the involucre cup is often ruptured or split.

A fairly common parasite; it differs from all the Loranthacae of Khandala by its involucre, and by the fact that it puts out haustoria along most of its branches, which "creep" for fairly long distances along the branches of the host.

Hosts: the commonest is *Pouteria tomentosa* Baehni; occasionally it is found on *Hollarrhena antidysenterica* Wall., *Randia brandisii* Gamble, *Securinega* sp., *Ficus* sp.

Flowers.—June to August. *Fruits.*—July to September. *Leaves.*—July to March.

Graham "This strange looking parasite is to be found on *Kanta Koomla* (*Sideroxylon*) trees at Kandalla"; *Hallberg* in MS. catalogue; *Blatt. Herb.* 24448! 24525! 27945! *Santapau* 287A! 19! 819! 952! 1511! 2148! 4773! 4519! 4520! 4567! 4568! 4569! 4650! 6954! 6955! 8783!

Viscum Linn.

Viscum angulatum Heyne ex DC., Prodr. 4: 283, 1830; Wight & Arn., Prodr. 380; FBI. 5: 225; D. & G. 110; C. 2: 553; Talb. 2: 422, t. 481; G. 1257; Fischer in RBSI 11: 181 seq.

Viscum ramosissimum Wight, Icon. t. 1017 tantum, 1845.

A leafless parasite; young branches green, sharply angular; older ones terete, greyish. Flowers green or yellowish green, minute. Fruit globose, smooth, at first green, at length pale yellowish green.

A common parasite about Khandala, generally pendulous from the branches of the host and rather abundant. Hosts: the commonest is *Olea dioica* Roxb.; other hosts are *Syzygium cumini* Skeels, *Jasminum malabaricum* Wight, *Flacourtia latifolia* Cooke, *Linociera malabarica* Wall., *Carissa congesta* Wight, *Terminalia chebula* Retz., etc.

It is often found on the same host as *Taxillus cuneatus* v. Tiegh, but I have not seen this or any other members of the Loranthaceae parasitic on each other.

Flowers.—December to May. *Fruits*—April to October.

Blatt. Herb. 24538! 24539! 24484! 28346! *Santapau* 66A! 300A! 23! 567! 659! 1651! 2071! 4027! 4214! 4527! 4717! 6959! 8625!

Viscum nepalense Spreng.; Syst., Cur. Post. 47, 1827; Danser in Blumea 4: 283.

V. dichotomum D. Don., Prodr. Fl. Nep. 142, 1825 (non Gilibert 1792 nce Spreng. 1825).

V. attenuatum DC., Prodr. 4: 284, 1830; Gr. 85.

V. articulatum (non Burm. 1768) Hook. f. in FBI. 5: 226; C. 2: 553 pro parte; G. 1258; Fischer, loc. cit. 161 seq. (omnes incl. **var.** *dichotoma*).

Viscum nepalense var. *thelocarpum* Dans. in Blumea 4: 289, 1941.

Danser loc. cit. p. 267 gives the following differences between this species and the real *V. articulatum* Burm.:

"Internodes slender, usually not more than 5 mm. broad. Fruits white or greenish-white, globose, not more than 3 mm. in diameter. Nearly always parasitic on Loranthaceae: 7. *V. articulatum.*

"Fruits darker coloured, and also larger, or at least longer. Only now and then on Loranthaceae. Internodes 5-10 mm. broad. Fruit globose or somewhat oblong in the unripe stage: 8. *V. nepalense.*"

All the *Viscum* sheets in Kew Herb. have been examined by Danser, and the only specimens of *V. articulatum* Burm. from India come from Khasia Hills and Burma.

The var. *thelocarpum* Dans. seems to be based on too slender grounds to be maintained even as a variety.

A leafless parasite, green; internodes in young branches flattened, narrowed at the nodes; older branches more or less terete. Flowers minute, green or yellowish green. Fruit green and verruculose when young, at maturity smooth and yellowish; pulp very viscous, whitish; seed green, about 2×1 mm.

Hosts: *Mangifera indica* Linn., *Terminalia crenulata* Roth, *Schleichera oleosa* Merr., *Flacourtia latifolia* Cooke, *Eriolaena quinqueloculari*s DC., *Grewia* sp., etc.

Among the specimens from Khandala I have two, possibly juvenile forms, without flowers or fruits, where the branches are only 2-3 mm. broad; they seem to be an intermediate form between *V. angulatum* and *V. nepalense.*

Flowers and *Fruits.*—March to May.

Blatter in MS. catalogue; *Santapau* 67A! 3896! 3897! 4341! 4342! 4457! 8892! 8893!

Viscum monoicum DC., Prodr. 4: 278, 1830; Roxb., Fl. Ind. 3: 763, 1832; FBI. 5: 224 (incl. var. *Edgeworthii*); C. 2: 552, **pro parte**; G. 1257; Danser in Blumea 4: 305.

V. verruculosum Talb. 2: 419, pro parte (non Wt. & Arn.), 1911.

A pendulous parasite. Branches terete, striate, green. Leaves somewhat leathery, up to 7×3 cms., ovate or lanceolate, often falcately curved, acute to subacute, base tapering into the petiole, margins entire or more or less irregularly crenate or waved; basal nerves 3-5, fairly prominent. Flowers in axillary, sessile or pedunculate umbellate fascicles, minute, greenish. Fruit green, shining, smooth, with about 9 longitudinal whitish lines..

Host: the only host on which this parasite has been found in Khandala is *Mallotus philippensis* Muell.

Not common in the district. I have only seen two groups of these plants, one on Patanmal Plateau, the other on the slopes below Elphinstone Point.

Flowers and *Fruits:* February to May.

Santapau 3994-4007 ! 4113-4115 ! 6016-6024 ! 8798-8800 ! 8951-8958 !

SANTALACEAE.

Osyris Linn.

Osyris wightiana Wall., Cat. 4036, 1831; Gr. 177, 1839; Wight, Icon. t. 1853, 1852; D. & G. 223; Pilger in Pfam. (ed. 2) 16B : 77, t. 37.

O. arborea Wall., Cat. 4035, 1831; DC., Prodr. 14 : 633, 1857; FBI. 5 : 32; C. 2 : 555.

The two names, *O. arborea* and *O. wightiana*, were published as " nomina nuda " by Wallich in 1831; examination of Wallich's sheets in Kew Herb. shows that the two plants are identical. Graham in 1839 took up the name *wightiana*, but his description is too meagre to be accepted as valid under the rules; Wight's icon t. 1853 shows the plant correctly, and has to be accepted as valid under the rules, Art. 44. The name *O. wightiana*, therefore, is the oldest name effectively published for this plant, and the date of publication must be taken to be 1852, the date of Wight's publication of his Icon for this plant.

A very common shrub about Khandala, in open places or at the edge of the forest.

Local name: Jinjrat or Raktrorar.

Flowers and *Fruits.*—Most of the year, except the middle of the rainy season.

Graham; *Cooke*, Nov. 1891 ! *Gammie* 16158 ! *Blatt. Herb.* 24627 ! 24633 ! 24634 ! 24651 ! 24668 ! 28045 ! 28356 ! *Santapau* 35A ! 1545 ! 1645 ! 1925 ! 3371 ! 3587 ! 3729 ! 4237 ! 4238 ! 4470 ! 4648 ! 4654 ! 4655 ! 4693 ! 6130 ! 6131 ! 9016-9024 !

BALANOPHORACEAE.

BALANOPHORA Forst.

Balanophora indica Wall., Cat. 7247, 1832; Weddell in Ann. Sci. Nat. (ser. 3) 14 : 183, t. 9, 1850; FBI. 5 : 237; C. 2 : 557; Harms in Pfam. (ed. 2) 16 B : 332.

Langsdorffia indica Wight & Arn. ex Hook., Icon. t. 205-206, 1840.

From 1941 to 1949 I searched extensively for this plant, especially during October to December, when the plant is supposed to be in flower, but without success. In Blatt. Herb. there are no specimens from Khandala.

Woodrow ex Cooke "on roots of Carissa Carandas"; *Blatter* in MS. catalogue.

EUPHORBIACEAE.

EUPHORBIA Linn.

Euphorbia neriifolia Linn., Sp. Pl. 451, 1753; FBI. 5 : 255; D. & G. 226; G. 1277.

E. ligularia Roxb., Hort. Beng. 36, 1814 & Fl. Ind. 2 : 465, 1832; C. 2 : 563.

Ligularia lactea Rumph. : G. 179 & 251.

Very common in open country in the plateaus and slopes about Khandala, often planted as a hedge plant round cultivated fields; the largest specimens in the district are on the slopes of Bhoma Hill above the railway station.

Local name : Dhudli.

Leaves.—August to October. *Flowers* and *Fruits.*—December to May.

Hallberg in MS. Catalogue; *Ryan* 16 ! *Gammie* 16107 ! *Santapau* 8876 ! 8984 !

Euphorbia trigona Haw., Syn. Plant. Succul. 127, 1812; FBI. 5 : 256 pro parte; Wight, Icon. t. 1863; G. 1277.

Very similar in most respects to *E. neriifolia*, but different in having only 3 rows of leaves or stipular thorns and the tubercles being very pronounced. Among my Khandala specimens there is one with tubercles in three rows and each tubercle being about 2 cms. long, straight or recurved. My specimens match those in Kew Herb. marked "*Euphorbia trigona* Haw... Searampore. G(riffith)." Until further evidence be obtained, I give this plant only provisionally as occurring in Khandala.

Santapau 4834 ! 4835 !

Euphorbia pycnostegia Boiss., Cent. Euph. 9, 1860 ; FBI. 5 : 246 ; C. 2 : 565 ; G. 1274.

In grass fields or on grassy slopes. An elegant herb.

Flowers and *Fruits*.—September to December, or in moist places up to March.

Cooke, 5 November 1891 ! *Blatter* 13372 ! *Santapau* 1430 ! 2534 ! 3141 ! 5062 ! 8063 !

Euphorbia zornioides Boiss., in DC., Prodr. 15(2) : 19, 1862 ! FBI. 5 : 246 ; C. 2 : 565 ; G. 1270.

Very similar to *E. pycnostegia*, from which it is separated by its smooth, non-tuberculate seeds. Leaves are opposite, but branches quite often are only produced in the axil of one of them ; size of the leaves up to 55×17 mm. ; petioles 0-2 mm. long.

In view of the close resemblance between this species and the preceding one, I am very strongly inclined to merge them both under a single species, with at most two varieties.

Flowers and *Fruits*.—August to November ; in moist spots till May.

Blatt. Herb. 28197 ! 29370 ! *Santapau* 68/60, 68 ! 1022 ! 1203 ! 2586 ! 2759 ! 3142 ! 4747 ! 4748 !

Euphorbia hirta Linn., Sp. Pl. 454, 1753 ; Gr. 179 ; D. & G. 227 ; G. 1275 ; Pax & Hoffm. in Pfam. (ed. 2) 19 C : 210.

E. pilulifera Hook. f. in FBI. 5 : 250, C. 2 : 568, et al. auct. ind. passim, sed not Linn.

Erect, ascending or prostrate ; stems and branches green or purplish ; hairs on the branches simple but jointed. Leaves distinctly unequal-sided.

Common in waste lands and along the railway line ; an inconspicuous and unattractive herb.

Flowers and *Fruits*.—The whole year.

Blatter and *Hallberg* in MS. catalogues ; *Blatt. Herb.* 13804 ! *Santapau* 68/98 ! 6802 ! 6829 !

Euphorbia thymifolia Linn., Sp. Pl. 454, 1753 ; FBI. 5 : 252 ; D. & G. 227 ; C. 2 : 569 ; G. 1276 ; Pax & Hoffm. loc. cit.

E. prostrata Graham, Cat. 179, 1839 (non Ait.).

Fairly common in moist places ; it is particularly common along the railway line below Behran's Plateau and along stream beds in the ravines.

Flowers and *Fruits*.—January to June.

Hallberg in MS. catalogue ; *Blatt. Herb.* 13414 ! 13415 ! *Santapau* 68/15, 99, 108 ! 2114 ! 2129 ! 3753 ! 4011 ! 5958 ! 8608 ! 8829 ! 8865 ! 9112 ! 10035 !

Euphorbia microphylla Lamk., Encycl. 2 : 423, 1786; FBI. 5 : 252; C. 2 : 570; G. 1276.

E. uniflora D. & G. 227, 1861 (non Roxb.).

Very similar in appearance and habit to *E. thymifolia* with which it is often confused. The whole plant is glabrous or nearly so. Stems prostrat, green or occasionally reddish or whitish. Leaves minute, nearly as broad as they are long, light green, closely set along the branches. Inflorescence is glabrous.

Not common in Khandala. In rice fields, and along stream beds in the ravines.

Flowers and *Fruits*.—January to June.

Hallberg in MS. catalogue; *Blatt. Herb.* 13802 ! *Santapau* 3733 ! 3917 ! 9066 !

Euphorbia khandallensis Blatt. & Hallberg in JIB 2 : 48, t. 3, 1921.

In general appearance this species is very similar to *E. acaulis* Roxb. The type specimen was collected by McCann in Khandala in 1918; in 1941 McCann himself showed me the exact spot of the typical collection, and for several years I have been able to study the plant in detail on the spot. The shape and size of the bracts is the feature most readily separating this plant from *E. acaulis*.

Rootstock up to 70 cms. long, 10 cms. diam., simple or sparingly branched, completely covered underground. Leaves radical, appearing during the rains and falling off soon after they cease, green or more or less purplish. Inflorescence comes out soon after leaf fall; generally purplish, at times green in colour; in length it is up to 14 cms., in diam. about 10 cms. The lower bracts broadly triangular, as broad as or broader than long; higher bracts broadly ovate or suborbicular, abruptly acuminate.

Abundant in the spot where the type was collected, the spur at the South end of Behran's Plateau; I have not seen it elsewhere. The typical locality is an exposed rocky ground, where plants are subject to rather hard climatic conditions throughout the year.

My own specimen 2059 is the largest rhizome collected in Khandala. It was brought down to Bombay in June 1943, and left for nearly six months in the sun to dry; it was then placed in a cupboard where the concentration of formaline fumes was very strong. The specimen, however, flowered and fruited abundantly during February to April for three consecutive years on the cupboard shelves. It was then planted in a flower pot and has continued to thrive in Bombay.

Leaves.—June to October, occasionally young ones appear in March or April. *Flowers* and *Fruits*.—January to May.

McCann in Blatt. Herb. 12678 (type) ! *Santapau* 68/58, 77, 78, 80, 84, 102 ! 504 ! 2012 ! 2058 ! 2059 ! 2242 ! 4127 ! 4190 ! 4358-4359 ! 8708 ! 9012 !

Euphorbia elegans Spreng., Syst. 3 : 794, 1826 ; FBI. 5 : 246 ; C. 2 : 566 ; G. 1274.

E. rupestris Law ex G. 251, 1839 (non Fric. nec Mey.).

E. strobilifera Dalz. in Kew Journ. Bot. 3 : 229, 1851 ; D. & G. 226.

This plant is included on the authority of Blatter and Hallberg ; there are no specimens from Khandala in Blatt. Herb. ; I have not seen the plant in the field.

Blatter and *Hallberg* in MS. catalogues.

Euphorbia parviflora Linn., Syst. (ed. 10) 2 : 1759 ; Roxb., Fl. Ind. 2 : 472 ; Gr. 179 ; D. & G. 227.

E. hypericifolia Linn. Sp. Pl. 454, 1753, pro parte ; FBI. 5 : 249, pro parte.

E. hypericifolia var. *parviflora* Prain, Beng. Pl. 2 : 924, 1903 ; C. 2 : 567.

Blatter in his list mentions this plant from Khandala ; I nave not seen it in the district where the closely allied species, *E. pycnostegia* and *E. zornioides*, are fairly common. There are no specimens from Khandala in any of the herbaria consulted.

Blatter in MS. catalogue.

Euphorbia pulcherrima Willd. ex Klotzsch. in Otto & Dietr., Allg. Gartenz. 2 : 27, 1834 ; FBI. 5 : 239 ; C. 2 : 570 ; G. 1278 ; Merrill, Plant Life Pac. World 258 f. 238.

Poinsettia pulcherrima R. Graham in Edinb. New Phil. Journ. 20 : 412, 1836 ; D. & G. Suppl. 76.

Blatter lists this plant as cultivated in Khandala gardens ; I have observed it on two occasions (Jan. and March 1945) but could not gather any specimens. The plant is very common in Bombay gardens.

Blatter in MS. catalogue ; *Santapau* January and March, 1945 !

Bridelia Willd.

Bridelia squamosa Gehrm. in Engl. Bot. Jahrb. 41, Beibl. 95 : 30, 1908 ; Santapau in JBNHS. 50 : 308, f. 2.

B. retusa Hook. f. in FBI. 5 : 268 & Cooke 2 : 573 ambo pro-parte, non Spreng.

B. retusa var. *squamosa* Muell.-Arg. in DC., Prodr. 15(2) : 493, 1866.

Gehrmann, loc. cit. remarks : " This species differs from *B. retusa* from which it has been distinguished as a variety by J. Mueller, clearly through the flower clusters being usually axillary on the branches and the leaves having long, broad stipules. The flowers are, moreover, larger than in *B. retusa*, the leaves much more strongly coriaceous ;

the shape of the leaf is characteristic as it tapers from an oval or rounded base to a short apical point." The attenuated acute apex distinguishes this species from *B. roxburghiana* Gehrm. which has ovate-elliptic leaves with a rounded apex.

This is one of the commonest trees in Khandala, in open country, on the slopes of hills and along the ravines.

Local name : Asana.

Flowers.—January to September, mostly April to May. *Fruits.*—April to December.

Cooke ! *Chibber* June 1909 ! *Gammie* 15472 ! *Bhide* 857 ! *Blatt. Herb.* 24477 ! 24686 ! 25348 ! 25540 ! 28085 ! 28049 ! *Santapau* 68/9 13, 54, 86, 95, 100, 101 ! 380 ! 747 ! 2203 !

Bridelia hamiltoniana Wall., Cat. 7882, 1847 ; FBI. 5 : 271 ; C. 2 : 573 ; Gehrm. loc. cit. 30.

B. montana Gamble, Madr. Fl. 1281 (non Willd.), 1925.

A shrub up to 2 m. high, with long sarmentose branches. Leaves variable in shape, often irregularly rhomboid. Inflorescence in axillary clusters.

A rare plant in Khandala ; only found low down on the slopes of St. Mary's Ravine and near Monkey Hill.

Flowers.—Not seen. *Fruits.*—October to November.

Blatt. Herb. 28212 ! *Santapau* 1343 ! 4665 !

GLOCHIDION Forst.

Glochidion hohenackeri Bedd., For. Man. in Flor. Sylv. p. cxciii, 1873 ; FBI. 5 : 514 ; C. 2 : 579.

G. lanceolarium Dalz. in D. & G. 235, 1861 (non Voigt).

Bridelia sinica Graham, Cat. 184, 1839 ?

Gamble in Kew Herb., MS., remarks that he can see no reason for separating this plant from *G. ellipticum* Wight. These two species are very similar, but in my opinion they differ in the structure of the female early and of the stigma sufficiently for them to be kept apart.

Very common in open spaces all over Khandala.

Local name : Bhoma.

Flowers.—December to March. *Fruits.*—Persisting for the whole year.

Graham ; Cooke ; *Blatt. Herb.* 24653 ! 24654 ! 24677 ! 25341 ! 25355 ! 29029 ! 28465 ! 28568 ! *Santapau* 68/43, 72, 73, 74, 85 ! 560 ! 1124 ! 2218 ! 3203 ! 3589 ! 3600 ! 3637 ! 3638 ! 3727 ! 4967 ! 5860 ! 8622 !

SECURINEGA Juss.

Securinega virosa (Roxb. ex Willd.) Pax & Hoffm., in Pfam. (ed. 2) 19 C : 60, 1931.

Phyllanthus virosus Roxb. ex Willd., Sp. Pl. 4 : 578, 1805 & Fl. Ind. 3 : 639, 1832.

Fluggea microcarpa Blume, Bijdr. 580, 1825 ; FBI. 5 : 328 ; C. 2 : 581.

F. virosa Baill., Etud. Gen. Euph. 593, 1858 ; Merrill, Enum. 2 : 390 ; G. 1296.

F. Leucopyrus D. & G. 236, 1861 (non Willd.).

Phyllanthus retusus Roxb. : G. 180.

Chorisandra pinnata Wight, Icon. t. 1994, 1853.

There seems to be very little distinction between this species and *S. Leucopyrus* ; Cooke and Gamble state that the latter is armed with spines, the former unarmed ; but the specimens in Kew Herb. do not bear out such a distinction. The size of the leaves is another uncertain character as often *S. virosa* has very small leaves.

The specimens listed below have all been matched with many of the sheets in Kew Herb. identified by Gamble. In every case leaves are small 1-3 cms. long, elliptic, ovate or obovate in shape, acute, subacute or obtuse at the apex, acute or cuneate at the base ; the plant is a fairly large shrub entirely unarmed. Fruit edible.

Common in open parts of the district or towards the edges of the forest.

Flowers.—May to July. *Fruits.*—May to August.

Garade 47-48 ! *Blatt. Herb.* 24630 ! 24630(2) ! *Santapau* 68/53 ! 580 ! 2057 ! 2098 ! 2241 ! 2173 ! 4247 ! 4412 ! 4469 ! 4478 ! 4494 ! 4588 ! 4616 ! 9040 ! 9041 ! 9042 ! 9065 !

Securinega leucopyrus (Willd.) Muell.-Arg. in DC., Prodr. 15(2) : 451, 1866 ; Pax & Hoffm. loc. cit.

Flueggea (*Fluggea*) *Leucopyrus* Willd, Sp. Pl. 4 : 757, 1805 ; FBI. 5 : 328 ; Wight, Icon. t. 1875 ; C. 2 : 581 ; G. 1296.

F. virosa D. & G. 236, 1861 (non Baill.).

A fairly large shrub, similar to *S. virosa* ; some of the upper axillary branches bearing flowers and fruits and leaves are spine-like in structure, tapering from a thick base to a more or less fine point ; I have failed to discover any real spines in any of the sheets in Herb. Kew.

In consideration of the close similarity between these two species, I am strongly inclined to unite them under a single specific name ; in deference to the authority of Gamble, I keep them separate.

Santapau 8875 ! in flower and fruit in May 1946.

MELANTHESA Blume.

The common plant of this genus generally known under the name of *Breynia patens* Rolfe is treated below. The generic name *Breynia* Forst. is an illegitimate one, since it is a later homonym of *Breynia* Linn. which was given to quite a different plant. On the whole question of the nomenclature of this genus, see Croizat in Sargentia 1 : 48 seq. 1942.

Melanthesa turbinata (Koen. ex Roxb.) Wight, Icon. 5(2) : 26, t. 1897, (" truncata " sub tab. per sphalm.) 1852 ; D. & G. 234.

Phyllanthus turbinatus Koen. ex Roxb., Hort. Beng. 104, 1814 & Fl. Ind. 5 : 666, 1832 ; Gr. 180.

Breynia patens Rolfe in Journ. Bot. (N.S.) 11 : 359, 1882 : FBI. 5 : 329 ; C. 2 : 583 ; G. 1304.

Melanthesa obliqua Wight, Icon. t. 1898, 1852.

A shrub 1-2 m. high. Leaves distichous, of a bright green colour. Flowers are usually pendulous ; as the fruit develops it becomes erect and the calyx becomes enlarged and turns red ; the fruit is sometimes spoken of as the " cup in the saucer ".

The plant is one of the most elegant shrubs about Khandala. It is common in open country and in the undergrowth of deciduous forests.

Flowers.—May to August. *Fruits*.—June to August.

Woodrow ; Garade 25 June 1903 ! *Blatt. Herb.* 24606 ! 24606(2) ! *Santapau* 564 ! 594 ! 2048 ! 2158 !

PHYLLANTHUS Linn.

Phyllanthus urinaria Linn., Sp. Pl. 982, 1753 ; FBI. 5 : 293 ; Gr. 180 ; C. 2 : 387 ; G. 1287.

P. leprocarpus Wight, Icon. t. 1895, f. 4, 1852.

An elegant herb found in grass lands or on grassy slopes. Seeds prominently transversely ridged.

Flowers and *Fruits*.—August to September.

Woodrow ; Blatter in MS. catalogue ; *Blatt. Herb.* 29654 ! *Santapau* 88/61 ! 739 ! 2440 ! 4820 ! 6902 ! 6944 ! 6977 ! 6980 !

Phyllanthus niruri Linn., Sp. Pl. 981, 1753 ; FBI. 5 : 298 ; Gr. 180 ; Wight, Icon. t. 1894 ; D. & G. 234 ; C. 2 : 587 ; G. 1288.

Capsules glabrous and smooth ; seeds brownish, tuberculate with minute tubercles which are arranged in longitudinal rows.

Common in gardens as a weed, in cultivated ground and along the railway line. Locally the plant is not used medicinally.

Flowers and *Fruits*.—April to September.

Santapau 68/97 ! 2603 ! 4660 ! 5694 ! 6791 ! 6943 ! 8303 ! 9247 !

Phyllanthus maderaspatensis Linn., Sp. Pl. 982, 1753; FBI. 5: 292; Gr. 180; Wight, Icon. t. 1895, f. 3; C. 2: 586; G. 1289.

The occurrence of this plant is given on the authority of Blatter. The seeds are typical, being muriculate in parallel lines which are intersected by minute cross-bars.

There is in Blatt. Herb. a specimen, no. 24647 labelled *Ph. maderaspatensis*, but the specimen is too imperfect for exact determination.

Blatter in MS. catalogue.

EMBLICA Gaertn.

Emblica officinalis Gaertn., Fruct. 2: 122, 1791; Wight, Icon. t. 1896; D. & G. 235; G. 1295.

Phyllanthus Emblica Linn., Sp. Pl. 982, 1753; FBI. 5: 289; Gr. 180; C. 2: 585.

Common in the district in open country; it is abundant on the small plateau below Echo Point towards the western side. The fruit is edible.

Local name: Auli, Amli.

Flowers.—March to May. *Fruit.*—May to March.

Blatt. Herb. 24652 ! 24657 ! *Santapau* 68/65, 87, 89 ! 1209 ! 1719 ! 3924 ! 3925 !

KIRGANELIA Baill.

Kirganelia reticulata (Poir.) Baill., Etud. Gen. Euph. 613, 1858; G. 1294.

Phyllanthus reticulatus Poir. in Lamk., Encycl. 5: 298, 1804; FBI. 5: 288; C. 2: 585; Merrill, Enum. Pl. Borneo 327.

Ph. multiflorus Willd., Sp. Pl. 4: 581, 1805; Gr. 180.

Anisonema multiflora Wight, Icon. t. 1899, 1852; D. & G. 234.

A sarmentose shrub in Khandala reaching up to 2 m. in height, but not climbing.

There is a large clump of these plants growing in the stream bed near Kune among rocks; for a good part of the year these plants are practically submerged in the stream. I have seen no other specimens in the district.

Flowers and *Fruits.*—April to October.

Blatt. Herb. 27579 ! *Santapau* 4393-4396 ! 8843 ! 8844 !

CICCA Linn.

Cicca acida (Linn.) Merrill, Interpr. Herb. Amb. 314, 1917.

Averrhoa acida Linn., Sp. Pl. 428, 1753.

Cicca disticha Linn., Mant. 1 : 124, 1767 ; Gr. 180 ; D. & G. Suppl. 78.

Phyllanthus distichus Muell.-Arg. in DC., Prodr. 15(2) : 413, 1866 ; FBI 5 : 304 ; C. 2 : 589.

A fairly large tree cultivated in some of the gardens in Khandala. Leaves distichous, up to 5·5×3 cms., ovate, acute, glabrous. Flowers clustered along a 6 cms. long rachis on the old wood, reddish, minute. Fruit a berry up to 1·5 cms. diam., edible.

Flowers and *Fruits*.—April 1946.

Santapau 8840 !

PUTRANJIVA Wall.

Putranjiva roxburghii Wall., Tent. Fl. Nep. 61, 1826 ; FBI. 5 : 336 ; D. & G. 236 ; Wight, Icon. t. 1876 ; C. 2 : 590 ; G. 1311 ; Pax & Hoffm. loc. cit. 59 f. 13C.

The whole tree has a typical appearance due to the colour and structure of the leaves and the general shape of the tree. Common on the slopes along the torrent between Elphinstone Point and the railway line ; not seen elsewhere in the district.

Flowers.—March to May. *Fruits*.—March to December.

Dalz. & Gibs. ; *Blatt. Herb.* 27466 ! 27472 ! *Santapau* 58/51 ! 1467 ! 1774 ! 1775 ! 1776 ! 3306-3309 ! 4136 ! 4137 !

DRYPETES Vahl.

Drypetes venusta (Wight) Pax & Hoffm. in Pfreich. 81 : 268, 1922.

Astylis venusta Wight, Icon. t. 1992, 1853.

Hemicyclia venusta Thw. in Kew Journ. Bot. 7 : 272, 1855 ; FBI. 5 : 339 ; D. & G. 229 ; C. 2 : 591.

A middle-sized tree with deep green foliage. Leaves coriaceous, elliptic or oblong. Flowers not seen in Khandala. Fruit on a long, slender pedicel reaching up to 4 cms. long.

Only one tree has been observed in the district ; it grows near the main gate of Convalescent Home.

Fruits —August and September 1944 ; January 1945.

Santapau 4773-4777 ! 4824 ! 4825 ! 5851-5853 ! 9164 !

ANTIDESMA Linn.

Antidesma bunius (Linn.) Spreng., Syst. 1 : 826, 1825; FBI. 5 : 358; Wight, Icon. 5 : 819; C. 2 : 593.

Stilago Bunius Linn., Mant. 1 : 122, 1767.

Antidesma alexiteria Gr. 186, 1839 (non Linn.).

This plant has not been collected in Khandala recently, it is included on the authority of the authors here mentioned.

Graham; Talbot ex Cooke; *Blatter* in MS. catalogue.

Antidesma diandrum Roth, Nov. Plant. Sp. 369, 1821; FBI. 5 : 361 pro parte; D. & G. 237; C. 2 : 593; Pax in Pfreich. 143.

A. lanceolarius Wall., Cat. 7284, 1832; Wight, Icon. t. 766.

This plant is included on the authority of Blatter; I have seen no specimens from Khandala.

Blatter in MS. catalogue.

JATROPHA Linn.

Jatropha curcas Linn., Sp. Pl. 1006, 1753; FBI. 5 : 383; Gr. 183; D. & G. Suppl. 77; C. 2 : 598; Pax, loc. cit. 77, f. 78.

This plant is occasionally seen in Khandala gardens as a hedge or fence plant; I have not heard of its being used for medicinal purposes.

Santapau cultivated!

Jatropha podagrica Hook., Bot. Mag. t. 4376, 1848; C. 2 : 598.

For a number of years there was a group of these plants growing on the banks of the torrent near the main road in front of Khandala station. In 1949 the plants seemed to have disappeared from that locality.

Stems 50-100 cms. high, about 2·5-4 cms. diam., enlarged just above the ground level to about 10 cms. for a distance of 20 cms. Flowers small, bright scarlet. Fruits small. The leaves are typically peltate with rounded lobes. A garden escape.

Santapau Dec. 1940! April 1942! 68/103!

DIMORPHOCALYX Thw.

Dimorphocalyx lawianus (Muell.-Arg.) Hook. f. in FBI. 5: 305, 1887; C. 2 : 604; Pax in Pfreich. 47 : 31; G. 1337.

Trigonostemon lawianus Muell.-Arg. in Linnea 34 : 212, 1865 pro parte & in DC., Prodr. 15(2) : 1105 pro parte.

Croton ramiflorum Graham, Cat. 182, 1839 (tantum probabiliter).

Fairly common in dense forest, on the slopes below Echo Point; elsewhere it is rare.

Flowers and *Fruits*.—March to January.

Woodrow, 28 December 1890! *Blatt. Herb.* 27532! *Santapau* 68/69, 71, 76, 93, 94! 1307! 1553! 1731! 3214! 3263! 3584! 6029!

AGROSTISTACHYS Dalz.

Agrostistachys indica Dalz. in Kew Journ. Bot. 2 : 41, 1850 ; FBI. 5 : 406 ; D. & G. 232 ; C. 2 : 605 ; Pax in Pfreich. 57 : 103.

This plant is given only on the authority of Blatter who mentions it is his list. There are no specimens in the Blatt. Herb.

Blatter in MS. catalogue.

CHROZOPHORA Neck.

Chrozophora rottleri (Geis.) Juss. ex Spr., Syst. 3 : 850, 1826 ; Prain in Kew Bull. 1918 : 95 ; Pax & Hoffm. in Pfreich. 57 : 19 ; G. 1316.

Croton rottleri Geis., Crot. Monogr. 57, 1807.

C. plicatum Roxb., Hort. Beng. 69, 1814 & Fl. Ind. 3 : 681, 1832 ; Gr. 182 (non Vahl).

Chrozophora plicata Voigt, Hort. Sub. Calc. 156, 1846 ; D. & G. 233 ; C. 2 : 607 ; (non A. Juss.).

C. plicata 1 Hook. f. in FBI. 5 : 409, 1887.

The nomenclature of this plant is rather complicated ; for a full treatment of the question see Prain, loc. cit. Rare in Khandala.

Flowers and *Fruits*.—March 1917.

Blatt. Herb. 24673 ! *Hallb.* in MS. catalogue.

Chrozophora prostrata Dalz. in D. & G. 233, 1861 ; C. 2 : 607 (excl. sp. afric.) ; Prain loc. cit. 90 ; G. 1316.

C. plicata 3 Hook f. in FBI. 5 : 440, 1887.

B. plicata Pax & Hoffm. loc. cit. 19, pro parte ; non Juss.

A prostrate herb with branches closely appressed to the ground : the whole plant is densely stellately hairy or woolly. It is found occasionally on the dry banks of Khandala talao during the hot season ; but the plant is easily confused with some of the *Mollugos*, than which it is much more rare.

Santapau !

TREWIA Linn.

Trewia polycarpa Benth. in Gen. Pl. 3 : 318, 1880 ; FBI. 5 : 424 ; C. 2 : 614 ; G. 1319.

T. nudiflora Wight, Icon. t. 187 (quoad flor. fem. tantum).

T. nudiflora Linn. : Pax & Hoffm. 63 : 141 1935, pro parte.

Male flowers not seen. Female flowers in racemes near the ends of the branches. Fruit at first densely hairy or tomentose, at length in Khandala always entirely glabrous and very dark purple or almost

black; fruits observed in Khandala are two-celled, subglobose or more often in shape like two hearts laterally pressed one against the other. Fruits are edible.

Fairly common on the slopes between Elphinstone Point and the railway line and along the bottom of the ravine; occasionally this tree has been observed on Battery Hill Plateau.

For a long time the identity of this tree proved to be an insoluble problem; all doubts were removed when the fruits on some of the Kew sheets were found to be tomentose when young and glabrous at maturity.

Local name : Petári.

Flowers.—February. *Fruits.*—March to June. *Leaves.*—May to December.

Blatt. Herb. 28107 ! *Santapau* 197-198 ! 406 ! 890 ! 1347 ! 2131 ! 2178 ! 2179 ! 4212 ! 4259 ! 4260 ! 4453 ! 4454 !

MALLOTUS Lour.

Mallotus philippensis (Lamk.) Muell.-Arg. in Linnea 34 : 196, 1865; FBI. 5 : 442; C. 2 : 615; Pax in Pfreich. 184 f. 47; (auct. non pauci per sphalm. *philippinensis* scribunt).

Croton philippense Lamk., Encycl. 2 : 206, 1786.

Rottlera tinctoria Roxb., Pl. Cor. 2 : 36, t. 167, 1798; Gr. 184; D. & G. 230.

A common tree; found in open country or in the ravines; it is made rather prominent by the masses of bright red fruits against a mass of pale green leaves.

Local name : Shéndri.

Flowers.—October to December. *Fruits.*—January to April.

Blatter in MS. catalogue; *Blatt. Herb.* 21182 ! 24635 ! 24635(2) ! 27556 ! 28349 ! *Santapau* 68/10 ! 1423 ! 1655 ! 1753 ! 3249 ! 3250 ! 3381 ! 3539 ! 3540 ! 5882 !

Mallotus stenanthus Muell.-Arg. in Linnaea 34 : 191, 1865; in DC., Prodr. 15(2) : 972, 1866; FBI. 5 : 437; C. 2 : 616; Pax in Pfreich. 190, 1914.

A glabrous shrub with minute, yellow, shining glands on the young branchlets, capsules and underside of leaves. Leaves about 12×3 cms. Flowers not seen in Khandala. Capsules 3-lobed, echinate with spines which are fairly stout and about 1 mm. long.

A rare plant in Khandala, where I have only collected it on one occasion in fruit, on July 20th, 1941.

Santapau 68/52 (1-3) !

Mallotus aureo-punctatus (Dalz.) Muell.-Arg. in DC., Prodr. 15(2): 973, 1866; Pax, loc. cit. 192.

Rottlera aureo-punctata Dalz. in Kew Journ. Bot. 3: 122, 1851; D. & G. 230.

Mallotus Lawii Muell.-Arg. in Linnaea 34: 192, 1865; FBI. 5: 438; C. 2: 617.

A shrub about 2 m. high; young branches and inflorescence fairly densely pubescent. Leaves up to 22·5 × 8 cms., rarely entire, generally sinuate-toothed, dotted on the underside with numerous, minute, greenish yellow resinous glands; base acute or rounded. Flowers greenish. Male flowers in fascicles, pedicels 0-4 mm. long. Female, flowers in few-flowered racemes. Capsules covered with long hairs.

A fairly common shrub in the ravines in evergreen forest.

Flowers and *Fruits*.—November to July.

Woodrow, 1 January 1891! *Blatter* in MS. catalogue; *Santapau* 68/52 *! 1310! 1466! 2149! 3220! 3247! 3312-3314! 3577! 8089!

CLEIDION Blume.

Cleidion spiciflorum (Burm.) Merrill, Inter. Herb. Amb. 322 in nota, 1917.

Acalypha spiciflora Burm., Fl. Ind. 203, t. 61, f. 2, 1768.

Cleidion javanicum Blume, Bijdr. 613, 1825; FBI. 5: 444; C. 2: 618; Pax, loc. cit. 290, f. 47; G. 1325.

The fruit of this tree seems to be eaten by monkeys or squirrels, the ground below the tree often being littered with the empty "shells".

A rare tree, only seen in Meroli Plateau, where it grows in dense forest and attains a large size.

Local name: Radkure.

Flowers.—October to March. *Fruits*.—October to June.

Blatt. Herb. 27419! 27469! 28433! 28434! *Santapau* 139! 1242! 1881! 1882! 1981! 3550-3553! 4209! 4509! 5242-5247!

MACARANGA Thouars.

Macaranga peltata (Roxb.) Muell.-Arg. in DC., Prodr. 15(2): 1010, 1866; Prain in Beng. Pl. 951; Pax, loc. cit. 347, f. 57.

Osyris? peltata Roxb., Fl. Ind. 3: 855, 1832; Gr. 177.

Mappa peltata Wight, Icon. t. 817, 1844.

Macaranga Roxburghii Wight, Icon. 5(2): 23, 1852, & 6: t. 1949, f. 4, 1853; FBI. 5: 448; D. & G. 228.

M. tomentosa Wight, Icon. 5(2): 23, 1852, & 6: t. 1949, f. 1, 1853; C. 2: 619.

A large shrub or a small tree; it is common on the ravine slopes, and is rather conspicuous on account of the structure and bright green colour of the leaves. Near Forbay there was a tree about 10 m. high, the largest specimen seen in the district, but this tree has unfortunately been cut down lately.

Local name : Chandya.

Flowers.—January to April. *Fruits.*—March to May.

Graham ; Herb. Coll. Sci. Poona 16154 ! *Woodrow,* Febr. 1891 ! *Cooke* ; *Hallberg* in MS. catalogue ; *Blatt. Herb.* 24619 ! 24655 ! 28054 ! *Santapau* 68/12, 14, 96 ! 4107 ! 8626 ! 8627 ! 8628 !

TRAGIA Linn.

Tragia muelleriana var. **unicolor** (Muell.-Arg.) Pax & Hoffm. in Pfreich. 68 : 81, 1935.

T. Miqueliana var. *unicolor* Muell.-Arg. in DC., Prodr. 15(2) : 843, 1866.

T. involucrata Cooke 2 : 621, pro parte.

A climber, very abundant above Forbay in places from which the forest has been removed. Leaves cordate at base, at least when old ; young leaves subcordate to rounded at the base. Female calyx accrescent in fruit ; segments up to 12 mm. long, elliptic or oblong in shape, about 6 mm. broad, with 5-6 pairs of narrow teeth ; the whole calyx on the outside is covered with rather stiff, white or greyish-white hairs.

The calyx segments in the present variety are intermediate between the broadly ovate segments of the typical *T. Muelleriana* and the very narrow ones of *T. hispida* ; Pax and Hoffm. consider the present variety deserving of specific rank.

This is about the most painful stinger found in Khandala ; the burning sensation of the sting may last for well over 3 hours. As a remedy against such painful stings, I have found the external application of a dilute solution of ammonia rather soothing.

Flowers.—August to November, occasionally till March. *Fruits.*—October to January ; the calyx remains long after the fruit has disappeared.

Nene, February 1891 ! *Meebold* 8913, ex Pax & Hoffm., loc. cit. *Gammie* 15475 ! *Chibber* 61 ! *Blatt. Herb.* 25379 ! *Santapau* 8/16, 36 ! 788 ! 1159 ! 1176 ! 1418 ! 1705 ! 3382 ! 5473 !

SAPIUM R. Br.

Sapium insigne Benth. var. **malabaricum** (Wight) Hook. f. in FBI. 5 : 472, 1885.

Falconeria malabarica Wight, Icon. t. 1866, 1852.

Sapium insigne Cooke 2 : 622.

Common in open country near Kune; elsewhere only occasional. When in leaf this tree has a remote similarity to *Plumeria acuminata* Ait.; the floral spikes are generally erect, the fruiting spikes either spreading or more generally pendulous.

Local name : Sheror or Sherod.

Flowers.—January to April. *Fruits.*—March to June. *Leaves.*—May to October.

Wight ! *Blatt. Herb.* A 7 ! 27911 ! *Santapau* 68/44, 88, 111 ! 657 ! 1696 ! 1697 ! 1715 ! 1928 ! 2019 ! 2045 ! 2099 ! 2260 ! 3819 ! 5912 ! 6030 ! 8834 ! 8891 !

PEDILANTHUS Neck.

Pedilanthus tithymaloides (Linn.) Poir. in Ann. Mus. Hist. Nat. Paris 19 : 390, t. 19, 1812; FBI. 5 : 239; C. 2 : 626.

Euphorbia tithymaloides Linn., Sp. Pl. 453, 1753; D. & G. Suppl. 76.

A succulent shrub about 1 m. high, with practically unbranched, erect stems. Leaves somewhat fleshy, during the rainy season along the whole stem, later on only in the upper third of the stem. Flowers scarlet, red or pink in colour.

The whole plant is of a deep green colour, with shining smooth stems. A garden escape that has become naturalized in several parts of the district. An uninteresting plant.

Flowers.—January to July. *Fruits.*—Not seen.

Blatt. Herb. 24607 ! *Santapau* 68/11 !

RICINUS Linn.

Ricinus communis Linn., Sp. Pl. 1007, 1753; FBI. 5 : 457; Gr. 183; D. & G. Suppl. 78; C. 2 : 627.

The Castor-oil Plant, found as an escape in several places about Khandala. In the district it flowers and fruits profusely. The leaves and inflorescence are of the larger green variety mentioned by Cooke.

Local name : Erand or Rand.

Blatter and *Hallberg* in MS. catalogues; *Santapau* 9087-9089 !

HURA Linn.

Hura crepitans Linn., Sp. Pl. 1008, 1753; D. & G. Suppl. 76; C. 2 : 627.

There is a good specimen of this tree in the grounds of Khandala Hotel; the fruits are said to dehisce with a noise like the crack of a pistol.

Flowers.—April to May. *Fruits.*—October.

Santapau 10939-10942 ! *Cooke*; *Blatter* in MS. catalogue; *Kirtikar* in JBNHS. 18 : 513-514, 1908.

ULMACEAE.

HOLOPTELEA Planch.

Holoptelea integrifolia (Roxb.) Planch. in Ann. Sci. Nat. (ser. 3) 10 : 266, 1848 ; FBI. 5 : 481 ; D. & G. 238 ; Wight, Icon. t. 1968 ; C. 2 : 629 ; Fischer in G. 1348.

Ulmus integrifolia Roxb., Pl. Cor. 1 : 56, t. 78, 1795 ; Gr. 188.

A very fine tree, one of the largest in open country about Khandala ; it is fairly common on the slopes below Echo Point ; there is a fine specimen in the middle of the main street in Khandala village itself.

Local name : Waula.

Flowers.—February to March. *Fruits.*—March to May.

Graham ; Blatt. Herb. 6412 ! 25539 ! 25542 ! 25543 ! *Santapau* 8/5, 29 ! 1702 ! 3810 ! 3811 ! 4069 ! 8636 ! 12214-12215 !

CELTIS Linn.

Celtis cinnamomea Lindl. in Wall., Cat. 3691, 1831 ; Planch. in Ann. Sci. Nat. (ser. 3) 10 : 303, 1848 ; FBI. 5 : 482 ; C. 2 : 630 ; Talb. 2 : 299, t. 514 ; Fischer 1349.

C. Wightii Planch., loc. cit. 307, 1848 ; Wight, Icon. t. 1969 ; Cooke & Fischer, 11. cc.

After careful examination of the type sheets in Kew Herb., I have come to the conclusion that *C. Wightii* cannot be maintained as a separate species. Fisher, loc. cit., gives an elaborate key for the separation of the two species, but in practice I find no constant characters by which to distinguish them ; Fischer himself writes of *C. Wightii* : "In the same localities as the last species (*i.e. C. cinamomea*) ; very similar to it and not easily distinguished from it." As a matter of fact there are in Kew Herb. several sheets identified by Fischer first as one species and then corrected to the other. The structure of the sepals and leaves cannot be taken as a determining character.

This is a fairly common tree about Khandala, generally found in open country, sometimes in the forest on ravine slopes.

Flowers.—February to March. *Fruits.*—May.

Cooke ! *Woodrow* ; *Bhiva,* March 1891 ! *Id.* 24 August 1892 ! *Blatt. Herb.* 25624 ! 28467 ! *Santapau* 8/7, 16, 30, 31, 32, 33 ! 430 ! 1701 ! 2494-2496 ! 3928-3930 ! 4143-4145 ! 4334 ! 4335 ! 8633 ! 9064 !

TREMA Lour.

Trema orientalis (Linn.) Blume, Mus. Bot. Lugd.-Bat. 2 : 58, 1856 ; FBI. 5 : 484 ; C. 2 : 631 ; Talb. 2 : 500, t. 515.

Celtis orientalis Linn., Sp. Pl. 1044, 1753 ; Gr. 189.

Sponia wightii Planch. in Ann. Sc. Nat. (ser. 3) 10 : 322, 1848 ; Wight, Icon. t. 1971 ; D. & G. 238.

A small tree, about 4 m. high. Leaves up to 14×5 cms., obliquely and narrowly ovate, base cuneate or rounded or cordate, unequal-sided ; petioles pubescent. Flowers greenish, inconspicuous.

Common in the district ; the shape of the leaves renders the appearance of this tree rather typical. Locally no use is made of it except for fuel.

Flowers.—October to February. *Fruits*.—The whole year.

Woodrow ; *Bhide* 1023 ! *Blatt. Herb.* 25246 ! 25340 ! 25345 ! 25536 ! 25541 ! *Santapau* 8/15, 17, 22, 28, 38 ! 1207 ! 2156 ! 3639 ! 5125 !

URTICACEAE.

FLEURYA Gaud.

Fleurya interrupta (Linn.) Gaud., in Bot. Freyc. Voy. 497, 1826 ; FBI. 5 : 548 ; D. & G. 238 ; Wight, Icon. t. 1975 ; Weddell, Mon. 115, t. A, f. 9 ; C. 2 : 632.

Urtica interrupta Linn., Sp. Pl. 985, 1753 ; Gr. 187.

A common gregarious herb found on forest slopes or on old walls during the rainy season. Stinging hairs on the stems make this a somewhat difficult plant to handle ; the stings, however, are much less painful than those of *Tragia*.

Flowers and *Fruits*.—July to September.

Gammie 15350 ! *Santapau* 68/50, 59 ! 753 ! 2248 ! 2410 ! 2529 ! 4580 ! 4766 ! 6817 ! 6969 ! 9221 ! 9222 !

GIRARDINIA Gaud.

Girardinia zeylanica Decne. in Jacq., Voy. 152, 1844 ; Weddell, Mon. 166 ; C. 2 : 633 ; Fischer 1373.

Urtica heterophylla Roxb. (non Vahl) : Gr. 187 ; Wight., Icon. t. 687.

Girardinia heterophylla D. & G. 238, 1861 (non Decne.).

G. heterophylla var. *zeylanica* Decne, loc. cit. ; FBI. 5 : 551.

Not common in the district ; it is abundant along a hedge near the main road, not far from St. Xavier's Villa. This is a very disagreeable stinger, about as bad as *Tragia*.

Flowers and *Fruits*.—October to November.

Blatt. Herb. 28265 ! *Santapau* 1202 ! 1335 ! 2976 ! 2977 ! 5099 ! 5100 !

LECANTHUS Wedd.

Lecanthus peduncularis (Wall.) Wedd. in DC., Prodr. 16 : 164, 1869, pro parte ; Merrill, Enum. 2 : 77.

Procris peduncularis Wall., Cat. 4634, 1831 ; Royle, Ill. t. 83, f. 2, 1839.

Lecanthus Wallichii Wedd. in Ann. Sci. Nat. Bot. (ser. 4) 1 : 187, 1854 ; C. 2 : 634.

L. Wightii Wedd., loc. cit. ; FBI. 5 : 559 ; C. loc. cit.

Elatostemma oppositifolium Dalz. in Kew Journ. Bot. 3 : 179, 1851 ; D. & G. 239.

E. ovata Wight, Icon. t. 1985, 1852.

The two species, *L. Wightii* and *L. Wallichii* of Weddell are here fused into one species ; in this I have followed Merrill. Examination of the sheets in Kew Herbarium and of the living plants in Khandala has forced this course on me.

A common and gregarious monsoon plant, found on rocks and old walls, or in sheltered positions on the ground.

Flowers and *Fruits*.—August to October.

Cooke ! *Blatt. Herb.* 25528 ! 28196 ! *Gammie* 15362 ! *Santapau* 8/14 ! 709 ! 869 ! 1088 ! 2405 ! 2513 ! 2656 ! 2746 ! 6962 !

ELATOSTEMMA Forst.

Elatostemma cuneatum ("*cuniata*") Wight, Icon. 6 : 35 & t. 2091, 1853 ; FBI. 5 : 568 ; D. & G. 239 ; Wedd., Mon. 330 ; C. 2 : 635.

A rare plant in Khandala ; found on old walls during the rains. It is often mistaken for *Lecanthus* or *vice versa*.

Flowers and *Fruits*.—July to August.

Santapau 6897 ! 6898 ! 6949 ! 9292 !

BOEHMERIA Jacq.

Boehmeria scabrella (Roxb.) Gaud. in Bot. Freyc. Voy. 500, 1826 ; C. 2 : 636.

Urtica scabrella Roxb., Hort. Beng. 67, 1814 & Fl. Ind. 3 : 581, 1832 ; Wight, Icon. t. 691.

Splitgerbera scabrella D. & G. 239, 1861.

Boehmeria platyphylla Don, var. *scabrella* Wedd., Mon. 365, 1856 ; FBI. 5 : 578.

Gregarious and very common on slopes all over the district, in open country under the shade of trees, or on forest slopes. The stinging hairs cause a burning sensation which may be felt for several hours.

Flowers.—August to September. *Fruits*.—September to January.

Blatt. Herb. 25229 ! 25298 ! 25349 ! 27580 ! 28062 ! *Gammie* 15555 ! *Chibber* 52 ! *Santapau* 8/13 ! 435 ! 1049 ! 3100 !

Pouzolzia Gaud.

Pouzolzia zeylanica (Linn.) Benn., Pl. Jav. Rar. 67, 1838; Merrill, Inter. Herb. Amb. 202.

Parietaria zeylanica Linn., Sp. Pl. 1052, 1753.

P. indica Linn., Mant. 1 : 128, 1767; Gr. 187.

Pouzolzia indica Gaud., Bot. Freyc. Voy. 503, 1826; FBI. 5 : 581; D. & G. 240; Wight, Icon. t. 1980, f. 1, t. 2100, f. 40; Wedd., Mon. 398; C. 2 : 638.

An erect herb, 16-64 cms. high, glabrous; in Khandala this plant is always erect, with but a few roots in the lower part of the stem. Leaves 1-7 cms. long; petioles very slender.

Flowers greenish white or green. Seeds brownish, smooth and shining. Fairly common among grasses.

Flowers and *Fruits*.—July to September.

Bhiva 18 July 1892 ! *Blatt. Herb.* 25280 ! 25384 ! *Santapau* 728 ! 2411 ! 2560 ! 6792 ! 6941 ! 7000 ! 9272 !

Debregeasia Gaud.

Debregeasia longifolia (Burm.) Wedd. in DC., Prodr. 16 : 235, 1869; Merrill, in Bibl. Enum. Born. Pl. 234.

Urtica longifolia Burm., Fl. Ind. 197 (erron. 297), 1768.

Debregeasia velutina Gaud., Bot. Voy. Bonite, t. 90, 1844-46; FBI. 5 : 590; Wedd., Mon. 460, t. 15A, ff. 1-9; C. 2 : 640; Talb. 2 : 533, f. 435.

Conocephalus niveus Wight, Icon. t. 1959, 1853; D. & G. 239.

Boehmeria ramiflora Gr. 187, 1839 (non Jacq.).

The occurrence of this plant is given on the authority of Blatter who mentions it in his list; I have not seen the plant in Khandala or in any of the herbaria consulted. The leaves and branches are remarkably similar to those of *Trema orientalis*.

Blatter in MS. catalogue.

Pilea Lindl.

Pilea microphylla (Linn.) Liebm. in Vidensk. Selsk. Skr. (5) 2 : 296, 1851; C. 2 : 659.

Parietaria microphylla Linn., Syst. (ed. 10) 1308, 1759.

Pilea muscosa Lindl., Coll. Bot. t. 4, 1821; FBI. 5 : 551.

A small succulent herb, often cultivated as a border plant in gardens in Khandala and elsewhere in Western India. The leaves and stems are generally green, fairly often reddish, the colour possibly being due to age.

Blatt. Herb. 28287 ! *Santapau*, in gardens, 9161 !

MORACEAE.

Ficus Linn.

Ficus gibbosa Blume, var. **parasitica** (Koen.) King, Sp. Fic. 6, t. 26, f. A, 1887-1889; C. 2 : 644.

F. parasitica Koen. ex Willd., in Mem. Acad. Berol. 1798 : 102, 180.

F. ampelos Koen. : Wight, Icon. t. 652 (non Burm.).

Urostigma ampelos D. & G. 315, 1861.

U. volubile D. & G. 242, 1861.

An erect or epiphytic tree; when erect, it is generally a small tree. Leaves up to 14×6 cms., often very irregular in shape, acute or acuminate; main nerves prominent beneath. Receptacles at first green, then orange, at length orange or yellow, about 7 mm. diam.

Fairly common. It is a conspicuous plant especially when it is a strangler on palms and other trees.

Receptacles.—October to March.

Blatt. Herb. 25618 ! 28462 ! *Santapau* 1254 ! 1566 ! 1704 ! 5482 !

Ficus gibbosa Blume, var. **cuspidifera** King, loc. cit. 6, t. 2a. 1887-1889.

F. cuspidifera Miq. in Lond. Journ. Bot. 7 : 434, 1848.

"Leaves elongate, gradually narrowed above, and more or less acuminate; slightly rough below from minute tubercles, not shining, and but little coloured." (King, loc. cit.)

In Blatt. Herb. there is but one specimen from Khandala, identified by Fischer in Kew Herb. The leaves are narrower and smaller than in the previous variety.

Blatt. Herb. 25431 !

Ficus gibbosa Blume, var. **tuberculata** King, loc. cit. 6, t. 2b, f. B, 1887-1889.

F. tuberculata Roxb., Fl. Ind. 3 : 554, 1832; Wight, Icon. t. 651.

"Very like var. *parasitica*, but with narrower leaves, which are sometimes irregularly serrate." (King, loc. cit.)

Blatt. Herb. 25482 !

Ficus bengalensis Linn., Sp. Pl. 1059, 1753; FBI. 5 : 499; King 18, t. 13, & t. 81, f. C; C. 2 : 645; Talb. 2 : 507, f. 518; Fischer 1361.

F. indica Linn., Amoen. Acad. (3 ed.) 1 : 27 (excl. syn. Kataualou Rheede); Gr. 189.

Urostigma bengalense Gaspar, Nov. Gen. Fic. 7, 1844; Wight, Icon. t. 1989; D. & G. 240.

The Banyan-tree, not common in Khandala; Blatter recorded it from the district but left no specimens in his herbarium. I have only collected it once, at the base of Behran Plateau, near the railway line; my entry in the field diary is as follows: "Receptacles abundant at end of branches, "Pomegranate Purple" (Ridg. 71, i); leaves shining above, pubescent and paler beneath."

Lacal name : Wad.

Receptacles.—14 June 1943.

Blatter in MS. catalogue; *Santapau* 2209 !

Ficus mysorensis Heyne in Roth, Nov. Pl. Sp. 390, 1821; FBI. 5; 500; King 19, t. 14, & t. 81, f. D; C. 2 : 645; Talb. 2 : 508, t. 519; Fischer 1361.

This is one of the largest species of *Ficus* in Khandala; it has no aerial roots. Leaves coriaceous, the largest of the genus in the district, 13-22·5×7·5-14 cms.; young leaves slightly tomentose above, densely so beneath, older leaves glabrous and shining above, pale green and tomentose beneath; base rounded or sub-cordate; margins entire, somewhat repand; lateral nerves forming an angle of 50-60 degrees with the midrib, parallel among themselves and uniting into an intra-marginal prominent nerve.

Receptacle at first green, then yellowish with white or greenish spots, at length orange red. Monkeys seem to eat the fruit readily.

A very large and elegant tree, common in the ravines; some of the finest specimens grow in the ravine just below St. Xavier's Villa.

Local name : Wad.

Receptacles.—March to June.

Blatt. Herb. 25476 ! *Santapau* 1748 ! 2166 ! 3986-3988 ! 4270-4272 ! 8809 !

Ficus retusa Linn., Mant. 129, 1767; FBI. 5 : 511; King 50, t. 61 & t. 84, f. P; C. 2 : 647; Talb. 2 : 510, t. 220; Fischer 1362.

F. benjamina Willd., Sp. Pl. 4 : 1143, 1806 (non Linn.); Gr. 191.

Urostigma nitidum Miq. : D. & G. 242.

U. retusum Gasp. : D. & G. 241.

A small tree with a few aerial roots. Leaves shining, with numerous slender lateral nerves. Receptacles small, yellow or orange.

This tree is extensively planted in Khandala as a shade tree; there is a fine avenue of such trees in St. Xavier's Villa.

Blatt. Herb. A10 ! 25403 ! 25465 ! 25466 ! 25468 ! *Santapau* 4038 ! 4486 !

Ficus nervosa Heyne in Roth, Nov. Pl. Sp. 338, 1821; FBI. 5 : 512; King 53, t. 65, f. A; C. 2 : 647; Talb. 2 : 512, t. 522; Fischer 1364.

A very large tree, with bruttress-like trunk. In my field dairy I entered against No. 8793: "Large tree, loaded with receptacles. Leaves very brittle, glabrous and shining on both sides; petioles not jointed, margins recurved. Receptacles axillary, in pairs; peduncle 13 mm. long, with 3 hairy, small bracts at the base; ripe receptacles orange, glabrous, shining."

In dense forest in the ravines, where this tree is common, I have measured specimens over 32 m. high; the finest specimens are found on Meroli Plateau, on the slopes below Elphinstone Point and on those of Echo Point Ravine. This is the largest species of *Ficus* in Khandala.

Receptacles.—April to August.

Santapau 8/10 ! 1893 ! 4685 ! 8794 ! 8795 !

Ficus religiosa Linn., Sp. Pl. 1059, 1753; FBI. 5: 513; Gr. 190; King 55, t. 67A & t. 84, f. U; C. 2: 649; Talb. 2: 514, t. 523; Fischer 1363.

Urostigma religiosum Gasp., Ric. Caprif. 82, t. 7, ff. 1-5, 1845; Wight, Icon. t. 1967; D. & G. 241.

A large tree, planted in the village; I have seen no specimens in the jungle around Khandala.

Local name: Pipal.

Blatter in MS. catalogue; *Santapau*, cultivated !

Ficus arnottiana Miq. in Ann. Mus. Lugd.-Bat. 3: 287, 1867; FBI. 5: 513; King 56, t. 68, & t. 84, f. V; C. 2: 649; Talb. 2: 516, t. 524; Fischer 1363.

F. cordifolia Gr. 192, 1839 (non Roxb.).

Urostigma cordifolium D. & G. 242, 1861.

A glabrous, deciduous tree. Leaves shortly caudate-acuminate, bright red or vinaceous when young, at length green, glabrous. Receptacles appear when the tree is leafless.

This is about the commonest or at least one of the commonest species of *Ficus* in the district; common in the ravine slopes or in open country. A fine tree.

Local name: Pair.

Graham "Kandalla, pretty common"; *Blatt. Herb.* A 8 ! 25471 ! 25538 ! *Santapau* 8/9, 23, 24, 37 !

Ficus lacor Buch.-Ham. in TLS. 15: 150, 1825.

F. infectoria Roxb., Fl. Ind. 3: 550, 1832 (excl. syn. Rheede); FBI. 5: 515; Gr. 191; Wight, Icon. t. 665; D. & G. 241; King 60, t. 75, & t. 84, f. V; C. 2: 651; Talb. 2: 519; Fischer 1362 (non Willd., 1806).

The nomenclature of this plant is to be noted. Roxburgh's name "infectoria" is invalid, as it is preoccupied by that of Willdenow, which is a synonym of *F. Tsjakela* Burm. Hamilton's *F. lacor* was published in 1825; the same year saw the publication of Blume's *F. lutescens*; I have been unable to discover which of these two names has priority of publication. One thing is clear, and that is that Roxburgh's name cannot stand in accordance with the Rules.

A fairly large tree. Leaves membranous, nerves strong on both sides. Receptacles sessile or very shortly pedunculate, with three bracts just below the receptacle.

Occasionally found in the ravines.

Locol name: Pipli.

Receptacles.—October to May.

Blatt. Herb. 25408! 25475! *Santapau* 1219! 1474! 1525! 8085; 8086!

Ficus lacor Buch.-Ham. var. **lambertiana** (Miq.) comb. nov.

F. infectoria var. *lambertiana* King, Sp. Fic. 63, t. 76, 1887; C. 2 : 651; Talb. 2 : 520, t. 527; Fischer 1363.

Urostigma lambertianum Miq. in Hook. Lond. Journ. Bot. 6 : 565, 1847; D. & G. 241.

"Leaves distinctly coriaceous, their bases broad, rounded, emarginate or subcordate, rarely narrowed; receptacles ·3 to ·4 in. across, on pubescent pedicels from ·2 to ·3 in. long." (King, loc. cit.)

This is quite a clear variety, distinguished by the broader leaves and the pedunculate receptacles; both the leaves and the receptacles are larger than in the typical species.

About as common in Khandala as the typical species; on ravine slopes, especially below Elphinstone Point.

Receptacles.—October to June.

Santapau 8/6! 4266-4268! 4532! 7445! 9200!

Ficus asperrima Roxb., Fl. Ind. 3 : 554, 1832; FBI. 5 : 522; Gr. 191; Wight, Icon. t. 633; D. & G. 243; King 80, t. 100; C. 2 : 536; Talb. 2 : 522, t. 529; Fischer 1366.

A large shrub or small tree, without aerial roots. Leaves up to 18·5×8·5 cms., acute or acuminate, shallowly crenate or more or less deeply 3-lobed, scabrid on both sides.

Receptacles solitary, pedunculate, up to 21 mm. diam., scabrid, red when ripe, often produced on old branches away from the leaves.

Fairly common in moist situations; the 3-lobed leaves, which Cooke considers a sport and which King does not mention, are about as common in Khandala as the entire or crenate leaves.

Receptacles.—December to June.

Blatt. Herb. 25448 ! 25354 ! 25478 ! 25523 ! 27497 ! 27539 ! *Santapau* 77(2)A ! 389 ! 484 ! 1444(1-3) ! 3053 ! 3732 ! 4533 !

Ficus hispida Linn. f., Suppl. 442, 1781; FBI. 5: 522; King 116, tt. 154-155; C. 2: 653; Talb. 2: 523, t. 530; Fischer 1367.

F. oppositifolia Willd.: Gr. 191; Wight, Icon. t. 638.

Cevellia oppositifolia Gasp.: D. & G. 243.

C. daemonum Miq.: D. & G. 244.

Ficus daemonum Koen.: Gr. 192; Wight, Icon. t. 641.

A shrub or small tree, often unbranched and only 1-3·5 m. high; branches hollow. Leaves up to 35×16 cms., margins toothed, crenate or entire; lateral nerves very prominent on both sides, petioles up to 5 cms. long. Receptacles mostly on short branches, which come from the old wood, often from near the ground or even from under the ground; receptacles hispid.

This plant is conspicuous on account of the size and opposite arrangement of its leaves, and the position of the receptacles. Occasionally found in dense forest, usually in moist situations.

Local name: Boimbar.

Receptacles.—May to July.

Dr. Arbuckle ex Graham; *Blatt. Herb.* 25444 ! 26665 ! 27578 ! *Santapau* 431 ! 662 ! 1082 ! 8911 !

Ficus glomerata Roxb., Pl. Cor. 2: 13, t. 123, 1798; FBI. 5: 535; Gr. 190; Wight, Icon. t. 667; King 173, t. 218 A; C. 2: 654; Talb. 524, t. 531; Fischer 1364.

Covellia glomerata Miq.: D. & G. 243.

A large tree. Receptacles from the old wood, on the trunk and branches, clustered; at first green, at length red and edible, but generally full of insects; monkeys seem to eat the fruit with impunity but I have heard of a number of persons being taken seriously ill after eating such insect-infected fruits. The size of the receptacles reaches up to 4·7×2·3 cms.

This is the most abundant *Ficus* in Khandala; when growing in the open, the tree seldom attains a good size; in dense forest on the ravine slopes, it is one of the largest trees.

Local name: Umbar.

Receptacles.—Whole year.

Blatt. Herb. 25375 ! 27455 ! *Santapau* 386 ! 511 ! 3783 !

Ficus rumphii Blume, Bijdr. 437, 1825; King 54, t. 67B & t. 67, T; C. 2: 648; Talb. 2: 514.

F. cordifolia Roxb. (non Blume): Wight, Icon. t. 640.

Urostigma cordifolium Miq.: D. & G. 242.

Talbot, loc. cit., states: "Western Ghats near Bombay at Khandala. A moderate-sized tree closely resembling *F. religiosa.*"

Talbot, loc. cit.

Ficus elastica Roxb., Hort. Beng. 65, 1814 & Fl. Ind. 3: 541, 1832; FBI. 5: 508; Gr. 190; D. & G. Suppl. 79; King 45, t. 54; C. 2: 655.

Occasionally planted in gardens in Khandala.

Santapau 11176 !

Ficus sp. (prox. *F. Talboti* King).

In my collection there is one specimen that seems to match these of *F. Talboti* King. in Kew Herb.; it was collected in the ravine slopes below St. Mary's Villa. The petioles are longer and the lateral nerves stronger than in *F. retusa,* which it much resembles. On the other hand, the description and plates of *F. Tsiela* Roxb. given by King seem to place my plant under the latter species. In the absence of receptacles, however, it is not possible to settle the identity of the plant satisfactorily.

Santapau 8/3 ! April 1941.

ANTIARIS Leschen.

Antiaris toxicaria (Pers.) Leschen in Ann. Mus. Par. 16: 478, 1810; FBI. 5: 537; C. 2: 655; Talb. 2: 530, t. 534; Merrill, Plant Life Pac. World, 1.

Ipo toxicaria Pers., Syn. 2: 566, 1807.

Antiaris sacoidora Dalz. in Kew Journ. Bot. 3: 232, 1851; D. & G. 244.

Lepurandra sacoidora Nimmo in Gr. 193, 1839.

A tall tree, but in Khandala I have seen no specimen of the dimensions mentioned by Cooke. Leaves about 12×5 cms., bifarious, polished and shining above and to a lesser extent also beneath; base distinctly unequal-sided; lateral nerves conspicuous on both sides.

The flowers were seen for the first time in 1944, after keeping the tree under observation for over 4 years. Male flowers crowded on a flat receptacle, 13 mm. diam., the underside of which is covered with minute bracts; as the flowers develop, the receptacle grows in size and its edges become recurved; the mature receptacle measures up to 18·5 mm. diam., on a peduncle 19 mm. long; the colour of the receptacle is at first green, later it becomes yellowish. Female flowers could not be collected. Fruit deep red or purple, subglobose, velvety, up to 18 mm. diam.; the ripe fruit is eaten by the Ḳatkaris.

A rare tree in the district. The best specimen noticed in Khandala grows near the main road, where this passes over tunnel No. 24, G.I.P. Ry. line. The leaves are often covered with honey-dew; the fruit is

eaten locally, but the tree is too scarce for any use to be made of its bark. As regards the poisonous qualities of the tree, I have often handled branches without any ill effect.

Local name : Tarar.

Flowers.—October. *Fruits.*—October to February.

Graham : " Grows in the deep ravines at Kandalla "; *Dalzell* and *Gibson* ; *Blatter* in MS. catalogue ; *Santapau* 1492 ! 1534 ! 1535 ! 1871 ! 3342 ! 3343 ! 5223 ! 11725 !

ARTOCARPUS Forst.

Artocarpus integra (Thunb.) Merrill, Interpr. Herb. Amb. 190, 1917 ; id. Enum. 2 : 41.

Radermachia integra Thunb., in Vet. Akad. Handl. Stockh. 254, 1776.

Artocarpus integrifolia Linn. f., Suppl. 412, 1781 ; FBI. 5 : 541 ; Gr. 192 ; D. & G. 244 ; C. 2 : 657 ; Fischer 1368.

A fairly large tree cultivated in St. Xavier's Villa and elsewhere for shade and for the sake of its " fruit ". Typically the " fruit " reaches a large size (up to 60×30 cms.) and is produced from stout peduncles on the stem and branches. Nowhere have I seen it wild in the district.

Local name : Phannas.

Blatter in MS. catalogue ; *Santapau* 8/4 ! 6087 !

CANNABINACEAE.

CANNABIS Linn.

Cannabis sativa Linn., Sp. Pl. 1027, 1753 ; FBI. 5 : 487 ; Gr. 187 ; D. & G. Suppl. 79 ; C. 2 : 659.

The only authority for the inclusion of this plant is Blatter, who mentions it is his list. The plant is sometimes cultivated in western India for its fibre and for the various drugs obtained from it. I have seen the plant in Khandala neither in the wild state nor under cultivation.

Blatter in MS. catalogue.

CASUARINACEAE.

CASUARINA Linn.

Casuarina equisetifolia ("equisefolia") Linn., Amoen. Acad. 4 : 143, 1759 ; Forst., Charact. 104, t. 52, 1776 ; FBI. 5 : 598 ; D. & G. Suppl. 82 ; C. 2 : 660 ; Talb. 2 : 536.

C. muricata Roxb., Fl. Ind. 3 : 519, 1832 ; Gr. 196 ; D. & G. Suppl. 82.

A tall tree planted and thriving in Khandala gardens. There are several fine specimens in St. Xavier's Villa and in Khandala Hotel; in both places the tree produces fruit regularly.

Hallberg in MS. catalogue; *Blatt. Herb.* 25574! *Santapau* 6/1!

SALICACEAE.

SALIX Linn.

Salix tetrasperma Roxb., Pl. Cor. 1: 66, t. 97, 1795; FBI. 5: 626; Gr. 195; Wight, Icon. t. 1954; D. & G. 220; C. 2: 661: Talb. 2: 537, t. 536; Fischer 1390.

In Blatt. Herb. there is but one specimen from Khandala identified by Blatter himself; the exact locality is given as "Below Tata's p." I have seen no other specimens from the district.

Blatt. Herb. 25724!

CERATOPHYLLACEAE.

CERATOPHYLLUM Linn.

Ceratophyllum demersum Linn., Sp. Pl. 992, 1753; FBI. 5: 639; C. 2: 663.

This is an elegant plant when its leaves are spread out in the water of the village tank. It is fairly abundant in Khandala in the talao during the dry season. The fruit is generally 5-6 mm. long, ovate, with a subulate style reaching 12 mm. long, and a spur 6 mm. long on either side of the base.

Flowers and *Fruits*.—November.

Blatter Herb. 26436! *Santapau* 8118!

GNETACEAE.

GNETUM Linn.

Gnetum ula Brongn. in Duperrey, Voy. Coquille 12, 1829; Markgraf, Monogr. Gnet. 469, t. 6, f. 4, 1930 (non Marsten nec alior.).

G. funioulare Smith ex Wight, Icon. t. 1955, 1853.

G. scandens Brandis, For. Fl. 502, 1874; Talb. 2: 543, f. 537; C. 2: 665; Fischer 1392 (non Roxb.).

Common in the district; the largest specimens with stems 50 cms. Broad and about 15-20 cms. thick have been observed on Meroli Plateau.

Local name: Tólumbi.

Blatt. Heb. 27909! *Santapau* 298-299A! 134-137! 1517! 1575! 1576! 1650! 1884! 3567! 4686-4690! 5845-5847!

HYDROCHARITACEAE.

LAGAROSIPHON Harv.

Lagarosiphon alternifolius (Roxb.) Druce in Rep. Bot. Exch. Cl. Brit. Isl. 1916 : 630, 1917.

Valisneria alternifolia Roxb., Hort. Beng. 71, 1814 & Fl. Ind. 3 : 750, 1832 ; Gr. 199 : Wight, in Hook. Bot. Misc. 2 : 344, Suppl. t. 11.

Lagarosiphon Roxburghii Benth. in Benth. & Hook., Gen. Pl. 3 : 452, 1883 ; FBI. 5 : 659 ; C. 2 : 669.

Nemachandra Roxburghii Planch. : D. & G. 277.

Stems very slender, green. Leaves membranous, bright green. Flowers minute, axillary. Grows submerged in Khandala village tank.

Santapau 8112 !

VALLISNERIA Linn.

Vallisneria spiralis Linn., Sp. Pl. 1015, 1753 ; FBI. 5 : 660 ; C. 2 : 669.

V. spiraloides Roxb. : Gr. 200.

Blatter recorded this plant for Khandala in October 1916 : I have seen no specimens from the district.

Blatter in MS. catalogue.

BLYXA Thouars.

Blyxa octandra (Roxb.) Planch. ex Thw., Enum. Pl. Zeyl. 332, 1864.

Vallisneria octandra Roxb., Pl. Cor. 2 : 34, t. 165, 1798 ; Gr. 199.

Blyxa Roxburghii Rich. in Mem. Inst. Fr. 77, t. 5, 1811 ; FBI. 5 : 660 ; C. 2 : 670.

A gregarious herb growing towards the edges of tanks and pools in Khandala during the rainy season ; stems practically none, leaves tufted, green or purplish, membranous.

Flowers not seen. Fruits linear, 1·5-5 cms. long ; seeds numerous, sparingly tuberculate, "tails" about 1-3 mm. long.

Fruits.—September to December.

Santapau 2569-2572 ! 3355-3357 ! 8115 ! 8116 !

BURMANNIACEAE.

BURMANNIA Linn.

Burmannia pusilla (Wall. ex Miers.) Thw., Enum. Pl. Zeyl. 325, 1864 ; FBI. 5 : 665 ; Yonker, Mon. Burman. 30, 1938.

B. coelestis var. *pusilla* Trim., Handb. Fl. Ceyl. 4 : 131, 1898; C. 2 672.

B. coelestis Fischer, in G. 1399, 1928 (non Don).

B triflora Roxb.: D. & G. 271.

B. disticha Gr. 223, 1839 (non Linn.).

A very slender herb; stems generally unbranched, occasionally aparingly branched, filiform. Leaves inconspicuous, minute and rare. Flowers "Hortense Violet" (Ridg. 61, b), 1-3 on a scape.

On Behran's Plateau and other grassy places, common during the second half of the monsoon; often associated with *Drosera indian* and *Exacum Lawii*, so that one can seldom find one of these plants without finding the rest together.

Flowers and *Fruits*.—September to October.

Blatt. Herb. 27532 ! 27561 ! 28024 ! 28084 ! *Santapau* 2771 ! 2893 ! 5040 ! 7425 !

ORCHIDACEAE.

Oberonia Lindl.

Oberonia recurva Lindl. in Bot. Reg. Misc. no. 8, 1839; FBI. 5: 680; D. & G. 260; C. 2: 676; Blatt. & McCann in JBNHS. 35: 257; King & Pantl. in ARBG. 8: t. 9; Fischer 1405-6.

Epiphytic on *Ficus* sp., *Careya arborea* Roxb., etc. Leaves green; inflorescence greenish yellow, erect, up to 7 cms. long.

Flowers and *Fruits*.—March to April.

Law 39 ! *Santapau* 233/4 ! 3622 !

Microstylis Nutt.

Microstylis versicolor Lindl., Gen. & Spec. Orch. 21, 1830; C. 2: 678; Blatt. & McC. 259.

M. Rheedei Wight, Icon. t. 902, 1844-1845; FBI. 5: 690; D. & G. 260 (excl. syn.); Hook. f., Icon. Plant. t. 1832.

Malaxis Rheedei Heyne: Gr. 202.

A rare plant in Khandala. In Blatt. Herb. there are at present but a few scraps of a specimen that has been identified by Blatter himself as *M. versicolor*. I include this plant on the authorities cited below; I have not seen any living specimens from Khandala.

Cooke; *Hallberg*; *Blatter* and *McCann* 25836, 25837; *Blatt. Herb.* 25233 (?) !

Dendrobium Swartz.

Dendrobium microbulbon Rich. in Ann. Sc. Nat. (ser. 2) 15: 19, t. 8, 1841; FBI. 5: 716; D. & G. 261; C. 2: 681; Blatt. & McC. 361; Kranz., in Pfreich. 45: 79, t. 3T.

D. humile Wight, Icon. t. 1643, 1852.

D. crispum Dalz. in Kew Journ. Bot. 4: 111, 1852.

Epiphytic on *Memecylon umbellatum* and *Terminalia crenulata*. Leaves coming out during the monsoon, up to 5 from the same bulb, bright green. Flowers appearing when the plant is leafless, white or creamy white, lip pinkish with darker purple veins.

One of the commonest orchids of Khandala, where during the monsoon it may be seen covering large patches on the trunks of trees.

Flowers.—December to January. *Fruits.*—Up to May.

Blatter in MS. catalogue; *Santapau* 233/30 ! 1037 ! 1439 ! 2452 ! 4363 ! 4600 !

Dendrobium sp. (prope *D. Mabelae* Gammie).

Epiphyte; pseudobulbs 2-3-jointed. Leaves up to 5 on the same plant, and up to 14×1·3 cms., bright green, submembranous, acute. Flowers not seen. This may be a stouter form of the preceding species, but in the absence of flowers I find it impossible to determine the species.

Santapau 4740-4742 ! 5049 ! 6932 !

Dendrobium ovatum (Willd.) Kranz. in Pfreich. 45: 71, 1910; Blatt. & McC. 262.

Cymbidium ovatum Willd., Sp. Pl. 4: 101, 1805; Gr. 203.

Dendrobium Chlorops Lindl., in Bot. Reg. Misc. 44, 1844; FBI. 5: 719; D. & G. 261; C. 2: 682.

D. barbatulum Wight, Icon. t. 910, 1843 (non Lindl.).

This plant is included on the authority of Blatter and McCann, who mention it in their Revision; I have seen no specimen from Khandala; the specimen mentioned below has disappeared from Blatt. Herb.

Blatt. & Hallberg 26492.

Dendrobium barbatulum Lindl. in Wall., Cat. 2013, 1828 & in Gen. & Spec. Orch. 84, 1830; FBI. 5: 719; D. & G. 261; C. 2: 682; Kranz. 70; Fischer 1416.

Epiphytic on *Vitex Negundo* Linn., *Ficus* sp. and *Terminalia crenulata* etc. Stems 5-30 cms., tapering but slightly towards the apex. Leaves appearing during the monsoon, deciduous, up to 11·5×2·8 cms., narrowed at the base above the sheath.

Flowers appearing long before the leaves, from pure white to deep rosy pink, in racemes from the upper axils or terminal; usually there is but one raceme, but occasionally there are up to 3, one being then terminal, the others lateral. Fruit with 3 strong and 3 weak ribs, all reddish or purplish against a green or yellowish background.

Very common in Khandala, especially in St. Xavier's Villa and Convalescent Home; most of the trees in either place support one or more Dendrobiums.

Leaves.—June to October. *Flowers.*—January to April. *Fruits.*—May to June.

Hallberg 26539; *Blatter* 26540; *McCann*; *Blatt. & Hallb.* 26537 *Blatt. & McC.*, 26491 (all ex Blatt. & McC., in Revision); *Santapa* 233/6, 28 ! 838 ! 1675 ! 1676 ! 2197 ! 2223 ! 3613 ! 3614 ! 4362 ! 6123 8644 ! 8645 ! 8768 ! 9179 ! 12261 !

PORPAX Lindl.

Porpax papillosa Blatt. & McCann in JBNHS. 35 : 268, f. 4, 193

Pseudobulbs lying flat on branches of supporting tree, covered wit reticulate sheaths. Leaves up to 5×2·4 cms., ovate or obovate lanceolate, subacute or obtuse at the apex, margins entire but minutel papillose, base gradually tapering, midnerve fairly clear, lateral nerv very faint, the whole leaf glabrous and bright green in colour. Flowe about "Brazil Red" (Rdg. I, 5-i) in colour, 11·5 mm. long, 4 mm. broa sessile or subsessile. Fruits 6 mm. long and about as much in widt pyriform.

This small orchid seems to be fairly common about Khandala, b due to its small size is not easy to find. Khandala, moreover, is t typical locality of the species.

Flowers.—June. *Fruits.*—October. *Leaves.*—July to October.

Hallberg ex Blatt. & McCann.; *Blatt. Herb.* 27629 ! *Santapau* 743 823 ! 2150 ! 2151 ! 2252! 2620 ! 2808 ! 4516 ! 6930 !

ERIA Lindl.

Eria reticosa Wight, Icon. t. 1637, 1852; FBI. 5 : 787; C. 2 690 : Blatt. & McC. 272.

E. uniflora Dalz. in Hook. Kew Journ. Bot. 4 : 111, 1852.

E. braccata Kranz. in Pfreich. 50 : 18, f. 1, pp.; Fischer 1425, p

The occurrence of this plant is mentioned by Blatter; I have se no specimen from the district.

Blatter in MS. catalogue.

Eria dalzellii Lindl. in JLS 3 : 47, 1858; FBI. 5 : 789; & G. 262; C. 2 : 691; Kranz. 19, f. 2 A-C pp.; Blatt. & McC. 273.

Dendrobium filiforme Wight, Icon. t. 1642 (Icon. centr. & sinistra).

Very common and abundant especially on Behran's Plateau, wh in the rains it may be seen covering large areas on trunks of trees. T flowers are very sweetly, though not strongly, scented.

Flowers.—July to August. *Fruits.*— August to October.

Hallberg 26520 ! *Blatter* 25840; *McCann* 25834; *Blatt. & Mc* 25839; *Santapau* 583 ! 623 ! 720 ! 1036 ! 2450 ! 2451 ! 4604 ! 489 4895 ! 5050 ! 6903 ! 6929 !

Eria microchilos Lindl. in JLS 3 : 47, 1858 ; C. 2 : 691 ; Blatter & McCann 273.

E. Dalzellii var. *fimbriata* Hook. f. in FBI. 5 : 789, 1890 ; Kranz. 20.

Dendrobium fimbriatum Dalz. in Hook. Kew Journ. Bot. 4 : 292, 1852.

D. microchilos Dalz. loc. cit. 3 : 345, 1851.

An epiphytic herb very similar to the preceding species. Leaves 2-4 with a small one, sheath-like, at the base. Flowers secund, creamy or yellowish white. Sepals with minute, hyaline, glandular hairs. Lip minute, pandurate.

It can easely be distinguished from *E. dalzellii* in the secund arrangement of the flowers, the shape of the lip and the time of flowering, which is somewhat later in this than in the former species.

Common and gregarious on Behran's Plateau, on tree trunks ; flowers are sweetly scented.

Flowers and *Fruits*.—July to August, but slightly later than in *E. dalzellii*.

Hallberg ; Sedgwick ; *Santapau* 304 A ! 414A ! 624 ! 2244 ! 4613 ! 4706 ! 4743 ! 6828 !

THUNIA Reich.

Thunia venosa Rolfe, in Orch. Rev. 13 : 206, 1905 ; C. 2 : 692 : Blatt. & McC. 484 ; Fischer 1427.

Phajus albus Lindl. in Wall., Cat. 3749 & Gen. & Sp. Orch. 128, 1830 -40, pro parte ; FBI. 5 : 818 pro parte ; Gr. 205.

Graham : "On trees at Kandalla—rare". Among my collections there are two specimens from Khandala, 4645 & 4878, which may belong to this species ; leaves up to 18 cms. long (excl. the long sheath) and up to 3·1 cm. broad, acute, strongly nerved ; flowers or fruits not seen.

EULOPHIA R. Br.

Eulophia ochreata Lindl. in JLS. 3 : 24, 1858 ; D. & G. 265 ; FBI. 6 : 2 ; C. 2 : 693 ; Fischer 1435 ; Blatt. & McC. 485.

Roots tuberous ; tubers up to 17 in a line ; scape up to 45 cms. long. Leaves up to 21×8 cms. (excl. sheaths). Flowers yellow, lip with some purple lines on the inner side ; bracts green to greenish purple.

A rare ground orchid.

Flowers.—June.

Blatt. Herb. 28604 (?) ! *Santapau* 787 ! 2138 ! 2139 !

Eulophia pratensis Lindl. in JLS. 3 : 25, 1858 ; FBI. 6 : 4 ; D. & G. 264 ; C. 2 : 694 ; Fischer 1435 ; Blatt. & McC. 486.

E. ramentacea Wight, Icon. t. 1666, 1851 (non Lindl.).

E. virens Graham, Cat. 202 (non R. Br.), 1839.

On March 2, 1945 a friend living in Khandala gave me a tuber of this plant, which was planted in St. Xavier's College, Bombay. It came into flower in October 1949.

The tubers are eaten raw, and locally are reputed as energetic rejuvenators; the friend who gave me the tuber remarked on that occasion: "The tuber was collected on Bhoma Hill, Khandala, and the man who collected it showed no signs of rejuvenation; obviously the tuber it not so powerful as local people believe".

RHYNCHOSTYLIS Blume.

Rhynchostylis retusa Blume, Bijdr. 286, t. 49, 1825; FBI. 6: 32; King & Pantl. in ARBG. 8: 212, t. 284; C. 2: 698; Fischer 1440; Blatt. & McC. 490.

Saccolabium [illegible] Lindl. in Wall., Cat. 7308, 1832; D. & G. 263; Wight, Icon. tt. 1745, 1746.

Aerides retusa Sw.: Gr. 294.

Epidendrum retusum Linn., Sp. Pl. 1351, 1753.

Rare in Khandala; I have only found it on one occasion, and then it was in fruit. This is the largest epiphytic orchid seen in Khandala.

Fruits.—July 1949.

Santapau 10169 ! 10170 !

SARCOCHILUS R. Br.

Sarcochilus dalzellianus Santapau in Kew Bull. 1948: 498, 1949.

Micropera viridiflora Dalz. in Kew Journ. Bot. 3: 282, 1851.

Saccolabium viridiflorum Lindl. in JLS. 3: 36, 1858; FBI. 6: 63.

Sarcochilus viridiflorus Cooke, Fl. Pres. Bomb. 2: 697, 1907; Blatt. & McC. 488 (non Hook. f., 1890).

The specific name *viridiflorus* is preoccupied for the genus by Hook. f.'s name which is based on *Aerides viridiflorum* Thwait.; the present species is named afetr Dalzell, who was the first to recognize the specific standing of this plant.

For several years I have observed a good number of these plants growing epiphytically on *Ficus retusa* in St. Xavier's Villa; elsewhere I have observed them on other sps. of *Ficus* and on *Tetrameles nudiflora* R. Br., and *Olea dioica* Roxb. It is not common in the district.

Flowers.—May to June. *Fruits.*—June.

Blatt., Hallb. & McC. ex Blatt. & McC. in Revision; *Santapau* 487 ! 507 ! 1352 ! 4350 ! 4521 ! 9077 !

AERIDES Lour.

Aerides maculòsum Lindl. in Bot. Reg. t. 58, 1845; FBI. 6: 45; D. & G. 266; C. 2: 699; Fischer 1442; Blatt. & McC. 490.

Saccolabium speciosum Wight, Icon. tt. 1674-1675, 1851.

Common and very showy; I have recorded the following trees as supports of this orchid: *Terminalia crenulata*, the commonest, *Eriolaena quinqueloculari*s, *Heterophragma quadriloculare* and *Euphorbia neriifolia* (the last on June 13, 1943, on Ghira Hill).

Flowers.—May to June. *Fruits.*—June onwards, persistent.

Hallberg in MS. catalogue; *Blatt. Herb.* 27962! *Santapau* 417A! 498! 506! 542*! 2049! 2191! 2441! 4482! 9008! 9048! 9120-9122!

Aerides crispum Lindl. in Wall., Cat. 7319, 1828 & Gen. & Spec. Orch. 239, 1830-1840, & Bot. Reg. t. 55, 1841; FBI. 6: 45; D. & G. 265; C. 2: 700; Fischer 1442; Blatt. & McC. 490.

A. Lindleyana Wight, Icon. t. 1677, 1851; D. & G. 265.

The scent of this plant is fairly strong and very pleasant. This orchid is larger in all its parts than the preceding species, which it otherwise much resembles. It is rare in Khandala.

Flowers.—May. *Fruits.*—From May onwards, apparently remaining on the parent plant most of the year.

Hallberg ex Blatt. & McC. loc. cit.; *Santapau* 485! 8910!

COTTONIA Wight.

Cottonia macrostachya Wight, Icon. 5(1): 21 & t. 1755, 1852; FBI. 6: 26; D. & G. 263; Bot. Mag. t. 7099; C. 2: 702; Fischer 1439; Blatt. & McC. 494.

Stem about 20 cms. long; leaves bifarious. Inflorescence paniculate; common peduncle about 20 cms. long (up to 50 cms. in some specimens collected in N. Kanara); branch peduncles clearly and strongly compressed. Petals and sepals uniform in colour, greenish yellow with a touch of pink or purple; midlobe of lip fiddle-shaped, deep purple almost black, with yellow hairy sides. Fruit not seen in Khandala.

In N. Kanara this plant is common; in Khandala it seems to be extremely rare, Blatter does not mention it for the district, and I have only seen it on the one occasion mentioned below; it was epiphytic on *Vitex Negundo* L. and in full bloom on May 6th, 1950. The general appearance of the vegetative portion of this plant very much resembles some of the common orchids of the district, *Aerides* sp., with which it may have been confused in the past.

Flowers and *Fruits.*—April-May.

Santapau 10953!

NERVILIA Comm.

Nervilia infundibulifolia Blatt. & McC. in JBNHS. 35: 725, t. 3, 1932.

Fairly widely scattered over the district, but nowhere abundant; it is found in forests under the shade of trees. In St. Xavier's Villa there is a good group of such plants which I have kept under observation for several years ond some of which I have successfully cultivated in Bombay.

In my collection there is a specimen, no. 6812, collected on July 21, 1945, that seems to be an intermediate form between the present species and *N. monantha* Blatt. & McC. : the leaves are typical of the present species, but the fruiting stem is about 21 cms. long (typical of *N. monantha*).

Flowers and *Fruits*.—June. *Leaves*.—August to November.

Cooke, 1892 (in Kew Herb.) ! *Santapau* 634 ! 643 ! 664 ! 824 ! 2036 ! 2037 ! 2060 ! 2220 ! 4510 ! 455 ! 4597(2) ! 9140 !

Nervilia hallbergii Blatt. & McC. in JBNHS. 35: 726, 1932.

When comparing the description of this and of the preceding species with my Khandala specimens, I have been left in considerable doubt about the validity of the present species: both descriptions seem to fit my plants, and the diagrams given by Blatt. & McC. do not show sufficient details. In the absence of the type sheet, it is not easy to decide such a point. The type specimen was collected by Hallberg in Kune, during June 1917.

Hallberg ex Blatt. & McC. loc. cit.

Nervilia plicata (Andr.) Schlecht. in Engl. Bot. Jahrb. 14: 403, 1911; Fischer 1458; Blatt. & McC. 727.

Arethusa plicata Andr., Bot. Rep. t. 321, 1803.

Pogonia plicata Lindl., Gen. & Sp. Orch. 415, 1840; FBI. 6: 119; King & Pantl. in ARBG. 8: 268, t. 358; C. 2: 707.

This plant is included on the authority of Blatter, who mentions it in his MS. catalogue; Blatter & McCann in their Revision cite Cooke, whose specimen they assert to have seen.

In Kew Herb. is a sheet labelled "Pogonia plicata Lindl. collected at Khandala (hill station in the Deccan Bombay Presidency) 1800 ft. by T. Cooke June 1892"; the specimens on that sheet are clearly those of *N. infundibulifolia* Blatt. & McC. In the Herb. of the Agric. College, Poona, there is another sheet collected by Cooke in Khandala in June 1890; according to the key given by Blatt. & McC. loc. cit. the Poona plants are also *N. infundibulifolia* and not *N. plicata*.

Blatter in MS. catalogue; *Cooke* ?

Nervilia carinata (Roxb) Sclecht. in Engl. Bot. Jahrb. 14: 404, 1911; Fischer 1459; Blatt. & McC. 729.

Epipactis carinata **Roxb., Fl. Ind. 3: 454, 1832; Gr. 205.**

Pogonia carinata Lindl., Gen. & Sp. Orch. 414, 1840; FBI. 6 : 121 ; D. & G. 270 ; Duthie in ARBG. 9 : t. 124 ; C. 2 : 707.

Rare in Khandala. In the undergrowth of the forest slopes near Meroli Plateau.

Flowers.—June. *Leaves.*—End of June.

Blatter in MS. catalogue ; *Santapau* 4500 ! 4501 ! 4502 !

PERISTYLUS Blume.

Peristylus stocksii (Hook. f.) Kraenz, Orch. Gen. & Spec. 1 : 513, 1901 ; C. 2 : 710 ; Fischer 1475 ; Blatt. & McC. 735.

Habenaria Stocksii Hook. f. in FBI. 6 : 158, 1880.

A common ground orchid, found under the shade of trees or under dense shrubs ; often found on sloping ground.

Flowers.—July to September. *Fruits.*—September to October.

Santapau 773 ! 805 ! 2491 ! 4575 ! 4576 ! 4672 ! 4771 ! 6883-6886 ! 9224 ! 9225 ! 9248 ! 9249 !

PLATANTHERA Rich.

Platanthera susannae (Linn.) Lindl., Gen. & Sp. Orch. 259, 1835 ; Wight, Icon. t. 920 ; D. & G. 269 ; C. 2 : 713 ; Fischer 1475.

Orchis Susannae Linn., Sp. Pl. 939, 1753.

Habenaria Susannae R. Br., Prodr. 312, 810 ; FBI. 6 : 137.

H. gigantea Don, Prodr. Fl. Nep. 24, 1825 ; Gr. 201.

A stout herb, often reaching 1 m. in height. Leaves very elegant and beautifully arranged all along the stem, up to 20·5×7 cms. Flowers pure white, strongly and very sweetly scented ; floral bracts up to 7·5 ×2·5 cms., very acute, base broad but scarcely sheathing. The expanded flowers reach 8·4 cms. diam. Dorsal sepal up to 4·2 cms. at its broadest. Petals up to 6 mm. broad, somewhat falcate. Lip with very conspicuous pectinate side-lobes ; the whole lip up to 4·5 cm. long ; spur reaching 12 cms. long. Ovary 4 cms. long. Pollinia about 6 mm. long.

I have found a few plants growing in St. Xavier's Villa and Convalescent Home ; on the slopes of Bhoma Hill it is more frequent. In general, this, the most beautiful and fragrant of Khandala orchids, seems to be doomed to disappear from the district unless a check is put to the thoughtless practices of both local people and visitors. The tubers are said to be a delicacy for wild pigs ; on several occasions I have seen plants from which the tubers had been removed by such creatures.

Flowers.—September to October. *Fruits.*—October.

Graham : " At Kandalla, on the open ground above Sir Herbert Compton's Bungalow " ; *Stocks* 7 ! *Cooke & Woodrow* ex Cooke ; *Blatter & Hallberg*, ex Blatt. & McC. ; *Blatt. Herb.* 25953 ! *Santapau* 775 ! 1064 ! 1101 ! 2672 ! 2818-2820 ! 5010 ! 5360 ! 11156 !

HABENARIA Willd.

Habenaria digitata Lindl., Gen. & Sp. Orch. 307, 1835 ; FBI. 6 : 134, pro parte ; D. & G. 267 ; C. 2 : 715 ; Blatt. & McC. op. cit. 36 : 14.

H. trinervia Wight, Icon. t. 1701, 1852.

Common in grass fields and grassy slopes especially under the shade of trees. On several occasions after collecting the plant I have placed it in a vase and kept it overnight ; during the evening and night it emits a strong and very unpleasant odour, which can only be qualified in the words of one of my assistants as a "powerful and revolting stench" ; during the day time the plant is odourless.

Flowers.—July to August. *Fruits.*—August.

Hallberg, ex Blatt. & McG. ; *Blatter* in MS. catalogue ; *Santapau* 301A ! 398A ! 618 ! 646 ! 745 ! 770-772 ! 774 ! 803 ! 2259 ! 2460 ! 4590 ! 4591 ! 4725 ! 4768-4770 ! 4888 ! 6782 ! 6878 ! 6913 ! 6914 ! 6920 ! 6952 ! 6953 ! 9226 !

Habenaria digitata var. **foliosa** Hook. f. in FBI. 6 : 135, 1890 ; C. 2 : 716.

H. foliosa A. Rich. in Ann. Sc. Nat. (ser. 2) 15 : 71, 1841 ; Wight, Icon. t. 1700 ; D. & G. 267 ; Blatt. & McC. 15.

" Khandala under a hedge, *Sedgwick* 2586." This specimen is no longer in Sedgwick Herb. I have seen no specimen of this plant from Khandala.

Habenaria digitata var. **gibsoni** (Hook. f.) Fischer in G. 1469, 1928.

H. Gibsoni Hook. f. in FBI. 6 : 135, 1890 ; Blatt. & McC. 15.

H. digitata Cooke 2 : 715, pro parte.

In my opinion this plant is so similar to H. *digitata* Lindl. that it scarcely deserves even varietal rank. The lower lobe of the petals is slightly longer than in the typical plant.

Flowers.—July to August.

McCann 25814 ; *Blatter & Hallberg,* 25815 ; *Blatter* 25813, 2583 ; *Hallberg* 26527 ; *Blatt. Herb.* 35234 ! Another specimen without refer. number labelled "Khandala July 1917"! *Santapau* 6880 !

Habenaria rariflora A. Rich. in Ann. Sc. Nat. (ser. 2) 15 : 70, t. 2 D, 1841 ; FBI. 6 : 136 ; Wight, Icon. t. 924 ; D. & G. 268 ; C. 2 : 716 ; Fischer 1469 ; Blatt. & McC. 17.

Leaves rather variable in size and shape. Flowers scentless or only faintly scented at night. The tooth-like lobe mentioned by Blatter and McCann is rare among Khandala plants.

One of the commonest among *Habenarias* during the first half of the monsoon It is abundant on rocks, old walls and occasionally tree trunks ; it does not grow on the ground except rarely.

Flowers and *Fruits*.—July to August.

Hallberg 26497 ; *Blatter* 25842 ; *Blatt. Herb.* 35236 ! *Acland* 1167 ! *Santapau* 421A ! 617 ! 2254 ! 4607 ! 4608 ! 4718 ! 6787 ! 6868 ! 9240 !

Habenaria grandifloriformis Blatt. & McCann in JBNHS. 36 : 17, 1932.

Among my collections from Khandala there are three sheets which may belong to this species. Leaves 1 or 2 ; pedicels about twice as long as the fruit, one plant has 6 fruits, the rest 1-2 fruits each. The very broad lower bract typical of the species is not found on my specimens. In Sedgwick herbarium there is a sheet of this species, but unfortunately all the specimens on the sheet are only in flower.

Blatter and *McCann*, loc. cit. "Khandala, in grasslands, abundant"; *Blatter* 25835 ; *Hallberg* 26501 ; *Santapau* (only probably) 784 ! 6888 ! 6921 !

Habenaria grandiflora Lindl. in Wall., Cat. 7032, 1828, nom. nud. ; D. & G. 267, 1861 cum descript. ; FBI. 6 : 136 ; C. 2 : 716 ; Fischer 1469 ; Blatt. & McC. 18.

H. rotundifolia Lindl., Gen. & Sp. Orch. 306, 1835 (non Rich., 1823).

Leaf solitary, closely appressed to the ground. Flowers white, scentless. The bract below the lowest flower varies considerably in width, showing a continuous series from the narrow bract of this species to the very broad one of the preceding species.

This is the earliest *Habenaria* to come into flower during the monsoon and it is also one of the most abundant in grassy fields.

Flowers and *Fruits*.—July to August, rare in September.

Sedgwick 2627 ; *Blatt. Herb.* 35231 ! 35238 ! *Santapau* 233/5, 14 ! 619 ! 764 ! 840 ! 2255 ! 4589 ! 4606 ! 6788 ! 6832 ! 6867 !

Habenaria longecalcarata A. Rich. in Ann. Sc. Nat. (ser. 2) 15 : 71, t. 3, B, 1841 ; FBI. 6 : 141 ; Wight, Icon. t. 925 ; D. & G. 268 ; C. 2 : 718 ; Fischer 1470 ; Blatt. & McC. 20.

H. [illegible] Gr. 202, 1839.

H. longecalcarata var. *viridis* Blatt. & McC. loc. cit.

According to the rule of priority, Graham's name is the only legitimate one for this plant. I have not adopted it because of the solid weight of authority in favour of *longecalcarata* ; Graham's description of the plant seems to me to be as good as any in the botanical literature of the time.

The whole plant is 30-115 cms. high, the taller specimens being common towards the end of September among tall grasses. Leaves 3-10 (not counting the bract-like ones above), in size up to 23×4 cms. Flowers pure white, scented. Lateral sepals up to 14×6·5 mm. ; petals up to 12 mm. long, both petals and sepals with prominent nerves. Lip of a total length of 2·9 cms. Spur up to 14 cms., occasionally even longer. Fruit about 2-2·5 cms. long.

Tubers up to 5·9×1·8-2·5 cms. Medicinally the tubers are employed to reduce local swellings. The tubers are rootless, but a number of roots come out of the stem between the tuber and the lowest leaf.

A very common and variable plant, depending on its environment. The flowers at first are pure green, then white; the plant mentioned by Blatter and McCann as var. *viridis* seems to be an immature specimen, and for this reason I have fused it with the typical species.

Local name: Wagsaura.

Flowers and *Fruits*.—September to October.

Graham; *Acland* 1181 ! *Hallberg*; *Chibber* 90; *Gammie* 15467; *Garade*; *Cooke* ! *Woodrow*; *Blatt. Herb.* 28208 ! 28211 ! 28347 ! *Santapau* 508A ! 909 ! 913-916 ! 1020 ! 1054 ! 1078 ! 2492 ! 2559 ! 2611 ! 2612 ! 2829 ! 5032 ! 7430 !

Habenaria plantaginea Lindl., Gen. & Sp. Orch. 323, 1835; FBI. 6 : 141; Wight, Icon. t. 1710; Duthie in ARBG. 9(2) : 181, t. 132; C. 2 : 718; Fischer 1470; Blatt. & McC. 20.

Tubers 1·5-3×1-1·5 cms. The whole plant may reach 35 cms. high. Leaves radical, more or less flat on the ground. Flowers are pure white, subsecund to secund; the scapes are slender with numerous sheaths that gradually pass from the leaves to the floral bracts. Spur about 3 cms. long, very slender, much longer than the ovary, greenish in colour.

Rare in the district; I have only found it on sloping ground near Convalescent Home.

Flowers.—September. *Fruits*.—October.

Santapau 563A ! 910 ! 2490 ! 4993 !

Habenaria commelinifolia Wall. ex Lindl., Gen. & Sp. Orch. 325, 1835; FBI. 6 : 143; C. 2 : 719; Duthie 183, t. 134; Fischer 1470; Blatt. & McC. 20.

Orchis commelinifolia Roxb., Fl. Ind. 3 : 451, 1832; Gr. 201.

The occurrence of this plant is given on the authority of Woodrow ex Cooke; I have seen no specimens from Khandala; Blatter & McCann likewise do not seem to have seen any plant from the district or from anywhere in the [illegible].

Woodrow ex Cooke; *Blatter* in MS. catalogue.

Habenaria heyneana Lindl., Gen. & Sp. Orch. 320, 1835; FBI. 6 : 148; Wight, Icon. t. 923; D. & G. 268; C. 2 : 719; Fischer 1471; Blatt & McC. 22.

H. subpubens A. Rich. in Ann. Sc. Nat. (ser. 2) 15 : 75, t. 4 C, 1841.

H. candida Dalz. in Kew Journ. Bot. 2 : 262, 1850; D. & G. 267.

H. cerea Blatt. & McC. in JBNHS. 36 : 21, t. 6, 1932.

During my two years' stay in Kew (1946-1948) I examined at leisure the following species of *Habenaria*: *H. subpubens*, *H. candida* and *H. heyneana*, and came to the conclusion that they are all one and the same species. Then on comparing my Khandala sheets, some of which had been identified as *H. cerea* by McCann himself, I failed to see why these should not be placed under *H. heyneana*. On my return to India I had a chance to examine Sedgwick 7907, which seems to be a paratype of *H. cerea* and which bears a label in Blatter's own hand; the identity of the two species is entirely clear to me, and in consequence Blatt. & McC.'s name must give way to the much older one of Lindley.

The whole plant is generally 10-25, occasionally up to 53 cms. high. Leaves subimbricate (rarely) to subdistichous or distichous. Flowers at first greenish or whitish, then pure white, at length waxy yellow; the turning into yellow due to age seems to be gradual, so that first the lip, then the petals, finally the sepals become yellow; the colour of the flower, white or yellow, cannot be made into a specific difference. The size of the bracts relative to that of the flowers is most variable: on the paratype of *H. cerea*, Sedgwick 7907, most of the bracts are by far longer than the flowers; from the very numerous specimens which I have examined, I conclude that the flower at first is much shorter than the bract, but later on, when the ovary is more or less fully developed, the flower may be pushed out of the bract. The size of the sepals, another specific difference of *H. cerea* according to the original description, is fairly constant and in every case the dorsal sepal in slightly shorter than the lateral ones; this is the case in the Kew sheets of *H. heyneana* Lindl., in my sheets from Khandala and in Sedgwick 7907.

This is one of the commonest *Habenarias* in Khandala; it is very abundant on several more or less level grassy fields on Bhoma Hill. A very pretty plant.

Flowers.—August to September. *Fruits.*—September to October

Local name: English-speaking visitors often call this "the Tooth brush orchid".

Jacquemont 619 "in herbosis a Carli ad Kandala"! *Blatter* in MS. catalogue; *Blatt. Herb.* 27990! *Santapau* 541A! 559A! 722! 804! 948! 2458! 2459! 2493! 2669! 4719-4721! 4883! 6950! 6951!

Habenaria ovalifolia Wight, Icon. t. 1708, 1851; FBI. 6: 149; Fischer 1471; Blatt. & McC. 23.

The following is my entry under no. 853, for Sept. 5, 1942: "Orchid. Meroli Plateau, in clearing in forest. Green all over; ground orchid, Lateral sepals spreading; petals entire; lip 3-lobed, divided almost to the base; lateral lobes of lip subulate, acute; midlobe ovate-lanceolate, obtuse, slightly falcate; spur slightly longer than the ovary, slender, somewhat inflated towards its apex, apex itself acute. Leaves clustered about the middle of the stem. Only one specimen seen today".

A rare orchid in Khandala; my specimens match those of Kew Herb., with which my sheets were compared.

Flowers.—August to September.

Santapau 853 ! 6931 !

Habenaria hallbergii Blatt. & McCann in JBNHS. 36 : 24, 1932.

According to the original description, this plant is very similar to *H. ovalifolia* Wt.; the main differences are : (*a*) The bracts are lanceolate-subulate and longer than the flowers. (*b*) The spur is a little curved, linear, twisted, somewhat compressed and clavate at the apex. (*c*) The lobes of the lip are all of the same length, the lateral ones being narrowly linear, rigid and patent. (*d*) The glands are narrow and very long.

For a full description of the plant, see loc. cit.

The type was found in Khandala in a ravine by Hallberg and is preserved in Blatt. Herb., Bombay !

Habenaria marginata Coleb. in Hook. Exot. Bot. t. 136, 1825; FBI. 6 : 150; Gr. 201; D. & G. 268; Duthie in ARBG. 9 : 184, t. 136; C. 2 : 721, Fischer 1471; Blatt. & McC. 23.

There is in Blatt. Herb. but one specimen from Khandala; the sheet has been compared with those in Kew Herb. and found to match with *H. marginata* Coleb. The yellow or yellowish margins of the leaves are typical of this plant.

Flowers.—September 1919.

Blatt. Herb. 29672 !

ZINGIBERACEAE.

KAEMPFERA Linn.

Kaempfera scaposa (Nimmo) Benth. in Benth. & Hook., Gen. Pl. 3 : 642, 1883; FBI. 6 : 224; Schumann in Pfreich. 20 : 72; C. 2 : 726.

Hedychium scaposum Nimmo in Gr. 205, 1839; D. & G. 273.

Monolophus scaposus Dalz. in Kew Journ. Bot. 2 : 143, 1850; Wight, Icon. t. 2030.

Not common in Khandala; there is a patch near the top of Bhoma Hill among grasses under an isolated clump of trees. The plant seems to be abundant about Lanavla.

Flowers.—September.

Blatt. Herb. 28213 ! *Chibber* 125 ! *Santapau* 808 ! 808(2) ! 4880 ! 4881 ! 5002-5006 !

HITCHENIA Wall.

Hitchenia caulina (Graham) Baker in FBI. 6 : 224, 1890; Schumann 97; C. 2 : 728 (an pro parte ?).

Curcuma caulina Gr. 210, 1839; D. & G. 275; Lisboa in JBNHS. 2 : 140, t. opp. p. 140.

For a long time I have been in great doubts about the identity of this plant in relation to *Curcuma pseudomontana* Grah.; all such doubts have been set at rest after studying Lisboa's description and icon, and after examining large numbers of living specimens in Mahableshwar. The two plants are really and truly distinct.

Hitchenia has flowers borne on a central spike, which usually possesses a long peduncle; the structure of the anther cells shows a small *straight* "tail" at the base of each cell, the "tail" being not more than 1/5 as long as the anther cell itself. In the case of *Curcuma* the peduncle is considerably shorter even in specimens where the peduncle is quite clearly distinct from the surrounding leaves; at the base of the anther cells there are two spurs that in length are about 1/2 as long as the cells themselves.

A rare plant in Khandala; I have seen no living specimens.

Blatter in MS. catalogue; *Cooke*, August 1892, in Herb. Econ. Botanist, Poona!

CURCUMA Linn.

Curcuma pseudomontana Graham, Cat. 210, 1839; D. & G. 275; C. 2: 730; Santapau in JBNHS. 45: 618-624, 1945.

C. montana Baker in FBI. 6: 214, 1890, pro parte (non Roscoe); Schumann, loc. cit. 106, pro parte.

C. Ranadei Prain in JBNHS. 11: 463, 1898.

Following Cooke, I retain this species as distinct from *C. montana* Rosc. For a full description of the plant, see Santapau loc. cit.

Characteristic of this plant are the following points: (*a*) Rhizome fairly large, with many fibrous roots which bear ovoid or ellipsoid or subglobose tubers at their ends; I have not seen any plant with sessile tubers. (*b*) The tubers are at first white, then yellowish inside and strongly aromatic. (*c*) There is a lateral spike that comes into flower either immediately before or together with the leaves; when this lateral spike has decayed, there appears a central one on the same plant; occasionally both lateral and central spikes are present on a plant at the same time. (*d*) The colour of the flowers is always pure yellow. (*e*) The colour of the sterile coma is generally purple, but often enough it is pure white, or white with green or purplish streaks, or very deep purple (at times nearly black). (*f*) As regards the leaf shape, the ratio of leaf length to width is often about 2: 1. (*g*) Root-fibres always bear tubers at their ends, but these are not easy to extract from the ground on account of the length of the root-fibres.

A very common plant in Khandala during the rains, and a very showy one. It grows in open fields, on hill slopes, in the undergrowth of secondary forests, etc. In St. Xavier's Villa it is one of the commonest plants and certainly the most conspicuous until the Balsams take the field.

Local name: Kachora.

Flowers: (*a*) Lateral inflorescence: June to beginning of August. (*b*) Lateral and central inflorescence: first half of August. (*c*) Central inflorescence: August to October, occasionally to November. *Fruits*: June to November.

Sedgwick 2633 ! *Blatt. Herb.* 29648 ! 29649 ! 29650 ! *Santapau* 229/6-7 ! 508 ! 517 ! 541 ! 556 ! 557 ! 591-593 ! 750-752 ! 888 ! 2221-2222 ! 2263(2) ! 2283(2) ! 2416-2422 ! 2525 ! [illegible] ! 3010 ! 4360-4361 ! 4463-4464 ! 4497-4499 ! 4618-4621 ! 4999 ! 5028 ! 6815 ! 6818(2) ! 8982 ! 9073-9076 ! 9139 ! 9145-9146 ! 9184-9186 ! 9204-9213 !

Curcuma purpurea Blatt. in Journ. & Proc. As. Soc. Beng. (N.S.) 26 : 358, 1930.

The colour of the corolla is yellow with purple streaks; there is one sessile tuber, which is yellow inside.

Flowers: "during the early monsoon 1917".

Hallberg 14566.

ZINGIBER Adans.

Zingiber cernuum Dalz. in Hook. Kew Journ. Bot. 4 : 342, 1853; FBI. 6 : 245 ; C. 2 : 734 ; Schumann 182.

In my field work, I have had great difficulty in identifying this plant; the cause of the difficulty is that my plants from Khandala seem to show a mixture of the characters that Dalzell attributes to Z. *nimmonii* and Z. *cernuum*. These two species require an intensive field study.

The following notes have been extracted from my field diaries, and cover a period of nearly ten years; they were written after examination of numerous fresh specimens.

Stem leafy, up to 1·5 m. high, green or purplish green. Leaves the largest for the genus in Khandala, long petiolate, the base of the petiole sheathing; ligules about 5 mm. long, scarious; leaf blade up to 50 × 11·5 cms., oblong lanceolate, acuminate, deep green and shinning above, pale green, pubescent or subpubescent and dull beneath; margins undulate; midrib canaliculate above, prominent beneath; side nerves numerous, prominent above, canaliculate beneath; leaf base rounded or subacute.

Spike just appearing above ground; peduncle with a few sheaths each flower supported by 2 bracts; the whole spike up to 9 cms. diam. Bracts at first whitish or yellowish, at length the exposed parts turn reddish or even red, the unexposed parts remain whitish; outer bract broadly ovate, subacute, about 3·2 × 1·8 cms. when supporting the fruit; inner bract 3·2 × 2·5 cms., strongly parallel-veined, shortly trifid at apex.

Calyx 1·5 cms. long, shortly 3-lobed or more or less truncate, hyaline, split down one side. Corolla 8 cms. long; tube about equal to the lobes in length, 1·5 mm. diam., regularly cylindric from the base to

near the limb, then gradually widening or becoming infundibuliform. Corolla lobes 3, white, the upper lobe about 3×1·5 cms., the lateral ones 3×0·8 cms. Lip 3-lobed; midlobe 2-fid, 3-3·5 cms. long, about 2 cms. broad, white with red spots; side lobes of the lip half as long as the midlobe, 7-8 mm. broad, yellow with red spots or lines, some of which are confluent. Anther 2-celled, cells about 12 mm. long, curled; style white and filiform; stigma bearded or fringed with a row of short hyaline bristles all round.

Fruit inferior, trigonous, somewhat falcately bent, whitish when young, turning uniformly and deeply red at maturity, exceeding the bracts by about half its length, up to 45×27×21 mm. Seeds 6·5×3·2 mm., dark red, finely striate, with a white aril. The inner wall of the loculi of the ovary is bright scarlet. Placentas central; seeds 53 in one fruit, in three rows in each loculus.

The rhizome is purplish or purplish lilac inside with a strong aromatic scent.

Gregarious under the shade of trees, not seen in open ground; usally 2 or more spikes come out of each rhizome.

According to Dalzell Z. *cernuum* has glabrous leaves and variagated (white and red) lip; whilst Z. *nimmonii* has pubescent leaves and yellow lip. My Khandala plants show pubescent leaves together with variagated midlobe of lip but with yellow side lobes of the lip. Dr. S. K. Mukerjee of the Sibpur Herbarium identified all my specimens as Z. *nimmonii* Dalz.; I checked them all in Kew Herb. but reached no definite conclusion except that the original descriptions are very deficient and much work has to be done in the field on this as well as other monocotyledonous plants.

Flowers.—July to October. *Fruits.*—August to October.

Santapau 393A ! 448A ! 645 ! 1104 ! 2278 ! 3018 ! 3019 ! 4594 ! 4597 ! 6912 !

Zingiber macrostachyum Dalz. in Hook. Kew Journ. Bot. 4 : 342, 1852; FBI. 6 : 247 ; D. & G. 273 ; C. 2 : 735 ; Schumann 179.

Alpinia Neesiana Graham Cat. 207, 1839 ?

Dried herbarium specimens of this and of many other species of the Family are most difficult of examination. The following notes were written after examination of very large numbers of fresh specimens.

Height of plant generally about 1·5 m., occasionally up to 2 m. Rhizome small in direct continuation of the stem, pale sulphur yellow inside with strong aromatic odour; old rhizomes deep yellow inside. Root fibres numerous from the present and the previous seasons' rhizome, up to 30 cms. long, 4-5 mm. thick with fusiform tubers at their ends; such tubers are up to 3·2×1·4 cms. and may continue into a long fibrous root, i.e. the tuber itself is on a fibrous root that is produced for some distance beyond the tuber.

Stems consist of a small core in the middle, the rest is made up of the sheaths of leaves; the nodes are inconspicuous, the internodes about 7·5 cms. long. Leaves petiolate, sheathing, with a scarious and truncate ligule which is about 5 mm. high; the leaf blade is deep green and shining above, glabrous; paler green and slightly hairy especially on the nerves beneath; margins undulate, entire; apex acute or acuminate, base tapering, leaves generally distichously arranged.

Inflorescence: there are generally 1-2 scapes from the same rhizome both lateral to the stem, in length about 1 m.; the lower part of the scape is covered with sheathing bracts. The length of the spike is from 6 cms. in young specimens to 50 cms. in older ones; usually the spike is simple but not seldom it is branched. Bracts of the spike each supporting one flower; above the flower there is a second bract enclosing the calyx and corolla-tube, this inner bract being up to 2·6 × 1·5 cm. and both inner and outer bracts are acute or slightly emarginate.

Calyx truncate, hyaline, up to 1 cm. long. Corolla tube about 25 mm. long, curved near its mouth and widening gradually; dorsal petal broadly ovate-lanceolate, subacute with about 13 parallel nerves, and about 27×12 mm.; lateral petals lanceolate, subacute, 5-nerved, about as long and half as broad as the dorsal petal. Lip 3-lobed; midlobe longer than the lateral ones and deeply cleft, with a few red dots forming two lines for each segment of the midlobe. Anther 2-celled, cells splitting longitudinally and releasing masses of white pollen; connective overtopping the style; the anther cells are 5 mm. long, the projection of the connective 4 mm. long. Style long, filiform, whitish; stigma minute, indistinct from the style, with an erect ring of short bristles. Fruit ellipsoid or subglobose, 3-locular, 3-valved, many-seeded, crowned with the remains of the flower; seeds with a white, hyaline, membranous aril, in the immature stage the seeds are pink with a white dot at each end.

Colour of the plant: the stem and scape are either green or green with touches of purple; bracts of the spike green or vinaceous red with green tips; flowers cadmium yellow; fruits deep red at maturity.

Common and abundant all over the district in open grass fields, occasionally under the shade of trees.

Flowers and *Fruits*.—July to November.

Graham: "The borders of Lanowlee grove, and below bushes and detached trees of the undulating ground about Kandalla"; *Garade* 25 June 1903 ! *Blatt. Herb.* 25854 ! 25841 ! 25943 ! 25955 ! 27936 ! 27974 ! 28200 ! *Santapau* 54B ! 574 ! 2215 ! 2216 ! 4632 ! 4636 ! 4767 ! 4998 ! 6992-6993 ! 9148-9150 !

Costus Linn.

Costus speciosus (Koenig) Smith, in TLS. 1 : 249, 1800 ; **FBI.** 6 : 249 ; Gr. 208 ; Wight, Icon. t. 2014 ; D. & G. 274 ; Schumann 398 ; C. 2 : 736.

Banksia speciosa Koenig in Retz., Obs. 3 : 75, 1783.

On a few occasions I have found plants that were entirely green, and with stems straight.

Rare in Khandala except on Meroli Plateau and on the lower levels of the slopes below St. Mary's Villa.

Flowers and *Fruits.*—August to October, the fruits persisting.

Graham ; Cooke ; Blatt. in MS. catalogue ; *Santapau* 391A ! 879 ! 1166 !

CANNACEAE.

Canna Linn.

Canna indica Linn., Sp. Pl. 1, 1753 ; Bot. Mag. t. 454 ; FBI. 6 : 260 ; Gr. 211 ; D. & G. Suppl. 88 ; C. 2 : 744 ; Kraenzelin in Pfreich. 56 : 59.

Planted in gardens, but nowhere wild. Flowers are of various colours, bright red, or yellow, or variegated, the red variety being the more common.

Santapau 6 May 1946, in gardens !

MARANTACEAE.

Stachyphrinium Schum.

Stachyphrinium spicatum (Roxb.) Schum. in Pfreich. 11 : 46, 1902.

Phrynium spicatum Roxb., Hort. Beng. 1, 1814 & Fl. Ind. 1 : 5, 1832 ; FBI. 6 : 259 ; C. 2 : 739.

Very abundant in large patches in almost pure formations in the undergrowth of dense forest at Meroli. In general appearance it is very similar to some of the large-leaved grasses.

Flowers.—June to August. *Fruits.*—June to October. *Leaves.*—Throughout the year.

Santapau 1241 ! 1912 ! 2169-2172 ! 3541-3543 ! 4506-4508 ! 4691-4692 ! 5248-5249 !

Phrynium Willd.

Phrynium capitatum Willd., Sp. Pl. 1 : 17, 1797 ; FBI. 6 : 259 ; Gr. 212 ; Wight, Icon. t. 2016 ; D. & G. 271 ; C. 2 : 739.

This plant is included on the authority of Hallberg ; I have not seen any specimens from Khandala.

Hallberg in MS. catalogue.

MUSACEAE.

ENSETE Horan.

Ensete superbum (Roxb.) Cheesman, in Kew Bull. 1947 : 100, 1948.

Musa superba Roxb., Hort. Beng. 19, 1814 & Fl. Ind. 2 : 489, 1824 ; FBI. 6 : 261 ; Wight, Icon. tt. 2017-2018 ; D. & G. 272 ; C. 2 : 740.

M. textilis Graham, Cat. 213, 1839 (non Née).

For the differences between *Musa* sens. strict. and *Ensete*, see Cheesman, loc. cit. pp. 98-99.

Locally the young fruits are pickled ; the whole inflorescence spike is eaten as a vegetable, but only when the spike is very young.

Common all over Khandala, on hill or ravine slopes, in open grassy places or in more or less dense forest ; but seldom are fruits allowed to reach maturity. On several occasions I have noted this plant living epiphytically at the fork of some trees.

Hallberg in MS. catalogue ; *Blatt. Herb.* 27397 ! *Millard*, ex Ryan, in JBNHS. 15 : 586-593 ; *Santapau* 812 ! 4560-4563 !

MUSA Linn.

Musa sp. (*paradisiaca* Linn.?)

For the distinction between *Bananas* and *Plantains*, see Cheesman in Kew Bull. 1948(2) : 149 seq., 1948. In several Khandala gardens I have seen these plants under cultivation ; they produce fairly large fruits, the pulp of which is sweet and edible without cooking, the skin green.

Santapau, in gardens, 18 Febr. 1946 !

BROMELIACEAE.

ANANAS Mill.

Ananas comosus (Linn.) Merr., Interpr. Herb. Amb. 133, 1917.

Bromelia comosa Linn., in Stickman., Herb. Amb. 21, 1754.

Ananas sativus Schult. f., Syst. 7 : 1283, 1830 ; C. 2 : 744.

Bromelia Ananas L. Sp. Pl. 285, 1753 ; Gr. 222 ; D. & G. Suppl. 94.

The Pine-apple, cultivated occasionally in gardens in Khandala.

Santapau 15 March 1945, 6 May 1946, in St. Xavier's Villa grounds !

HYPOXYDACEAE.

HYPOXIS Linn.

Hypoxis aurea Lour., Fl. Coch. 200, 1790; FBI. 6: 277; Baker, Synops. in JLS. 17: 108; C. 2: 747; Fischer 1501.

Curculigo graminifolia Nimmo ex Gr. 215, 1830; D. & G. 276.

A very common plant all over Khandala, in open places, grassy slopes, etc.

Flowers.—June to October. *Fruits.*—July to October.

Nimmo ex Graham; *Dalzell* and *Gibson*; *Woodrow*; *Hallberg* and *Blatter* in MS. catalogues; *Blatt. Herb.* 27412 ! 27952 ! *Santapau* 223/7 ! 588 ! 626 ! 735 ! 951 ! 2052 ! 2257 ! 5055 ! 6861 ! 9178 !

CURCULIGO Gaertn.

Curculigo orchioides Gaertn., Fruct. 1: 63, t. 13, 1788; FBI. 6: 279; Gr. 215; Baker, Synop. 124; C. 2: 748; Fischer 1502.

C. malabarica Wight, Icon. t. 2043, f. 1, 1853; D. & G. 276.

C. brevifolia Dryand.: Gr. 215; Wight, Icon. t. 2043, f. 2; D. & G. 276.

Very common all over Khandala, especially under the shade of trees in deciduous forests, or in open country. This is one of the first monsoon plants to come into flower and one of the last to disappear.

Flowers.—June to October. *Fruits.*—September to October.

Hallberg and *Blatter* in MS. catalogues; *Blatt. Herb.* 26100 ! 27961 ! *Santapau* 224/3 ! 512 ! 527 ! 733 ! 2042 ! 2075 ! 4481 ! 4966 ! 9229 ! 9230 !

AMARYLLIDACEAE.

CRINUM LINN.

Crinum latifolium Linn., Sp. Pl. 291, 1753; FBI. 6: 283; Gr. 216; Wight, Icon. tt. 2019-2020; Baker, Handb. Amar. 87; C. 2: 750; Fischer 1504; Santapau, Circ. Ind. Gard. 1: 3.

This is one of the most showy and attractive of Khandala plants. Both in flower and in leaf this plant deserves a place in gardens. Gregarious on steep slopes at the foot of Behran's Plateau; not seen elsewhere in the district. For several years I have been cultivating this plant in Bombay from two bulbs originally brought down from Khandala. For the method of cultivation, see Santapau loc. cit.

Flowers.—May to July. *Fruits.*—May to August. *Leaves.*—End of June to October.

Blatt. Herb. 28522 ! 28523 ! *Santapau* 525 ! 531 ! 576 ! 2038-2041 ! 4483 ! 9079-9080 !

Crinum asiaticum Linn., Sp. Pl. 292, 753; FBI. 6: 280; Gr. 215; D. & G. 725; Baker, Hand. Amar. 75; C. 2: 749; Fischer 1504.

C. toxicarium Roxb. : Wight, Icon. tt. 2021-2022.

Hallberg mentions this plant from Khandala in his MS. catalogue ; there are no specimens in Blatt. Herb., and I have seen none from Khandala.

PANCRATIUM Linn.

Pancratium Sanctae-Mariae Blatt. & Hallberg in JIB. 2 : 52, f. 5, 1921.

The type of this plant is McCann 19854 which was collected near St. Mary's Villa in Khandala ; flowered in June. For a full description of the plant, see Blatt. & Hallb., loc. cit.

The specimens of my collection listed below seem to belong to the present species, but in the absence of the type, which seems to have perished, the matter remains uncertain.

The perianth segments of my plants are never linear, but lanceolate, 5-8 mm. broad, and leaves appear after the flowers ; these two characters are typical of *P. Sanctae-Mariae.* The neck of the bulb varies from 1·5 to 8 cms. ; the length of the perianth tube is also variable. Leaves up to 45 × 2·5 cms.

As soon as the first showers of the monsoon come down, this plant bursts into flower, and often finishes its flowering in 2-3 days, so that when the leaves appear the plant is already in fruit. Occasionally I have seen flowers and leaves together on the same plant. This is one of the most difficult plants to collect in flower on account of the ephimerous nature of the inflorescence.

Common in Khandala in open places or under the shade of trees ; it is abundant in St. Xavier's Villa and on Behran's Plateau.

Flowers.—May to June. *Fruits.*—June. *Leaves.*—June to August.

McCann 19854 ; *Blatt. Herb.* 28524 ! 28526 ! *Santapau* 516 ! 526 ! 597 ! 2034(2) ! 2044 ! 2050 ! 4173 ! 4480 ! 9015 ! 9046 ! 9113 ! 9114 !

AGAVEACEAE.

AGAVE Linn.

Agave sp. (*vera-cruz* Mill. ?)

For the distinction among the various species of *Agave* found in India, see Drummond and Prain in Agric. Ledg. 1906 : 77-271, 1907.

In St. Xavier's Villa and elsewhere in Khandala there is a species of *Agave* that seems to be *A. vera-cruz* Mill. Leaves form a lax rosette and are about 20 cms. at their broadest ; inflorescence scape 2·5-4 m. high ; flowers pale yellow. The colour of the leaves is grey-green.

This plant has been naturalized in Khandala and much more so further inwards on the Deccan Plateau ; it produces normal flowers, but the seeds germinate *in situ*, so that often the inflorescence branches

support a large number of seedlings ; these fall off from the parent plant and take root fairly easily as independent plants. This explains the rapid propagation of the plant in many districts.

Santapau 510 ! 4031 !

DIOSCOREACEAE

Most of my specimens of this Family from Khandala have been checked by I. H. Burkill, M.A., F.L.S., in Kew Herbarium, October 1948 ; my indebtedness to him is hereby gratefully acknowledged.

DIOSCOREA Linn.

Dioscorea pentaphylla Linn., Sp. Pl. 1032, 1753 ; FBI. 6 : 281 ; Gr. 218 ; D. & G. 247 ; Wight, Icon. t. 814 ; Prain & Burkill in Proc. As. Soc. Beng. 10 : 23, & in ARBG. 14 : 160, t. 66 ; C. 2 : 757 ; Fischer 1511 ; Santapau in JBNHS. 49 : 631.

D. triphylla Linn., Sp. Pl. 1032, 1753 ; Gr. 218 ; D. & G. 247.

D. Jacquemontii Hook. f. in FBI. 6 : 290, 1892.

For a full description of the plant and its varieties, see Prain and Burkill, loc. ult. cit. or Santapau, loc. cit.

A very common plant in Khandala ; flowers cream coloured and slightly scented. The flower buds of male and occasionally of female flowers are used locally as a vegetable in curries ; one of my local helpers, whenever he came out into the jungle in my company, was in the habit of collecting several pounds of the flowers for the pot, and he used to say that they made a very palatable dish.

Flowers.—September to October. *Fruits.*—September onwards, persisting on the dry plant till April of the following year.

Meebold 8798 ! *Cooke ; Blatt. Herb.* 25880 ! 28352 ! 28566 ! 29553 ! 29557 ! *Santapau* 225/1 ! 496A ! 515A ! 522-523A ! 555A ! 896 ! 1172 ! 1283 ! 2503 ! 2537 ! 2538 ! 2615 ! 5112 ! 10175 ! 10221 ! 10222 !

Dioscorea bulbifera Linn., Sp. Pl. 1033, 1753 ; Gr. 219 ; Wight, Icon. t. 878 ; C. 2 : 758 ; Prain & Burkill in Proc. 26, & in Ann. 11, t. 50 ; Fischer 1511 ; Santapau 628.

D. sativa Thunb., Fl. Jap. 151, 1784 (non Linn.) ; FBI. 6 : 295 (excl. *D. cliffortiana*).

Hemia bulbifera Kunth : D. & G. 247.

For a full description, see Prain & Burkill, loc. ult. cit.

This species has the largest leaves among the Dioscoreas of Khandala. Male flowers white or creamy white, or pinkish ; female flowers creamy. Common only on Kune Plateau. The bulbils are caducous and this is why they are often missing from herbarium sheets.

Flowers.—July to September. *Fruits.*—September onwards.

Blatt. Herb. 25881 ! *Santapau* 818 ! 2539-2541 ! 6781 ! 10163 ! 10173 !

Dioscorea oppositifolia Linn., Sp. Pl. 1033, 1753; FBI. 6: 292; Gr. 219; Wight, Icon. t. 813; D. & G. 247; C. 2; 758; Prain & Burkill in Proc. 30, & in Ann. 392, t. 139; Fischer 1512.; Santapau 632.

The petioles are reddish; the stems green or reddish or dark purple.

Fairly common in Khandala; flowers come out during the first half of the monsoon, the fruits may remain on the parent plant until the next rainy season; during the hot weather dry fruits show at times a silvery sheen, that I have not seen in any herbarium specimens.

Flowers.—June to August. *Fruits.*—August onwards.

Graham; Cooke; Garade ex Prain & Burkill; *Blatt. Herb.* 25879 ! 36030 ! 28565 ! *Santapau* 495A ! 519 ! 898 ! 1170 ! 2116 ! 2504 ! 2849 ! 4429 ! 4465 ! 4473 ! 4657 ! 9052 ! 10162 ! 10170-10172 !

Dioscorea belophylla Voigt, Hort. Sub. Calc. 653, 1845; Prain & Burkill in Proc. 36, & in Ann. 348, t. 127; Fischer 1512; Santapau 634.

This plant is not given in Cooke's Flora.

Climbing plant; stems purplish; bulbils very frequent in the axils of leaves, but in my Khandala specimens such bulbils are oblong or ellipsoid, not globose (as is the case with *D. bulbifera*). Leaves sagittate-cordate, the sides of the sinus straight or nearly so.

A rare plant in Khandala.

Flowers.—September to October.

Santapau 954 ! 2848 ! 10165 !

Dioscorea wallichii Hook. f. in FBI. 6: 295, 1892; Prain & Burkill in Proc. 31 & in Ann. 281, t. 115; Fischer 1512; Santapau 633.

This is another species not included in Cooke's Flora. For a full description, see Prain and Burkill, loc. ult. cit. or Santapau loc. cit.

Climbing plant; stems without bulbils. Leaves suborbicular, broadly cordate, the sinus occasionally very broad; petioles as long as or even longer than the leaves themselves, slender.

Flowers.—October to November. *Fruits.*—December.

Santapau 3090 ! 5377 ! 9821 ! 9822 ! 10174 !

LILIACEAE.

Asparagus Linn.

Asparagus racemosus Willd., var. **javanica** Baker in JLS. 14: 624, 1874; FBI. 6: 316; C. 2: 762.

A. sarmentosus Gr. 221, 1839 (non Linn.).

A. Jacquemontii Baker, loc. cit., 615, 1874.

Asparagopsis sarmentosa D. & G. 246, 1861 (non Kunth.).

For several years I have botanized on Ghira Hill, which is a short distance from Karli and forms part of the range of hills on which Karli is built. Some of my specimens collected on Ghira Hill are exactly like the type of *A. Jacquemontii* Bak. (Jacquemont 526 ! in Kew Herb.) ; such specimens seem to be but juvenile stages of the common *A. racemosus* var. *javanica* ; for this reason I have fused *A. Jacquemontii* with the other species.

A common plant all over Khandala, particularly so in thickets in open country. It is especially abundant on Behran's Plateau.

Flowers.—May to August. *Fruits.*—July to September.

Santapau 317A ! 532 ! 584 ! 638 ! 717 ! 1030 ! 2103 ! 2444 ! 4291-4293 ! 4492 ! 4570 ! 6814 ! 9009 ! 9115-9117 !

Asparagus laevissimus Steud. in Hohen., Pl. Nilg. Exsicc. no. 1304 ; Baker in JLS. 14 : 623, 1874 ; FBI. 6 : 317 ; C. 2 : 762.

Blatter in his MS. catalogue mentions this plant for Khandala ; I have seen no specimen from the district ; there are none in Blatt. Herb.

GLORIOSA Linn.

Gloriosa superba Linn., Sp. Pl. 305, 1753 ; FBI. 6 : 358 ; Gr. 221 ; Wight, Icon. t. 2047 ; C. 2 : 766 ; Fischer 1519.

Methonia superba Dalz. & Gibs., Bomb. Fl. 205, 1861.

The tubers are said to be rather poisonous.

This plant is abundant on the Konkan plains and goes up along the railway line up to about $\frac{2}{3}$ of the way to Khandala ; I have seen the plant only at the extreme lower limit of the district covered by this flora ; Blatter has recorded the plant from Khandala itself.

Flowers and *Fruits.*—July to August.

Blatter in MS. catalogue ; *Santapau* 19 August 1945, a little above Thakurwadi station.

IPHIGENIA Kunth.

Iphigenia indica (Linn.) A. Gray in Kunth, Enum. 4 : 213, 1843 ; FBI. 6 : 357 ; C. 2 : 766 ; Fischer 1528.

Anguillaria indica R. Br. : Gr. 222.

Melanthium indicum Linn., Mant. 2 : 226, 1771.

Common in grassy places about Khandala, often growing on paths or under trees ; it is very common on the main path at the entrance of St. Xavier's Villa.

Flowers.—July to September, occasionally to October. *Fruits.*—July to October.

Graham ; Blatt. Herb. 29670 ! *Santapau* 517A ! 573A ! 683 ! 1085 ! 2239 ! 2481 ! 4603 ! 4684 ! 6946 ! 9270 ! 9286 !

SCILLA Linn.

Scilla viridis Blatt. & Hallberg in JIB. 2 : 52, 1921.

For a full description, see reference.

The tuber was collected in leaf in Khandala and brought down to Bombay, where it flowered in March 1919. The type sheet, 14500, is in Blatt. Herb.

URGINEA Steinh.

Urginea indica (Roxb.) Kunth, Enum. 4 : 333, 1843 ; FBI. 6: 347 ; D. & G. 250 ; C. 2 : 768 ; Fischer 1527.

Scilla indica Roxb., Fl. Ind. 2 : 147, 1832 ; Graham 220 (non Baker).

Abundant on the S.W. part of Behran's Plateau, especially among *Terminalia* trees ; not seen elsewhere in Khandala.

Flowers.—March to April. *Fruits*.—April to May. *Leaves*.—June to October.

Santapau 4484 ! 4511 ! 4512 ! 8699 ! 8706 ! 8707 !

CHLOROPHYTUM Ker.

Chlorophytum tuberosum (Roxb.) Baker in JLS. 15 : 332, 1875; FBI. 6 : 334 : C. 2 : 772 ; Fischer 1526.

C. anthericoideum Dalz. in Kew Journ. Bot. 2 : 141, 1850 ; D. & G. 251.

Phalangium tuberosum Wight, Icon. t. 2036, 1853.

Anthericum tuberosum Roxb., Fl. Ind. 1 : 149, 1832 ; Gr. 219.

Roots fleshy, generally with numerous tubers which are 2-2·5× 0·8-1 cm. Leaves about 8 in number, membranous, up to 35×2·4 cms., linear, tapering towards an acute apex, slightly narrowed at the base. Scape erect, naked or with only one sheath, as long as or much shorter than the leaves.

Flowers white, in simple, few-flowered racemes ; bracts ovate, long subulate-acuminate ; pedicels erect, up to 1·2 cms. long in fruit, jointed a little below the middle. Perianth segments up to 10-12×3-5 mm., acute or subacute, 5- or more-nerved. Filaments glabrous, a little sharter than the anthers, which are about 6 mm. long. Style about as long as or a little shorter than the stamens. Capsules subglobose, strongly 3-keeled (scarcely 3-winged) with strong horizontal nerves.

Flowers and *Fruits*.—June.

Santapau 2182 ! 2183 ! 2184 ! 4503 ! 4504 ! 4505 !

Chlorophytum glaucum Dalz. in Kew Journ. Bot. 2 : 142, 1850 ; D. & G. 252 ; FBI. 6 : 334 ; C. 2 : 772 ; Fischer 1526.

A very common plant during the second half of the monsoon, and rather conspicuous on account of both its leaves and its flowers ; on grassy slopes in open places about Khandala.

Flowers.—July to September. *Fruits.*—August to October.

Blatt. Herb. 25895 ! 25899 ! 28042 ! *Santapau* 440A ! 567A ! 632 ! 719 ! 801 ! 802 ! 2443 ! 4708 ! 4709 ! 9291 !

SMILACEAE.

Smilax Linn.

Smilax zeylanica Linn., Sp. Pl. 1029, 1753; FBI. 6 : 309; Fischer 1518.

S. macrophylla Roxb., Hort. Beng. 72, 1814; Fl. Ind. 3 : 793, 1832; FBI. 6 : 310; Clarke, Smilac. in DC., Mon. Phan. 1 : 193; Gr. 219; D. & G. 246; C. 2 : 763 (non Willd.).

S. ovalifolia Roxb., Fl. Ind. 3 : 794, 1832; Gr. 219; Wight, Icon. t. 809; D. & G. 246.

A very common plant in Khandala, in secondary scrub forests.

Flowers.—August to December. *Fruits.*—September to April.

Blatt. Herb. 26066 ! 26104 ! 26595 ! 26596 ! 27577 ! *Santapau* 223/1 ! 816 ! 817 ! 1127 ! 1315 ! 1414 ! 1415 ! 3334 ! 3393 ! 4063 ! 4417 ! 4627 !

COMMELINACEAE.

Commelina Linn.

Commelina nudiflora Linn., Sp. Pl. 41, 1753 (non. Linn., Mant. 2 : 177); FBI. 6 : 369; Gr. 223; Clarke in DC., Mon. Phan. 3 : 144; C. 2 : 781; Fischer 1538.

C. communis D. & G. 252, 1861 (an eadem ac Walt., Fl. Carol. 68, 1788?).

Erect or suberect, rooting at the lower nodes. Flowers blue, exserted from the spathe. Fruit 3-celled, each of two cells with 2 seeds, the third cell with one seed only.

This seems to be a rare plant in Khandala.

Flowers.—October 1945, April 1941.

Santapau 219/2 ! 7475 !

Commelina benghalensis Linn., Sp. Pl. 41, 1753; FBI. 6 : 370; Gr. 223; Wight, Icon. t. 2065; D. & G. 253; Clarke in DC., Mon. Phan. 3 : 159, & Comm. Cyrt. Beng. t. 4; C. 2 : 782; Fischer 1539.

Stems usually creeping and rooting at the lower nodes. Leaves ovate to suborbicular, acute to obtuse. Flowers blue. Underground flowers and fruits abundant from many of the lower nodes.

Fairly common about Khandala in open places.

Flowers and *Fruits.*—August to November.

Santapau 5102-5104 ! 5236 ! 5237 ! 5273 ! 5476 ! 6940 ! 6968 ! 7470 !

Commelina obliqua Buch.-Ham. in Don, Prodr. Fl. Nep. 45, 1825 ; FBI. 6 : 372 ; Clarke, Mon. 178, & Comm. Cyrt. Beng. t. 9 ; C. 2 : 784 , Fischer 1539.

C. polyspatha Wight, Icon. t. 2066, 1853.

Erect or creeping and rooting at the lower nodes ; main roots fairly stout, cylindric. Leaves variable, but generally the largest among the Commelinas of Khandala. Spathes usually crowded in terminal heads. Flowers blue, large for the genus. Seeds about 5 mm. long, sub-reniform.

This is about the commonest species of the genus in Khandala ; it grows in grass fields or by the sides of paths.

Flowers and *Fruits*.—July to October.

Blatt. Herb. 27396 ! 27626 ! 28345 ! *Gammie* 15461 ! *Santapau* 718 ! 822 ! 2585 ! 4656 !

MURDANNIA Royle.

Murdannia spiratum (Linn.) Brueckner, in Pfam. (ed. 2) 15A : 173, 1930.

Commelina spirata Linn., Mant. 176, 1767.

Aneilema spiratum R. Br., Prodr. 271 (in adnot.), 1810 ; FBI. 6 : 377 ; Clarke, Mon. 207 & Comm. Cyrt. Beng. t. 18 ; C. 2 : 787 ; Fischer 1545.

A. canaliculatum Dalz. in Kew Journ. Bot. 3 : 137, 1851 ; D. & G. 254.

A. nanum W. Kunth : Wight, Icon. t. 2077.

Annual, about 15 cms. high, but occasionally reaching 30 cms. Leaves amplexicaul, small. Flowers in terminal or axillary panicles ; peduncles and pedicels filiform. Corolla blue or pinkish, ephimerous. Fruit in Khandala specimens 3-celled, each cell usually 4-, rarely more-, occasionally 3-seeded, seeds yellowish brown.

Common about Khandala, by the sides of paths, on rocks, etc. The pinkish or salmon-pink flowered variety is rather rare.

Flowers and *Fruits*.—July to September, occasionally later in moist spots.

Blatt. Herb. 26276 ! 27400 ! 29656 ! *Gammie* 15392 ! *Santapau* 488A ! 553A ! 4522 ! 4584 ! 4728 ! 8718 ! 9245 !

Murdannia versicolor (Dalz.) Brueckner, loc. cit. 173, 1930.

Aneilema versicolor Dalz. in Kew Journ. Bot. 3 : 136, 1851 ; D. & G. 253 ; FBI. 6 : 378 ; Clarke, Mon. 208 ; C. 2 : 788.

An erect herb, up to 30 cms. high, at first unbranched, at length much branched, but branches erect and not spreading.

Flowers salmon-pink ; pedicels axillary, at first solitary, finally up to 5 from an axil. Capsules about as long as or just a little longer than the persistent calyx, 5- or more-seeded.

A very distinct plant on account of its habit and axillary inflorescence, but rare in Khandala.

Flowers and *Fruits*.—10 October 1944, 8 November 1943.
Santapau 3118 ! 4952 !

Murdannia nudiflorum (Linn.) Santapau, comb. nov.

Commelina nudiflora Linn., Mant. 177, 1767 (non Linn., Sp. Pl. 1753) ; Gr. 223.

Aneilema nudiflorum R. Br., Prodr. 271 (in adnot., 1810 ; FBI. 6 : 378 ; D. & G. 253 ; Clarke, Mon. 210, & Comm. Cyrt Beng. t. 21 ; C. 2 : 788 ; Fischer 1545.

Wholly erect, or creeping and rooting at the lower nodes ; leaves up to 10 × 0·8 cms. ; the strong cilia on the margins of the sheath continue downwards along the stem in a line at least as long as the sheath itself.

In a large number of fruits examined, I have found 2 cells each with 2 seeds, and one cell with 3 seeds.

Flowers and *Fruits*.—September to November.

Blatt. Herb. 26229 ! *Santapau* 219/13 ! 4853 ! 4580 !

Murdannia semiteres (Dalz.) Santapau, in Poona Agric. Coll. Mag. 41 : 284, 1951.

Aneilema semiteres Dalz. in Kew Journ. Bot. 3 : 138, 1851 & in D. & G. 254.

A. paniculatum Wall., Cat. 5216, 1831-2, nom. nud. ; Clarke, Mon. 215, 1881 ; FBI. 6 : 381 ; C. 2 : 790 ; Fischer 1546.

Dichaespermum Juncoides Wight, Icon. t. 2078, 1853.

Commelina Nimmoniana Graham, Cat. 224, 1839.

The oldest name for this plant is clearly that of Wallich, but as it is a *nomen nudum* it is invalid according to the Rules, Art. 37 ; Graham's description is so meagre that it can only be considered as little better than a bare name. The first complete description is that of Dalzell (1851) and in accordance with the rules of priority Dalzell's name is the oldest valid one for this species.

A common plant in Khandala, especially on rocky ground ; on the flat, rocky stretches near Kune stream and on Behran's Plateau this is one of the commonest herbs at the beginning of September. The whole plant is rather variable in colour, from dark green to deep purple.

Flowers and *Fruits*.—July to October.

Blatt. Herb. 33848 ! *Gammie* 15404 ! *Gammie* 20-9-1902 ! *Santapau* 486A ! 539A ! 768 ! 2630 ! 4867 ! 5030 ! 6900 ! 9288 !

Murdannia dimorphum (Dalz.) Brueckner, loc. cit. 173, 1930.

Aneilema dimorphum Dalz. in Kew Journ. Bot. 3 : 138, 1851 ; D. & G. 254 ; FBI. 6 : 377 ; Clarke, Mon. 206 ; C. 2 : 787 ; Fischer 1545.

A. paniculata Wight, Icon. t. 2075, 1853.

The only specimen from Khandala which I have examined is that in Sedgwick Herb., under number Sedg. 2617 !

CYANOTIS Don.

Cyanotis tuberosa (Roxb.) Schult. f., Syst. 7 : 1153, 1830 ; FBI. 6 : 386 ; D. & G. 256 ; Clarke, Mon. 249 ; C. 2 : 793 ; Fischer 1549.
Tradescantia tuberosa Roxb., Pl. Cor. 2 : t. 108, 1798 ; Gr. 223.

Roots consisting of a number of fusiform tubers, each up to 4·5 cms. long, about 4-5 mm. diam., the root continuing beyond the tuber as a thin cylindric root. Stem up to 90 cms. long, erect or rooting at the lower nodes ; these, at least the lower ones, are hairy with silky hairs which may reach 12 mm. in length. Radical leaves up to 16×2·5 cms. or larger, the upper leaves smaller ; sheaths of radical leaves up to 2·5 cms. long, silky along the margin and suture, the line of silky hairs continuing downwards to the lower sheath and upwards along the leaf margins. All leaves strongly parallel-veined.

Corolla deep blue. Filaments about 15 mm. long, bearded in upper part with moniliform, purplish-blue hairs; anthers bright orange yellow. Ovary slightly 3-lobed, hairy above ; stigma fusiform, white, its apex level with the anthers.

Capsule 3-locular, with usually one seed in each loculus.

Common and abundant in St. Xavier's Villa and on the South spur near the top of Behran's Plateau. It is the only species of the genus which is conspicuous on account of the massed flowers in each head. On one occasion, after handling one of these plants, I had a severe attack of urticaria ; the experience has not been repeated, but after that time I have been careful not to touch the plant with bare fingers.

Flowers and *Fruits*.—June to October, mainly in September.

Blatt. Herb. 28603 ! *Santapau* 752(2) ! 855 ! 933 ! 934 ! 1092 ! 3020 ! 3021 ! 4726 ! 6942 !

Cyanotis fasciculata (Heyne ex Roth) Schult. f., Syst. 7 : 1152, 1830 ; FBI. 6 : 387 ; Wight, Icon. t. 2086 ; D. & G. 255 ; Clarke, Mon. 253 ; C. 2 : 387 ; Fischer 1550.

C. rosea, dichrotricha, decumbens, Wight, Icon. tt. 2086-2088, 1853·
Tradescantia fasciculata Heyne ex Roth, Nov. Pl. Sp. 189, 1821.

An erect, annual, slender herb. Root fibrous ; stem up to 29 cms. long, very rarely rooting at the lower nodes, glabrous, subglabrous or more or less floccosely woolly. Leaves recurved, with a very short sheath at the base.

Flowers in cymes from the upper or most of the axils ; peduncles filiform. Flowers blue, occasionally pure white ; filaments bearded with hairs of a uniform colour, blue or white, according to the colour of the petals.

Common on rocky ground.

Flowers.—August to October. *Fruits.*—September to October.

Blatt. Herb. 28073 ! 29565 ! 29655 ! *Santapau* 219/10 ! 752 (3) ! 940 ! 941 ! 1023 ! 2626 ! 2627 ! 2628 ! 4854 ! 4855 ! 4890 ! 5031 !

Cyanotis cristata (Linn.) Schult. f., Syst. 7 : 1150, 1830 : FBI. 6 : 385 ; Wight, Icon. t. 2082 ; D. & G. 256 ; Clarke, Mon. 247 & Comm. Beng. t. 36 ; C. 2 : 794 ; Fischer 1549.

Commelina cristata Linn., Sp. Pl. 42, 1753.

Tradescantia cristata Jacq. : Gr. 223.

A common plant about Khandala ; the cymes are typical.

Flowers and *Fruits.*—July to November.

Blatt. Herb. 5468 ! 26162 ! 26189 ! 28183 ! *Gammie* 15462 ! *Santapau* 2649 ! 2879 ! 3079 ! 4704 ! 4705 ! 4727 ! 5105 ! 5106 ! 5166 ! 6890 ; 6984 ! 9257 ! 9258 !

ZEBRINA Schnizl.

Zebrina pendula Schnizl. in Bot. Zeit. 7 : 870, 1849 ; C. 2 : 796.

In Blatt. Herb. there is a specimen, no. 28265, collected during October 1918 in Khandala. The specimen has no flowers, but a note by the collector states that "leaves white-striped above, purple beneath. Cultivated". I have seen no other specimen from Khandala.

PALMAE.

CARYOTA Linn.

Caryota urens Linn., Sp. Pl. 1189, 1753 ; FBI. 6 : 422 ; Gr. 226 ; D. & G. 278 ; C. 2 : 805 ; Fischer 1560 ; Blatter, Palms Brit. Ind. 339, t. 57, f. 48.

Trunk 10-20 m. high, in dense jungle at Meroli many specimens reach over 30 m. high. A very elegant tree, especially in the young stages.

Very common in dense forest. After the ripening and falling of the fruits, there is often a large number of them germinating on the ground round the parent plant ; seedlings are elegant miniature palms ; I have often noticed such seedlings on Meroli Plateau at the beginning of the rainy season.

Flowers.—October to May. *Fruits.*—January to June.

Santapau 1983 ! 3564-3566 ! 4440 !

PHOENIX Linn.

Phoenix sylvestris (Linn.) Roxb., Hort. Beng. 73, 1814 & Fl. Ind. 3 : 787, 1832 ; FBI. 6 : 425 ; Gr. 224 ; D. & G. 278 C. 2 : 801 ; Fischer 1559 ; Blatter, Palms 3 & tt. 2-3.

Elate sylvestris Linn., Sp. Pl. 1189, 1753, pro parte.

A much smaller palm than the previous species, in open country reaching 2-5 m. The fruit is orange yellow and edible, but rather poor in quality.

The In St. Xavier's Villa and other open places around Khandala ravines. wild date palm, perhaps cultivated. It is very rare in the it is tolerably common. It is far from pretty; in most cases leaves fall off leaving behind a length of the petiole, and this gives the whole tree a rather wild aspect.

Fruits.—March to June.

Blatter and *Hallberg* in MS. catalogues; *Santapau*, passim!

BORASSUS Linn.

Borassus flabellifer Linn., Sp. Pl. 1187, 1753; FBI. 6: 482 (excl. *B. aethiopum*); C. 2: 811; Blatt., Palms 174-213, tt. 38-39.

B. flabelliformis Murr., Syst. (ed. 13) 827, 1774 (ex Cooke); Gr. 226; D. & G. 278.

For a full description of the plant, see Blatt. loc. cit.

Occasionally planted in gardens in Khandala; I have not seen it wild anywhere in the district.

Santapau, cultivated!

TYPHACEAE.

TYPHA.

Typha angustata Bory & Chaub., Exp. Sc. Mor. 3 (2): 33, 1832; FBI. 6: 489; Graebner in Pfreich. 2: 14, f. 4 F; C. 2: 816; Fischer 1571.

T. elephantina Gr. 227, 1839 (non Roxb.).

A rare plant in Khandala; in Blatt. Herb. there are a few specimens collected on 29-4-1917 and Sept. 1918; I have not seen the plant in the district.

Blatt. Herb. 26368! 26369! 26370! 26371! 28065!

ARACEAE.

CRYPTOCORINE Fisch.

Cryptocorine spiralis (Retz.) Fisch. ex Wydler in Linnaea 5: 428, 1830; FBI. 6: 494; Wight, Icon. t. 773; Engler in DC., Mon. Phan. 2: 628, & in Pfam. 2(3): 152, f. 99 D-G, & in Pfreich. 73: 237, f. 58 K; C. 2: 818; Blatt. & McC. in JBNHS. 35: 15; Fischer 1575.

Arum spirale Retz., Obs. 1: 30, 1779; Graham, 228.

In rock pools near St. Peter's School, and along the sandy banks of Kune stream, usually growing partly submerged in water. An inconspicuous grass-like plant, in dense clusters and gregarious.

Flowers and *Fruits.*—October to January.

Santapau 214/19! 1246! 3046-3049! 5208! 5209! 5921!

ARISAEMA Mart.

Arisaema murrayi (Graham) Hook. in Bot. Mag. t. 4388, 1848; FBI. 6: 507; D. & G. 258; Engler in Mon. 552, & Pfreich. 162; C. 2: 821; Blatt. & McC. 18; Fischer 1585.

Arum Murrayi Graham, Cat. 229, 1839.

For a full description of the plant, see Blatt. & McC., loc. cit. Most plants have only one leaf, occasionally two; in the latter case one leaf is much larger than the other. Some leaves have two clear intramarginal nerves, others have but one, or at any rate a clear one, the second nerve being either absent or very faint.

The appendix of the spadix is usually shorter than the limb of the spathe, but it so bent that it often protrudes from the spathe. As regards the sexes of the flowers, I have found plants with only male flowers or with male above, female flowers below on the same spadix. I have not seen plants with only female flowers. Most of the female flowers seem to be covered with minute cystoliths, which are whitish and quite prominent.

Common in Khandala in secondary forests or among bushes, sometimes epiphytic.

Flowers.—June to July. *Fruits.*—August to October.

McCann, Bhiva, both ex Blatt. & McC., Revis.; *Sedgwick* 2616 ! *Acland* 1256 ! *Santapau* 214/16 ! 555 ! 749 ! 1237 ! 2079 ! 2101 ! 2102 ! 2187 ! 2193 !

Arisaema tortuosum (Wall.) Schott., Melet. 1: 17, 1832, ; FBI. 6: 502; Engler, Mon. 545 & Pfreich. 190, f. 42; C. 2: 820; Blatt. & McC. 21; Fischer 1584.

Arum tortuosum Wall., Pl. As. Rar. 2: 10, 1830.

Arum curvatum Wight, Icon. t. 788, 1844; D. & G. 258 (non Kunth).

The occurrence of this plant is given on the authority of Blatter who mentions it in his manuscript catalogue and of Blatter & McCann who in their Revision mention having seen Chibber's specimen from Khandala. I have not seen the plant in the disrtict.

Chibber ex Blatt. & McC.; *Blatter* in MS. catalogue.

Arisaema neglectum Schott. in Bonpl. 7: 26, 1859; FBI. 6: 504; Engler in Mon. 554, & Pfreich. 192. f. 43; Blatt. & McC. 21.

A. tortuosum Schott. var. *neglectum* Fischer in G. 1585, 1931.

For a full description of the plant see Blatt. & McCann in Revision or Engler in Pflanzenreich, loc. cit.

My Khandala specimens are all one-leaved and either monoecious or dioecious. Tuber about 2 cms. diam., depressed globose, with numerous roots coming from the upper part of the tuber. Petiole up to 25 cms. long; leaflets 5-7, subsessile, ovate or elliptic, acute or subacuminate, margins strongly waved, nerves about 10 pairs joining in

an intramarginal nerve 3-5 mm. from the edge. Peduncle nearly as long as the petiole, green or with a few purple spots or striae. Spathe green all over; tube cylindric without constrictions at the mouth; limb incurved at nearly right angles to the tube, acuminate; average size of the spathe: tube 4 cms. long, limb 7 cms. long, 4 cms. broad at about the middle. Spadix: flowers all male in some specimens, male above, female below in others; anthers 2, 4 or 6 on a stout filament; fertile part of spadix about 3 cms. long, sterile part greenish or purplish, long exserted, the whole spadix from a little longer than to twice as long as the spathe, sigmoid.

This species seems to be fruiting quite as freely as *A. Murrayi*, but in the absence of the sterile appendix of the spadix it is not possible to distinguish from the latter species.

Flowers.—July. *Fruits.*—August to October?

Santapau 2140 ! 2141 ! 2160-2153 ! 9160 ! 9177 !

Arisaema leschenaultii Bl. in Rumph. 1: 93, 1835; FBI. 6: 504; Engler in Mon. 552 & in Pfreich. 179; C. 2: 821; Blatt. & McC. 19; Fischer 1585.

Arum erubescens D. & G. 258, 1861.

Blatter in his MS. catalogue mentions this plant from Khandala. On the other hand in their Revision Blatter and McCann state: "We doubt the occurrence of this species in the Presidency". I have not seen any specimens from Khandala or from any other place in the State of Bombay.

SAUROMATUM Schott.

Sauromatum guttatum (Wall.) Schott., Melet. 1: 17, 1832; FBI. 6: 508, emend.; Engler in Mon. 570, & in Pfreich. 123, f. 18 A-L; C. 2: 824; Blatt. & McC. 25.

Arum guttatum Wall., Pl. As. Rar. 2: 10, t. 115, 1831.

For a full description of this plant, see Blatter & McCann, loc. cit. and McCann in JBNHS 34: 518, f. 1, 1930.

In St. Xavier's Villa grounds I have found giant specimens of the leaf, their measurements being: petiole up to 1·5 m. high, 5 cms. diam. below, blade over 1 m. diam. Peduncle up to 9 cms. long; spathe, (tube and free portion included) up to 55 cms. long; spadix up to 43 cms. long. When in fruit, the spadix above the ovaries decays, whilst at the height of the ovaries it becomes enlarged to form almost a perfect ball about 5 cms. diam. The fruit is at first green, then reddish or purple, at length almost black.

Common in Khandala, but easily missed; first the flowers appear, then when the plant is already in fruit, the leaf expands.

Flowers.—May to June. *Fruits.*—July to September.

Blatter & McCann ex Revision; *Santapau* 214/20 ! 585 ! 647 ! 648 ! 649 ! 1083 ! 9218 ! 9219 ! 9220 !

AMORPHOPHALLUS Blume.

Amorphophallus commutatus (Schott) Engler in DC., Mon. Phan. 2 : 319, 1879 & in Pfreich. 48 : 95 ; C. 2 : 826 ; Blatt. & McC. 27.

Conophallus commutatus Schott in Bonpl. 7 : 28, 1859.

Dracontium polyphyllum Gr. 229, 1839 (non Denst.).

Amorphophallus sylvatica D. & G. 259, 1861 (non Kunth.).

The appendix of the spadix is locally eaten as a vegetable. This is a most noticeable plant : the carrion stench emitted by the inflorescence is almost overpowering and can be felt a long way away from the plant ; on several occasions I have had people complaining of defective sewage in the neighbourhood of the place where the plant grew.

A common plant in the undergrowth about St. Xavier's Villa and Convalescent Home.

Flowers.—May to June. *Fruits.*—June to July.

Blatter in MS. catalogue ; *McCann* ex Blatt. & McC. in Revision *Santapau* 518 ! 530 ! 2067 ! 2094 ! 2167 ! 2217 ! 4403-4405 ! 4439 ! 8983 ! 9078 !

Amorphophallus bulbifer (Roxb.) Blume in Rumph. 1 : 148, 1835 ; FBI. 6 : 515 ; Engler in Mon. 317 & in Pfreich. 98 ; C. 2 : 825 ; Blatt. & McC. 27 ; Fischer 1587.

Arum bulbiferum Roxb., Fl. Ind. 3 : 510, 1832 ; Gr. 229.

For a full description, see Blatt. & McC., loc. cit.

This plant is abundant on Meroli Plateau, in the undergrowth of dense forest ; I have not seen it anywhere else in the district. Bulbils appear in the primary and secondary forks of the leaves ; segments of leaves (or "leaflets") up to 25 × 6·5 cms., elliptic, tapering at both ends, acuminate. The presence of bulbils and the shape of the leaf segments are typical. This plant has only been seen in leaf.

The petioles of my specimens reach 1 m. in length, and are green with whitish, elongated patches.

Santapau 214/15 ! 849 ! 2574 ! 4670 ! 4671 ! 5253 ! 5254 !

ARIOPSIS Nimmo.

Ariopsis peltata Nimmo in Graham, Cat. 252, 1839 ; FBI. 6 : 519 ; D. & G. 259 ; Engler in Mon. 528 & in Pfreich. 71 : 130, f. 29 ; C. 2 : 827 ; Blatt. & McC. 30 ; Fischer 1580.

Remusatia vivipara Wight, Icon. t. 900, 1844-1845 (non Schott.).

Common and gregarious on trunks of trees (especially on *Ficus glomerata* Roxb.) or on rocks during the first half of the monsoon. Locally the leaves are used as a vegetable.

Flowers.—June to July. *Fruits.*—July to August.

Hallberg ex Blatt. & McC., Revision ; *Santapau* 331 A ! 587 ! 633 ! 2105 ! 2118 ! 4514 ! 4524 ! 6783-6786 ! 9147 !

REMUSATIA Schott.

Remusatia vivipara (Roxb.) Schott, Melet. 1: 18, 1832; FBI. 6: 521; D. & G. 259; Engler in Mon. 496; Krause in Pfreich. 71: 16, f. 4, A-M; C. 2: 828; Blatt. & McC. 30; Fischer 1583.

Arum viviparum Roxb., Hort. Beng. 65, 1814 & Fl. Ind. 3: 496, 1832; Gr. 228; Wight, Icon. t. 798.

Roxburgh's name in Hort. Beng. is validly published by reference to Rheede's Hort. Malab. 12: t. 9, and is therefore the oldest available one for this plant. Loddige's name (*Caladium viviparum* Lodd., Bot. Cab. t. 281, 1820) is six years later than that of Roxburgh.

Common in Khandala, especially on Bhoma Hill, generally epiphytic. The scape often bears adventitious roots at the lower nodes, or, if the scape is prostrate along the ground, then at all the nodes.

Locally the leaves are used as vegetables; the tubers are used against open flesh wounds. In times of scarcity the tubers are eaten but they require very careful boiling to rid them of some very irritating crystals.

Flowers and *Fruits.*—Not seen in Khandala. *Bulbiferous shoots.*—August to October.

Woodrow; Hallberg, Chibber 53, *McCann* ex Blatt. & McC. in Revision; *Meebold* 8878 ex Krause, loc. cit.; *Blatt. Herb.* 28601 ! *Santapau* 796 ! 1076 ! 2282 ! 2474 ! 2475 ! 2662 ! 5212-5215 ! 6961 !

POTHOS Linn.

Pothos scandens Linn., Sp. Pl. 968, 1753; FBI. 6: 551 pro parte; Gr. 229; D. & G. 257; Engler in Mon. 84 & in Pfreich. 21: 26; C. 2: 828, pro parte; Blatt. & McC. 31; Fischer, 1592.

For a full description of the plant, see Engler, loc. ult. cit., or Blatt. & McC. The occurrence of this plant is given on the authority of Blatter who mentions it in his MS. catalogue; I have not seen the plant in Khandala.

COLOCASIA Schott.

Colocasia esculenta (Linn.) Schott, Melet. 1: 18, 1832; Merrill, Rumph. Herb. Amb. 131; Blatt. & McC. 29.

Arum esculentum Linn., Sp. Pl. 965, 1753.

Arum Colocasia Linn., Sp. Pl. 965, 1753; Gr. 228.

Colocasia antiquorum Schott, Melet. 1: 18, 1832; FBI. 6: 523; Engler in Mon. 491 & in Pfreich. 71: 65; C. 2: 829; Fischer 1580.

For a description of the plant and its many varieties, see Engler in Pfreich., loc. cit. Cultivated in gardens about Khandala; the leaves are eaten as vegetable. I have often seen it in leaf in St. Xavier's Villa; but have seen it in flower only on one occasion.

Santapau, in gardens, 13005 !

POTAMOGETONACEAE.

POTAMOGETON Linn.

Potamogeton indicus Roxb., Fl. Ind. 1: 452, 1820; FBI. 6: 565; Gr. 200; D. & G. 248; C. 2: 837; Aschers. & Graeb. in Pfreich. 31: 64; Fischer 1600.

Stems creeping below and rooting at the nodes; petioles from about as long as or up to three times longer than the leaf blade; stipules scarious, somewhat sheathing. Spikes generally above the surface of the water, erect. Fruit with a strong ventral keel and two faint lateral keels.

Common in Khandala talao; leaves mostly floating, a few occasionally submerged.

Flowers.—Cold season. *Fruits.*—Hot season.

Blatt. Herb. 26433 ! 28541 ! 28542 ! 28545 ! *Santapau* 3763 ! 3764 ! 3765 ! 3766 !

ERIOCAULACEAE.

ERIOCAULON Linn.

Note. All my specimens of *Eriocaulon* have been checked by Dr. H. N. Moldenke of New York, to whom I extend sincere thanks.

Eriocaulon dianae Fyson, var. **triloboides** Fyson in JIB. 2: 260, t. 15, 1921.

The occurrence of this plant is given on the authority of Fyson, who refers to *Meebold* 9102, 9103 in Calcutta Herb.

Eriocaulon dianae Fyson var. **parviflora** Fyson, *ibid.* 260. Fyson mentions *Gammie* 15422 from Khandala, the sheet being in the Herb. Agric. Coll. Poona.

Eriocaulon eleanorae Fyson in JIB. 2: 316, 1921.

Blatt. Herb. 2794, ex Fyson; *Santapau* 9604-9608 ! 10280-1028 ! 10447 !

Eriocaulon minutum Hook. f. in FBI. 6: 579, 1893; Ruhl. in Pfreich. 13: 111, no. 190; Fyson, 317.

Meebold 9105, in herb. Calcutta, ex Fyson; *Santapau* 2928 !

Eroriocaulon thomasi Fyson, *ibid.* 318, 1921.

Meebold 9104 in herb. Calcutta; this seems to be the type or at least an isotype of this species; see Fyson, loc. cit.

Eriocaulon sollyanum Royle, Ill. 409, t. 97, f. 1, 1830.

E. trilobum Buch.-Ham. ex Koern., in Linnaea 27: 645, 1856; FBI. 6: 583; C. 2: 848; Fyson 206; Ruhl. 74.

This seems to be a fairly common species in Khandala; it occurs in rice fields after the harvest forming dense mats on the ground; heads are very dark, almost black.

Blatt. Herb. 27983 ! 28009 ! 28068 ! *Santapau* 218/4 ! 767 ! 2925 ! 3127 ! 4817 ! 4844 ! 4945 ! 1290 in part !

Eriocaulon cinereum R. Br., Prodr. 254, 1810; Moldenke, in litt. *E. Sieboldianum* Sieb. & Zucc. ex Steud., Syn. Pl. Cyp. 2 : 272, 1855 ; FBI. 6 : 577 ; C. 2 : 845 ; Ruhl. 111 ; Fyson 3 : 15.

My specimens were collected from a drying pool in St. Xavier's Villa ; most of the pool was covered with a large mass of a very gregarious plant.

Santapau 8101 !

Eriocaulon humile Moldenke in Phytologia 3 : 162, 1949.

The following description is taken from Moldenke, loc. cit. : "Acaulescent herb ; leaves basal, rosulate, linear, membranous, uniformly green on both surfaces, dull, 2-4 cm. long, about 1 mm. or less wide at the midpoint, acute at the apex, somewhat inconspicuously fenestrate toward the base, glabrous on both surfaces, the venation obscure ; sheaths rather close, about 1·5 cm. long, often conspicuously twisted, glabrous, obliquely split at the apex, the blade short, usually erect, subacute or blunt at the apex ; peduncles numerous, 7-30 per plant, very slender, stramineous, 3-13·5 cm. long, 3-costate, much twisted, glabrous ; heads small, grayish stramineous, hemispheric, 2-3 mm. in diameter ; involucral bractlets rather few, elliptic, stramineous, about 2 mm. long and 0·7 mm. wide, attenuate-acute or subacuminate at the apex, glabrous and shiny ; receptacle long-villous ; receptacular bractlets obovate, whitish-subhyaline, about 1·4 mm. long and 0·5 mm. wide, concave-cucullate, abruptly subacuminate at the apex, glabrous ; staminate florets : sepals 2, oblanceolate, hyaline, about 0·8 mm. long and 0·2 mm. wide, abruptly short-acuminate at the apex, glabrous ; petal-tube about 0·7 mm. long, very slender ; stamens 4 ; anthers brown, small ; pistillate florets : sepals 3, free, hyaline, oblanceolate, about 1·3 mm. long and 0·4 mm. wide, sharply acute at the apex, pilose on the back toward the apex ; petals 3, free, hyaline, narrowly oblong, about 1·5 mm. long and 0·4 mm. wide, sharply attenuate-acute at the apex, sparsely pilose on the upper half of the back ; ovary subglobose, about 0·5 mm. long and wide, glabrous, 3-sulcate, 3-celled, 3-ovulate ; style about 0·4 mm. long, glabrous ; stigmas 3, about 0·4 mm. long."

"The type of this little species was collected by Blatter, Hallberg and McCann (no. 28009, in part) at Khandala, Bombay, India, in October, 1918, and is deposited in the Britton Herbarium at the New York Botanical Garden."

Eriocaulon indicum Moldenke in Phytologia 3 : 163, 1949.

Moldenke's description is as follows : "Acaulescent herb ; leaves basal, apparently very few or even absent, grass-like, uniformly bright-green on both surfaces, erect, thin-membranous, 13-14 cm. long, many-nerved, not plainly fenestrate, acute at the apex, glabrous on both surfaces ; sheath very lax, foliaceous and conspicuous, 10-13 cm. long, thin-membranous, glabrous, obliquely split at about ¾ of its length and prolonged into an erect, foliaceous, acute or attenuate-aouminate,

glabrous blade; peduncles 12 or more per plant, 10-14 cm. long, 3-costate, flattened in drying, very slightly twisted, glabrous; heads conic, gray, 5-8 mm. long and wide; involucral bractlets similar to the receptacular ones but slightly broader and blunter; receptacular bractlets very numerous and conspicuous, dark-brown (except at the base), angular obovate, about 1·9 mm. long and 1·7 mm. wide, keeled transversely at the widest part and slightly umbonate on the back, cucullate, apiculate at the apex, farinose above the keel on the back, otherwise glabrous; staminate florets: sepals 3, free, oblanceolate, brownish, about 1·5 mm. long and 0·4 mm. wide, obtuse at the apex, very minutely ciliolate at the apex; petals 3, united into a stramineous membranous tube about 1·3 mm. long, 3-lobed at the apex, the lobes narrow-attenuate, hyaline, with a black gland below the apex and a small erect tuft of hair at the apex; stamens 6; pistillate florets: sepals 3, filiform, free, hyaline, about 1·3 mm. long, densely long-villous from near the base to the apex; pistil 1·7-2 mm. long, glabrous; ovary 3-celled, 3-sulcate, 3-ovulate, glabrous."

"The type of this very distinct species was collected by H. Santapau (no. 2924) at Khandala, on the Kune Plateau, Bombay, India, on October 4, 1943, and is deposited in the Britton Herbarium at the New York Botanical Garden."

This is a very common species all over Khandala during the latter part of the monsoon; it occurs in rock pools, near Khandala Hotel and elsewhere. Typically this plant has the largest leaves and sheaths among the Eriocaulons of Khandala, and the whole plant looks rather pale green when fresh.

Blatt. Herb. 28071 ! *Santapau* 891 ! 2924 (type) !

Eriocaulon lanceolatum Miq., var. **pilosum** Moldenke in Phytologia 3 : 164, 1949.

This is the largest plant of the family in Khandala; it occurs in rock pools during the rains, the lower part of the plant being submerged. Scapes up to 30 cms. long, slender, filiform. In his description Moldenke states: "This variety differs from the typical form of the species in having the peduncles densely spreading-pilose or villous. The type was collected by H. Santapau (no. 2182) in rock pools at Khandala, Bombay, India, on September 5, 1941, and is deposited in the herbarium, of St. Xavier's College at Fort, Bombay". The exact locality of this plant is on Kune Plateau, about half way between Kune village and the Katkari Settlement.

Santapau 218/2 (type) ! 2567 ! 2568 ! 4845 !

Eriocaulon santapaui Moldenke in Phytologia 3 : 166, 1949.

The following is Moldenke's description: "Acaulescent herb; leaves basal, rosulate, grass-like, membranous, about 4 cm. long, about 3 mm. wide at the mid-point, acute at the apex, not fenestrate, glabrous on both surfaces, indistinctly many-nerved; sheaths rather lax, green, 1·8-2·8 cm. long, not twisted, glabrous, indistinctly nerved, obliquely

split at the apex, the blade short, blunt; peduncles about 50 per plant, slender, stramineous, 4-costate, 8-20 cm. long, glabrous; heads small, stramineous, hemispheric, 2·5-3 mm. in diameter; involucral bractlets few, elliptic, about 2 mm. long and 1 mm. wide, stramineous, obtuse at apex, glabrous; receptacle densely long-villous; receptacular bractlets brownish, obovate, somewhat concave-cucullate, about 1·3 mm. long and 0·6 mm. wide, rounded at the apex, finely white-pilose on the back toward the apex; staminate florets: sepals 3, stramineous, connate only at the very base, about 1 mm. long and 0·2 mm. wide, obtuse and slightly white-pilose on the back at the apex; petals 3, united into a whitish membranous tube about 1·7 mm. long, the free lobes about 0·2 mm. long; stamens 6; anthers brown; pistillate florets: sepals 3, hyaline, narrowly oblong, free, about 0·6 mm. long and 0·1 mm. wide, acute at the apex, glabrous throughout; petals 3, free, hyaline, narrowly oblong, about 0·8 mm. long and 0·1 mm. wide, subacute at the apex, glabrous; ovary subglobose, about 0·4 mm. long and wide, glabrous, 3-sulcate, 3-celled, 3-ovulate; style about 0·6 mm. long, glabrous; stigmas 3, about 0·4 mm. long."

"The type of this very distinct species was collected by H. Santapau and C. McCann (no. 1290) in a stream near Kune Mission at Khandala, Bombay, India on November 7, 1942, and is deposited in the Britton Herbarium at the New York Botanical Garden."

Eriocaulon vanheurckii Muell.-Arg. in Heurck, Obs. Bot. 2: 98, 1870; Moldenke in litt.

This plant is not mentioned in Fyson's monograph. The plants listed below have been identified by Moldenke.

Santapau 218/3 ! 2566 ! 4843 !

CYPERACEAE.

All the Cyperaceae of Khandala have been checked by Mr. E. Nelmes of Kew Herb., to whom I gladly acknowledge my indebtedness from these pages.

CYPERUS Linn.

Cyperus albomarginatus Mart. & Schrad. ex Nees in Mart., Fl. Bras. 2(1): 9, 1842; C. 2: 858; Kuekenth. in Pfreich. 101: 359, f. 42 E-H.

Pycreus albomarginatus Nees in Mart., Fl. Bras. 2(1): 9, 1842; FBI. 6: 594; Fischer 1628; Blatt. & McC. in JBNHS. 37: 29.

St. Mary's Villa grounds, *McCann* C 103; flowers and fruits: Sept. 1918.

Cyperus aristatus Rottb., Descr. & Icon. 23, t. 6, f. 1, 1773; FBI. 6: 606; C. 2: 866; Blatt. & McC. 263; Kuekenth. 502, f. 55 F-J.

Blatter, Hallberg and *McCann*, 2403, 2404, 3064; flowers and fruits July 1919.

Cyperus articulatus Linn., Sp. Pl. 44, 1753; FBI. 6: 611; Blatt. & McC. 269; Kuekenth. 77.

This plant is not given in Cooke's Flora. For a description, see Blatt. & McC., or Kuekenthal, loc. cit.

Flowers and *Fruits*.—April 1917.

McCann 3195.

Cyperus brevifolius (Rottb.) Hassk., Cat. Hort. Bogor. 24, 1844; Kuekenth. 600.

Kyllinga brevifolia Rottb., Descr. & Icon. 13, t. 4, f. 3, 1773; FBI. 6: 588; Clarke, Illustr. Cyp. t. 1, f. 1-4; Blatt. & McC. 25.

Not in Cooke's Flora. For a description see Blatt. & McC,. or Kuekenthal, loc. cit.

Flowers and *Fruits*.—March 1929; April 1929; June 1944; July 1917.

Sedgwick 2571; *Blatt. & McC.* 3033, 3041; *McCann* 400, 402, 343, 346; *Santapau* 4446 ! 4447 !

Cyperus compressus Linn., Sp. Pl. 46, 1753; FBI. 6: 605; C. 2: 866; Blatt. & McC. 262; Kuekenth. 156, & f. 4 A-D.

Flowers and *Fruits*.—September 1919.

St. Xavier's Villa, *McCann* C. 113.

Cyperus corymbosus Rottb., Descr. & Icon. 42, t. 7, f. 4, 1773; FBI. 6: 612; C. 2: 870; Blatt. & McC. 270; Kuekenth. 80, f. 10.

Blatter and McCann in their Revision, loc. cit., have fused *C. tegetum* Roxb., *C. tegetiformis* Roxb. and *C. Pangorei* Rottb. with the present species. The sheets of *C. corymbosus* from Khandala are not in the Blatt. Herb., and in consequence I am unable to decide their identity for certain. The following references are given on the authority of Blatter and McCann, and must be taken as representing *C. corymbosus* understood *sensu latiore* of these two authors.

Blatter 1856; *McCann* C. 117; *Blatter, Hallberg* and *McCann* 2420, 3049; *Blatter* and *Hallberg*, Khandala to Karjat, 3171.

Cyperus cyperoides (Linn.) O. Kuntze, Rev. Gen. 3: 333, 1898; Kuekenth. 514.

Scirpus cyperoides Linn., Mant. 2: 181, 1771.

Mariscus Sieberianus Nees in Linnaea 9: 289, 1835; FBI. 6: 622; Clarke, Illustr. Cyp. t. 23, f. 5-6; Fischer 1645.

M. paniceus Vahl, Enum. 2: 337, 1806; Blatt. & McC. 533.

For a description of the plant, see Blatt. & McC. or Kuekenth. My plants were found growing by the side of a pool at the foot of Behran's Plateau.

Flowers and *Fruits*.—July 1917; August 1942: October 1643.

Sedgwick 2553; *Blatter, Hallberg* and *McCann*, 28580; *Santapau* 641 ! 2812 !

Cyperus cyperoides var. **subcompositus** (Clarke) Kuekenth. in Pfreich. 101 : 516, 1936.

Mariscus Sieberianus var. *subcomposita* Clarke in FBI. 6 : 522 ; 1893.

Cyperus konkanensis Cooke, Fl. Pres. Bomb. 2 : 874, 1908.

Mariscus konkanensis Sedgw. in JBNHS. 25 : 698, 1918 ; Blatt. & McC. 534.

Blatter in MS. catalogue ; *Bhide* 15417 ex Blatt. & McC., Revis.

Cyperus difformis Linn., Cent. Pl. 2 : 6, 1756 & Amoen. Acad. 4 : 302, 1760 ; FBI. 6 : 599 ; C. 2 : 862 ; Fischer 1640 ; Blatt. & McC. 259 ; Kuekenth. 237, f. 27 F-H.

My own specimens were collected in a pool near Khandala station. They are not common in the district.

Woodrow ; Sedgwick 2551 ! *McCann* C. 92 ; *Blatter* and *McCann* 3155, 3168 ; *Santapau* 483 !

Cyperus digitatus Roxb., Hort. Beng. 81, 1814 & Fl. Ind. 1 : 205, 1832 ; FBI. 6 : 618 ; C. 2 : 873 ; Fischer 1642 ; Blatt. & McC. 277 ; Kuekenth. 55.

Sedgwick, in a rivulet, 2572 ! *Blatter* and *McCann*, Soldier's Play ground, in watercourse, 2401 ; *McCann* C 219.

Cyperus eleusinoides Kunth, Enum. 2 : 39, 1837 ; FBI. 6 : 608 ; C. 2 : 868 ; Blatt. & McC. 267 ; Kuekenth. 144.

Flowers and *Fruits*.—March 1917, 1929 ; May 1917 ; July 1916.

McCann 3187, 3188 ; *Blatter* and *McCann* 3156, *Khandala* tank ; *Blatter, Hallberg* and *McCann*, 3048 ; *Blatt. Herb.* 28206 !

Cyperus exaltatus Retz., Obs. 5 : 11, 1789 ; FBI. 6 : 617 ; C. 2 : 872 ; Blatt. & McC. 275 ; Kuekenth. 64, f. 9 A-F.

Flowers and *Fruits*.—July 1916, 1917 ; Sept. 1918 ; October 1905.

Sedgwick, in a rivulet 2572 ! *Blatter* 1854 ; *McCann* C. 207 ; *Blatter* and *McCann*, 3165 ; *Blatter, Hallberg* and *McCann* 2410, 3056.

Cyperus flavescens Linn., Sp. Pl. 68, 1753 ; Clarke in JLS. 21 : 36, t. 4, ff. 40-41, 1884 ; Kuekenth. 398.

Pycreus flavescens Reich., Fl. Germ. Exc. 72, 1830 ; Nees in Linnaea 9 : 283, 1835 ; FBI. 6 : 589 ; Blatt. & McC. 27.

For a description of this plant, see Blatt. & McC. or Kuekenth., loc. cit.

Gammie 14386 ; *Herb. Econ. Bot. Bombay* (without number) ; *McCann* C. 197.

Cyperus globosus Allion., Fl. Pedem. 49, 1789; C. 2: 857? Kuekenth. 352.

Pycreus globosus Reich., Fl. Germ. Exc. 140, 1830; Blatt. & McC. 29.

P. flavidus Retz., Obs. 5: 13, 1789 (nec Clarke, nec aliorum).

P. capillaris Nees in Linnaea 9: 283, 1834; FBI. 6: 591.

Flowers and *Fruits*.—March 1917, 1929; September 1919.

Blatter and *McCann* 3181.

Cyperus iria Linn., Sp. Pl. 45, 1753 (excl. Tab. Rheed.); FBI. 6: 606; C. 2: 867; Blatt. & McC. 264; Kuekenth. 150.

C. Iria var. *paniciformis* Clarke in FBI. 6: 607, 1893.

This is one of the commonest of the Cyperaceae in Khandala; it is a conspicuous plant, rather rank in appearance. Some of my specimens were collected in rice fields after the harvest, or in moist ground along the railway line.

Flowers and *Fruits*.—March 1917; May 1917; July 1916; August 1916, 1942, 1945; September 1919; November 1943.

Woodrow; *Sedgwick* 2560! *Blatter* and *McCann* 3162; *Blatter, Hallberg* and *McCann* 1993, 1994, 3046, 28603; *Santapau* 630! 3123! 6847!

Cyperus iria var. **pariflorus** (Nees) Miq., Fl. Ind. Bat. 3: 270, 1859; Kuekenth. 152.

C. pariflorus Nees in Wt., Contrib. 87, 1832, excl. syn. (non Vahl).

Flowers and *Fruits*.—July 1942.

Santapau 577, in rice fields!

Cyperus kyllingia Endl., Cat. Hort. Vindob. 1: 94, 1842; Kuekenth. 606, f. 64 C-D.

Kyllinga monocephala Rottb., Descr. & Icon. 13, t. 4, 1773 (excl. syn. nonnullis); FBI. 6: 588 & Ill. Cyp. t. 2, f. 1-2; C. 2: 876; Fischer 1624; Blatt. & McC. 25.

Gammie 15385.

Cyperus latespicatus Boeck. in Flora 42: 441, 1859; C. 2: 855; Kuekenth. 392.

Pycreus latespicatus Clarke in FBI. 6: 590, 1893 & Illustr. Cyp. 3; Blatt. & McC. 27.

I have seen this plant only on the higher hill tops in the district.

Flowers and *Fruits*.—September 1942, 1943.

Chibber; *Santapau* 953! 2505!

Cyperus leucocephalus Retz., Obs. 5 : 11, 1789; FBI. 6 : 602; C. 2 : 864; Blatt. & McC. 261; Kuekenth. 278, f. 31 A-D.

Flowers and *Fruits.*—July 1943.

Santapau 1249 !

Cyperus malabaricus (Clarke) Cooke, Fl. Pres. Bomb. 2 : 856, 1908; Kuekenth. 390.

Pycreus malabaricus Clarke in JLS. 34 : 12, 1898; Blatt. & McC. 28, t. 3.

Cooke ; *Blatter, Hallberg* and *McCann* 3044; *Herb. Econ. Bot. Bombay ; Santapau* 4840 !

Cyperus metzii (Hochst.) Mattf. & Kuekenth. in Pfreich. 101 : 612, 1936.

Kyllinga squamulata Thonn. ex Vahl, Enum. 2 : 381, 1806; FBI. 6 : 589; Clarke, Illustr. Cyp. t. 1, f. 5-7; Fischer 1624; Blatt. & McC. 24.

Cyperus squamulatus Suringar, Het. Gesl. Cyp. 46, t. 2, f. 2, 1898 (non Steud. 1855).

Kyllinga Metzii Hochst. ex Steud., Syn. Cyp. 70, 1855.

Flowers and *Fruits.*—July 1916, 1917; October 1921.

Sedgwick 7228, on a wall ! *Blatter* and *McCann* 3037, 3057.

Cyperus michelianus (Linn.) Link, subsp. **pygmoeus** (Rottb.) Aschers. & Graebn., Syn. 2(2) : 273, 1930; Kuekenth. 312, f. 35 F.-G.

Cyperus pygmaeus Rottb., Descr. & Icon. 20, t. 14, f. 4-5, 1773; C. 2 : 859.

Juncellus pygmaeus Clarke in FBI. 6 : 596, 1893; Fischer 1629.

J. Michelianus Blatt. & McC. in JBNHS. 37 : 33, 1934.

Flowers and *Fruits.*—March 1917; April 1929; May 1917.

McCann, in a marsh near the station, 379, 393, 408, 409; *Blatter* and *McCann* 3163, 3173, 3174, 3186.

Cyperus nutans Vahl, Enum. 2 : 363, 1806; FBI. 6 : 607; C. 2 : 868; Fischer 1640; Blatt. & McC. 266; Kuekenth. 144, f. 5 A-D.

Flowers and *Fruits.*—November 1916; January 1943.

Woodrow; Blatter & McCann 2756; *Santapau* 1527 ! 2523 !

Cyperus pangorei Rottb., Descr. & Icon. 31, t. 7, f. 3, 1773; Kuekenth. 76 (non Retz., nec. C. B. Clarke).

C. Corymbosus Kunth, Beck et alior., non Rottd.

C. tegetum Boxb., Fl. Ind, 1 : 208, 1832; Clarke in FBI. 6 : 613, & Illustr. Cyp. t. 17, f. 1.

Santapau 1328 ! In St. Xavier's Ravine, November 1942.

There is some confusion in the literature as regards this plant and its relation to *C. corymbosus* Rottb. The following key is based on that of Kuekenthal pp. 73-74 :

1. Rhizome shortly creeping; scales somewhat remote, oblong-elliptic, rufous.....*C. Pangorei.*

2. Rhizome long-creeping, often stoloniferous ; scales mostly densely imbricate, broader, dark or blood-coloured.....*C. corymbosus.*

Cyperus pumilus Linn., Cent. Pl. 2 : 6, 1756, & Amoen. Acad. 4 : 302, 1788 ; C. 2 : 857 ; Kuekenth. 375, f. 44 A-E.

Pycreus pumilus Dom. in Bibl. Bot. 85 : 417, 1916 ; Fischer 1527 ; Blatt. & McC. 31.

P. nitens Nees : Clarke in FBI. 6 : 591, 1893.

Flowers and *Fruits.*—March 1917, 1929 ; April 1929 ; May 1917 ; September 1902, 1919.

Gammie 15387 ; *McCann* 351, 3184, C. 119, C. 120.

Cyperus pumilus Linn. var. **membranaceus** (Vahl) Clarke, in JLS. 21 : 44, 1884 ; Kuekenth. 376.

C. membranaceus Vahl, Enum. 2 : 330, 1806.

Meebold 8843, ex Kuekenth. loc. cit.

Cyperus rotundus Linn., Sp. Pl. 45, 1753 ; FBI. 6 : 614 ; C. 2 : 871 ; Blatt. & McC. 273 ; Kuekenth. 197, f. 13.

Flowers and *Fruits.*—August 1916.

Blatter, Hallberg and *McCann* 3045, 4066.

Cyperus sanguinolentus Vahl, Enum. 2 : 351, 1806 ; C. 2 : 856 ; Kuekenth. 385.

Pycreus sanguinolentus Nees in Linnaea 9 : 283, 1836 ; FBI. 6 : 690 ; Fischer 1627 ; Blatt. & McC. 28.

Flowers and *Fruits.*—March 1917, 1929 ; April 1929 ; May 1917 ; September 1895, 1918.

Woodrow ; *Gammie* 15407 ; *Herb. Econ. Bot. Bombay ; McCann* 3196, C. 110, 389, 403 ; *Blatter* and *McCann* 3160, 3191.

Cyperus triceps (Rottb.) Endl., Cat. Hort. Vindob. 1 : 94, 1842 ; Kuekenth. 578.

Kyllinga triceps Rottb., Descr. & Icon. 14, t. 4, f. 6 (excl. cit. Rheed.) 1773 ; FBI. 6 : 587 ; C. 2 : 877 ; Fischer 1623 ; Blatt. & McC. 23.

Flowers and *Fruits.*—July 1917, 1943.

Bbatter, Hallberg and *McCann* 2435, 27457 ; *Santapau* 2256 !

FIMBRISTYLIS Vahl.

Fimbristylis aestivalis Vahl, Enum. 2 : 288, 1806; FBI. 6 : 637; C. 2 : 881; Blatt. & McC. 541.

Flowers and *Fruits.*—March 1918, 1929; April 1906; May 1917, 1942.

Talbot 4796; *Blatter* and *McCann* 3175, 3177; *McCann* 391, 392, 1866, 1867, 3190; *Santapau* 419!

Fimbristylis annua Roem. & Schult., var. **paucispiculata** Blatt. & McC. in JBNHS. 37 : 544, 1934.

F. diphylla Vahl, var. *annua* Clarke in FBI. 6 : 637, 1893.

Flowers and *Fruits.*—September 1919.

Sedgwick 2588! *McCann* C. 82.

Fimbristylis dichotoma Vahl, Enum. 2 : 287, 1806; FBI. 6 : 637; C. 2 : 880; Blatt. & McC. 542.

This is one of the commonest plants of the genus in Khandala.

Flowers and *Fruits.*—January 1945; February 1946; March 1917, 1929, 1944; April 1917, 1942; May 1917, 1942.

Woodrow; McCann 342, 345, 385; *Blatter* and *McCann* 3152; *Santapau* 212/20! 478! 3841! 5919! 8634!

Fimbristylis digitata Boeck in Flora 61 : 35, 1878; FBI. 6 : 648; C. 2 : 884; Blatt. & McC. 545.

This is a common species in Khandala and conspicuous in the monsoon; the inflorescence is white and rather conspicuous among small grasses.

Flowers and *Fruits.*—May 1917; June 1943; July 1916, 1941, 1942; August 1908.

Sedgwick 2595! *Blatt.* 1858; *McCann* 1857, 3194, 3220; *Blatter, Hallberg* and *McCann* 3052; *Santapau* 212/7! 572! 2214!

Fimbristylis diphylla (Retz.) Vahl, Enum. 2 : 289, 1806; FBI. 6 : 636; Nelmes in litt.

Scirpus diphyllus Retz., Obs. 5 : 15, 1789.

Flowers and *Fruits.*—March 1929; June 1917; July 1917; September 1902, 1918, 1919; October 1918.

Sedgwick 2588! *Blatter, Hallberg* and *McCann* 3047, 3060; *McCann* C. 80, 372; *Blatt. Herb.* 27949! 27989! 28037!

Fimbristylis ferruginea Vahl., Enum. 2 : 291, 1806; FBI. 6 : 638; C. 2 : 881; Blatt. & McC. 544.

Flowers and *Fruits.*—August 1917.

Blatter and *McCann* 3001; Bhor Ghat, *Blatt. Herb.* 3123.

Fimbristylis miliacea Vahl, Enum. 2: 297, 1806; FBI. 6; 644,; C. 2: 883; Blatt. & McC. 546.

Flowers and *Fruits*.—March 1929; May 1917; July 1916.

Sedgwick 2575! *McCann* 352, 3193; *Blatter, Hallberg* and *McCann* 3050, 3059.

Fimbristylis quinqueangularis Kunth, Enum. 2: 229, 1837; FBI. 6: 644; C. 2: 883; Blatt. & McC. 547.

Flowers and *Fruits*.—March 1917, 1929; July 1917.

Sedgwick 2573! *McCann* 388; *Blatter* and *McCann* 3170.

Fimbristylis schoenoides Vahl, Enum. 2: 286, 1806; FBI. 6: 634; C. 2: 880; Blatt. & McC. 541.

Flowers and *Fruits*.—July 1916; September 1919, 1943; October 1915.

Woodrow; Saxton 1204; *McCann* C 57; *Blatter, Hallberg* and *McCann* 3036; *Santapau* 2556!

Fimbristylis tenera R. & S., Syst. 2, Mant.: 57, 1824; FBI. 6: 642; Blatt. & McC. 546.

Flowers and *Fruits*.—March 1917; July 1916; September 1919, 1942.

Blatter, Hallberg and *McCann* 3042, 3051, 3055, 3063, 3065; *Santapau* 798!

Fimbristylis tetragona R. Br., Prodr. 226, 1810; FBI. 6: 631; C. 2: 879; Blatt. & McC. 539.

Flowers and *Fruits*.—March 1917, 1929; April 1929; June 1917; July 1916; September 1941, 1943.

Sedgwick 2550! *McCann* 344, 381, 382, 404; *Blatter* and *McCann* 3153, 5317; *Blatt. Herb.* 27965! *Santapau* 212/11! 2556!

Fimbristylis woodrowii C. B. Clarke in JLS. 34: 68, 1898; C. 2: 884; Blatt. & McC. 545.

According to Cooke, loc. cit., Khandala is the typical locality of this plant.

Flowers and *Fruits*.—March, May and July 1917; August 1916; September 1895, 1919.

Woodrow ex Cooke; *Sedgwick* 2576! *McCann* 3185; *Blatter, Hallberg* and *McCann* 3002; *Herb. Econ. Bot. Bombay.*

ELEOCHARIS R. Br.

Eleocharis atropurpurea Kunth, Enum. 2: 151, 1837; FBI. 6: 627; C. 2: 889; Blatt. & McC. 537.

Blatter and *McCann* 1740.

SCIRPUS LINN.

Scirpus articulatus Linn., Sp. Pl. 47, 1753; FBI. 6: 656; C. 2: 891; Blatt. & McC. 767.

McCann 27447.

Scirpus supinus Linn., Sp. Pl. 49, 1753; FBI. 6: 655; 2: 892; Blatt. & McC. 766.

Flowers and *Fruits*—March 1929; November 1918.

McCann C. 11, 383, 386, 387, 390.

RHYNCHOSPORA Vahl.

Rhynchospora wightiana Steud., Cyper. 148, 1855; FBI. 6: 669: C. 2: 901; Blatt. & McC. 774.

Flowers and *Fruits*.—July 1917; August 1896; September 1902, 1942, 1943.

Jacquemont 649; *Woodrow*; *Sedgwick* 2589! *McCan* 28067, 29550; *Gammie* 15401; *Saxton* 1195; *Santapau* 930! 2558!

SCLERIA Berg.

Scleria stocksiana Boeck. in Linnaea 38: 474, 1874; FBI. 6: 687; C. 2: 905; Blatt. & McC. 779.

Flowers and *Fruits*.—October 1918.

Blatter and *McCann* 27593.

CAREX Linn.

Carex filicina Nees var. **glaucina** (Boeck) Kuekenthal in Pfreich. 38: 274, 1909.

C. glaucina Boeck, in Linnaea 40: 353, 1876.

Blatt. Herb. 27550! October 1918.

BULBOSTYLIS Kunth.

Bulbostylis capillaris Kunth, Enum. 2: 212, 1837, var. **trifida** (Kunth) Clarke, in FBI. 6: 652, 1893; Blatt. & McC. 765.

B. trifida Kunth, Enum. 2: 213, 1837.

Gammie 15424, September 1902.

GRAMINEAE.

All the specimens in Blatter Herbarium, whether of my own collections or of Blatter, Hallberg, McCann and other collectors, have been checked in Kew Herbarium by Dr. N. L. Bor, to whom I tender sincere thanks.

APLUDA Linn.

Apluda aristata Linn., Cent. Pl. 2 : 71, 1756 ; D. & G. 303 ; Bor in Ind. For. Rec., Bot. 2(1) : 219, & in Fl. Assam 5 : 431.

A. varia Hack. var. *aristata* Hack., Mon. Androp. in DC., Mon. Phan. 6 : 196, 1889 ; FBI. 7 : 150 ; Blatt. & McC., Bombay Grasses 29, t. 20.

A. mutica Linn. var. *aristata* Pilger in Pfam. (ed. 2) 14 e : 130, 1940.

McCann 5294 ! 5411 ! *Santapau*, slopes behind St. Mary's Villa, 1349.

ARISTIDA Linn.

Aristida setacea Retz., Obs. 4 : 22, 1786 ; Gr. 218 ; D. & G. 295 ; FBI. 7 : 225 ; C. 2 : 1008 ; Fischer 1809 ; Blatt. & McC. 211, t. 139.

Graham, loc. cit. ; *Blatter* in MS. catalogue.

ARTHRAXON Beauv.

Arthraxon hispidus (Thunb.) Makino in Bot. Mag. Tokyo 26 : 214, 1912 ; Bor, Fl. As. 378 ; Pilger 156.

Phalaris hispida Thunb., Fl. Jap. 44, 1784.

Arthraxon ciliaris Beauv., Agrost. 111, 1812, pro parte.

McCann A 89 ! 9740 ! 9747 ! 9749 ! 9950 !

Arthraxon inermis Hook. f. in FBI. 7 : 145, 1896 ; C. 2 : 968 ; Blatt. & McC. 74, t. 45.

McCann A 90 ! 5289 ! 5291 ! 5413 ! 9744 ! 9750 ! 9753 ! *Santapau*, Stream near Kune, 1271 !

Arthraxon jubatus Hack., Mon. Andr. 358, 1889 ; FBI. 7 : 147 ; C. 2 : 970 ; Blatt. & McC. 79, t. 50 ; Pilger 156.

Hallberg, on damp rocks, 9788 ! Sept. 1918.

Arthraxon lancifolius (Trin.) Hochst. in Flora 188, 1856 ; Blatt. & McC. 77, t. 48 ; Fischer 1729 ; Bor, Fl. As. 378 ; Pilger 156.

Andropogon lancifolius Trin., in Mem. Acad. Petersb. (ser. 6) 2 : 271, 1833.

McCann 9741 ! On Railway line 9745, 9746 ! 9748 ! Tata's Lake 9752 ! *Gammie* 15460 ! *Blatt. Herb.* 5077(2) !

Arthraxon meeboldii Stapf. in Kew Bull. 1908 : 449, 1908 ; C. 2 : 969 ; Fischer 1728 ; Blatt. & McC. 76, t. 47.

The type of this species was collected in "*India.* Concan, in open grassland on a hillside near Khandala, 600 m. Meebold, 9132 " (Stapf, loc. cit.).

Meebold 9132 ; *Gammie*, 20 Sept. 1902, 15361 ! *Blatter* 4412 ! *McCann* 9948 ! 9949 ! *Blatt. Herb.* 440 ! 4413 ! 6751(2) ! 9751(2) ! 9751(3) ! 5041(3) !

Arthraxon quartinianus (Rich.) Nash in N. Amer. Fl. 17 : 99, 1912 ; Blatt. & McC. 78, t. 49 ; Pilger 156.

Alectoridia quartiniana A. Rich., Tent. Fl. Abyss. 2 : 448, t. 99, 1851.

Arthraxon ciliaris Beauv. subsp. *quartinianus* Hack., Mon. 356, 1889 (excl. vars. *Hookeri & glabrescens*).

McCann 5321 ! 9751 ! 9744 !

ARUNDINELLA Raddi.

Arundinella nepalensis Trin., Sp. Gram. t. 268, 1828 ; Bor 76, t. 9 & Fl. As. 183.

A. brasiliensis Hook. f. in FBI. 7 : 73, 1896 (non Raddi) ; C. 2 : 1003.

A. hispida Blatt. & McC., Bomb. Gras. 195 (non O. Kuntze).

Saxton 1205 ; *Lisboa* ex Blatt. & McC.; *Blatt. Herb.* A 175 ! 5050(25) !

Arundinella pumila (Hoscht.) Steud., Syn. Pl. Glum. 114, 1854 ; Fischer 1854 ; Bor, Fl. As. 181 & in JIB. 27 : 61.

A. tenella Nees & Wight ex Steud., loc. cit. 115 ; D. & G. 292 : FBI. 7 : 71 ; C. 2 : 1001 ; Blatt. & McC. 193, t. 127.

Acratherum pumilum Hochst. in A. Rich., Tent. Fl. Abyss. 2 : 414, 1851.

Jacquemont 631, ex Blatt. & McC.; *Blatter* 4400 ! 4408 ! *McCann* A 1671 ! 5293 ! 9596 ! 9599 ! 9605 ! *Santapau*, Kune stream, 1264 !

Arundinella pygmaea Hook. f. in FBI. 7 : 72, 1896 ; C. 2 : 1002 ; Fischer 1801 ; Blatt. & McC. 194 ; Bor, loc. ult. cit. 62.

McCann 5318 !

Arundinella sp.

Blatt. Herb. 5312 ! 9600 !

BAMBUSA Schreb.

Bambusa bambos (Linn.) Voss in Vilmorin, Blümengartn. 1 : 1189, 1896 ; McClure in Blumea, Suppl. 3 : 108, 1946 ; Bor in litt.

Arundo bambos Linn., Sp. Pl. 81, 1753.

Bambusa arundinacea Hook. f., Cooke, Blatt. & McC., et al. (non Willd.).

Common in the district and very noticeable ; it is particularly abundant in and around St. Xavier's Villa (possibly planted), and on the ravine slopes especially below Duke's Nose. In the course of about ten years I have seen this plant in flower on only one occasion, November 7th, 1942, and then it was only a small clump of these plants that flowered, all the neighbouring plants being entirely unaffected.

For the question of the flowering of the bamboos, see Blatter in JBNHS. 33 : 899-921 ; 34 : 135-141, 447-467.

McCann A 224 ! A 225 ! A 226 ! *Santapau* 1255 !

BHIDEA Stapf ex Bor.

Bhidea burnsiana Bor in Kew Bull. 1948 : 445, 1949.

Blatt. Herb. 9918 of Sept. 1919 !

BOTHRIOCHLOA O. K.

Bothriochloa compressa (Hook. f.) Henrard in Blumea 3 : 456, 1940.

Andropogon compressus Hook. f. in FBI. 7 : 172, 1896 ; C. 2 : 977.

Amphilophis compressa Blatt. & McC. in JBNHS. 32 : 421, 1928, & Bomb. Gras. 83, t. 53.

Hallberg 9432 ! *Hallberg* 9657 & *Bhide* ex Blatt. & McC.; *McCann*, Plain behind the Saddle, 9433 ! *Saxton & Bhide* 9688 !

Bothriochloa concanensis (Hook. f.) Henrard, in Blumea 3 : 457, 1940.

Andropogon concanensis Hook. f. in FBI. 7 : 174, 1896.

Amphilophis concanensis Blatt. & McCann in JBNHS. 32 : 422, 1928, & Bomb. Gras. 87, t. 56.

Saxton & Bhide 1214 ! *McCann*, in watercourse, 9651 ! 9954 !

Bothriochloa intermedia (R. Br.) A. Camus in Ann. Soc. Linn. Lyon (N. S.) 76 : 164, 1930 ; Bor 81, & Fl. As. 367 ; Pilger 161.

Andropogon intermedius R. Br., Prodr. 202, 1810 ; FBI. 7 : 175 ; C. 2 : 980.

Amphilophis glabra Blatt. & McC., Bomb. Gras. 87 (non Stapf.).

McCann, in watercourse, 9435 !

Bothriochloa kuntzeana (Hack.) Henrard in Blumea 3 : 456, 1940.

Andropogon kuntzeanum Hack. in DC., Mon. 6 : 478, 1889.

Santapau, in Kune Stream, 1274 !

BRACHIARIA Griseb.

Brachiaria eruciformis (Sibth. & Smith) Griseb. in Ledeb., Fl. Ross. 4 : 469, 1833 ; Bor, Fl. As. 274 ; Pilger 28.

Panicum eruciforme Sibth. & Smith, Fl. Graec. 1 : 44, t. 59, 1806.

P. isachne Roth in Nov. Pl. Sp. 54, 1821 ; FBI. 7 : 28 ; C. 2 : 931.

Brachiaria isachne (Roth) Stapf in Fl. Trop. Afr. 9 : 552, 1918 ; Blatt. & McC. 133, t. 85.

McCann 9566 !

Brachiaria ramosa (Linn.) Stapf, in Fl. Trop. Afr. 9 : 542, 1919 ; Blatt. & McC. 134, t. 86 ; Fischer 1770 ; Bor, Fl. As. 277.

Panicum ramosum Linn., Mant. 29, 1767 ; FBI. 7 : 36 p.p. ; C. 2 : 932.

Sedgwick 2631 ex Blatt. & McC.

CAPILLIPEDIUM Stapf.

Capillipedium filiculme (Hook. f.) Stapf in Hook. Icon. t. 3085, 1922; Blatt. & McC. 82; Fischer 1730; Henrard in Blumea 3 : 461.

Andropogon filiculmis Hook. f. in FBI. 7 : 181, 1896; C. 2 : 982.

Blatter & Hallberg, Khandala to Karj A 287 ! *Blatt. Herb.* 5011 !

Capillipedium hugelii (Hack.) Camus in Rev. Bot. Appl. 1(4) : 306, 1921; Blatt. & McC. 81, t. 52; Fischer 1730.

Andropogon Hugelii Hack., Mon. 492, 1889; FBI. 7 : 180; C. 2 : 982.

McCann, St. Xavier's Villa, 9423 ! 9647 !

CHIONACHNE R. Br.

Chionachne koenigii (Spreng.) Thw., Enum. 369, 1864; Fischer 1706; Bor 87, t. 14; Pilger 181, f. 101.

Coix Koenigii Spreng., Syst. 1 : 228, 1825.

C. barbata Roxb., Fl. Ind. 3 : 569, 1832; D. & G. 289.

Polytoca barbata Stapf in FBI. 7 : 102, 1896; C. 2 : 999; Blatt. & McC. 6, t. 3.

Santapau, slopes leading to Meroli Plateau, fairly abundant !

CHRYSOPOGON Trin.

Chrysopogon montanus Trin., in Spreng., Neue Entdeck. 2 : 63, 1820-1822; Blatt. & McC. 70, t. 42; Bor 94, tt. 17-18; Pilger 153.

Andropogon monticola Schult., Mant. 665, 1824; FBI. 7 : 192 cum vars.; C. 2 : 985.

Blatter & Hallberg, Khandala to Karjat, A 232 !

COIX Linn.

Coix lachryma-Jobi Linn., Sp. Pl. 972, 1753; FBI. 7 : 100; C. 2 : 997; Blatt. & McC. 3, t. 1; Bor 99, t. 20; Pilger 190, f. 103.

C. lachryma Linn., Syst. (ed. 10) 1261, 1759; Gr. 240; D. & G. 289.

Blatter 4415 ! *McCann* 9405 ! 9412 ! 9411 ! 9398 ! 9396 ! *Santapau*, common on ravine slopes 211/10, 11 ! 256 ! 4876 !

CYMBOPOGON Spreng.

Cymbopogon citratus (DC.) Stapf in Kew Bull. 1906 : 357, 1906 & Fl. Trop. Afr. 9 : 282, 1919; Blatt. & McC. 103; Pilger 164.

Andropogon citratus DC., Cat. Hort. Monsp. 78, 1813.

A. Schoenanthus Linn., Syst. (ed. 10) 1304, 1759 (non 1753).

Blatt. Herb. 4414 !

Cymbopogon martini (Roxb.) Watson in Atkins., Gazet. N. W. Prov. Ind. 392, 1882; Stapf in Kew Bull. 1906: 359; Blatt. & McC. 104; Bor 104, t. 21 & Fl. As. 384; Pilger 164.

Andropogon Martini Roxb., Fl. Ind. 1: 280, 1820.

A. Schoenanthus var. *Martini* Hook. f. in FBI. 7: 204, 1896 (excl. syn. Afric.)

McCann, "very common", ex Blatt. & McCann; *Blatt. Herb.* 4098 ! 5344 ! 5408 ! 9428 ! *Santapau*, along railway line near Monkey Hill, 4189 ! 7300 !

Cynodon Rich.

Cynodon dactylon (Linn.) Pers., Syn. 1: 85, 1805; FBI. 7: 288; C. 2: 1032; Blatt. & McC. 250, t. 166; Fischer 1835; Bor 110, t. 22, & Fl. As. 125.

Panicum dactylon Linn., Sp. Pl. 58, 1753; Gr. 236.

Blatt. Herb. 5050(12) ! 5050(20) ! 5421 ! 5433 ! 5461 ! 27938 ! *McCann* 5301 !

Dactyloctenium Willd.

Dactyloctenium aegyptium (Linn.) Beauv., Agrost. 72, 1812; Blatt. & McC. 262, t. 176; Fischer 1840; Bor 112, t. 23, & Fl. As. 110.

Cynosurus aegyptius Linn., Sp. Pl. 72, 1753.

Dactyloctenium aegyptiacum Willd., Enum. 1029, 1809; Gr. 235; D. & G. 297.

Eleusine aegyptiaca Desf., Fl. Atlant. 1: 85, 1798; FBI. 7: 295; C. 2: 1038.

McCann, ex Blatt. & McC.; *McCann*, Khandala to Kampoli, A 209 ! *Gammie* 15395 !

Danthoniopsis Stapf.

Danthoniopsis griffithiana (Muell.) Bor, in Fl. As. 5: 187, 1940.

Danthonia griffithiana C. Muell., Bot. Zeit. 14: 348, 1856.

Arundinella avenacea Munro ex Thw., Enum. 362, 1864; FBI. 7: 69; C. 2: 1000 (*arenacea* per sphalm.); Blatt. & McC. 191, t. 124; Fischer 1801.

Chibber 40 ! *McCann* 9604 ! *Blatt. Herb.* 9595 ! 9597 ! 9598 ! 9603 ! *Santapau*, Behran's Plateau, 2608 ! Top of Echo Point, 958 !

Dichanthium Willem.

Dichanthium annulatum (Forsk.) Stapf in Fl. Trop. Afr. 9: 178, 1917; Blatt. & McC. 94, t. 72; Bor 116, t. 25, & Fl. As. 371; Pilger 161.

Andropogon annulatum Forsk., Fl. Aegypt.-Arab. 173, 1775; Hack., Mon. 570; FBI. 7: 196; C. 2: 988.

"Khandala, very common (McCann 5297 !)", ex Blatt. & McC. ; *Blatt. Herb.* 9635 ! *McCann* 5297 !

Dichanthium aristatum (Poir.) Hubbard, in Kew Bull. 1939 : 654, 1940.

Andropogon aristatum Poir., Encycl. Suppl. 1 : 585, 1810.

McCann 5315 !

Dichanthium armatum (Hook. f.) Blatt. & McC. in JBNHS. 32 : 425, 1928, & Bomb. Gras. 91, t. 59 ; Pilger 162.

Andropogon armatus Hook. f. in FBI. 7 : 197, 1896 ; C. 2 : 987.

McCann, Ghira Hill, 9430 ! 9431 !

DIGITARIA Rich.

Digitaria longiflora (Retz.) Pers., Syn. 1 : 85, 1805 ; C. 2 : 941 ; Blatt. & McC. 127, t. 81 ; Bor, Fl. As. 211 ; Pilger 51.

Paspalum longiflorum Retz., Obs. 4 : 15, 1786 ; FBI. 7 : 17, pro parte (non Trin.).

Blatt. Herb. St. Mary's Villa, Sept. 1919, 3900(2) !

Digitaria adscendens (H.B.K.) Henrard in Blumea 1 : 92, 1934.

Panicum adscendens H.B.K., Nov. Gen. & Spec. 1 : 97, 1815.

Digitaria marginata Link, var. *fimbriata* Stapf in Fl. Trop. Afric. 9 : 440, 1919 ; Blatt. & McC. 125, t. 78 ; Fischer 1764.

D. marginata var. *ciliaris* Prain, Beng. Pl. 1181, 1903 ; C. 2 : 940.

Paspalum vars. *ciliare* & *commutatum* Hook. f. in FBI. 7 : 15, 1896.

McCann 3604 ! 3650 ! 3652 ! 5050(18) ! 5302 ! 5313 ! 5404 ! 5434 ! 5444 ! 9532 ! Large village water tank 27460 ! Saddle 9545 ! *Santapau* St. Xavier's Villa grounds, 6126 !

Digitaria stricta Roth ex R. & S., Syst. 2 : 474, 1817.

Paspalum royleanum Nees ex Thw., Enum. 358, 1864 ; FBI. 7 : 18.

Digitaria royleana Prain, Beng. Pl. 1181, 1903 ; C. 2 : 942 ; Blatt. & McC. 127, t. 82 ; Fischer 1765 ; Bor, Pl. As. 210.

Gammie, Sept. 1902, 15365 ! *Blatt. Herb.* 9511 ! *Santapau*, Behran's Plateau, 2247 !

DIMERIA R. Br.

Dimeria blatteri Bor, in Kew Bull. 1949 : 70, 1949.

The type sheet of this species, *Blatt. & McCann* 9918(17) ! was collected in Khandala, and is preserved in the Blatter Herbarium, Bombay. For a full description of the plant see Bor loc. cit.

Dimeria filiformis (Roxb.) Hochst. ex Miq., in Verh. Nederl. Inst. (3) 4 : 35, 1851 ; Pilger 109.

D. ornithopoda Trin., Fund. Agrost. 167, t. 14, 1829 ; Hack., Mon. Andr. 81, 1889 ; FBI. 7 : 104 ; Cooke 2 : 945 ; Blatt. & McC. 8, t. 4.

Andropogon filiformis Roxb., Fl. Ind. 1 : 260, 1820 & 1 : 256, 1832.

Woodrow, ex Blatt. & McC.; *Saxton*, Oct. 1915, 9477 ! *McCann* A 309 ! A 310 ! 9885 ! 9887 ! 9918(18) ! *Santapau*, in a ditch near station, 5366 !

Dimeria gracilis Nees ex Steud., Syn. Pl. Glum. 413, 1855 ; FBI. 7 : 105 ; C. 2 : 946 ; Blatt. & McC. 9 ; Fischer 1713.

McCann A 318 ! *Saxton & Bhide*, in open grassland, 9478 !

Dimeria stapfiana Hubbard ex Pilger, in Pfam. (ed. 2) 14 e : 109, 1940.

Woodrowia diandra Stapf in Hook. Icon. t. 2447, 1896 ; FBI. 7 : 241 ; C. 2 : 1012.

Dimeria diandra Stapf ex Bhide, in Journ. & Proc. As. Soc. Beng. (N. S.) 7 : 515, 1911 ; Blatt. & McC. 9 (non Griff.).

McCann A 318 ! A 319 ! 9918(16)! 9918(17) ! *Saxton & Bhide* 9478 ! *Gammie* 15435 !

ECHINOCHLOA Beauv.

Echinochloa colonum (Linn.) Link., Hort. Berol. 2 : 209, 1827 ; Blatt. & McC. 148, t. 94 ; Bor 122, t. 27 & Fl. As. 246 ; Pilger 31.

Panicum colonum Linn., Syst. (ed. 10) 870, 1759 ; FBI. 7 : 32 ; C. 2 : 931.

McCann 5308 ! 5332 ! 5336 ! 5407 ! 5438 ! 5443 ! 9582 ! 27441 ! *Santapau*, in pools near Khandala station, 480 !

Echinochloa crus-galli (Linn.) Beauv., Agrost. 161, 1812 ; Blatt. & McC. 150, t. 95 ; Bor, Fl. As. 247 ; Pilger 31.

Panicum crus-galli Linn., Sp. Pl. 56, 1753 ; FBI. 7 : 30, pro parte.

McCann A 101 ! *Blatt. Herb.* 5288 ! 9582 ! 9582(2) !

[*Echinochloa stagnina* (Retz.) Beauv.: Blatt. & McC., 151, write : " Khandala, in water tank in the small village tank (McCann 27441!)" ; the sheet in question has been identified by Dr. Bor in Kew as belonging to *E. colonum* Link. The occurrence of *E. stagnina* in Khandala is doubtful.]

ELEUSINE Gaertn.

Eleusine coracana (Linn.) Gaertn., Fruct. 1 : 8, t. 1, 1788 ; Gr. 235 ; D. & G. Suppl. 97 ; FBI. 7 : 294 ; C. 2 : 1039 ; Blatt. & McC. 260, t. 173 ; Bor, Fl. As. 109.

Cultivated on ground where on account of its slope rice or other more profitable crops cannot be grown ; it is often parasitized by members of the Scrophulariaceae, especially by various *Striga* sps.

Local name : Natchni.

Blatt. Herb. 4406 ! 5402 ! *Santapau*, along a path, escape from cultivation, 7416 !

Eleusine indica (Linn.) Gaertn., Fruct. 1 : 8, 1788 ; Blatt. & McC. 259, t. 172 ; Bor 124, t. 28 & Fl. As. 108 ; Henrard in Blumea 3 : 454.

Cynosurus indicus Linn., Sq. Pl. 72, 1753.

Eleusine tristachya Lamk., Ill. 1 : 203, t. 203, 1791 ; FBI. 7 : 263 ; C. 2 ; 1037.

Blatter & McCann, March 1917, Khandala to Karjat, 5323 ! *McCann* 5303 ! 9407 ! 52916 !

ELYTROPHORUS Beauv.

Elytrophorus spicatus (Willd.) Camus in Lecomte, Fl. Gen. Ind. Ch. 7 : 547, 1923 ; Bor, Fl. As. 92.

Daccylis spicata Willd., in Ges. Naturf. Fr. Neue Schrift. 3 : 416, 1801.

Elytrophorus articulatus Beauv., Agrost. 67, t. 14, f. 7, 1812 ; FBI. 7 : 306 ; Blatt. & McC. 276, t. 188.

McCann 9392 ! *Santapau*, in cultivated fields, fairly common !

ERAGROSTIELLA Bor.

Eragrostiella bifaria (Vahl) Bor, in Ind. For. 66 : 270, 1930.

Poa bifaria Vahl, Symb. 2 : 19, 1791.

Eragrostis bifaria Wight ex Steud., Nom. (ed. 2) 1 : 562, 1840 ; Syn. Pl. Glum. 264, 1855 ; FBI. 7 : 325 ; C. 2 : 1029 ; Blatt. & McC. 241 ; Fischer 1828.

Woodrow, ex Blatt. & McCann, loc. cit.

ERAGROSTIS Beauv.

Eragrostis aspera (Jacq.) Nees, Fl. Afr. Austr. 408, 1841 ; FBI. 7 : 314 ; C. 2 : 1023 ; Blatt. & McC. 230 ; Fischer 1825.

Poa aspera Jacq., Hort. Vindob. 3 : 32, 1770-1776.

Blatt Herb. 5050(15) !

Eragrostis diarrhena (Schult.) Steud., Syn. Pl. Glum. 266, 1854 ; Fischer 1826 ; Bor, Fl. As. 97.

Poa diarrhena Schult., Mant. 616, 1827.

Eragrostis interrupta var. *diarrhena* Stapf in FBI. 7 : 316, 1896.

Poa interrupta Blatt. & McCann, Bombay Grass. 233, 1935, pro parte.

Blatter & Hallberg, Khandala to Karjat, 5322 ! *McCann* 9998 ! 5298 ! 5269 ! 5324 ! 5338 ! 5342 ! *Santapau*, Kune stream, 3816 !

Eragrostis chariis (Schult.) Hitch. in Lingnan Sci. Journ. 7 : 193, 1931.

Poa chariis Schult., Mant. 2 : 314, 1824.

Eragrostis gangetica Cooke, Blatt. & McC., et alior., non Steud.

E. elegantula Stapf in FBI 7 : 318, 1896.

Blatter & Hallberg, Khandala to Karjat A 3 ! *McCann* A 10 ! 5319 ! 5026(12) ! *Santapau*, St. Xavier's Ravine, 4449 !

Eragrostis japonica Trin., in Mem. Acad. Petersb. (ser. 6) 1 : 405, 1831 ; Bor, Fl. As. 97.

E. interrupta Blatt. & McC., Bomb. Grass. 233, 1935, pro parte.

E. interrupta var. *tenuissima* Stapf in FBI. 7 : 316, 1896.

Blatter Herb. 5079(2) ! 5326 ! 5330 ! 5341 !

Eragrostis cilianensis (All.) Link ex Lutati in Malpighia 18: 386, 1904 ; Blatt. & McC. 237, t. 157 ; Fischer 1827 ; Bor, Fl. As. 98.

Poa cilianensis Allion., Fl. Pedem. 2 : 246, t. 91, f. 2, 1785.

Eragrostis major Host, Gram. Austr. 4 : 14, t. 24, 1809 ; FBI. 7 : 320 ; C. 2 : 1026.

Blatter, along the main road, July 1916, 5445 !

Eragrostis gangetica (Roxb.) Steud., Syn. Pl. Glum. 266, 1854.

Poa gangetica Roxb., Fl. Ind. 1 : 341, 1820.

Eragrostis [illegible] Hochst. ex Miq., Anal. Bot. Ind. 2 : 27, 1851 ; FBI. 7 : 318, 1896 (excl. syn. nonnullis).

E. nutans Blatt. & McC. 237, 1935 ; Fischer 1826 ; Bor, Fl. As. 103, (non Steud).

McCann 5319 !

Eragrostis pilosa (Linn.) Beauv., Agrost. 71, 1812 ; FBI. 7 : 323 ; C. 2 : 1028 ; Blatt. & McC. 241, t. 160 ; Fischer 1827 ; Bor, Fl. As. 103 ; Henrard in Blumea 3 : 419.

Poa pilosa Linn., Sp. Pl. 68, 1753.

McCann A 7! A 7(2)! *Blatt. Herb.* 5333! 5410! 5050(26)! 5050(27)!

Eragrostis tenella Beauv., var. **plumosa** (Retz.) Stapf in FBI. 7 : 315, 1896 ; C. 2 : 1024 ; Blatt. & McC. 232, t. 155.

Poa plumosa Retz., Obs. 4 : 20, 1786.

Blatter, Oct. 1905, 4376 !

Eragrostis tenuifolia Hochst. in Flora 24 : I. Intellig.: 20, 1841, nom. nud.; Stapf in FBI. 7 : 322, 1896 ; C. 2 : 1027.

McCann, behind Khandala Hotel, Oct. 1918, A 18 !

Eragrostis unioloides (Retz.) Nees ex Steud., Syn. Pl. Glum. 264, 1855 ; Blatt. & McC. 235, t. 156 ; Fischer 1826 ; Bor 129, t. 29 & Fl. As. 99 ; Henrard in Blumea 3 : 423.

Poa unioloides Retz., Obs. 5 : 19, 1789; Gr. 236.

Eragrostis amabilis Wt. & Arn. ex Nees in Hook. & Arn., Bot. Beech. Voy. 251, 1830-1841 ; C. 2 : 1925 (non Linn.).

Blatter, Oct. 1905, 4375 ! 4404 ! 4409 ! *McCann* 5440 ! 3601 ! 3601(2) ! 3937 ! 5339 ! 5450 ! 5456 ! 9983 ! 9983(2) ! *Blatt. Herb.* 5050(4) ! 5050(17) ! *Santapau*, in grassy field near station, 8127 !

Eragrostis viscosa (Retz.) Trin. in Mem Acad. Petersb. (ser. 6) 1 : 397, 1831 ; D. & G. 298 ; Blatt. & McC. 233 ; Fischer 1826 ; Bor 127 & Fl. As. 95.

Poa viscosa Retz., Obs. 4 : 20, 1786 ; Gr. 236.

Eragrostis tenella var. *viscosa* Stapf in FBI. 7 : 315, 1897 ; C. 2 : 1024.

Blatter & *McCann*, loc. cit.

EULALIA Kunth.

Eulalia fimbriata (Hack.) O. Kuntze, Rev. Gen. Pl. 775, 1891 ; Blatt. & McC. 53, t. 36.

Pollinia fimbriata Hack., Mon. 164, 1898 ; FBI. 7 : 112, 1896 ; C. 2 : 950.

McCann 5300 ! 9724 ! *Santapau*, slopes of Duke's Nose Ravine, 1320 !

Eulalia trispicata (Schult.) Henrard, in Blumea 3 : 453, 1940.

Andropogon trispicatus Schult., Mant. 2 : 452, 1824.

Pollinia argentea Trin., in Bull. Soc. Sci. Petersb. 1 : 71, 1836 ; FBI. 7 : 111 ; C. 2 : 950.

Eulalia argentea Brongn., Voy. Coq. Bot. 92, 1829-1831 ; Blatt. & McC. 52, t. 35.

McCann, Behran's Plateau, 97 ! Saddle, 9918(14) ! At 600 m. alt., 9716 ! 9719 ! 9918 (7) ! 9721 ! 9718 ! 9720 ! 9918(4) ! *Hallberg*, 9659 ! *Santapau*, at altit. 600 m., 211/33 ! On earth banks behind Khandala Hotel, 9566 ! 9567 ! 9568 ! Kune plateau, 1273 !

GARNOTIA Brongn.

Garnotia arborum Stapf ex Woodrow in JBNHS 13 : 439, 1901 ; C. 2 : 1013 ; Blatt. & McC. 206, t. 135.

McCann. ex Blatt. & McC., loc. cit.

Garnotia stricta Brongn. in Duperr. Voy. Bot. 133, t. 21, 1829 ; FBI. 7 : 243 ; C. 2 : 1013 ; Blatt. & McC. 207, t. 136 ; Fischer 1812 ; Bor, Fl. As. 152.

McCann A 299 ! A 301 ! A 302 !

HACKELOCHLOA O. Kuntze.

Hackelochloa granularis (Linn.) O. Kuntze, Rev. Gen. pl. 776, 1891 ; Pilger 134, t. 74 ; Fischer 1758.

Cenchrus granularis Linn., Mant. 2 : App. 575, 1771.

Manisuris granularis Linn. f., Nov. Gram. Gen. 40, 1779 ; Gr. 234 ; FBI. 7 : 159 ; C. 2 : 955 ; Blatt. & McC. 32, t. 22.

Woodrow, McCann 9410 ex Blatt. & McCann, loc. cit. ; *McCann* 9393 !

HETEROPOGON Pers.

Heteropogon contortus (Linn.) Beauv. ex R. & S., Syst. 2 ; 836, 1817 ; Blatt. & McC. 109, t. 71 ; Pilger 183.

Andropogon contortus Linn., Sp. Pl. 1045, 1753 ; FBI. 7 : 199 ; C. 2 : 990.

McCann A 268 ! 3900 ! 9628 ! 9427 ! 9650 ! St. Mary's villa, A 265 ! Railway line, 9628 ! Altit. 600 m., 3899 ! Behind Duke's Nose, 5050(25) ! St. Xavier's villa, 9422 ! 9952 ! Echo Point, 9629 ! *Sedgwick*, 7978 ! *Santapau*, Altit. 600 m. 211/32 ! Kune Plateau, 1265 !

Heteropogon polystachyos (Roxb.) Schult., Mant. 2 : 460, 1824 : Blatt. & McC. 107.

Andropogon polystachyos Roxb., Fl. Ind. 1 : 261, 1832.

Woodrow, ex Blatt. & McC., loc. cit.

Heteropogon ritchiei (Hook. f.) Blatt. & McC. in JBNHS 32 : 623, 1928 & Bomb. Gras. 108, t. 70.

Andropogon ritchiei Hook. f. in FBI. 7 : 201, 1896 ; C. 2 : 990.

Blatt. Oct. 1905, 4404 ! *McCann* A 265 ! 9424 ! 9649 !

Heteropogon triticeus (R. Br.) Stapf ex Craib in Kew Bull. 1912 : 432, 1912 ; Pilger 183.

Andropogon triticeus R. Br., Prodr. 201, 1810 ; Steud., Syn. Pl. Glum. 368, 1855 ; FBI. 7 : 200 ; C. 2 : 989.

Heteropogon insignis Thw., Enum. 437, 1864 ; Blatt. & McC. 108, t. 69.

McCann 9390 ! 9425 ! 9646 ! 9648 ! *Santapau*, Monkey Hill Plateau, 7414 ! 7415 !

HYGRORIZA Nees.

Hygroriza aristata (Roxb.) Nees in Edinb. N. Phil. Journ. 15 : 380, 1833 ; FBI. 7 : 95 ; C. 2 : 1041 ; Blatt. & McC. 271, t. 184.

Leersia aristata **Roxb., Fl. Ind. 2 : 207, 1832 ; Gr. 235.**

***Santapau*, abundant in village talao, 10041—10043 ! 12942 !**

ISACHNE R. Br.

Isachne globosa (Thunb.) O. Kuntze, Rev. Gen. Pl. 778, 1891; Pilger 87; Henrard in Blumea 3 : 463-464.

Milium globosum Thunb., Fl. Jap. 49, 1784.

Isachne australis R. Br., Prodr. 196, 1810; FBI. 7 : 24; C. 2 : 923; Blatt. & McC. 188, t. 122.

Blatter 4407 ! 17730 ! 27437 ! *McCann*, 4409(6) ! 5050(6) ! 52871 ! 5307 ! 5311 ! 5459 ! 9554 ! 9556 ! 9557 ! 9558 ! 9559 ! 9838 ! 9840 ! A 22 ! *Santapau*, St. Xavier's Villa, 2765 !

Isachne gracilis C. E. Hubbard, in Kew Bull. 1939 : 654, 1940.

Gammie 15388 !

Isachne miliacea Roth ex R. & S., Syst. 2 : 476, 1817; Henrard, loc. cit. 465; FBI. 7 : 25; C. 2 : 923; Blatt. & McC. 189, t. 123.

Santapau, Kune Plateau, 1262 !

Isachne pulchella Roth, Nov. Pl. Sp. 58, 1821; Henrard in Blumea 3 : 472.

I. elegans Dalz. in D. & G. 291, 1861; FBI. 7 : 23; C. 2 : 923; Blatt. & McC. 187, t. 121; Fischer 1797.

McCann 5286 ! 9400 ! Behind Khandala Hotel 9555 !

ISCHAEMUM L.

Ischaemum aristatum Linn., Sp. Pl. 1049, 1753; FBI. 7 : 126; C. 2 : 958; Blatt. & McC. 11, t. 6; Pilger 126.

I. ciliare Retz., Obs. 6 : 36, 1791.

McCann 9908 ex Blatt. & McC.; 5305 ! 9933 ! 9618 ! 9612 ! 9614 ! 9918(2) ! 9929 ! 9932 ! 9620 ! *Santapau*, in village talao, 10041—10043 !

Ischaemum bombaiense Bor in JBNHS 49 : 165, 1950.

For a full description of the plant, see reference.

The type, Blatter 9904, was collected in Khandala, Tata's Lake and is preserved in Herb. Kew. and in Blatt. Herb., Bombay. "This is a most remarkable species. At first sight it might be taken for *Ischaemum rugosum* Salisb. were it not for the very large spikelets. A further remarkable and unique feature in the genus is the presence of nodules on the upper glume of both the sessile and pedicelled spikelets. This grass should be sought for again and should not be very difficult to find." (Bor, loc. cit. p. 166.)

Ischaemum diplopogon Hook. f., FBI. 7 : 129, 1896; C. 2 : 960; Blatt. & McC. 14, t. 8.

Saxton & Bhide, in open grassland, 9491 ! *Blatt. Herb.* 5355 ! 9918(5-6) ! *McCann* 9909 ! *Santapau*, Kune Plateau, 1272 !

Ischaemum imbricatum Stapf ex Ridley, Fl. Mal. Pen. 5: 200, 1925; Bor, Fl. As. 422.

McCann 9905 ! 9944 (2-3) !

Ischaemum impressum Hack., Mon. Andr. 210, 1889; FBI. 7: 132; Blatt. & McC. 17.

McCann 9943 !

Ischaemum molle Hook. f., FBI. 7 : 128, 1896; C. 2 : 959; Blatt. & McC. 13; Fischer 1722.

McCann 5405 ! Saddle, 9902 ! Railway line, 9944 !

Ischaemum rugosum Salisb., Icon. Stirp. 1, t. 1, 1791; FBI. 7 : 127; C. 2 : 959; Blatt. & McC. 12, t. 7; Bor 147, t. 35; Pilger 126.

Saxton, Oct. 1915, 9489 ! *McCann* 5316 ! 9903 ! 9904 !

Ischaemum santapaui Bor in JBNHS 49 : 167, 1950.

The type of this species, Santapau 9665, was collected at Karjat, at the foot of the Ghats, just below Khandala ; this grass is very common all along the railway line from Karjat to Khandala, and in the neighbourhood of Khandala Station.

Santapau 10560-10563 !

Ischaemum semisagittatum Roxb., Hort. Beng. 8, 1814 & Fl. Ind. 1 : 320, 1832; FBI. 7 : 130; C. 2 : 961; Blatt. & McC. 15, t. 10; Fischer 1722.

Blatter 5292 ! *McCann*, at 600m. altit., 5304 ! 5331 ! 5340 ! 9912 ! St. Xavier's Villa, 4409(2) ! 9418 ! 9420 ! Khandala to Campoli, 9910 ! Railway line, 9913 ! Without exact locality, 9416 ! 9417 ! 9611 ! 9611(2) ! 9613 ! 9917 ! 27441(2) ! 4409 (3) ! 9615 ! *Santapau* !

McCann remarks : " No. 9416 has variegated leaves. The leaves are longitudinally striped with green and white."

Ischaemum timorense Kunth, Rev. Gram. 1 : 369, t. 98, 1829; FBI. 7 : 136; Blatt. & McC. 19; Fischer 1722.

McCann, Saddle, 9917 ! *Santapau*, Kune Plateau, in cultivated fields after the harvest, 1270 !

Ischaemum sp.

The following two specimens are too imperfect for an exact determination ; they are definitely *Ischaemum* sp.

Blatt. Herb. 5305 ! 5405 !

MANISURIS Sw.

Manisuris clarkei (Hack.) Bor, comb. nov.

Rottboellia clarkei Hack., in Oest. Bot. Zeitschr. 41 : 8, 1891; FIB. 7 : 156; C. 2 ; 954.

Coelorhachis clarkei Blatt. & McC. in JBNHS 32 : 33, 1927, & Bomb. Grass. 41, t. 29.

McCann, behind Khandala Hotel, 9410 !

Manisuris forficulata Fischer in Kew Bull. 1933 : 355, 1933 & in Gamble, Fl. Madr. 1761 ; Pilger 136.

Rottboellia [illegible] : Lisboa, Bomb. Gras. 57, 1896 ; FBI. 7 : 155 (non Hack.).

Peltophorus divergens Blatt. & McC., Bomb. Grass. 34, t. 23, 1935 (non Camus).

Woodrow, ex Blatt. & McC., loc. cit.; *McCann* A 68 ! A 69 ! A 70 ! 5050(9) ! 9616 !

MELANOCENCHRUS Nees.

Melanocenchrus jacquemontii Jaub. & Spach., Ill. Pl. Or. 4 : 36, 1851.

M. royleana Nees ex Steud., Syn. Pl. Glum. 218, 1854.

Gracillea royleana Hook. f., FBI. 7 : 284, 1896 ; C. 2 : 1031 ; Blatt. & McC. 248, t. 165.

McCann, Khandala to Campoli, A 57 !

OPLISMENUS Beauv.

Oplismenus burmannii (Retz.) Beauv., Agrost. 54, 1812 ; FBI. 7 : 68 ; C. 2 : 927 ; Blatt. & McC. 154, t. 97 : Bor 158 & Fl. As. 263 ; Pilger 47.

Panicum burmannii Retz., Obs. 3 : 16, 1783.

McCann, 9392 ! 9592 !

Oplismenus compositus (Linn.) Beauv., Agrost. 54, 1812 ; FBI. 7 : 66 ; C. 2 : 927 ; Blatt. & McC. 152, t. 96 ; Bor 157, t. 42 A. & Fl. As. 262 ; Pilger 47.

Panicum compositum Linn., Sp. Pl. 57, 1753.

McCann 5335 ! Ghira Hill, 9391 ! St. Xavier's Villa, 9434 ! *Santapau* at altit. 600m., 211/31 ! Kune Plateau 1268 ! Duke's Nose Ravine 1325 !

ORYZA Linn.

Oryza sativa Linn., Sp. Pl. 333, 1753 ; FBI. 7 : 92 ; C. 2 : 1043 ; Blatt. & McC. 274, t. 187 ; Bor, Fl. As. 170.

Blatt. Herb. 5309 ! 9402 ! *Santapau* sparsely cultivated in the district.

PANICUM Linn.

Panicum miliare Lamk., Illustr. 1 : 173, 1791 ; FBI. 7 : 46 ; Gr. 237 ; C. 2 : 939 pro parte ; Blatt. & McC. 160, t. 101.

Blatt. Herb. 5088 ! 5334 ! Ghira Hill, Oct. 1918 !

Panicum montanum Roxb., Fl. Ind. 1 : 313, 1820 ; FBI. 7 : 53 ; C. 2 : 938 ; Blatt. & McC. 164, t. 105 ; Fischer 1783 ; Bor 180 & Fl. As. 234.

McCann, A 136 ! A 143 !

Panicum paludosum Roxb., Hort. Beng. 8, 1814 & Fl. Ind. 1 : 307, 1832 (non Nees) ; Blatt. & McC. 162 ; Bor 166, & Fl. As. 229 ; Pilger 18.

P. proliferum Hook. f., FBI. 7 : 50, 1896 (non Lamk.).

McCann, altit. 600 m., 5310 ! *Blatt. Herb.* 3596 ! Sept. 1918 !

Panicum psilopodium Trin., Gram. Panic. 217, 1826 ; FBI. 7 : 46 ; Blat. & McC. 158 ; Fischer 1782 ; Bor, Fl. As. 233 ; Pilger 22.

Blatt. Herb. 5036(2) ! 5050(8) ! 5050(14) ! 5403 ! 5442 ! 5435 ! 5448 ! 9838(2) ! 5454 ! 5464 ! 5446 ! 5374 ! 9918(8, 9, 10, 11, 12, 13) ! *Santapau*, St. Xavier's Villa, 9236 ! Monkey Hill, 9269 !

PASPALIDIUM Stapf.

Paspalidium flavidum (Retz.) A. Camus in Lecomte, Fl. Gen. Indo-Ch. 7 : 419, 1922 ; Blatt. & McC. 141, t. 90 ; Bor 172, t. 44 & Fl. As. 258 ; Pilger 29.

Panicum flavidum Retz., Obs. 4 : 15, 1786 ; FBI. 7 : 28 ; C. 2 : 929. *Woodrow* ex Cooke, loc. cit.

PASPALUM Linn.

Paspalum compactum Roth, Nov. Pl. Sp. 36, 1821 ; FBI. 7 : 12 ; C. 2 : 943 ; Blatt. & McC. 138, t. 88 ; Fischer 1772 ; Bor, Fl. As. 251.

Blatter 9507 ! *McCann*, 5050(10)! 5050(19) ! St. Mary's Villa 9553 ! In gravelly soil, 9823 ! *Blatt. Herb.* 9506 ! *Santapau*, in a ditch in grass field near Reversing Station, 5367 !

Paspalum scrobiculatum Linn., Mant. 1 : 29, 1767 ; FBI. 7 : 10 (excl. syn. *P. orbic.* Forsk.) ; C. 2 : 943 ; Blatt. & McC. 136, t. 87 ; Bor 174, t. 45 & Fl. As. 253 ; Pilger 62.

Blatt. Herb. 5455 ! 5050(7) ! 5050(13) ! 5050(23) ! Behind Khandala Hotel, 5462 ! *McCann*, large water tank, 27434 ! *Santapau*, 211/15 ! Top of Bhoma Hill, 2510 ! In moist ground along water course, St. Xavier's Ravine, 4448 !

PENNISETUM Pers.

Pennisetum typhoides (Burm.) Stapf & Hubbard in Kew Bull. 1933 : 271, 1933 ; Fischer 1792 ; Bor, Fl. As. 297.

P. typhoideum Rich. in Pers., Syn. 1 : 72, 1805, pro parte ; FBI. 7 : 82 ; C. 2 : 917 ; Pilger 81.

Alopecuros typhoides Burm., Fl. Ind. 27, 1768.

McCann, St. Mary's compound, 9397 ! *Santapau*, along the railway line, 2446 ! 5053 ! In ditch near railway station, solitary, 8624 !

POGONACHNE Bor.

Pogonachne racemosa Bor in Kew Bull. 1949 : 176, 1949.

Blatter & McCann 9924 ! 9925 ! 9926 !

PSEUDANTHISTIRIA Hook. f.

Pseudanthistiria heteroclita (Roxb.) Hook. f., FBI. 7 : 219, 1896 ; Blatt. & McC. 121, t. 76 ; Fischer 1749 ; Pilger 158.

Anthistiria heteroclita Roxb., Fl. Ind. 1 : 249, 1832.

McCann A 332 ! A 333 ! A 290 ! 5041(2) ! 5359 !

Pseudanthistiria hispida Hook. f., FBI. 7 : 219, 1896 ; C. 2 : 992 ; Blatt. & McC. 120 ; Fischer 1749.

McCann, railway line, A 331 ! A 292 !

PSEUDODICHANTHIUM Bor.

Pseudodichanthium serrafalcoides (Cooke & Stapf) Bor in Ind. For. 66 : 272, 1940.

Andropogon serrafalcoides Cooke & Stapf, in Kew Bull. 1908 : 450, 1908.

A. cookei Stapf ex Woodrow in JBNHS 13 : 438, 1898, nom nud. ; C. 2 : 986, 1908, cum descript.

Dichanthium serrafalcoides Blatt. & McC., in JBNHS 32 : 426, 1928 ; Bomb. Grass. 95, t. 63.

McCann & Hallberg, Echo Point, 9403 ! 9404 !

PSEUDORAPHIS Griff.

Pseudoraphis aspera (Koen.) Pilger in Notizbl. Bot. Mus. Berl.-Dalh. 10 (No. 93) : 210, 1928 ; Blatt. & McC. 168, t. 109 ; Fischer 1790 ; Pilger 76, f. 453 J-S.

Panicum asperum Koenig, in Naturf. 23 : 209, 1789.

Chamaeraphis spinescens Poir., Encycl. Suppl. 2 : 189, 1811 ; FBI. 7 : 62 ; C. 2 ; 922.

McCann, on banks of village tank, 9848 !

PSEUDOSORGHUM A. Camus.

Pseudosorghum fasciculare (Roxb.) Camus in Bull. Mus. Hist. Nat. Paris 26 : 662, 1920.

Andropogon fascicularis Roxb., Fl. Ind. 1 : 269, 1820 (non Thw.).

Santapau, Kune Plateau, 1269 !

SEHIMA Forsk.

Sehima nervosum (Rottl.) Stapf in Fl. Tr. Afr. 9 : 36, 1917 ; Blatt. & McC. 21, t. 14 ; Bor 194, t. 57 ; Pilger 128.

Andropogon nervosum Rottl. ex Willd. in Verh. Naturf. Fr. Berlin 4 : 218, 1803.

Ischaemum laxum R. Br., Prodr. 205, 1810 ; FBI. 7 : 136, pro parte ; C. 2 : 964, pro parte.

McCann 5106 ! Bhoma Hill, 9413 ! *Santapau*, Behran's slopes, 5038 !

Aeginetia pedunculata Wall. was growing as a parasite on the roots of this plant ; the slopes of Behran's Plateau are the only place in Khandala where this association has been observed in Khandala.

Sehima spathiflorum (Hook. f.) Blatt. & McC. in JBNHS. 32 : 23, 1927 ; Bomb. Grass. 20, t. 13.

Ischaemum spathiflorum Hook. f., FBI. 7 : 138, 1896 ; C. 2 : 963.

Woodrow ex Blatt. & McC. loc. cit.; *McCann* 9918 ! 9921 ! 9927 ! 9928 ! 9919 ! *Blatter* 5406 ! *Santapau*, Duke's Nose Ravine, 1322 !

SETARIA Beauv.

Setaria glauca (Linn.) Beauv., Agrost. 51, 1812 ; FBI. 7 : 78 pro parte ; Blatt. & McC. 172 ; Bor 198, t. 59 & Fl. As. 290.

Panicum glaucum Linn., Sp. Pl. 56, 1753.

Blatt. Herb. 3597 ! 4402 ! 5437 ! *McCann*, 3600 ! 5306 ! 9406 ! 9465 ! 9609 ! *Santapau*, grass fields on slopes of Behran's Plateau, 629 ! 2250 ! St. Xavier's Villa, 6876 !

Setaria intermedia R. & S., Syst. 2 : 489, 1817 ; FBI. 7 : 79 ; C. 2 : 920 ; Blatt. & McC. 174 ; Fischer 1789 ; Bor, Fl. As. 288.

Panicum intermedium Roth, Nov. Pl. Sp. 47, 1821 (non Vahl).

Blatter, Oct. 1905, 4410 ! *McCann* 5436 ! 5452 !

SORGHUM Pers.

Sorghum halepense (Linn.) Pers., Syn. 1 : 101, 1805 ; Blatt. & McC. 55, t. 37 ; Bor 200, t. 60 ; Pilger 144, f. 79A.

Holcus halepensis Linn., Sp. Pl. 1047, 1753.

Andropogon halepensis Brot., Fl. Lus. 1 : 89, 1804 ; FBI. 7 : 182 ; C. 2 : 983.

McCann, railway line, 9426 ! *Blatt. Herb.* 9399 ! *Santapau*, along the railway line at foot of Behran's Plateau, 929 !

SPODIOPOGON Trin.

Spodiopogon rhizophorus (Steud.) Pilger in Pfam. (ed. 2) 14 e : 119, 1940.

Andropogon rhizophorus Steud., Syn. Pl. Glum. 381, 1855.

Spodiopogon albidus Benth. in JLS 19 : 66, 1881 ; FBI. 7 : 108 ; C. 2 : 947 ; Blatt. & McC. 51, t. 34.

Blatter 4399 ! *McCann*, Hotel 5432 ! St. Mary's Ravine, 9395 ! 9442 ! Altit. 600 m. 9401 ! Ghira Hill 9441 ! *Blatt. Herb.* Sept. 1919 ! *Santapau* in fairly dense forest, St. Mary's slopes, 1096 ! Monkey Hill, 2965 !

SPOROBOLUS R. Br.

Sporobolus diander (Retz.) Beauv., Agrost. 25, 1812 ; FBI. 7 : 247 ; C. 2 : 1017 ; Blatt. & McC. 221, t. 148 ; Fischer 1817 ; Bor 202, & Fl. As. 117.

Agrostis diandra Retz., Obs. 5 : 19, 1789.

McCann, at 600 m. altit., 5409 !

THEMEDA FORSK.

Themeda quadrivalvis (Linn.) O. Kuntze, Rev. Gen. Pl. 794, 1891 ; Blatt. & McC. 118.

Andropogon quadrivalvis Linn., Syst. (ed. 13) 758, 1774.

Themeda ciliata Hack., Mon. 664, 1889 ; C. 2 : 994.

Anthistiria ciliata Linn. f., Suppl. 113, 1781 ; FBI. 7 : 213.

Blatt. Herb. (without date)! *Santapau*, Kune Plateau, 1266 !

Themeda triandra Forsk., Fl. Aeg.-Ar. cxxiii & 178, 1775 ; Blatt. McC. 115, t. 74 ; Bor 208 & Fl. As. 406.

Anthistiria imberbis Retz., Obs. 3 : 11, 1783 ; FBI. 7 : 211.

A. ciliata Retz.: Gr. 239 ; D. & G. 304.

Themeda imberbis Cooke, Fl. Pres. Bomb. 2 : 993, 1908 ; Haines, Bot. Bih. & Or. 1049, 1924.

McCann, common, A 291 ! October 3918, (sine num.)!

Themeda tremula (Nees.) Hack., Mon. 667, 1889 ; C. 2 : 995 ; Blatt. & McC. 119, t. 75 ; Fischer 1746.

Anthistiria tremula Nees ex Steud., Syn. Pl. Glum. 401, 1855 ; FBI. 7 : 214.

McCann 5041(2) !

TRILOBACHNE Schenk ex Henrard.

Trilobachne cookei (Stapf) Schenck ex Henrard in Mededeeling van's Rijks Herb. no. 67 : 4, 1931 ; Pilger 189.

Polytoca cookei Stapf in Hook. Icon. 24 : t. 2333, 1894 ; FBI. 7 : 101 ; C. 2 : 998 ; Blatt. & McC. 5, t. 2.

McCann, behind Duke's Nose, 9394 ! At 1600 ft. altit. 9879 ! 9881 !

TRIPOGON Roth.

Tripogon capillatus Jaub. & Spach, Illustr. Pl. Or. 4 : 47, t. 332, 1850-53 ; FBI. 7 : 285 ; C. 2 : 1036 ; Fischer 1833 ; Blatt. & McC. 267, t. 179.

Garade Sept. 1910 ! *McCann*, on rocks, A 61 ! Among stones A 62 ! A 63 ! 9779 ! *Santapau*, St. Xavier's Villa, 858 ! Monkey Hill Plateau, 7431 !

Tripogon jacquemontii Stapf in Kew Bull. 1892 : 85, 1892 ; FBI. 7 : 286 ; C. 2 : 1037 ; Fischer 1833 ; Blatt. & McC. 268, t. 181.

Blatter & McCann 3599 ! *McCann* A 336 ! *Santapau*, Kune Plateau 1267 !

Tripogon lisboae Stapf in Kew Bull. 1892 : 84 ; FBI. 7 : 286 ; C. 2 : 1036 ; Blatt. & McC. 267, t. 180.

Bhide ex Blatt. & McC.; *Garade*, Sept. 1910 ! *McCann* 5050(5) ! 5050 (16) ! 9779(2)! A 334 ! *Santapau*, Monkey Hill slopes, on rocks in shaded spots, 7432 !

Tripogon pauperculus Stapf in Hook. Icon. t. 2442, 1896 (sphalm. " pauperulus ") ; FBI. 7 : 285 ; C. 2 : 1036 ; Blatt. & McC. 266, t. 178.

McCann, on rocks, A 65 ! A 66 ! A 67 ! *Santapau*, on flat rocks in open places, 4868 !

Tripogon sp.

The following specimens are too imperfect for an exact determination, they are definitely *Tripogon* : *McCann* 5050(2) ! 5050(21) !

TRITICUM Linn.

Triticum aestivum Linn., Sp. Pl. 85, 1753 ; Gr. 234 ; Blatt. & McC. 279.

T. vulgare Vill.: FBI. 7 : 367, 1896.

Blatt. Herb. 5314 !

VETIVERIA Thou.

Vetiveria zizanioides (Linn.) Nash in Small, Fl. Southeast U. S. 67, 1903 ; Blatt. & McC. 65, t. 40 ; Bor 216, t. 44.

Phalaris zizanioides Linn., Mant. 2 : 183, 1771.

Andropogon squarrosus Hook. f., FBI. 7 : 186, 1896 (non Linn. f.) ; C. 2 : 991.

Santapau, grassy fields on Kune Plateau, 2547 !

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