THE FLORA OF PURANDHAR

or

An Enumeration

of all the Phanerogamic Plants discovered

in Purandhar during the years 1944 - 1956.

By

H. Santapau, S.J., Ph.D., F.N.I.

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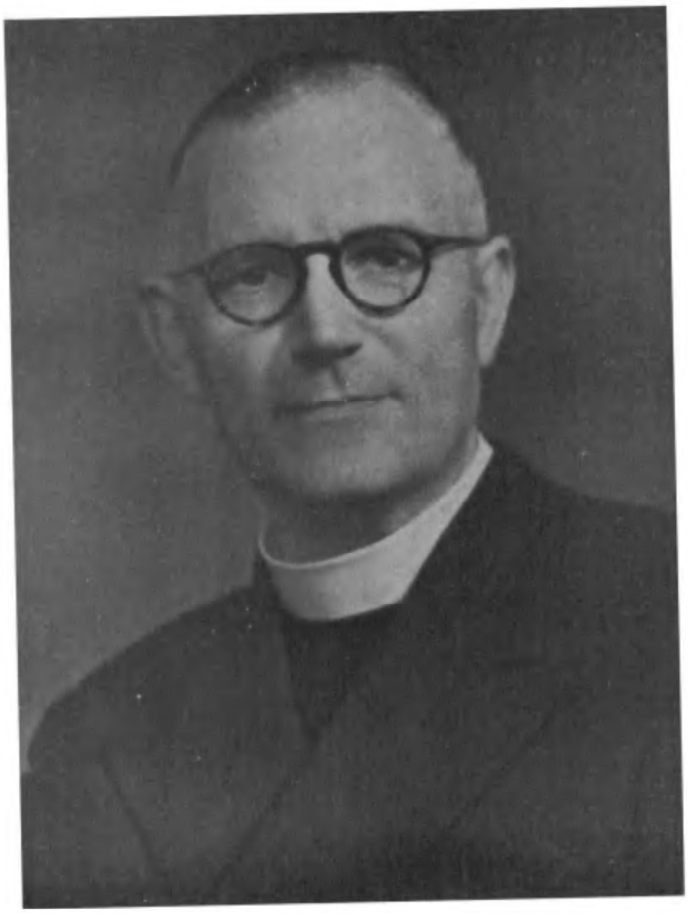
For 20 years he conducted explorations in Khandala, Purandhar, Mahableshwar, Saurashtra, the Dangs Forest, North Kanara and Salsette Islands. He was also engaged in explorations in Baluchistan. His total collections from these areas amount 65,000 plants. His publications in local and foreign journals number well over a hundred.

Purandhar is a hill station in the Bombay State. The book provides an interesting taxonomic study for an inquisitive botanist.



FR. H. SANTAPAU

Rev. Fr. H. Santapau, S. J., who was Rector and Head of the Botany Department at St. Xavier's College, has left Bombay for Calcutta to take charge of his new appointment as Chief Botanist, Botanical Survey of India, where he will carry out intensive exploration of medicinal and economic plants in India.

During the last 15 years, he has conducted explorations in Khandala, Purandhar, Mahableshwar, Saurashtra, the Dang forest, North Kanara, Bombay and Salsette Islands. He was also engaged in exploration of plants in Baluchistan, which he had to abandon owing to partition. The total collection from these areas which he classified till the end of October this year amount to 55,000 plants, while his publications in local and foreign journals number well over 100.

—*Times of India.*

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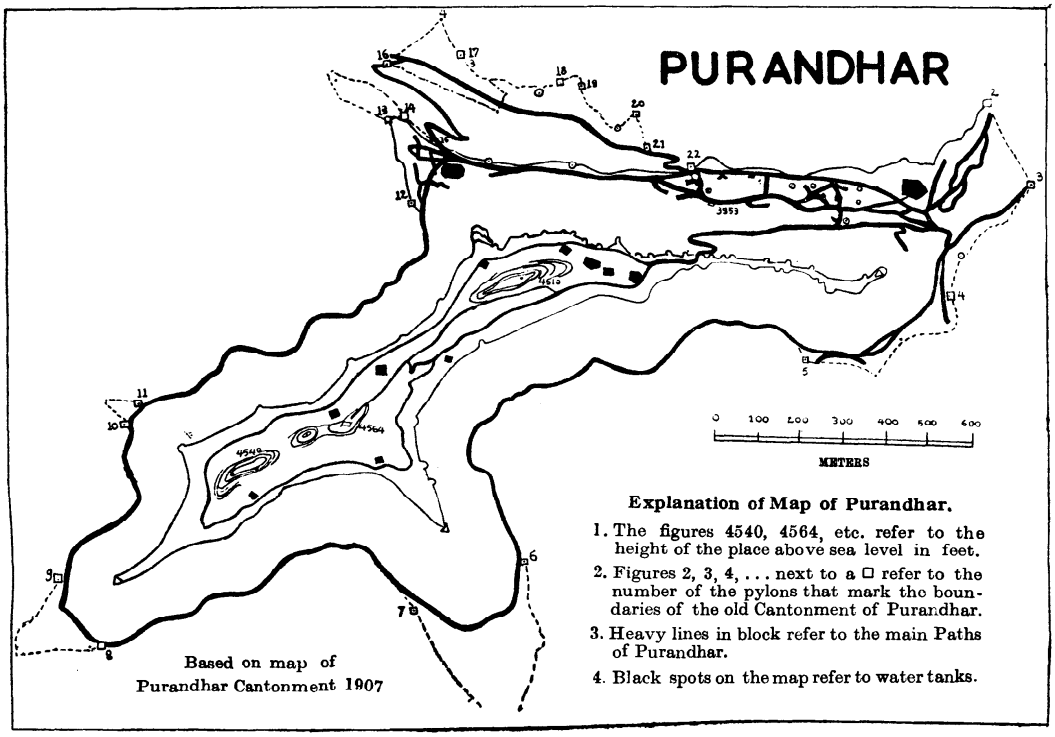

PURANDHAR
0 100 200 300 400 500 600
METERS
Based on map of
Purandhar Cantonment 1907
Explanation of Map of Purandhar.
1. The figures 4540, 4564, etc. refer to the height of the place above sea level in feet.
2. Figures 2, 3, 4, ... next to a □ refer to the number of the pylons that mark the boundaries of the old Cantonment of Purandhar.
3. Heavy lines in block refer to the main Paths of Purandhar.
4. Black spots on the map refer to water tanks.

PREFACE

The order followed in the Enumeration of the Plants of Purandhar is the same as that of Cooke in his *Flora of the Presidency of Bombay;* the nomenclature has, as far as possible, been brought up to date; the author, however, has been unable to check the names of the authors of the various generic and specific names so as to bring them to accord with Art. 42 of the *International Code of Botanical Nomenclature;* on the subject see Santapau in *Indian Forester* 79: 611 613, 1953. The degree of frequency of the plants, their flowering times and their relative abundance are generally mentioned in the body of the Enumeration, whenever field data warrant such an inclusion.

References to the classical books on the botany of Western India have been generally omitted; the reader is referred to the author's book on the Flora of Khandala in *Records of the Botanical Survey of India* 16(1) for full references. Synonyms have also been omitted except in cases where they are necessary to show the validity of the name adopted in the book.

Most of the plants of my collection have been checked against their types or against authentic specimens in Kew Herbarium; the data concerning name changes have been gathered in many years of work both in Kew and in India.

It is my pleasant duty to acknowledge my indebtedness to Sir Edward Salisbury, the Director, to Dr. W. B. Turrill, the Keeper of the Herbarium, to Dr. N. L. Bor, the Asstt. Director, and in general to the members of the staff of the Herbarium, Royal Botanic Gardens, Kew, for their constant help and encouragment. Dr. S. K. Mukerjee, the Curator of the Indian Botanic Garden, Calcutta, and Mr. M. B. Raizada, the Forest Botanist, Dehra Dun, have given me much help in the identification of my Purandhar specimens. My special thanks go to Mr. A. S. Holland, the Commandant of the Internment Camp and Parole Centre, Purandhar, for allowing me to visit the Camp for several years, and to Rev. J. Rudolph, S.J., my kindly and genial host during my many visits to the Camp.

As my visits to Purandhar have always been a great source of pleasure to me, it is my sincere hope that the following pages will help local botanists to enjoy their stay in one of the finest of our hill stations.

Bombay, Jan. 1st. 1957. *H. Santapau*

Purandhar Fort
from Vazirghad.

Purandhar Fort
from the South.

INTRODUCTION

Purandhar is a Maratha hill fort, situated about 40 kms. (25 miles) S.E. of Poona City, and about 10 kms. (6 miles) from Saswad town; the approximate bearings of Purandhar hill are 74° 2' E. and 18° 17' 30" N. Purandhar hill rises suddenly from the Deccan plains, and its approaches on the Poona side are unencumbered by any lesser hills; the view of Purandhar from the top of Diva Ghat is almost forbidding, a black mass of mountains that rise sheer out of the plain and tower above the whole district. Strategically the fortress under the Moghuls and later under the Peshwas was one of the strongest among the many strong hill forts. As is usual in military Maratha architechture, the fort of Purandhar is protected by a second fort, Vazirghad, situated to the N.E. and joined to it by a narrow "Saddle" or neck.

The highest point of Purandhar according to the Survey of India data rises to 1,387 m. (4,564 ft.) above sea level, and about 760 m. (2,500 ft.) above the surrounding plains. Vazirghad top is but a little lower than Purandhar, that is to say, 1,347 m. (4,420 ft.) above sea level. The outer or lower bastions of Purandhar are about 150 m. below the top; the Camp, so often mentioned in the following pages, lies within the outer bastions on the N. side of Purandhar.

The Camp became a military sanatorium about the middle of last century, and from that time many of the trees at present seen in Purandhar gardens were planted; among such trees foreign importations are predominant. The Camp itself is served by numerous roads that cross it in every direction, particularly E. to W.; leading out of the Camp in either direction there are two good roads that run round Vazirghad and Purandhar forts, the roads being level, broad and generally well preserved; until recently both roads could be used by fairly large vehicles. The limits of the Camp are marked by a number of pylons placed on the outer side of these roads; the pylons are numbered 1 to 22, the first being situated near the Madmavli tank in the Camp, and the numbering continues East to South and then West to North; pylon No. 9 marks about the farthest South West point of the hill.

My own Exploration of Purandhar

In the literature one often sees references to Purandhar, especially in connection with some of the rare plants of Bombay; but, to my know-

ledge, there had never been a systematic exploration of the hill. The nearest approach to such an exploration was that conducted by Blatter and McCann in 1917 1918, but then these two botanists confined themselves almost exclusively to the collection of grasses; the results of their work can be seen in their monograph on the Grasses of Bombay.

How I came to explore the flora of Purandhar, is one of the many accidents of World War II. Soon after the Allies began taking the initiative in Africa, numerous civilians were rounded up in Abyssinia and other parts of Africa and brought to India for internment; these new arrivals together with a number of other civilian internees were soon brought together to Purandhar, which thereby became an Internment Camp and Parole Centre. Mr. A. S. Holland, I.P. (Ret.) was put in command of the new camp; to help the internees pass their time less tediously, the commandant from time to time invited various lecturers to give talks to his people. Thanks to the help of Fr. J. Rudolph, I received a very kind invitation to visit the camp and give a few lectures on the plants of Purandhar. Guided by Fr. J. Rudolph, I went up to Purandhar from October 1944 to January 1946, more or less every three months; my stay in the camp usually lasted about a week. The routine followed after my first visit was this: first I spent several days studying the seasonal plants of the hill and its immediate neighbourhood, and then gave a talk and a demonstration on the same plants to the internees. Gradually the interest of the internees was aroused and soon I found myself surrounded by a band of eager helpers, who carried on the work of exploration during my absence from the Camp. Of such voluntary helpers three stand out as the most asiduous, and their names must be recorded here in token of gratitude for their help; they are G. L. Leszczynski, J. Kulp and R. E. Eklund. With the help of Mr. Holland, who was keenly interested in our work, we were able to explore the parts of the hill in or out of Camp, and in my absence the three collectors mentioned continued to gather large number of plants; the bulk of these collections they carried away when they were released from the Camp, but not before I had had time critically to examine most of their specimens and select a fair number for my own collection. In addition to plant collecting, Mr. R. E. Eklund, a very gifted artist and painter, made beautiful line or water-colour drawings of the more showy of Purandhar plants; a number of such drawings is now preserved in the Blatter Herbarium, Bombay. It is with sincere gratitude that from these pages I wish to acknowledge my indebtedness to these three willing helpers, whose company and assistance

made my work in Purandhar very pleasant indeed, and enabled me to see some of the rarer plants of the district.

Climatic Conditions.

All the data here given on climate, rainfall, etc. were put at my disposal by the Commandant, who very kindly allowed me to inspect the archives of the Camp and to make use of the information thus gathered. The series of annual rainfall tables extends from 1927 to 1936 and 1942 to 1945; up to 1936 they were compiled by the official military metereologist in charge of the station; from 1942 onwards observations were made by some of the professional metereologists interned in the Camp. As regards temperature data, I have been able to gather those relating to the same years as the rainfall, but in addition secured a detailed daily series for the whole of 1945.

a. Rainfall

Due to the distance from the coast, and because of the intervening mountain ranges, the rainfall at Purandhar is considerably less heavy than at e.g. Khandala or Mahableshwar, as may be seen from the following table:

TABLE 1 (i)

Total Annual Rainfall in Purandhar

Year	In Inches	In mm.
1927	58.5	1485
1928	56.5	1434
1929	43.5	1105
1930	60.5	1537
1931	60.25	1530
1932	64.5	1638
1933	64.75	1644
1934	57.75	1467
1935	40.50	1028
1936	43.00	1092
1942	63.05	1601
1943	67.76	1721
1944	64.93	1648
1945	54.66	1388

(i) According to the data supplied by Metereological Office, Poona, the mean annual rainfall for the years 1897—1911 was 43.79 inch. or approximately 109.4 cms.

The maximum rainfall for the years given on this table corresponds to 1943, with 67.76 in. or 1721 mm., the minimum to 1935 with 40.50 in. or 1028 mm.; the average for these years is 57.01 inches or 1451 mm.

The distribution of the rainfall in the months of the year follows more or less closely the same rate as for most parts about Bombay, with a decided emphasis on the middle of the monsoon. The following table gives the monthly rainfall in mm. for the years 1942 to 1945:

TABLE 2 (ii)

Year	Jan.	Febr.	March	Apr.	May	June	July	Aug.
1942	...	...	...	...	...	241	780	326
1943	13	...	19	...	111	198	730	239
1944	...	...	...	...	20	220	665	370
1945	...	...	...	10	...	166	486	525

	Sept.	Oct.	Nov.	Dec.	Total
1942	101	60	...	93	1601
1943	248	146	16	...	1720
1944	161	182	29	...	1649
1945	70	130	...	...	1387

The following table shows the maximum amounts of rainfall for a single day during the years 1942-1945, for the months of June to October; the original rainfall was measured in inches, but I have given it in mm.

TABLE 3

Year	June	July	August	Septem.	October.
1942	37.6	135	62	34	49
1943	16	147	34	38	33
1944	43	131	53	48	69
1945	18	50	107	8	43

b. Relative Humidity.

Among the climatic data in the archives of Purandhar I have not been able to find those concerning the Relative Humidity. From my own

(ii) The average monthly rainfall for the years 1897—1911, from the data supplied by the Metereological Office, Poona, is the following, in mm.: Jan. O.O; Feb. 1; Mar. O.5; Apr. 20.2; May 36; June 165; July 347.5; Aug. 271.5; Sep. 146; Oct. 70.75; Nov. 29; Dec. 6,7., *Total*: 1094,75.

experience, however, I may say that it is very high all through the monsoon months, often above 95%; Purandhar is often enveloped in dense clouds of mist that make life very hard during the monsoon months; keeping clothes, books, etc. free from various forms of mildew is a difficult task. During the dry months, in the early hours of the morning humidity may rise to 60 70 %, but during the noon and afternoon hours it comes down tc about 25%.

c. Temperature.

The temperature of Purandhar is very agreeably cool and pleasant during the greater part of the year; it is seldom that the maximum reaches 37.8°C (or 100°F) or the minimum goes below 10°C (or 50°F). Outside the Camp any changes in the tempearature are keenly felt, on account of the almost total absence of shade in any form; exposure to the sun often leads to severe sun-burns. The following two tables give the maximum and minimum temperatures for every month of the year for 1932 1936 and 1945, in degrees Centigrade.

TABLE 4

Maximum Monthly Temperatures.

	1932	1933	1934	1935	1936	1945
January	23.5	31.1	23.3	24.4	23.9	23.0
February	23.5	28.9	29.4	27.2	25.6	28.0
March	32.2	32.8	34.4	32.2	31.7	33.9
April	37.8	34.4	34.4	33.3	35.6	32.8
May	38.0	33.3	35.6	37.8	36.1	35.1
June	31.7	28.3	33.3	32.2	26.7	31.7
July	27.8	23?9	27.2	24.4	22.2	24.4
August	28.4	24.4	26.1	24.4	...	25.5
September	27.8	25.6	23.9	25.0	...	23.9
October	27.2	25.0	24.4	26.7	...	26.7
November	25.0	25.6	22.8	23.3	...	23.9
December	23.9	21.7	22.2	23.3	...	22.8

TABLE 5

Minimum Monthly Temperatures.

	1932	1933	1934	1935	1936	1945
January	13.3	11.1	11.7	11.7	11.1	7.2
February	12.2	14.4	10.6	13.3	12.2	13.3
March	16.7	16.7	14.4	12.2	12.2	15.0

April	16.7	17.2	19.4	18.3	18.3	17.5
May	18.3	17.2	17.8	18.9	20.0	19.7
June	18.3	18.3	18.3	18.9	18.9	18.3
July	16.1	16.7	16.1	17.2	18.9	17.2
August	16.7	16.7	16.7	16.7	...	16.7
September	16.1	15.6	16.1	15.6	...	16.7
October	16.7	15.7	16.7	17.8	...	16.7
November	13.9	15.0	13.3	16.1	...	15.5
December	13.3	13.9	13.3	14.4	...	11.7

Generad Aspect of the Vegetation of Purandhar Hill

Without wishing to come down to details, that may be seen in the body of this book, there are a few salient points in the vegetation of Purandhar that strike the visitor very forcibly.

1. As was customary in the case of most hill forts of Western India, the original forest of the slopes below the fort has been cut down repeatedly, so that at present there is no part of Purandhar that may be said to possess a real forest. Some of the original trees seem to have survived such deforestation, and this is especially the case on the north-eastern slopes below "Bottle Hill"; there one can see most of the commoner trees found in other parts of Western India. The reasons for this general cutting down of trees in the beginning seem to have been purely strategical, that is to say, trees or, in general, obstacles that could afford any cover to an invading army were carefully removed. But even after Purandhar ceased to have any strategic importance, the custom of cutting down the trees seems to have continued; the villagers living in several hamlets at the foot of the hill have been providing themselves with firewood from the regenerated trees on Purandhar slopes. This has resulted in the bare appearance of these slopes during the dry season. The soil has been largely eroded and carried away, so that at present only some of the hardiest shrubs or herbs are able to find a foothold on the whole hill.

2. The Camp has been largely replanted with a number of foreign trees or shrubs, among which *Casuarina, Grevillea, Hibiscus rosa-sinensis* are the most conspicuous. Such trees or shrubs seem to thrive well under local conditions, especially when given the proper attention during the seedling stages; many of the paths in the Camp are brightened with the showy flowers of *Hibiscus* or of *Reinwardtia.*

3. During the rainy season Purandhar is a glorious sight; the slopes are covered with *Thalictrum, Impatiens dalzellii, Lepidagathis cuspidata,* and

a multitude of grasses. On the upper parts of the fort much room is taken by *Delphinium, Phaseolus khandalensis* (*Ph. grandis*) and various plants of the family Zingiberaceae. In the period immediately following the monsoon, the dominant plants almost everywhere are *Celosia argentea, Impatiens balsamina, Vicoa cernua, Centratherum* and *Lamprachenium,* not to mention the ubiquitous *Senecio grahamii* and *Linum mysorense.* On the slopes the dominant plants are undoubtedly *Carvia callosa* and *Lantana camara* var. *aculeata* together with *Agave* mixed with numerous specimens of *Euphorbia neriifolia.* Very common all over the hill, but not sufficiently abundant to give character to the vegetation are such plants as *Kalanchoe olivacea, Hamiltonia suaveolens, Notonia grandiflora, Plectranthus stocksii, Lavandula gibsonii,* etc. Several species of *Artemisia* are very abundant, but their flowers are inconspicuous.

4. A very noticeable feature of Purandhar is the large number of rare or very rare plants that have been preserved on the spot. Among the most conspicuous of these rare plants, it is sufficient to mention *Delphinium, Cerastium glomeratum, Thalinum cuneifolium, Kickxia incana, Cissus woodrowii, Dolichos bracteatus* and *D. falcatus, Campanula alphonsi, C. canescens* and *C. ramulosa,* etc. Some of these plants are only found in the northern parts of India, Afghanistan, etc. or far to the south of the country. They may form but the relics of a vegetation that may have stretched from the far north to Purandhar and may have been wiped out by the drastic climatic changes that were brought to the intervening country in the course of geological history. This point makes the study of the flora of Purandhar rather interesting.

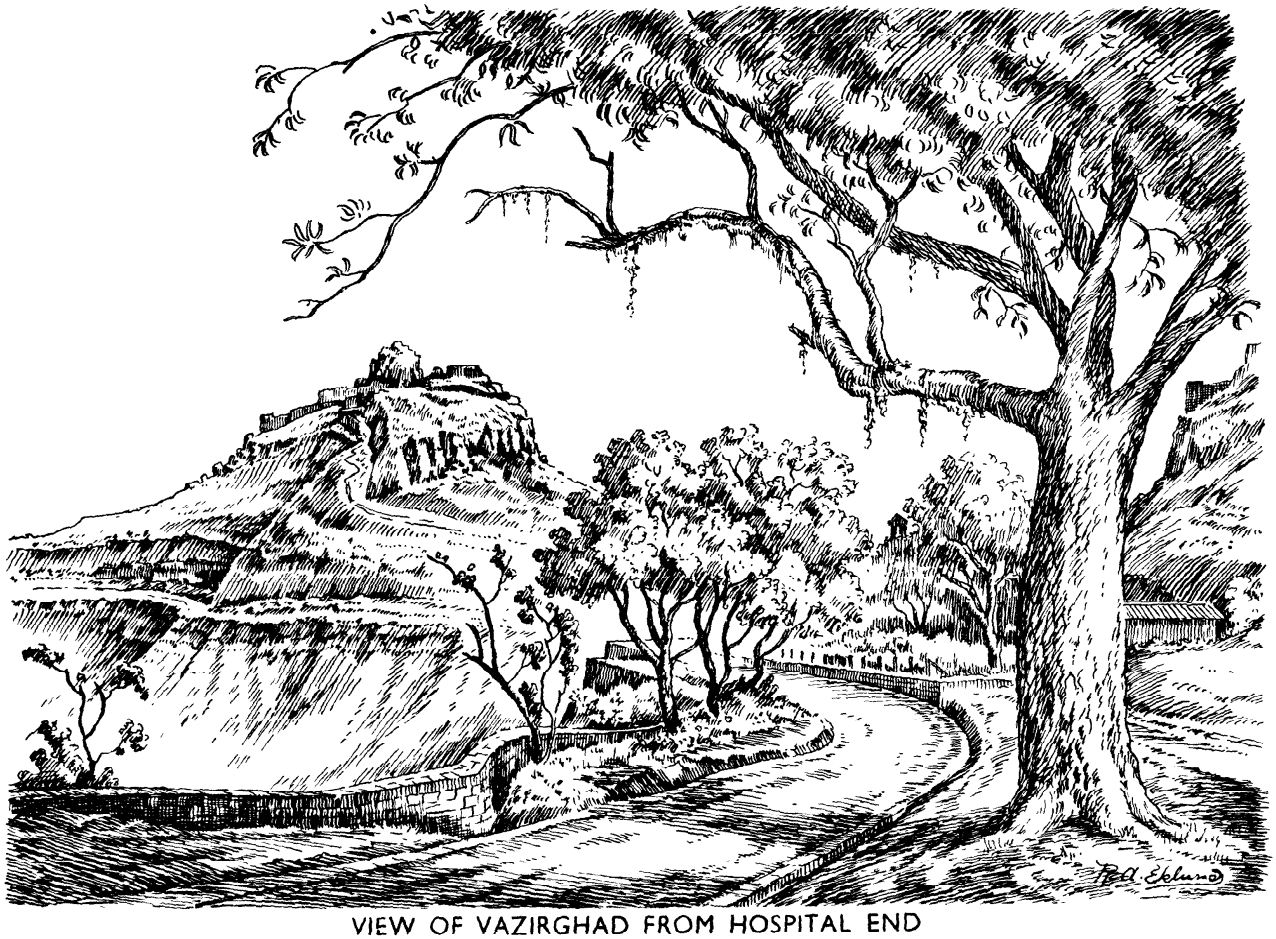
5. Plants that have been introduced from temperate areas seem to have become so naturalised in Purandhar that much of the ground on its slopes is dominated by such foreign introductions. *Lantana* and *Agave* have already been mentioned as two of the dominant plants on many of the slopes.

6. The slopes of Purandhar for many years have been very carefully protected against the usual summer fires, that cause so much damage to the vegetation of many of our hills. Thus it was that many plants, e.g. *Impatiens balsamina* var. *rosea* were able to persist for most of the year in moist and sheltered spots. In 1945 there was an accidental conflagration of the whole of the northern part of the hill; soon after the fire passed, some notable plants made their appearance, such as *Urginea indica, Peristrophe bicalyculata,* etc. Such plants were able to resist the ravages of fire on

account of their underground parts, which were not damaged by the intense but rapid fire that swept the hill sides.

7. The rocks on the upper parts of the hill deserve very special study; plants such as the Campanulas mentioned above, *Senecio edgworthii*, the two species of *Kickxia*, *Lindenbergia*, are common on them. Recently I had occasion to examine the rocks crowning "Bottle Hill" and found no fewer than 45 different species of plants growing on a relatively small space on the surface of the rock.

8. Finally one aspect of the vegetation that has struck me rather forcibly is the clear localisation of many of the finer plants of Purandhar. At a given spot, such plant or plants may be not only abundant, but even dominant over the rest of the vegetation, whilst at the same time they may be entirely absent from the rest of the hill. The eastern slopes below Purandhar fort show large and dense clumps of *Smithia setulosa; Barleria gibsonii* is only found on the north-eastern slopes below Vazirghad; *Dolichos bracteatus* and *D. falcatus* are abundant on the northern slopes below "Bottle Hill"; *Coleus forskohlaei* has been seen in dense patches on "Paradise Hill" slopes and below "Bottle Hill"; *Rungia repens* is very abundant only on the slopes towards the NW. below Vazirghad; whilst *Cephalostigma* is practically absent from Purandhar except on the eastern slopes of "Bottle Hill" where it is a conspicuous feature of the grassy slopes.



VIEW OF VAZIRGHAD FROM HOSPITAL END

ENUMERATION OF THE PLANTS OF PURANDHAR

Ranunculaceae

Climbing shrubs or undershrubs; petals absent	*Clematis*
Erect herbs; petals present:	
Flowers very irregular, blue; leaves, at least the lower ones, deeply lobed	*Delphinium*
Flowers, white; leaves crenate, but not at all or only shallowly lobed	*Thalictrum*

Clematis triloba Heyne ex Roth.

Herbaceous or woody climber, common on the higher slopes of the hill. Leaves simple, entire or more or less deeply lobed, or ternate, the leaflets entire or lobed. Sepals white, spreading, mucronate. Connective of anthers not produced. The flowers are among the largest for the wild species of the genus in Bombay State.

Flowers: September to November. *Fruits* : October to January.

Santapau 5352, 5352 (bis), 8396, 8407.

Clematis gouriana Roxb.

This is a difficult plant to identify in the absence of stamens; in many respects it is very similar to *C. hedysarifolia;* it may be distinguished by the pinnate to tripinnate leaves as against the simply pinnate ones of *hedysarifolia.* The only clear difference is in the connective of the anthers, which in the present species is not produced. Some of the specimens mentioned below may actually belong to the other species. Common on the higher parts of the hill.

Flowers: September to November. *Fruits:* December.

Santapau 5677, 8165, 8332, 8334; *Blatt. Herb.* 17429.

Clematis hedysarifolia DC.

The leaves of this species are simply pinnate, but the lowest pair or one of the pair of leaflets may occasionally by compound. Such compound leaflets are found on the same plant with a clearly produced connective. Common all over Purandhar.

Flowers: September to October. *Fruits:* October to January.

Santapau 5296.

Delphinium dasycaulon Fres.

One of the showiest of the wild plants of Purandhar; the flowers are of a deep blue, fading to pale blue or almost white. On the parts of the hill from the Camp upwards this is also one of the commonest and most abundant of plants; it seems to thrive only in well-watered and well-drained soil, it is found only on very steep slopes.

Flowers and fruits: July to December and onwards, but the plants were not kept under observation after December.

Santapau 5278, 5625, 5737, 8197, 8341, 8381; *Blatt. Herb.* 17420, 17430, 17431, 17432, 17433.

Thalictrum dalzellii Hook.

Stems erect, up to 70 cms. high when growing in dense patches; leaves glabrous, of a fine dark green, brittle when fresh. Flowers pure white, very elegant though small. This is one of the most elegant of the wild plants of Bombay. It is gregarious and abundant, growing in almost pure stands on the upper parts of the hill.

Flowers: July to September. *Fruits:* August to September.

Cooke & Woodrow, ex Cooke; *Bhiva* 31.8.1890; *Santapau* 7072, 7096, 7152, 7276, 7284.

Magnoliaceae

Michelia champaca Linn.

There are two large trees in a garden just behind the General Stores; both trees were in fruit during October 1950. The trees in Purandhar seem to be much larger than the average trees in Bombay, but their fruits were much smaller.

Santapau 11335 (2).

Menispermaceae

Cocculus hirsutus (Linn.) Diels.

A climbing or prostrate plant, herbaceous to subwoody. Not seen on the hill of Purandhar proper; it is found in dry waste lands or in cultivated fields at the very base of the hill, and in the absence of suport it is prostrate or procumbent.

Flowers and fruits: December.

Santapau 5691, 5768, 8445; *Blatt. Herb.* 17471.

Cocculus pendulus Diels.

In Dec. 1956, a plant was collected on the spur known as "Paradise", in open ground; the plant was erect or suberect, glabrous or nearly so and deep green. Rare.

Santapau Dec. 1956.

Papaveraceae

Spinous plants; flowers yellow	*Argemone*
Spineless plants; flowers red or purplish	*Papaver*

Argemone mexicana Linn.

Rare on the hill itself, fairly common at the foot of the hill on waste lands.

Flowers and fruits: Most of the year, with the exception of the monsoon months.

Santapau 5639; also Oct. & Dec. 1944, May & Dec. 1945.

Papaver sp. (**rhoeas** Linn. ?)

The plant belongs to *Papaver*, sect. 1, *Orthorhoeadales* F. Fedde. Flowers are red or purplish. This is obviously an escape from cultivation, but has been found growing wild at a considerable distance from human habitation, at about the level of the Camp.

Santapau 8255.

Cruciferae

Pods tumid, not compressed; seeds 2-seriate	*Rorippa*
Pods narrow-linear, compressed; seeds 1-seriate	*Cardamine*

Rorippa indica (Linn.) Hochreut.

Prostrate or erect herb, or prostrate with erect inflorescence. During the rainy season this plant is erect with fewer branches than during the dry part of the year. Flowers yellow, seeds 2-seriate. Rare.

Lesc. 622.

Cardamine trichocarpa Hochst.

Erect or more or less prostrate; flowers yellow, small. For the number of stamens see Blatter in *Journ. Bomb. Nat. Hist. Soc.* 34: 295, 1930. The seeds are fewer than in *Rorippa*, distantly placed in a single row on

either side of the septum. Common in moist spots all over Purandhar.

Flowers and fruits: August to December, and perhaps later.

Santapau 7279; *Bhide* 7.9.1907.

Brassica sp. (**nigra** Koch. ?).

A weed of cultivated fields at the foot of the hill; rare; flowers yellow.

Santapau 5353; *Kp.* 232.

Capparidaceae

Herbs; unarmed:

Stamens sessile on the disk	*Cleome*
Stamens inserted on a gynophore	*Gynandropsis*
Shrubs or trees, often heavily armed	*Capparis*

Cleome simplicifolia (Camb.) Hook. f. & Thoms.

The colour of the flowers as noted in the field is between "Hermosa Pink" and "Eosine Pink" of Ridgway, *Col. Stand.* I, 1 f-d. The number of stamens on the same plant seems to vary between 6 and 12. Collected only on the slopes between the Camp and the foot of the hill. Rare.

Flowers and fruits: September 1945.

Santapau 7209, 7210.

Gynandropsis gynandra (Linn.) Briq.

A rare plant, only seen at the foot of the hill, possibly an escape from cultivation.

Flowers and fruits: Most of the year.

Kp. 529; *Lesc.* 628.

Capparis zeylanica Linn. (non *C. zeylanica* Hk. f. & Thoms.)

A large climber with flowers arranged in supra-axillary vertical lines or rows, up to four flowers in a row; the inflorescence and young parts rusty tomentose; stipular spines short, hooked. On the slopes below the Camp.

Flowers: October 1945.

Santapau 8444.

Flacourtiaceae

Flacourtia indica Merr.

A small tree; flowers pale yellow, in the axils of present or fallen leaves, stigmas usually 4; fruit edible when ripe and black.

Santapau Oct. 1944, Dec. 1945, Jan. 1946, 8350; *Blatt. Herb.* 17662.

Polygalaceae

Flowers rose-pink to red	*P. persicariaefolia*
Flowers yellow, fading to pink	*P. chinensis*

Polygala persicariaefolia DC.

A small herb, procumbent or erect, with lanceolate leaves and rose-coloured flowers. Common in Purandhar in grass fields, at the end of the monsoon.

Santapau 5305, 5640, 7094, 7175; *Patwardan* 3.9.1920; *Gammie* 1014.

Polygala chinensis Linn.

A small herb with narrowly oblong, obtuse leaves. The plant is easily confused with some of the *Crotalaria* sp. of Bombay. Flowers yellow. On the slopes below the Camp.

Flowers: September 1945.

Santapau 7214.

Caryophyllaceae

Erect herbs:

Leaves glabrous, sessile, broadly oblong	*Saponaria*
Leaves narrow linear	*Polycarpaea*
Prostrate or procumbent herbs	*Cerastium*

Saponaria vaccaria Linn.

A weed of cultivation, often found in Purandhar about the Camp. Petals rose-coloured, emarginate. An elegant plant often used as a border plant in gardens.

Flowers: October to December.

Santapau 8389.

Cerastium glomeratum Thuill.

A small herb, usually prostrate, occasionally the inflorescence is erect. The most typical part of the plant are the open capsules, which are straw-coloured and much longer than the sepals. "The only locality in the Bombay Presidency from which the plant has been obtained is Purandhar, a hill fort in the Poona Collectorate where it is doubtless an introduction". (Cooke, Fl. Pres. Bombay 1:64). Flowers are pure white.

Flowers: September to January.

Santapau 8320, 8321, 8338, 8426, 11411; *Blatt. Herb.* 18213, 20781; *Cooke* Sept. 1891; *Bhiva* Sept. 1891.

Polycarpaea corymbosa Lamk.

An erect, very elegant herb with green or purple stems and branches, growing in cultivated fields at the foot of the hill; found also gregariously growing on the narrow neck to Bottle Hill, and in waste lands from Purandhar to Saswad.

Flowers: October 1950, December 1944.

Santapau 5689, 8275, 11300, 11531; *Kp.* 458.

Portulacaceae

Shrubby, erect, up to 1 m. high, with purple flowers	*Talinum*
Herbaceous, erect or procumbent, with yellow flowers	*Portulaca*

Portulaca oleracea Linn.

A very common herb in cultivated ground or in waste places; it is a succulent herb with green or purple stems. Occasionally it is used as a vegetable. Flowers are bright yellow, but very soon fall off. The whole plant is prostrate or erect, or more commonly prostrate in the lower parts, erect or suberect in the branches bearing the flowers.

Flowers: Practically the whole year, especially in moist places; immediately after the monsoon the flowers are at their best for their abundance.

Santapau 6185.

Portulaca sp.

This is a garden plant that has run wild in some parts of Purandhar;

the flowers are large and showy, the colours various (red, pink, yellow, white etc.).

Santapau 6201, 6202, 6203; *Kp.* 95; *Lesc.* 151.

Talinum cuneifolium Willd.

An erect shrubby plant, about 1 m. high, succulent. Flowers in terminal panicles, purple. A very rare plant even for Purandhar. I have not found the plant on the hill; on the other hand Sedgwick in his own copy of Cooke's Flora has added a marginal note: "Common in gardens as a weed, Dharwar."

Woodrow ex Cooke.

Malvaceae

Erect trees; flowers with accrescent involucre — *Kydia*

Shrubs, undershrubs or herbs; involucre, when present, not accrescent:

- Involucral bracts usually absent:
  - Flowers large and showy, at least 5 cms. diam. — *Abutilon*
  - Flowers small, up to 2.5 cms. diam. — *Sida*
- Involucral bracts usually present:
  - Stigmas coherent into a club-shaped mass — *Thespesia*
  - Stigmas free, spreading:
    - Ovules 1 in each cell:
      - Involucral bracts 3 — *Malva*
      - Involucral bracts 6 9 — *Althaea*
    - Ovules 3 or more in each cell:
      - Calyx persistent in the ripe fruit — *Hibiscus*
      - Calyx deciduous in the ripe fruit — *Abelmoschus*

Kydia calycina Roxb.

A small to middle-sized tree, on the slopes below the Camp, not common.

Flowers: October to December.

Santapau Dec. 1945; 8367; *Blatt. Herb.* 17879; *Bhide* 9 Sept. 1907.

Althaea rosea Cav.

Cultivated in many gardens in Purandhar, but not found truly wild in the district. The colour of the flowers varies from red to pink, white or

yellow or intermediate colours.

Santapau 8 May 1945; *Lesc.* 186.

Malva parviflora Linn.

A small, prostrate herb with orbicular leaves. Fairly common at the foot of the hill, not seen on Purandhar proper.

Flowers: not seen. *Fruits:* August 1946.

Santapau 29 August 1946; *Kp.* 185.

Sida veronicifolia Lamk.

Common on the slopes of the hill during the latter part of the monsoon until December, erect or suberect.

Kp. 328; *Lesc.* 532.

Sida glutinosa Cav.

Very similar to *S. veronicifolia,* but the whole plant is more hairy and glutinous-hairy. Fairly common on the slopes of the hill from the Camp downwards.

Flowers: December.

Santapau 8319; *Blatt. Herb.* 17831.

Sida spinosa Linn.

Fairly common in Camp and other parts at about the same height. There are two small processes at the base of the leaf which can be easily appreciated by touch. Flowers yellow or very pale yellow or whitish.

Santapau Sept. & Dec. 1945, Dec. 1956.

Sida rhombifolia Linn.

This is the typical variety of a very variable plant; for a discussion of the various forms, see Blatter in *Journ. Bombay Nat. Hist. Soc.* 34: 628. I have had my own specimens matched with those in Kew Herbarium, and in consequence do not feel any doubt about the identity of the plant.

Santapau 7119; *Ekl.* 331; *Kp.* 175; *Lesc.* 369.

Sida rhombifolia Linn. var. **retusa** Mast.

This is the commonest of the species of *Sida*; the shape of the leaves is very striking and distinct.

Santapau Dec.1944 ; *Blatt. Herb.* 17825.

Abutilon polyandrum (Roxb.) Wt. & Arn.

A large shrub with long, spreading branches and showy yellow or orange flowers. This is one of the more showy plants of this Family in Purandhar. Common on the slopes of the hill at about Camp level.

Flowers: December.

Santapau 5669, 5670, 5671, 5672; *Blatt. Herb.* 18346.

Hibiscus trionum Linn.

In my field notes I find the following: "Common in cultivated field at base of hill. Up to 2′ high. Flowers yellow with purple spot inside, 1—1¼″ diam. when open; calyx nerves at first green, then purple, in the end brown..." The only specimens seen are those mentioned below, collected in a cultivated field of *Eleusine coracana* at the very base of the hill.

Flowers and fruits: December 1945.

Santapau 8293 8299.

Hibiscus hirtus Linn.

In Purandhar this is one of the commonest species of the genus; it is in flower or fruit practically throughout the year. It grows in open slopes, occasionally in the shade. Flowers are white; the shape and size of the leaves are very variable.

Santapau Oct. 1944, Dec. 1944, Dec. 1945; *Blatt. Herb.* 17849.

Hibiscus cannabinus Linn.

My field notes on this plant are the following: "Flowers pale yellow with purple centre; leaves deeply 3-lobed. Calyx with long stiff hairs from an inflated base or tubercle." This plant is often cultivated in these parts of India for the sake of its fibres.

Santapau 5734, at the base of the hill.

Hibiscus solandra L'Herit.

This is a difficult plant in the field, its identification often being problematic mainly because the plant has no involucral bracts. Flowers yellow to pale yellow, leaves entire or nearly so in the upper parts of the plant, more or less deeply palmately lobed below.

Flowers: December to January.

Santapau 8408; *Blatt. Herb.* 17854.

Hibiscus rosa-sinensis Linn.

This is the common "Shoe-flower" of our gardens; it is commonly cultivated in gardens in Camp. Flowers are bright red, the petals entire or nearly so.

Santapau Dec. 1944; *Blatt. Herb.* 17868.

Hibiscus schizopetalus Hook. f.

Cultivated in gardens, not truly wild in the district. Petals are highly divided into more or less regular segments.

Ekl. 225, 391; *Kp.* 37; *Lesc.* 39.

Abelmoschus manihot (Linn.) Medik.

Common in open grass lands all over the hill. The name *tetraphyllus* of Roxburgh is a misnomer as far as Purandhar and other parts of western India are concerned, the plant generally has 5 epicalyx bracts, rarely 4 or 6.

Flowers: October to December; *Fruits:* December till the next monsoon.

Santapau Oct. 1944, Dec. 1944, 1945.

Abelmoschus esculentus (Linn.) Moench.

Frequently cultivated for its fruits, which are used as vegetables; I have not seen the plant growing wild in the district.

Kp. 144; *Lesc.* 251.

Thespesia lampas Dalz. & Gibs.

Common all over the hill, noticeable particularly during the second half of the rains.

Blatt. Herb. 17873.

Bombacaceae

Salmalia malabarica (DC.) Schott & Endl.

The common Silk Cotton Tree; fairly common on the slopes below the Camp.

Santapau 6 May 1945; *Ekl.* 218; *Kp.* 478.

Sterculiaceae

Eriolaena quinquelocularis Wight.

A small tree, which at best looks but poor and rugged, even when in flower. Flowers yellow and rather large. One tree noted in bud and

leaf, with the remains of the capsules of the previous season, on top of Vazirghad hill.

Flowers and old fruits: 7 May 1945.

Santapau 6186.

Tiliaceae

Small trees or very large shrubs — *Grewia*
Herbs or undershrubs:
Stamens inserted on a raised torus; fruits ovoid to subspherical, spinous — *Triumfetta*
Stamens inserted on a contracted torus; fruits spherical or cylindric, not spinous — *Corchorus*

Grewia tiliaefolia Vahl.

In Purandhar this is a small tree, scarcely ever more than 3 m. high; flowers and fruits profuse. Common on the western slopes of the hill at about the height of the Camp.

Santapau 6165. 6180, 7173.

Triumfetta annua Linn.

This plant is not given in Cooke's Flora; it is a common plant in Purandhar and in other parts in western India. The fruits including the spines are about 12 mm. in diameter, occasionally larger.

Santapau 8358, 8439; *Kp.* 394; *Lesc.* 436.

Triumfetta bartramia Linn.

This is the plant known under the name of *T. rhomboidea* in Cooke's Flora. It is common, its fruits much smaller than in *T. annua.*

Santapau 7239; *Blatt. Herb.* 17924, 17905.

Triumfetta rotundifolia Lamk.

The leaves are typical in shape and size; upper surface stellately tomentose, lower surface more densely tomentose and greyish in colour. Not common.

Santapau 8438.

Corchorus trilocularis Linn.

A prostrate herb, in waste land at the foot of the hill. Rare in Purandhar.

Santapau Dec. 1945; *Blatt. Herb.* 17902, 17926.

Linaceae

Linum usitatissimum Linn.

Cultivated for its fibres, occasionally also in gardens for its flowers; sometimes found wild in the district.

Lesc. 552.

Linum mysorense Heyne.

Very common all over Purandhar Hill during the second half of the monsoon. Flowers generally yellow, fading to white or occasionally pure white even when fresh. Abundant among low grasses on slopes.

Flowers and fruits: August to December.

Santapau Oct. and Dec. 1944, August, Sept. & Dec. 1945; 5641, 8180.

Reinwardtia trigyna (Roxb.) Planch.

On the structure of the flower and its variations, see Cooke 1: 155. A shrub 50 90 cms. high with bright yellow flowers; styles 3, stigmas globose; stamens 3 long and 2 short. Very common in gardens from which it has escaped and now found wild in many parts especially along hedges in Camp.

Santapau 8357, 11321 11325; *Lesc.* 431.

Malpighiaceae

Styles 1, rarely 2; calycine gland large — *Hiptage*
Styles 3; calycine gland 0 — *Aspidopteris*

Hiptage benghalensis (Linn.) Kurz.

In Cooke's Flora known as *H. madablota* Gaertn. Rare on the hill, but locally rather abundant along the path from the foot of the hill to the Camp.

Kp. 502, 503; *Lesc.* 627.

Aspidopteris cordata (Heyne) A. Juss.

The leaves are typical; the acumination is about as long as the rest of the leaf; the petiole is rusty pubescent. Common on the slopes below Camp to the foot of the hill.

Santapau 5354—5357, 8377.

Zygophyllaceae

Tribulus terrestris Linn.

A common prostrate herb with yellow flowers, abundant on the drier parts at the foot of the hill; not found on Purandhar proper.

Santapau Sept. 1945; *Kp.* 386; *Lesc.* 463.

Geraniaceae

Geranium ocellatum Camb. var. **himalaicum** Knuth in Engler, Pflanzenreich 53: 62, 1912.

Not in Cooke. In Blatter Herbarium there is a specimen from Purandhar (*Blatter* 18682), which has been identified as *Erodium cicutarium* L'Her.; the structure of the leaves is definitely against this identification. The plant was found in fairly good abundance on some stone walls in Camp in Dec. 1956; flowers are red or reddish, with a deep purple "eye" at the centre of the corolla. Some of my assistants found the plant as a weed in gardens during the Internment Camp days.

Blatter 18682; *Ekl.* 173; *Kp.* 469; *Lesc.* 519; *Santapau* 21778, 21794, in flower and fruit Dec. 1956.

Pelargonium zonale (Linn.) Ait.

This is the common garden so-called Geranium, extensively planted in gardens in Purandhar and thriving well; I have not seen it run wild.

Santapau 8 May 1945.

Oxalidaceae

Oxalis corniculata Linn.

Very common in moist spots all through the year; flowers are yellow, the fruits erect. The leaves are eaten and are refreshingly acid.

Santapau Oct. & Dec. 1944, May, Sept. & Dec. 1945; 8211; *Blatt. Herb.* 21451.

Biophytum sensitivum (Linn.) DC.

Rare in Purandhar; on the slopes below Camp.

Kp. 396.

Tropaeolaceae

Tropaeolum maius Linn.

This plant has been seen under cultivation in Purandhar gardens

during the period of the Internment Camp. Flowers are very showy; leaves can be eaten in salads.

Balsaminaceae

Impatiena balsamina Linn. var. **rosea** Hook. f.

This is one of the commonest herbs in flower during the second half of the monsoon on the hill about the Camp. It grows to 1.5 m. high, with a thick, more or less succulent stem and swollen nodes; gregarious in the upper parts of the hill.

Flowers and fruits: August to December.

Santapau Oct. & Dec. 1944; Aug., Sept. & Dec. 1945; 5598; 5750, 7234.

Impatiens dalzellii Hook. f. & Thoms.

For a full description of the plant, see Blatter in *Journ. Bombay Nat. Hist. Soc.* 36: 312. This is a very abundant plant at Purandhar, at about the height of the Camp and a little higher. The flowers are yellow or pale yellow, in the axils of most leaves, solitary or fascicled on a peduncle, which is up to 2.5 cm. long. This is a very elegant and gregarious plant, it gives a touch of colour to slopes about Purandhar.

Woodrow ex Cooke; *Santapau* 5303, 7084, 7144, 7277, 7280, 11332, 11371.

Impatiens oppositifolia Linn.

A small plant, about 10 40 cms. high, erect and rather bushy in habit; the colour of the flowers is generally purple or rosy purple, but not seldom it is pure white, all the flowers on a given plant being uniform in colour. Occasional on slopes above Camp.

Santapau Oct. 1944, 1945; *Kp.* 304; *Lesc.* 420, 434.

Impatiens sp.

Among my specimens collected at Purandhar there is one, *Santapau* 5325, which bears a strong resemblance to *I. scabriuscula* Heyne; after detailed study in Kew Herb. I have come to the conclusion that it may be a proliferating specimen of *I. balsamina*; in most of the axils there seems to be an inflorescence axis, but instead of flowers there are several small vegetative shoots. This specimen was collected in October 1944.

Butaceae

Murraya koenigii (Linn.) Spreng.

A small tree with highly scented leaves, which are used as a condiment in curries. Not common; found on the slopes at about Camp level, especially on the SW. sides.

Santapau Dec. 1944, May, 1945; *Lesc.* 165.

Citrus sp.

The cultivated orange of western India, with a loose skin of the type of the tangerines or mandarine oranges. There is a good field of these oranges cultivated near the foot of the hill. Also planted in some gardens in the Camp.

Santapau Dec. 1945; *Lesc.* 335.

Burseraceae

Garuga pinnata Roxb.

A middle-sized tree, with deciduous leaves. One of the more typical characteristics of the tree are the unsightly reddish galls on the leaves. The tree flowers and fruits profusely on the hill.

Santapau January 1945, Dec. 1945.

Meliaccae

Seeds not winged, filaments united in a tube	*Azadirachta*
Seeds winged:	
Filaments united into a tube	*Soymida*
Filaments not united into a tube	*Toona*

Azadirachta indica A. Juss.

The *Nim* tree; planted at the foot of the hill, not seen on Purandhar itself.

Santapau May 1944.

Soymida febrifuga (Roxb.) A. Juss.

Seen only on the slopes below Vazirghad fort, a little above the height of the Camp, possibly planted.

Santapau May 1945.

Toona ciliata Roem.

In Cooke's Flora this tree goes under the name of *Cedrela toona* Roxb. Fairly common in gardens in Camp.

Flowers and fruits: May 1945.

Santapau 6198.

Celastraceae

Large shrub or small tree with white flowers — *Gymnosporia*
Sarmentose shrub, with yellowish or green flowers — *Celastrus*

Celastrus paniculata Willd.

An erect, suberect or climbing shrub with long pendulous branches and panicles of greenish yellow flowers. Seen in the neighbourhood of Bottle Hill.

Santapau Dec. 1945.

Gymnoporia spinosa Fiori.

In Cooke's Flora this tree goes under the name of *G. montana* Benth.; some authors consider that the proper name of the plant ought to be *G. senegalensis* (Lamk.) Loes. based on *Celastrus senegalensis* Lamk. Lamark's plant, however, does not seem to agree with our plant, and for this reason the name *G. senegalensis* is not adopted here.

A small tree with plenty of white flowers, found at the foot of Purandhar hill.

Santapau 8443.

Rhamnaceae

An unarmed small tree — *Colubrina*
Armed trees or climbing shrubs — *Zizyphus*

Zizyphus mauritiana Lamk.

In our floras this tree goes under the name of Z. *jujuba* Lamk., 1789 (non Z. *jujuba* Mill., 1768). The name Z. *jujuba* Lamk. is invalid, being a later homonym of that of Miller. On the subject please see Santapau in *Journ. Bombay Nat. Hist. Soc.* 51: 802.

In Purandhar this tree is rather small, scarcely a large shrub; common about the hill particularly on the slopes of Vazirghad fort.

Santapau Oct. 1944, 5654, 6155, Dec. 1945; *Blatt. Herb.* 9262.

Zizyphus glaberrima Santapau.

At the time of the collection of this plant, I put it down as Z. *xylopyra* Willd., but the specimens were not preserved; judging from the distribution of both species I am inclined to put my plants under my new species.

A small tree or large shrub, armed or unarmed, or only sparingly armed, with woody fruits. At about the height of the Camp, fairly common. Leaves glabrous on both sides.

Santapau Oct. 1944; *Ekl.* 244.

Zizyphus rugosa Lamk.

A large struggling shrub, at times a fairly powerful climber; branches strongly and abundantly armed. Inflorescence in terminal panicles reaching 1.5 m. long. The fruit is edible when ripe. Common on the slopes.

Santapau Dec. 1944, 1945; *Blatt. Herb.* 8260.

Colubrina asiatica (Linn.) Brogn.

A small tree, 2 4 m. high, probably planted, just above the Camp along one of the main paths. Flowers small, greenish; fruits 3-lobed, 3-celled. The tree looks remarkably like one of the species of *Flacourtia*.

Flowers and fruits: December.

Santapau 5665, 5762, 8176; *Lesc.* 597.

Rhamnus triqueter (Wall.) Laws.

"It has...been found at the hill fort of Purandhar about 25 miles from Poona." (Cooke, *Fl. Pres. Bombay* 1: 244.) "This species also grows on the slopes of the Purandhar hill fort near Poona. It is very like *R. Wightii*, and may have been formerly cultivated in the Deccan for its medicinal qualities. Fr. March April." (Talbot, *For. Flor.* 1: 300-301.)

Vitaceae

Shrubs, usually scandent and cirrhose; stamens distinct, free;

ovary 2-celled ***Cissus***

Erect shrubs, ecirrhose; stamens connate with disc;

ovary 3-6-celled ***Leea***

Cissus woodrowii Santapau.

An erect shrub with thick trunk and branches, and large leaves, without tendrils. Common on the slopes, especially below Vazirghad fort.

Flowers: May. *Fruits:* September to October and later.

Santapau 6204, 7205.

Cissus repanda Vahl.

A large climber with large leaves and multiple tendrils; the latter fork repeatedly and adhere to tree trunks by means of sucker-like knobs; young leaves bright red. On the slopes particularly along the spur SW. of Purandhar fort.

Santapau Dec. 1944, 1945; *Kp.* 73; *Lesc.* 172.

Cissus elongata Roxb.

A large climber, the commonest of the genus in Purandhar. It flowers and fruits profusely.

Flowers: May and through the monsoon; *Fruits:* September onwards.

Santapau 5679, 6206; *Blatt. Herb.* 18636.

Leea edgeworthii Santapau in Rec. Bot Surv. India 16(1): 54. 1953.

Leea aspera Edgew. in Trans. Linn. Soc. 20: 136, 1881 (non Wall. in Roxb. Fl. Ind. 2: 468, 1832, quae est *L. robusta* Roxb.)

The specific epithet used by Edgeworth is a later homonym of that of Wallich in Roxb. *loc. cit.* and cannot stand according to the *Intern. Code of Bot. Nomencl.*

Occasional on the slopes of Purandhar during the rains.

Santapau Aug. 1945; 7265 of Sept. 1945.

Leea robusta Roxb. Hort. Beng. 18, 1814, nomen, et Fl. Ind. 1: 655, 1832.

This plant is mentioned on the authority of *Kp.* 96, which I did examine at the time of collection; the specimen is not available for further examination at the time of writing. The plant is rare in Purandhar.

Kp. 96.

Sapindaceae

Cardiospermum halicacabum Linn.

A slender climbing herb, with very thin and light green leaves; flowers white; the fruit forms a large bladder and is quite typical. Common on slopes below Camp.

Kp. 380; *Lesc.* 504, 538.

Anacardiaceae

Mangifera indica Linn.

Common on the slopes and at the foot of the hill; there are some trees in Camp. Possibly planted. The fruit is of poor quality and size.

Santapau Oct. 1944, Dec. 1944; *Ekl.* 202.

Papilionaceae

Note. For a complete artificial key to the Papilionaceae, see Santapau in *Journ. Bombay Nat. Hist. Soc.* 48: 277-282; see also key to the commoner species of *Crotalaria* by the same author in the same journal 51: 960-962.

Heylandia latebrosa DC.

A prostrate herb, with yellow flowers; very similar to *Indigofera cordifolia* but for the colour of the flowers, which in the latter plant are bright red. Very common on the plains at the foot of the hill, rare above.

Santapau Dec. 1945; *Blatt. Herb.* 10001.

Crotalaria filipes Benth.

One of the commonest of the Papilionaceae in the district, especially in grass fields when the grasses are not too tall. A slender, graceful herb with yellow flowers.

Flowers and fruits: from the middle of the monsoon to about December.

Santapau 5331.

Crotalaria filipes var. **trichophora** Cooke.

Except for the greater hairiness of the stems and leaves and a more luxuriant habit, there is little to distinguish this plant from the typical variety.

Lesc. 445.

Crotalaria prostrata Roxb.

The only specimen from Purandhar that I have examined is the one mentioned below; a rare plant on the hill.

Lesc. 412.

Crotalaria vestita Baker.

In Blatter Herbarium there is a number of sheets identified by Blatter as *C. vestita.*; I have collected the plant in various outings to Purandhar, but in every case I had some serious doubt; my plants apparently are very similar to *C. calycina*, from which the present species differs by the absence of stipules.

Santapau 8178; *Blatt. Herb.* 10019, 10022, 10027, 11688, 11694, 11752, 12577.

Crotalaria triquetra Dalz.

A common herb among grasses, very typical on account of the triquetrous structure of its stems; specimens examined by the author reached 70 cm. long.

Santapau Oct. 1944, Dec. 1944, May 1945; *Ekl.* 127; *Kp.* 436; *Lesc.* 567.

Crotalaria albida Heyne.

Occasional in Purandhar, sides of road, etc.

Santapau Oct. & Dec. 1944.

Crotalaria nana Burm.

The commoner form found in Purandhar is the branched one mentioned by Cooke. Fairly common along the paths in the Camp and outside the Camp but at about the same altitude; flowers are pale yellow, fruits black or nearly so.

Flowers: October; *Fruits:* December and January.

Santapau 8248; *Blatt. Herb.* 11763.

Crotalaria retusa Linn.

A shrub, up to 1.5 m. high; flowers bright yellow and large and very showy. Rare in Purandhar.

Lesc. 516.

Crotalaria leptostachya Benth.

A stiff, erect undershrub, reaching 2 m. high; stems 4-angled, pubescent with golden hairs along the angles of the stem; corolla yellow,

pods densely fulvous silky. A fine plant. Common along the paths in the Camp from the Hospital end.

Flowers: October. *Fruits:* December.

Santapau 5337, 5678, 8195.

Crotalaria juncea Linn.

Common all over the hill down to the foot; pods silky with fulvous hairs.

Flowers: October. *Fruits:* December and January.

Santapau 5346, 5772, 8329, 8363; *Blatt. Herb.* 12576.

Crotalaria linifolia Linn. f.

I have not seen this plant in the field; there is a specimen in Blatt. Herb. identified by Blatter himself, and collected in Dec. 1917.

Blatt. Herb. 12580.

Crotalaria calycina Schrank.

A rare plant in Purandhar; the calyx is very typical and prominent, hence the name.

Santapau 8178.

Crotalaria mysorensis Roth.

Rare in Purandhar; the only specimen seen being the one of Blatter (*Blatter* 10759) in Blatt. Herb.

Crotalaria medicaginea Lamk.

Common along the paths and in grass fields on the slopes about the Camp; the size of the plant seems to suggest that my specimens belong to the variety *luxurians* Baker; they are well over 50 cm. long with the terminal leaflet about 3 cm. long, 1 cm. broad.

Flowers and fruits: October 1944.

Santapau 5771, 5334; *Blatt. Herb.* 10770, 11755.

Crotalaria orixensis Willd.

Common in grass fields; at first erect and extensively branched, later on procumbent or trailing.

Flowers and fruits: October to December 1944, 1945.

Santapau 5723, 8391, 7291, 8291. *McCann* 10024.

Indigofera linifolia Retz.

In my field notes for Dec. 28, 1944, I find the following entry: "Flowers bright red, pods globose, silvery. Plant with many branches, prostrate but not rooting, the branches spreading radially. In cultivated fields, abundant." The fields referred to are those at the foot of the hill.

Santapau 5716, 8310, 8386; *Blatt. Herb.* 10773.

Indigofera cordifolia Heyne.

A diffuse, prostrate herb, with many branches; in general appearance it is very similar to *Heylandia latebrosa,* but for the colour of the flowers; in *Indigofera* the colour is bright red, in *Heylandia* yellow. Abundant in cultivated fields and waste lands at the base of the hill, rare above.

Santapau 5715; *Blatt. Herb.* 10780.

Indigofera glandulosa Willd.

Flowers bright red in colour; abundant in cultivated fields at the foot of the hill, not seen above.

Santapau 5713, 5714; *Blatt. Herb.* 11684.

Indigofera hendecaphylla Jacq.

On the slopes of Vazirghad fort, or about the Camp slopes, not common. Flowers reddish purple. The whole plant is prostrate or procumbent with long branches.

Santapau 8222, 8374.

Indigofera trifoliata Linn.

Gamble in his *Flora of Madras* has separated *I. trifoliata* Linn. from *I. prostrata* Willd.; the latter has slender almost filiform pods, the former much stouter pods and in general is a much stouter plant. My specimens from Purandhar come definitely under the Linnean plant, with pods about 1.5 mm. thick.

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

Santapau 5339, 7230; *Blatt. Herb.* 11758.

In my collection, there is one specimen, *Santapau* 7174, which seems to belong to this species; it is not in flower, but the structure of the leaflets is that of the present species.

Indigofera oreophila Sant. & Panthaki in Journ. Bombay nat. Hist. Soc. 54: 221 224, t. 1, 1956.

A fairly common, stout undershrub, with reddish flowers and numerous reflexed pods in long axillary racemes. Particularly common on the northern side along the main path below Vazirghad.

Flowers: September. *Fruits:* December.

Santapau 8326 8327, 8368, 11398 11399.

Indigofera tinctoria Linn.

A large shrub, about 1.5 2 m. high, with bright green leaves and showy flowers. Common on the slopes about the height of the Camp on the eastern side of the hill.

Flowers and fruits: September to December.

Santapau 5283, 5707, 7228.

Indigofera pulchella Roxb.

In Blatter Herbarium there are two specimens labelled *I. pulchella,* but the specimens are too dilapidated for an accurate identification; they look rather like those of the preceding species with 13 leaflets in some of the leaves.

Blatt. Herb. 10017, 11762; *Santapau* 7255.

Psoralea corylifolia Linn.

A weed in cultivated fields at the foot of the hill, on hedges, fairly abundant. Flowers are bluish.

Flowers and fruits: September to December.

Santapau 5693, 8305.

Sesbania sesban var. **picta** Santapau.

Fairly common in hedges at the foot of the hill, in cultivated fields; gregarious; flowers pale yellow.

Santapau 8387.

Sesbania grandiflora (Linn) Pers.

Cultivated in gardens, not seen wild in the district. Flowers very large, white or creamy white. An ornamental small tree.

Santapau 8390; *Lesc.* 578.

Zornia diphylla (Linn) Pers.

Common among grasses in the Camp on sides of paths. Flowers pale yellow, inconspicuous.

Santapau 7232; *Lesc.* 415.

Smithia conferta Sm.

In our floras this plant at times is mentioned under *S. geminiflora* Roth var. *conferta* Baker. As a matter of fact, the species seem scarcely to merit even varietal rank.

Common on the slopes of Vazirghad fort.

Santapau 8331, 8361; *Lesc.* 440.

Smithia hirsuta Dalz.

This is a rare plant; it has been seen in one of the cultivated fields at the foot of the hill, growing gregariously in good profusion.

Santapau 11480.

Smithia setulosa Dalz.

A gregarious herb, growing in dense patches along the path on the east side at about the level of the Camp; it is one of the most conspicuous species not only of the genus but also of the Papilionaceae. Corollas are yellow with two fairly broad stripes of red on the standard.

Flowers and fruits: September to December, at their best in October, when the plant adds a bright touch of colour to the slopes.

Santapau 5280.

Smithia bigemina Dalz.

Among grasses on the slopes during the rainy season or in moist spots after the monsoon.

Lesc. 356.

Smithia blanda var. **racemosa** Baker.

Fairly common on grass slopes especially in shaded spots.

Santapau 7090.

Aeschynomene indica Linn.

At the foot of the hill, in cultivated fields, on the bunds between fields, forming dense masses, with small yellow flowers. Not seen on the hill itself.

Santapau Oct. 1944; *Kp.* 336, 372, 422; *Lesc.* 494.

Alysicarpus hamosus Edgw.

A diffuse or prostrate herb, with orbicular leaves and purplish flowers.

Flowers and fruits: October.

Santapau Oct 1944; *Ekl.* 152.

Alysicarpus vaginalis (Linn.) DC.

Erect or prostrate herb, with long trailing branches and very variable leaves.

Flowers and fruits: October to December.

Kp. 217; *Lesc.* 413, 442.

Alysicarpus rugosus (Willd.) DC.

It is difficult to determine to which of the varieties of this species my plants belong to; the stems are glabrous but for a line of hairs or occasionally for a few scattered silky hairs; rachis of inflorescence glabrous or subglabrous, 3-8 cm. long; joints of pod densely transversely rugose, glabrous. Common in grass fields.

Flowers and fruits: September to December.

Alysicarpus tetragonolobus Edgw.

The only specimen examined in 1945 was collected on the hill during the rainy season of 1945; in October 1950 I found several plants in cultivated fields at the foot of the hill.

Santapau Oct. 1945; Oct. 1950, 11469.

Alysicarpus pubescens Law.

The most typical part of the plant is the woolly inflorescence; leaves are very conspicuously reticulately veined and hairy. A fine plant, but not common; occasionally found among grasses at about the height of the Camp.

Flowers and fruits: October to December.

Santapau 5301, 5317, 8304; *Kp.* 219, 241; *Lesc.* 559.

Alysicarpus belgaumensis Wt.

A very elegant plant, up to 90 cm. high; leaves 1- and 3-foliate; flowers at first in globose or subglobose racemes, at length elongating to about 15 cms., the colour of the flowers rose or nearly red, turning lilac with age; the standard reaches up to 18 mm. in diameter. Common among grasses.

Flowers : September to November. *Fruits:* October to December.

Santapau Dec. 1944.

Alysicarpus belgaumensis var. **racemosus** Baker.

This variety seems to be quite as common as the typical plant; the variety is extensively branched from below and seldom reaches more than 15 20 cm. in height; flowers are bright purple turning bluish or lilac on wilting. Common among grasses in the upper parts of the Fort above Camp.

Flowers and fruits: September.

Santapau 7198, 5318.

Desmodium laxiflorum DC.

Common on the slopes below Vazirghad fort and elsewhere on the hill; the colour of the flowers is white or whitish or various.

Flowers: September 1945.

Santapau 7180; *Blatt. Herb.* 11763.

Desmodium triflorum (Linn.) DC.

A slender herb, prostrate or trailing; corolla bright red in the fresh flowers, finally turning lilac or bluish. On the slopes below the Camp along the main path, very common.

Flowers and fruits: August to December.

Santapau 7226.

Desmodium diffusum (Willd.) DC.

A rare plant; I have only seen the specimens mentioned below, but have not seen the plant in the field.

Blatt. Herb. 10767, Dec. 1917.

Desmodium gangeticum (Linn.) DC.

Occasional on the slopes below Camp.

Santapau Dec. 1944; *Blatt. Herb.* 11764, 10769.

Desmodium rotundifolium Baker.

This is a difficult plant to identify; it approaches very closely to *D. renifolium* Sch. (*D. reniforme* DC.) and *D. parviflorum* Baker. The leaves distinguish this plant from the other two; they are rounded or orbicular, and simple and more or less hairy or appresedly hairy beneath. Fairly common.

Flowers: October 1950. *Fruits*: December 1945.

Desmodium parviflorum (Dalz.) Baker.

Herbaceous with a woody or subwoody stem; glabrous or subglabrous below, hairy and somewhat striate above; leaves 1- and 3-foliate mixed together. Pods moniliform, both sutures indented. It is not easy to determine to which of the two genera, *Alysicarpus* and *Desmodium*, this plant should belong; Cooke mentions that it forms a connective link between the two genera.

Fruit: December 1945.

Santapau 8301, 8302.

Teramnus labialis (Linn. f.) Spreng.

A very variable plant in the size and shape of the leaves. Common in deep forests all over western India, occasional at Purandhar.

Flowers and fruits: September to December.

Santapau 5632; *Blatt. Herb.* 10771, 11750, 11765.

Mucuna prurita Hook.

In the opinion of Gamble in *Flora of Madras*, 356, this plant is not the same as that described by DC. under the name *M. pruriens*; DeCandolle himself seems to have had strong doubts about the identity of the Indian and American plants. From DC.'s description it seems that the American *M. pruriens* has leaves which are hirsute on the underside, the valves of the fruit sub-keeled and the peduncles ternate; the Indian *M. prurita* has "short appressed hairs beneath" (Gamble) the valves with a longitudinal rib and the peduncles solitary or 2-3-nate. On the slopes below the Camp, not common.

Santapau 1 Jan. 1945.

Erythrina sp.

At the foot of the hill and about half way up to the Camp there are several clumps of trees that belong to the genus *Erythrina;* I have seen them many times, but only in leaf. In the absence of the flower or fruit, it is impossible to determine the species.

Santapau Oct. & Dec. 1944, Dec. 1945, etc.

Butea monosperma (Lamk.) Taubert.

A very rare plant in Purandhar; only seen at the foot of the hill in more or less open country.

Ekl. 310.

Canavalia gladiata (Jacq). DC.

The identity of our Indian species of *Canavalia* is a difficult question; on the subject see Chatterjee in *Journ. Ind. Bot. Soc.* 28: 83 - 95.

The plant has been collected at the foot of the hill in the wild state, possibly an escape from cultivation.

Kp. 414; *Lesc.* 542.

Phaseolus khandalensis Santapau

The identification of this plant is very easy; the nomenclature is complicated. It is the plant listed in our floras under the name of *Ph. grandis* Dalz., which is not the same plant as *Ph. grandis* Wall. or *Ph. grandis* Benth.

A very common, abundant and conspicuous plant all over the upper parts of the fort from the Camp upwards. A gregarious stout herb, with very large stipules, small, pale yellow flowers. The seeds are eaten in times of scarcity.

Flowers and fruits: October to December.

Santapau 5290, 7202; *Blatt. Herb.* 10131, 10764.

Phaseolus trilobus Ait.

Leaves trifoliate, leaflets trilobed; flowers yellow. A prostrate or trailing plant, in cultivated fields at the foot of the hill.

Santapau 8384.

Phaseolus aconitifolus Jacq.

Only seen along the road at the base of the hill; a rare plant, which is now spreading in Western India.

Phaseolus dalzellii Cooke.

Prostrate, climbing or trailing, glabrous or nearly so all over, even on the pods; the leaves are entire or somewhat lobed, but not so clearly as in *Ph. trilobus.*

Santapau Dec. 1944.

Phaseolus radiatus Linn.

The nomenclature of this plant is complicated; on the subject see Piper in *Bull. U.S. Dept. Agric.* 119: 16 - 25. Erect or suberect when young, later on becoming a climber. Leaves trifoliate and very variable in shape

and size; flowers pale yellow; pods cylindric, very hairy. Very common all over the hill.

Santapau 5297, 8411; *Blatt. Herb.* 11681.

Vigna capensis Walp.

One of the commonest plants in flower about the middle of the rainy season; the fruit remains on the parent plant for a long time.

Santapau Aug. Sept. Dec. 1945.

Clitoria ternatea Linn.

Twining or climbing herb; flowers with a large, blue or white standard. At the foot of the hill.

Kp. 486. *Lesc.* 585.

Dolichos bracteatus. Baker in Hook. f. FI. Brit. Ind. 2: 210, 1876; Cooke, FI. Pres. Bombay 1: 381; Santapau in Rec. Bot. Surv. Ind 16(1): 81.

D. ghaticus Sant. & Pant. in Journ. Bombay Nat. Hist. Soc. 53: 502, 1956.

This plant seems to be endemic in western India. Very abundant on the slopes below Bottle Hill. The flowers are very showy, purple or occasionally white; peduncles up to 70 cm. long.

Flowers: September and October. *Fruits:* December; the fruits are eaten in times of scarcity.

Santapau 7164, 8274, 11510 11513.

Dolichos lablab Linn.

In cultivated fields at the foot of the hill, sometimes cultivated, often run wild. Flowers and fruits in December 1954.

Santapau 8312.

Dolichos biflorus Linn.

Corolla pale yellow; style filiform, bearded just below the stigma; pods flat, somewhat falcate. The flowers appear in pairs in the axils of many leaves, but each flower is borne on a short independent pedicel.

Flowers and fruits: November 1945.

Lesc. 426, 452.

Dolichos falcatus Klein.

A climbing herb with very slender branches; corolla up to 18 mm. in diameter, lilac or pink, not yellow. This plant is not given by Cooke in

his Flora; but the localities where the plant has been found both in Purandhar and elsewhere suggest that it is truly wild. Common on Bottle Hill.

Santapau 5299, 7105, 11410.

Atylosia sericea Benth.

An erect shrubby plant, with stems covered with silvery hairs. Very common all over Purandhar at about the level of the Camp.

Flowers and fruits: September to December.

Santapau 5351, 5753, 5773, 8285; *Blatt. Herb.* 10032, 12579.

Atylosia scarabaeoides (Linn.) Benth.

A small herbaceous twiner or climber, or when no support is available a prostrate spreading herb. Rare.

Blatt. Herb. 11676.

Cylista scariosa Roxb.

A powerful climber with white, scarious calyx and yellow corolla. On the slopes from the Camp downwards, common.

Santapau 5619; *Blatt. Herb.* 11686, 10029.

Rhynchosia minima (Linn). DC.

A slender, herbaceous climber; corolla yellowish small. On shrubs and hedges.

Santapau 8371; *Lesc.* 457, 584.

Moghania strobilifera (Linn.) St. Hil.

A large shrub, extensively branched, with very large bracts enclosing the flowers and fruits. Common on the slopes from the Camp downwards.

Flowers: December.

Santapau 5685, 8193; *Blatt. Herb.* 11767.

Dalbergia latifolia Roxb.

A fine tree with dark-green leaves; common on the slopes below the Camp.

Santapau Jan. & May 1945, Jan. 1946.

Dalbergia lanceolaria Linn. f.

A fine tree; flowers usually come out before the leaves in fairly large panicles. Corolla lilac to very pale lilac, almost white. Not common in Purandhar.

Blatt. Herb. 11679.

Pongamia pinnata (Linn.) Pierre.

The common *karanj* tree, often planted as a shade tree, rare on the hill.

Santapau May 1945.

Cajanus cajan (Linn.) Millsp.

Cultivated in some of the fields at the base of the hill, frequently run wild. Flowers yellow.

Flowers and fruits: December.

Santapau 5724; *Blatt. Herb.* 10021, 10777.

Cicer arietinum Linn.

Cultivated at the foot of the hill, occasionally seen wild as an escape. The seeds are eaten raw, or when mature after roasting or boiling.

Santapau 7217; *Blatt Herb.* 11753.

Caesalpiniaceae

Leaves 1-foliate	*Bauhinia*
Leaves simply pinnate:	
Corolla with 5 perfect petals	*Cassia*
Corolla with 3 perfect, 2 imperfect petals	*Tamarindus*
Leaves bipinnate:	
Petals yellow, corolla 2 cm. diam.	*Caesalpinia*
Petals bright red, corolla 5 cm. or more in diam.	*Delonix*

Caesalpinia sappan Linn.

On the slopes below the Camp, not common. Flowers yellow, filaments densely woolly at the base. Small trees.

Flowers and fruits: December 1945.

Santapau 8306, 8307.

Delonix regia (Boj). Raf.

The *Gul Mohor* of Indian gardens; planted in gardens in the Camp; a very ornamental tree.

Santapau May 1945.

Cassia fistula Linn.

A very showy tree, with bright yellow flowers. The *Indian Laburnum* of our gardens. On the slopes below Camp.

Flowers: May 1945.

Santapau 6161.

Cassia occidentalis Linn.

Not seen on the hill; very common at the foot of the hill and along the road to Saswad.

Santapau Oct. 1944.

Cassia sophera Linn.

Abundant at the foot of the hill.

Kp. 385.

Cassia tora Linn.

Common and abundant in waste places on the hill and near the villages at the foot of Purandhar. The leaves give out an unpleasant odour.

Santapau Dec. 1944; *Blatt. Herb.* 10768.

Cassia obtusifolia Linn.

For the differences between this species and *C. tora* see Cooke (*Flora* 1: 420). At the foot of the hill, in flower and fruit during September 1945.

Santapau 8355.

Cassia auriculata Linn.

Rare; at the foot of the hill, in flower and fruit during September 1945. This is a very common and showy plant on Diva Ghat, on the way between Poona and Saswad.

Santapau 8446.

Cassia pumila Lamk.

On the slopes a little above the Camp, generally in the undergrowth, or on paths. All the plants that I have examined in the field were erect

or suberect, with pale yellow flowers.

Flowers: September; *Fruits:* December.

Santapau 5330, 7173, 7222, 8427; *Blatt. Herb.* 10772.

Cassia glauca Lamk.

A large shrub or small tree, with bright yellow flowers. At the foot of the hill, possibly cultivated. In flower during October.

Santapau 8394.

Cassia mimosoides Linn.

Erect or suberect, in the undergrowth, on the slopes above Camp. In flower during September 1945.

Santapau 7229.

Bauhinia racemosa Lamk.

A small tree; on open ground towards the western spurs of Purandhar hill; in fruit during December 1944, in flower in May 1945.

Santapau 5760, 6164; *Blatt. Herb.* 10757.

Bauhinia purpurea Linn.

A small tree with large purple flowers; in gardens in the Camp. In flower during September 1944.

Santapau 5684.

Bauhinia auminata Linn.

Cultivated in gardens in Camp; not seen wild. Flowers variegated red and yellow, or occasionally white.

Flowers: May.

Santapau Dec. 1944, May 1945.

Tamarindus indica Linn.

Planted at the foot of the hill near some of the villages; also in the Camp.

Santapau Oct. 1950.

Mimosaceae

Stamens definite:

Pod straight, with continuous valves, dehiscing through the sutures — *Leucaena*

Pod slightly curved, with segmented valves, and persistent indehiscent sutures — *Mimosa*

Stamens indefinite and more or less free — *Acacia*

Leucaena glauca (Linn.) Benth.

A small tree; flowers in round balls or heads, corolla at first greenish, then creamy white, later on white, finally yellowish. Pods very typical. Probably planted; only seen behind the R.C. Church in the Camp

Santapau 5765; *Blatt. Herb.* 10775.

Mimosa pudica Linn.

A small shrubby plant; at the foot of the hill in waste lands.

Santapau May and Dec. 1945.

Mimosa hamata Willd.

Shrubby, up to 1.5 m. high; the fruit is typical with its prickles on the sutures. Found only at the foot of the hill.

Lesc. 462.

Acacia arabica Willd.

This is the *Babul* tree. Flowers yellow, stems and branches strongly armed with straight, long stipular spines. On the drier parts at the foot of the hill.

Santapau Oct. & Dec. 1944, May 1945.

Acacia farnesiana Willd.

A shrub or small tree; on the lower slopes of the hill. Rare.

Blatt. Herb. 10776, 11730.

Acacia tomentosa Willd.

Rare; at the foot of the hill.

Lesc. 623.

Acacia torta Craib.

The identity and nomenclature of this plant is rather complicated; the subject has been discussed by the present author in the Journ. Bombay Nat. Hist. Soc. 50: 310 - 312. Common on the slopes from Camp downwards.

Santapau Oct. 1944, Jan. & Sept. 1945.

Acacia pennata (Linn.) Willd.

A fairly stout climbing shrub, armed with numerous prickles; flowers at first white, then yellow. On the slopes below Camp.

Santapau Sept. 1945.

Rosaceae

Rosa sp.

In many of the gardens in Camp, roses were cultivated with success during the occupancy of the place as an Internment Camp. Generally the type of flowers preferred were of the double or multi-petalled varieties.

Santapau Dec. 1944, May 1945.

Crassulaceae

Calyx tubular, long, shallowly 4-fid	*Bryophyllum*
Calyx shorter, divided half way down	*Kalanchoe*

Bryophyllum pinnatum (Lamk.) Kurz.

Frequently cultivated in gardens in the Camp occasionally wild as an escape.

Santapau Dec. 1944 & 1945; *Lesc.* 197.

Kalanchoe olivacea Dalz.

An undershrub with succulent stems and leaves, the whole plant of an olive-brown colour and up to 1 m. high. In my field noted for 23 Dec. 1944, I have the following entry: "Flowers pure white. Peduncles, pedicels, calyx and corolla tube glandular hairy. Stems and roots thick, fleshy. Beautiful plant." The flowers are showy, but scentless or nearly so. Abundant on the slopes above the Camp on rocky ground or on vertical rocks; abundant also just outside the Bini gate.

Flowers and fruits: December.

Santapau 5308, 5585, 5611, 5745, 8182, 8339.

Combretaceae

Petals 0; flowers small, not over 8 mm. diam.	*Terminalia*
Petals large, over 15 mm. diam. tube very long	*Quisqualis*

Terminalia bellirica (Gaertn.) Roxb.

The fruit of the plant is typical among the *Terminalia* species; the tree is found occasionally on the slopes below Camp especially towards

the western part of the hill and on the spurs from the Konkani Tower of the Fort.

Santapau Dec. 1945, Dec. 1956.

Terminalia chebula Retz.

A large tree with scented flowers; fruits somewhat ribbed when ripe. More common than the preceding species.

Santapau 6173.

Terminalia crenulata Roth.

This is the tree that is popularly known under the name of *Ain*, and which Cooke in his Flora describes under *T. tomentosa*. These two valid species have been discussed by the author in Journ. Bombay Nat. Hist. Soc. 50: 305 307.

Common on the slopes below Camp; young leaves are densely rufous-tomentose, older ones glabrous. The glands on the underside of the leaves vary much in structure, size and position.

Santapau 6174.

Quisqualis indica Linn.

Planted in gardens and often running wild; seen in flower at Purandhar during May 1945.

Santapau 7, May 1945.

Myrtaceae

Large trees; fruit a juicy drupe	*Syzygium*
Large trees; fruit a dry capsule	*Eucalyptus*
A sweet-scented shrub with small leaves	*Myrtus*
A small tree, the bark peeling in white or whitish patches	*Psidium*

Syzygium cumini (Linn.) Skeels.

The well-known *Jambul* tree; a large tree with bright polished leaves; occasional on the slopes about Camp.

Santapau Oct. 1944, May & Dec. 1945.

Psidium guajava Linn.

Cultivated and run wild on many parts of the slopes below Camp; the fruits of the wild plant are small and very hard, even when ripe.

Lesc. 175; *Kp.* 456.

Myrtus communis Linn.

A small shrub, only seen under cultivation in some of the gardens in Camp.

Blatt. Herb. 19130.

Eucalyptus spec.

Cultivated in some of the gardens, but rare.

Blatt. Herb. 19131.

Lythraceae

Herbs:

Capsules septicidally dehiscent; capsule walls horizontally striate, but faintly	*Rotala*
Capsules indehiscent or irregularly dehiscent; capsule walls not striated	*Ammannia*

Shrubs:

Stamens 12; flowers bright red	*Woodfordia*
Stamens 8; flowers white or pink or cream	*Lawsonia*

Rotala densiflora (Roth) Koehne.

For the nomenclature of this plant, see Koehne in *Planzenreich* 17: 35. Very common all over western India; in Purandhar it is not abundant except in some of the rock pools at the foot of the hill.

Lesc. 520.

Rotala tenuis (Wt.) Koehne.

A small herb, usually found on rocks in running water; the whole plant soon becomes deep purple in colour. On the rocks along the spur on the SW. part of the fort.

Santapau 8415; *Blatter* 3305.

Ammannia multiflora Roxb.

Common in rice fields at the foot of the hill, during the winter months.

Lesc. 521.

Ammannia baccifera Linn.

This is about the commonest species of *Ammannia* in western India; at Purandhar it is common both on the hill itself and on the slopes and plains below the Camp. In flower and fruit during Dec. and Jan.

McCann 3429, 5998; *Kp.* 375

Woodfordia fruticosa (Linn.) Kurz.

A shrub, 1 2 m. high; flowers bright red, along the branches, persisting for some time on the plant. Common on the slopes all over the hill.

Flowers: December to May.

Santapau Oct. & Dec. 1944; May & Dec. 1945; *Blatt. Herb* 19205.

Lawsonia inermis Linn.

Cultivated in gardens as a hedge plant.
Ekl. 97, 214.

Punicaceae

Punica granatum Linn.

There is a fairly good specimen in one of the gardens in the Camp; not seen wild.

Flowers and fruits: December.

Onagraceae

Oenothera rosea Ait.

A small plant, 25 40 cm. high, with woody base and bright red flowers; found in gardens and as an escape all over the Camp and upwards.

Santapau 5302, 7143.

Fuchsia spec.

Several species of this plant seem to thrive very well in gardens in the Camp; not found wild.

Blatt. Herb. 19256.

Caricaceae

Carica papaya Linn.

Cultivated in gardens at Purandhar; also seen in the village at the foot of the hill; flowering and fruiting profusely.

Santapau Dec. 1944, May 1945.

Cucurbitaceae

Anther cells flexuose or conduplicate:
- Petals fimbriate — *Trichosanthes*
- Petals not fimbriate:
  - Stamens free, inserted on the mouth of the calyx; calyx with scales at the bottom — *Momordica*
  - Stamens free inserted on the tube of the calyx:
    - Male flowers racemose, fruit dry, fibrous, dehiscing operculately — *Lufa*
    - Male flowers not racemose; fruit a juicy berry, indehiscent — *Cucumis*

Anther cells straight or curved, not flexuose:
- Seeds 2 or 3 — *Dicoelospermum*
- Seeds 5 or more — *Melothria*

Trichosanthes bracteata (Lamk.) Voigt.

A large climber, or in the absence of support, a trailing plant with large flowers and spherical fruits. On the slopes below Vazirghad.

Flowers and fruits: May.

Santapau 6176, 6177.

Momordica dioica Roxb.

Flowers yellow, the largest among the wild plants of the family in Purandhar. On the slopes below the Camp.

Flowers: September.

Santapau 7282, 7283.

Luffa acutangula var. **amara** Clarke.

Fairly common on the slopes below Camp; the fruits remain on the parent plant even when the whole plant has dried up.

Santapau Dec. 1944.

Cucumis callosus (Rottl.) Cogn.

One of the commonest plants of the family in western India; the ripe fruits remain on the plant, generally until the rains of the next monsoon cause them to be decomposed; they are very bitter to taste.

Flowers: Monsoon months.

Santapau Oct. & Dec. 1944; May, Sept. & Dec. 1945.

Cucumis melo var. **agrestis** Naud.

A much smaller plant than the previous species; the fruits are also smaller and covered with soft hairs. Locally I have seen children eating the fruits with apparent relish.

Flowers: October.

Santapau 5327, 11344; *Blatt. Herb.* 19380, 19387.

Melothria maderaspatana (Linn.) Cogn.

In 1944 and 1945 I did find this plant in several spots on the slopes below Camp; in 1950 I could not find it but instead found plenty of *Dicoelospermum*. This made me doubt about the original identification of my specimens, which unfortunately are not available for further examination at present. I give this plant as doubtfully occurring in Purandhar.

Santapau Oct. & Dec. 1944, Sept. 1945.

Melothria heterophylla (Lour.) Cogn.

Common on the slopes of Purandhar, more or less over the whole hill. The variation in the shape and size of the leaves is very great; the commoner forms are those marked in Cogniaux' figure under nos. 1, 2, 6b, 10, occasionally also no. 5. (See Cogniaux, in *Pflanzenreich* 66: f. 28.)

Santapau 5343, 6158, 6167, 7295, 8348.

Cucurbita spec. (maxima?)

In a small garden a little above the Camp towards the East end of the hill for several years I noticed a patch of *Cucurbita* probably *maxima* Duch. under cultivation; gradually the plants took possession of a rubbish heap near the said garden. Flowers are bright yellow and over 15 cm. diam.

Dicoelospermum ritchiei Clarke.

This plant is very easily taken for *Melothria maderaspatana* than which it is far more common on the hill. The number and structure of the seeds clearly distinguish these two plants. In Oct. 1950 I made a special search for the present plant, and found it to be common and fairly abundant practically all over the hill. This made me doubt about the identification of *Melothria* as stated above. Ripe fruits are deep dull black.

Santapau 11342, 11343, 11345.

Begoniaceae

Begonia spec.

In one of the public gardens in Camp for several years I saw a dense clump of cultivated Begonias; such plants were cultivated for the sake of the multicoloured or variegated leaves. I have not seen any *Begonia* growing wild in the district.

Cactaceae

Opuntia elatior Mill.

Occasional on the slopes below Camp, but nowhere abundant.

Santapau Dec. 1944.

Molluginaceae

Glinus lotoides Linn.

This is the plant known as *Mollugo hirta* in Cooke's Flora. Fairly common all over the hill, especially on the lower parts of the slopes.

Santapau May 1945.

Mollugo pentaphylla Linn.

Not quite as common as the preceding species; often found in rice fields after the harvest at the base of the hill.

Santapau 8249 (4).

Umbelliferae

Umbels simple:

Mericarps with 3 ridges, the commisural one obscure; flowers white; pericarp of seeds thin — *Hydrocotile*

Mericarps with 7-9 ridges, the primary and secondary ones being similar; flowers red; pericarp thick — *Centella*

Umbels compound:

Fruit laterally compressed, not winged; commisure narrow; involucral bracts and bracteoles usually present:

Furrows with 1 vitta each — *Trachispermum*

Furrows with 2-3 vittae each — *Pimpinella*

Fruit much dorsally compressed; lateral ridges winged:

Usually glabrous herbs; petals not radiant; ovary glabrous; wings of fruit with thin margins — *Peucedanum*

Usually hairy herbs; petals radiant; ovary pubescent; wings of fruit thickened at the margin *Heracleum*

Centella asiatica (Linn.) Urb.

There is much confusion in our Indian floras between the two genera, *Hydrocotile* and *Centella;* to help clear such confusion I have given the two plants in the key, even though *Hydrocotile sensu stricto* has not been reported from Bombay. In Purandhar, *Centella* is common at the base of the hill in moist spots.

Santapau Oct. 1944.

Trachispermum stictocarpum Wolff var. **typicum** Wolff.

An erect, slender herb with white or very pale lilac flowers; fruits with 1 vitta in each furrow, glabrous or nearly so. Common.

Flowers and Fruits: October to December.

Santapau 5342, 8252, 8253.

Pimpinella tomentosa Dalz.

An erect herb; lower leaves with long petioles (up to 20 cm. long), upper ones gradually passing into bracts. The primary rays of the inflorescence often have no bracts occasionally there is but one bract. Flowers white. Common.

Flowers: October.

Santapau 5312, 7155, 11491.

Pimpinella monoica Dalz.

Among the plants of my own collection from Purandhar there are several that seem to belong to this species, but differ to some extent from Dalzell's type in Kew Herbarium; such specimens are possibly intermediate stages between *P. monoica* Dalz. and *P. multiradiata* Sant.

In the two sheets, *Santapau* 8259 & 8260, the primary rays are 8 - 19, generally about 16, and the rays are distinctly unequal in length; bracts 0; secondary rays generally about 20; the flowers are white, and seem to be all or nearly all fertile, since the numbers of fruits is generally the same as that of flowers. Bracteoles 1 - 3 in number, subulate, glabrous or nearly so. The surface of the fruits is covered with minute white or whitish granules and the shape of the fruits is ovoid or more commonly subovoid. In the type of fruits these sheets approach Dalzell's plant; in the number of the primary rays they approach my own species.

A gregarious plant, about 2 m. high, fairly common and abundant by the sides of roads just outside the Camp on the western side of the hill. When growing in dense patches, this is a very elegant plant. Abundant on the N. slopes.

Santapau 5298, 8259, 8260.

Peucedanum grande Clarke.

Fairly common on the slopes; in flower during the early part of the monsoon, in fruit about August. Flowers are yellow or yellowish in colour.

Santapau 7203.

Heracleum concanense Dalz.

An erec, rather bushy herb with succulent stems and branches, and with white flowers. Rather common in the second half of the monsoon; at the time it seems completely to replace *Peucedanum*.

Kp. 229; *Lesc.* 250.

Anethum graveolens Linn.

Cultivated at the foot of the hill for the sake of its seeds. Burkill (*Dict. Econ. Prod. Malay Pen.* 1: 158) is of opinion that the Indian plant, *Anethum sowa* Roxb. should be treated at least as a variety of the Linnean species, perhaps even be given specific rank.

Lesc. 509.

Coriandrum sativum Linn.

Cultivated in the villages near the foot of the hill, occasionally found wild as an escape.

Santapau 11462.

Araliaceae

Hedera spec.

In some of the gardens at Purandhar on several occasions I have noted some striking specimens of *Hedera;* Cooke speaks of *H. helix* Linn. as cultivated in Bombay; but the Purandhar specimens do not seem to be *H. helix* Linn. but *H. nepalensis* K. Koch. (syn. *H. helix* Wall. in Roxb. Fl. Ind. 2: 515, 1824 & Don, Prod, Fl. Nep. 187, 1825; non Linn.)

Rubiaceae

Herbs; erect, climbing or prostrate:

Leaves stipulate; not climbing:

Ovules numerous — *Oldenlandia*

Ovules few, 1 6 only:
Seeds plano-convex or globose, with a central cavity — *Anotis*
Seeds oblong, ventrally grooved — *Borreria*
Leaves exstipulate; climbing herbs — *Rubia*

Trees or shrubs, not herbs:
Fruit a capsule:
Bracts foliaceous, persistent, flowers in spikes — *Hymenodictyon*
Bracts small; flowers in panicled or sub-umbellate cymes — *Hamiltonia*
Fruit a berry or drupe, not capsular:
Flowers white, at length turning yellow:
Ovary 2-celled, may-seeded — *Randia*
Ovary 1-celled, many-seeded — *Gardenia*
Flowers persistently green, small — *Meyna*
Flowers persistently white, with long-exserted style and stigma — *Pavetta*

Hymenodictyon obvatum Wall.

On the slopes below Vazirghad fort I have seen one specimen in fruit on 29 Dec. 1945. No other specimens seen.

Santapau Dec. 1945.

Oldenlandia aspera (Heyne) DC.

The specimens of Purandhar have been checked at Kew Herbarium and found to be correct. Fairly common in cultivated fields.

Santapau 5731, 8292, 11471.

Oldenlandia corymbosa Linn.

Flowers white; common in cultivated fields at the foot of the hill.

Santapau 5315.

Oldenlandia spec.

Among the plants of my own collection there is one, *Santapau* 5332, which is certainly *Oldenlandia*, near *O. trinervia* Retz.; seeds about 14. The plant looks remarkably like *Anotis montholoni* Hook. f. but for the number of seeds.

Anotis lancifolia (Dalz.) Hook. f.

This is about the largest plant in the genus in western India; at Purandhar it is rather rare; in Khandala it is gregarious and rather showy, somewhat succulent.

Woodrow ex Cooke; *Santapau* 7092.

Anotis montholoni Hook. f.

Annual, erect, rather bushy herb, often found on old walls at Purandhar; flowers purple or white. Found also in cultivated fields.

Santapau 7195, 7215, 11482; *Blatt. Herb.* 20450.

Anotis foetida (Dalz.) Benth. et Hook.

A very common herb, growing on rocks and bare ground; abundant at about the middle of the monsoon; flowers rosy pink, purple or occasionally white.

Santapau 7270.

Anotis calycina Hook. f.

This plant is not included in Cooke's Flora; my specimens have been checked in Kew Herbarium against the types and found to match perfectly.

Santapau 7149, 7240.

Randia brandisii Gamble.

Gamble in his Flora of Madras has split the complex group generally included under *R. dumetorum* Lamk. into several species. *Randia dumetorum sensu stricto* does not occur in Purandhar and seems to be extremely rare in Bombay State, if at all found there.

Santapau Dec. 1944, May 1945.

Gardenia resinifera Roth, Nov. Pl. Sp. 150, 1821; Stearn in Blatt & Mill. Some Beaut. Ind. Trees, ed. 2, 83, 1955.

G. lucida Roxb. Hort. Beng. 15, 1814, nomen nud. et Fl. Ind. 2: 553, 1824; FBI. 3: 115, 1880.

At the foot of the hill probably cultivated.

Lesc. 280.

Meyna laxiflora Robyns.

Robyns in Tent. Mon. Vang., in *Bull. Jard. Bot. Bruxelles* 11: 228, 1928, gives the following key for the separation of the various species of

Meyna.

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. long. *M. 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. *M. spinosa et al.*

In my Flora of Khandala I have discussed Robyns' new combinations, and have stated: "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*."

Santapau Oct. 1944; Jan. & May 1945; Jan. 1946; *Blatt. Herb.* 20242.

Pavetta indica Linn.

A common shrub all over the hill; flowers persistently white, even when old; style long-exserted.

Santapau, passim; Ekl. 87, 95, 215, 368; *Lesc.* 110.

Pavetta indica var. **tomentosa** Hook. f.

There is a specimen among the plants of my collection that seems to belong to this variety; the leaves are tomentose beneath, especially along the nerves. Pedicels, peduncles and calyx densely tomentose.

Santapau 5683.

Hamiltonia suaveolens Roxb.

A very elegant shrub, with uniformly blue or uniformly white flowers, which are very sweetly and fairly strongly scented. Leaves usually opposite, occasionally ternate. A gregarious shrub particularly abundant on the lower slopes below Vazirghad fort, at about the altitude of the Camp.

Flowers: October. *Fruits:* December.

Santapau 5348, 5607, 5655, 5755, 8167.

Borreria stricta (Linn. f.) Schum.

A small erect herb, common all over the hill during the monsoon;

flowers white.

Santapau 8352; *Blatt. Herb.* 20230.

Borreria hispida (Linn.) Schum.

A larger plant than the preceding species, generally prostrate, occasionally erect or suberect, flowers mauve or pale pink.

Lesc. 553.

Rubia cordifolia Linn.

A slender climber; flowers pale yellow or greenish in colour, strongly and very sweetly scented. Common on the eastern side of the hill, from the Camp upwards.

Flowers and fruits: Winter months after the monsoon.

Santapau 5293, 5686, 5761, 5775, 11430.

Compositae

For a key to the genera of this complex family, the author begs to refer the reader to his own key published in *The Ind. Ecol.* vol. 1, no. 1, April 1946.

Centratherum phyllolaenum (DC.) Benth.

An erect herb, the largest species of the genus in Bombay State; the large herbaceous bracts distinguish this plant from the rest of the Compositae clearly. Not common on Purandhar Hill.

Flowers: October.

Santapau 8369, 8421.

Centratherum tenue (Wt.) Clarke.

Fairly common; a very elegant herb with lilac or blue purple flowers; this is easily confused with *Lamprachenium.*

Santapau 5285.

Centratherum hookeri Clarke.

On the type sheet of this species in Kew Herbarium there is a MS note by Otto Kuntze to the effect that this plant is not a *Centratherum* at all, but a *Vernonia,* and with this opinion I am inclined to agree.

A rare plant on Purandhar Hill.

Santapau 8416.

Lamprachenium microcephalum (Dalz.) Benth.

"Habit, pubescence and foliage of *Centratherum tenue*" (Fl. Brit. Ind. 3: 229). The general appearance of this plant is almost indistinguishable from *C. tenue*, except that the involucral bracts are small, even the outer ones. Common all over the hill.

Flowers: October.

Santapau 5328, 8419, 11381, 11433, 11442.

Vernonia cinerea (Linn.) Less.

This seems to be a perennial plant; when the hill sides above the Camp have been set on fire in the dry season, this is one of the first plants to reappear. During the dry season, it is a very low herb with woody or subwoody stems; during the rainy season, it is a tall herb with large leaves and paler flowers. Common on paths during the dry part of the year, often only a few centimeters high; abundant during the rains on slopes, and 50 100 cms. high.

Santapau Oct. 1944.

Vernonia divergens (Roxb.) Edgew.

An erect shrubby plant, 1.5 – 2 m. tall, gregarious, with dark leaves, and either unbranched or only very sparingly branched. Flowers purple. Abundant near the top of Vazirghad fort.

Santapau 5646, 5647, 8226; *Blatt. Herb.* 20962.

Vernonia anthelmintica (Linn.) Willd.

Only seen in cultivated fields at the foot of the hill. In flower during December.

Santapau 8316.

Ageratum conyzoides Linn.

A common herb, with white or bluish flowers; common on the higher parts of the fort. The plant has a strong and rather unpleasant odour.

Santapau 8342.

Dichrocephala latifolia DC.

Floral heads seem to be yellowish in the centre, white in the periphery; involucral bracts with scarious white tips. Gregarious, in dense patches about the Camp.

Flowers: August to October.

Santapau 7140, 7259, 11334.

Cyathocline purpurea (Don) O. Kuntze.

Common in Purandhar and in other parts of western India; the leaves are much smaller than in other parts and rather near those of *C. lawii*. Flowers purple.

Santapau 5596.

Cyathocline purpurea var. **alba** Santapau.

A much more slender plant than the common variety; flowers pure white. In flower during October, on the slopes above the Camp.

Santapau 5592, 8169.

Erigeron asteroides Roxb.

In Blatt. Herb. there is a specimen from Purandhar collected by McCann in Dec. 1917; I have compared this sheet with the types in Kew Herbarium, and found it matching. Cooke does not mention this plant in his Flora.

Blatt. Herb. 20774.

Conyza viscidula Wall. ex DC.

Not given in Cooke's Flora. Abundant at Purandhar on the upper slopes above Camp. At first sight it may be taken for one of the *Vernonia* species; I had all my specimens checked in Kew and found them correctly named. In young plants the pappus is pure white, in older ones it is reddish.

Santapau 5580, 5581, 8188; *Blatt. Herb.* 20960.

Conyza stricta Willd.

An elegant erect herb, sparingly or not at all branched; flowers pale yellow. On the slopes above Camp, in flower during December and January.

Santapau 5288, 5590; *Blatt. Herb.* 20968.

Blumea eriantha DC.

A rare plant, found on the upper slopes of Vazirghad fort. Checked in Kew.

Santapau 8235.

Blumea lacera DC.

An inconspicuous herb, found in flower on the slopes below Bottle Hill, in December 1945.

Blumea malcolmii (Clarke) Hook. f.

This is perhaps the most hairy of the Blumeas of Bombay; fairly common on the upper slopes at Purandhar.

Santapau 5616, 8185; *Blatt. Herb.* 20769, 20899, 20936.

Blumea membranacea DC.

A tall herb, rather extensively branched. Checked at Kew.

Santapau 5717

Blumea mollis (Don) Merr.

This is the only species of *Blumea* in Bombay State with purple flowers. Fairly common in Purandhar above Camp.

Santapau 5620, 5770.

Blumea oxyodonta DC.

This is one of the commonest species of the genus all over western India, in dry ground. Flowers yellow; branches erect or prostrate, and strongly scented.

Santapau Dec. 1944.

Pluchea tomentosa DC.

A rare plant in Purandhar.

Lesc. 625.

Sphaeranthus indicus Linn.

Common in cultivated fields during the winter months; on the hill itself it is somewhat rare. Leaves decurrent into the petiole, forming a toothed wing-like flap.

Santapau Dec. 1945.

Gnaphalium luteo-album Linn.

On the slopes above the Camp, fairly common during the winter months.

Santapau 5591; *Blatt. Herb.* 20977.

Gnaphalium indicum Linn.

This does not seem to be so common as the preceding species on the hill of Purandhar.

Santapau Dec. 1944.

Gnaphalium pulvinatum Del.

A rare plant, only seen in moist shaded spots at the base of the hill. *Ekl.* 183.

Vicoa indica (Willd.) DC.

An erect herb, sparingly branched, with deep green and reticulately veined leaves; flowers pale yellow. On the slopes above Camp.

Santapau 5757; *Blatt. Herb.* 21000.

Vicoa cernua Dalz.

An elegant herb, with yellow flowers and membranous leaves; common on the slopes from the Camp upwards.

Santapau 5608; *Blatt. Herb.* 20777.

Pulicaria wightiana (DC.) Benth. ex Clarke

In my collection there is but one specimen of this plant; it was collected in cultivated fields at the base of the hill. Checked at Kew.

Santapau 5727.

Pulicaria angustifolia DC.

A rare plant; in cultivated fields at the base of the hill.

Lesc. 614.

Caesulia axillaris Roxb.

Common in cultivated fields after the harvest, at times gregarious, erect or suberect or prostrate.

Santapau 8373.

Lagascea mollis Cav.

Not found on the hill itself; it is fairly common in hedges of cultivated fields at the foot of Purandhar. Flowers white or whitish.

Santapau 5718, 7225.

Siegesbeckia orientalis Linn.

Flowers minute, yellow; the whole inflorescence is viscous-hairy; young branches are densely woolly tomentose below, whitish in colour, gradually the pubescence disappears. An elegant plant, common on the slopes above Camp.

Flowers: October to December.

Santapau 5340, 5613, 5622.

Eclipta prostrata Linn. Mant. 2: 286, 1771.

Verbesina prostrata Linn. Spec. Plant. 902, 1753.
V. alba Linn. ibid. 902.
V. pseudo-acmella Linn. ibid. 901.
Cotula alba Linn. Syst. 2: 564, 1767.
Eclipta erecta Linn. Mant. 2: 286, 1771.
E. alba (L.) Hassk. Pl. Jav. Rar. 528, 1848.

The nomenclature of this plant is rather complicated. The specific names applying to this plant are *prostrata, alba* and *pseudo-acmella,* all of 1753; hence as far as priority is concerned all are equal. The correct name is decided according to custom by the use of the name in the proper genus by the next author or by the same author on the next occasion. In 1771 Linne used the specific names *prostrata* and *erecta* in the genus *Eclipta;* of these two names it is clear that *prostrata* has priority.

Erect or prostrate herb, with white flowers, common all over the hill, abundant at the foot in moist spots.

Blainvillea latifolia (Linn. f.) DC.

The name is synonymous with *B. rhomboidea* Cass. 1823; the specific epithet *latifolia* dates from 1781. An erect herb, 30 – 100 cm. high, with yellowish or whitish ligulate flowers, the ligules being minute. The fruit is typical. Common.

Santapau 5726, 7163, 11409.

Wedelia spec.

One of the specimens from Purandhar which I have examined is undoubtedly a *Wedelia;* but the specimen not being available at the time of writing, I cannot determine the species with certainty.

Lesc. 541.

Glossocardia bosvallea (Linn. f.) DC.

A prostrate herb; leaves divided into linear segments; flowers yellow; fruit flattened, hairy all over, pappus of two strong divaricate awns. On waste land at the foot of the hill.

Santapau 5359.

Bidens biternata (Lour.) Merr. et Sherff.

Sherff in his monograph, *The Genus Bidens,* shows clearly that the

common western Indian plant is not *B. pilosa* Linn. Common about Purandhar.

Santapau 5292, 11326.

Cosmos sulphureus Cav.

My plant has been checked at Kew; stem 1 m. high; ligulate flowers orange in colour, disc florets yellow or yellowish; in flower and fruit in Dec. 1944. The plant was growing on the slopes below Camp, away from human habitation; at first sight it is remarkably like a species of Bidens.

Santapau 5728.

Tridax procumbens Linn.

A very common and variable plant, often found in the drier parts of western India. Common at Purandhar, especially in the waste lands at the foot of the hill.

Santapau Dec. 1944; May, Aug., Sept. & Dec. 1945.

Artemisia parviflora Buch.-Ham.

The leaves of this plant are quite typical among the Compositae of western India; common on the hill at the height of the Camp or a little higher, particularly along the path to Vazirghad fort.

Santapau 5664, 5754, 8230.

Artemisia nilagirica (Clarke) Pamp.

In the nomenclature of this plant I have followed the monographic work of Pampanini, who has demonstrated that none of the Indian species of *Artemisia* corresponds to the European *A. vulgaris* of the Linnean herbarium; the oldest name is that of Clarke, *A. vulgaris* Linn. var. *nilagirica*, which has been raised by Pampanini to specific rank.

Very common on Purandhur hill, much more abundant than the preceding species.

Santapau 5289, 5383; *Blatt. Herb.* 20932.

Gynura angulosa DC.

Occasional on the slopes about the Camp; typical on account of the orange colour of its floral heads.

Santapau Oct. 1944.

Emilia sonchifolia (Linn.) DC.

A slender herb, with shining leaves and light purple flowers. On the slopes above Camp, not common.

Santapau Aug. 1945.

Notonia grandiflora DC.

A shrub, often 2 m. high, with very thick, fleshy stems and branches; leaves pale or whitish-green in colour; sap abundant, watery and colourless; the whole plant is rather brittle, and completely unarmed; otherwise from a distance it is easy to mistake this plant for one of the *Euphorbia* shrubs which it much resembles. On the highest parts of Purandhar and Vazirghad forts.

Santapau 5347, 5748, 6187; *Blatt. Herb.* 20897.

Senecio hewrensis (Dalz.) Hook. f.

Found on the slopes below Camp, not common.

Santapau 7227.

Senecio edgworthii Hook. f.

This is an interesting plant, growing on old walls in the upper parts of Purandhar fort; the stems are woody or subwoody, the leaves densely white woolly beneath, flowers yellow. Common on rocky walls.

Santapau 5601, 5658, 8231, 11428, 11521; *Bhide* 9.9.1907; *Blatt. Herb.* 27494.

Senecio grahami Hook. f.

During the second half of the monsoon this plant is very common all over the hill, from the highest parts down to the very base; it grows on slopes where there is plenty of fairly good soil, or alternatively on rocky ground and walls where there is practically no soil. Together with *Guizotia abyssinica* this plant brightens the whole of Purandhar the first part of October.

Santapau, passim, Oct. 1950.

Senecio belgaumensis (Wt.) Clarke.

Very similar to the preceding species, but the present plant has no pappus. Found on the upper parts of the fort, and on some of the slopes about Camp.

Santapau 7107, 7204.

Senecio gibsoni Hook. f.

Another species very similiar to *S. grahami*; among other details it differs from the latter species by the structure of the leaves and of the pappus; in the present species the pappus is not paleaceous, and the leaves are much narrower and longer. On the upper part of the hill.

Santapau 8232; *Blatt. Herb.* 20978.

Echinops echinatus Roxb.

Roxburgh published the description of this plant in *Fl. Ind.* 3: 647, 1832; nevertheless, Hooker in Fl. Brit. Ind. and Gamble in Fl. Madr. attribute this name to DC. in Wight's Contrib. 24, 1834; Roxburgh's name is two years prior to that of DC. The plant is not found on the hill itself; I have seen it along the roadsides at the foot of the hill.

Santapau Oct. 1944.

Tricholepis amplexicaulis Clarke.

An erect herb reaching 2 m. high, the dry stems persisting in the field long after dehiscence. Fairly common on the upper parts of Purandhar.

Santapau 8179.

Volutarella ramosa (Roxb.) Santapau in Pl. Saur. 22, 1953.

This is the plant listed in our floras under the name of *Volutarella divaricata* Hook. f. et Benth.; Roxburgh's name dates from 1832; another synonym for the same plant, *Centaurea divaricata* Wall. dates from 1831, but is a *nomen nudum* and therefore of no consequence for the purposes of priority. Rare in Purandhar.

Kp. 319, 327.

Goniocaulon glabrum Cass.

An erect herb, often over 1 m. high, with pale purple flowers. On the slopes below Camp, not abundant.

Santapau 5719, 8340.

Lactuca runcinata DC.

A rare plant in Purandhar; flowers pale yellow.

Santapau 5729, 8315.

Lactuca scariola Linn. var. **sativa** Clarke.

Cultivated as a salad herb in some of the gardens in Camp; flowers pale yellow.

Santapau May & Dec. 1945.

Sonchus oleraceus Linn.

Tolerably common on the upper parts of the hill during the winter months.

Santapau 5740, 7292, 8236, 8347.

Sonchus asper (Linn.) Hill.

Occasional on the slopes about Camp during the winter months.

Santapau 5623, 8318.

Sonchus arvensis Linn.

An erect herb, growing on old walls, rare; typical glandular hairs identify this plant. Rare.

Flowers Dec. 1956.

Santapau 21791 – 21793; 21796.

Launaea nudicaulis Hook. f.

Very similar to *Lactuca runcinata*, from which it can be distinguished by the achenes, which have no beak in the present species.

Santapau 5344.

Erigeron spec.

An escape from cultivation in the Camp; I have not seen the plant growing wild about the hill.

Kp. 65.

Carthamus tinctorius Linn.

Cultivated at the foot of the hill, growing also as an escape from cultivation.

Santapau 5733, 8308; *Blatt. Herb.* 20875.

Cichorium intybus Linn.

Found growing wild, probably an escape from cultivation, towards the west end of the Camp.

Santapau Dec. 1944.

Dahlia spec. (variabilis Desf.?)

A very popular plant in gardens in Camp; not seen wild.

Santapau Dec. 1944.

Guizotia abyssinica Cass.

Cultivated in many of the fields at the foot of the hill and on the lower slopes; seen also wild at the foot of the hill.

Santapau 8354.

Helianthus annuus Linn.

Cultivated in gardens; there seem to be several varieties all with yellow flowers, but differing much in the size of the floral heads.

Santapau Dec. 1944, May 1945.

Tagetes spec.

Cultivated in gardens; found wild on the lower slopes of Vazirghad far from human habitation.

Santapau 8273, 8328.

Acanthospermum hispidum DC.

This American weed was first recorded for Bombay State by the present writer in 1945; subsequently it has been seen in several parts of Bombay and Saurashtra, growing in dense profusion; in 1950 it was found along the main path from the bus-stand to the Bini Gate at Purandhar.

Santapau Oct. 22, 1950.

Lobeliaceae

Lobelia nicotianaefolia Heyne ex Roth.

Herbaceous, up to 2 m. high with white flowers in large terminal, simple or panicled racemes. Occasional on the upper parts of the hill.

Santapau 5721.

Lobelia heyneana Roem. et Schult.

Fairly common about the Camp in damp spots during the winter months.

Santapau 5319, 5752, 7165, 8210.

Campanulaceae

Capsule dehiscing at the top within the calyx-teeth *Cephalostigma*

Capsule dehiscing at the base or sides below the calyx-teeth *Campanula*

Campanula alphonsi Wall. ex DC.

Stems woody, much branched from a stout rootstock; flowers white. On old walls on the very highest parts of Purandhar fort, fairly abundant in dense clumps.

Flowers: October to December.

Santapau 5326, 8212, 8389, 11489.

Campanula canescens Wall. ex DC.

This plant is not menioned by Cooke in his Flora; for a full description, see Santapau in *Journ. Bombay nat. Hist. Soc.* 45: 446. Fairly common on the upper parts of the hill from the Camp upwards.

Flowers: October to December.

Santapau 5322, 5645, 8205 B, 11506, 11526.

Campanula ramulosa Wall. ex Roxb.

This is another new record, not mentioned in Cooke's Flora. I have followed Gamble in splitting the complex group under *C. colorata* Clarke.

A stout plant with many stiff branches from the rootstock; stems up to 50 cm. high, rather stout, softly strigosely villous, leafy; leaves oblanceolate, distantly and irregularly serrate or dentate, up to 5 cm. long, 1.5 cm. broad, usually smaller; flowers blue or bluish, about 1 – 1.5 cm. long, calyx-lobes triangular, 3–7 mm. long, faintly dentate, more or less hairy. It seems strange that Cooke has not taken up this species, as it is rather frequent on the upper parts of the hill from the Camp upwards.

Flowers: October to February.

Santapau 8200, 82305A, 11377, 11486, 11494.

Cephalostigma flexuosum Hook. f. & Thoms.

A slender erect herb; stems wiry, more or less geniculate; flowers pale yellow, minute; calyx teeth acute, spreading; corolla of 5 free petals. Growing occasionally along the road below Vazirghad Fort and in the undergrowth of *Carvia* bushes; abundant on grassy slopes below Bottle Hill.

Flowers: October December.

Santapau 5321, 5643–5644.

Plumbaginaceae

Plumbago zeylanica Linn.

Common all over the hill, in scrub forest on the slopes. Sometimes the plant assumes a more or less climbing habit, with very long branches, which are supported by neighbouring bushes.

Santapau 5606, 8192.

Plumbago capensis Thunb.

Cultivated in gardens, not seen wild; flowers are of a pale blue colour.

Blatt. Herb. 50009.

Primulaceae

Anagallis-arvensis Linn var. **coerulea** Gren. et Godr.

An erect or procumbent herb; leaves bright green; flowers bright blue. Common in gardens and cultivated ground on the hill within the fort, occasionally also in cultivated fields at the base of the hill.

Santapau 5627, 5690, 7129, 8228, 11435; *Blatt. Herb.* 21448.

Sapotaceae

Mimusops elengi Linn.

A middle-sized tree with dark foliage; flowers white. Rare on the hill.

Kp. 113; *Lesc.* 225.

Achras zapota Linn.

The cultivated *Chiku* plant; seen in cultivated fields at the foot of the hill.

Kp. 500; *Lesc.* 633.

Ebenaceae

Diospyros montana Roxb.

Occasionally seen on some of the slopes about the Camp; not a common tree.

Santapau 6169, 11500; *Blatt. Herb.* 21224.

Oleaceae

Jasminum malabaricum Wt.

Erect or subscandent; flowers white, fairly strongly scented. Common

from the Camp to the base of the hill.

Flowers: April and May. *Fruits:* May to July.

Santapau 6153, 7231.

Jasminum multiflorum (Burm. f.) Andr. Bot. Rep. t. 496, 1801, non Roth, 1821; Bakhuizen v.d. Brink in Blumea 6 : 383, 1950.

Nyctanthes multiflora Burm. f. Fl. Ind. 5, t. 3, f. 1, 1768.

Jasminum pubescens Willd. Sp. Pl. 1: 37, 1797 sensu lato.

Rare on the hill; occasionally found wild or cultivated at the foot of the hill, near villages.

Ekl. 224.

Jasminum officinale Linn.

On the slopes of hill; there is a large specimen in a garden at about half way up from the base to the Camp. The flowers are very highly scented.

Santapau Oct. 1950.

Nyctanthes arbor-tristis Linn.

Cultivated in gardens, not seen wild about Purandhar. This plant has been placed in the present family from the time of Linne and Jussieu; lately Airy Shaw and Margaret Y. Stant have shown, in Kew Bull. 1952: 271 – 273, that the plant should be placed in the Verbenaceae both from the external and the internal morphology.

Lesc. 642.

Apocynaceae

Trees:

Branches stout and soft; leaves subcoriaceous; fruits very rarely seen, consisting of two stout divaricate follicles — *Plumeria*

Branches slender, hard; leaves submembranous; fruits common, of two pendulous slender follicles — *Wrightia*

Shrubs:

Armed with stout axillary spines — *Carissa*

Unarmed plants:

Flowers white to purple, but not yellow:

Leaves linear-lanceolate — *Nerium*

Leaves obovate — *Lochnera*

Flowers yellow:

Leaves linear-lanceolate	*Thevetia*
Leaves lanceolate or elliptic, broad	*Allamanda*

Carissa congesta Wt.

This is the plant generally known in our floras as *C. carandas*; the real *C. carandas* Linn. is very rare in Bombay State, if at all present.

Rare on the upper parts of the hill; very abundant on the western slopes from Camp to the foot of the hill.

Santapau 6162.

Lochnera rosea (Linn.) Reich.

Cultivated in several gardens; in flower more or less throughout the year. Flowers white or purplish rose.

Santapau May 1945.

Wrightia tinctoria R. Br.

Occasional on the slopes below Vazirghad Fort and elsewhere, but not common. A small tree.

Santapau 6179; *Blatt. Herb.* 21333.

Plumeria rubra forma **acutifolia** (Ait.) Woodson.

"Corolla white, usually with a 'yellow eye'; occasionally flushed with rose without." (Woodson in *Ann. Missouri Bot. Gardn.* 25 : 211, 1938). Planted in gardens in Purandhar, not seen wild. Fruits have not been seen.

Ekl. 219; *Kp.* 268; *Lesc.* 191.

Nerium indicum Mill.

In some of the gardens in Purandhar this plant is cultivated for its flowers, which are usually red or reddish in colour.

Ekl. 212; *Kp.* 344; *Lesc.* 122.

In Blatt. Herbarium there is a specimen collected at Purandhar in January, 1918, with the following particulars; sepals 5 + 5, petals 15 to 16; the laciniae of the nectaries are filiform, and this is typical of *N. indicum* Mill. (Blatt. Herb. 21334.)

Thevetia peruviana (Pers.) Schum.

Frequent in gardens in Camp and in the villages at the base of the hill; leaves are narrow for their length; fruit is common in Purandhar.

Santapau Dec. 1945.

Allamanda cathartica Linn

Another favourite in gardens, not only in Purandhar but all over western India; the poisonous qualities of the plant protect it against the depredations of various animals. Flowers are large and showy; fruit is rarely produced.

Lesc. 216.

Asclepiacaceae

Erect herbs or shrubs:
- Flowers as broad as long or broader:
  - Flowers brightly coloured red and yellow — *Asclepias*
  - Flowers lilac or purple or white — *Calotropis*
- Flowers much longer than broad, variously coloured — *Ceropegia*

Twining or climbing plants:
- Follicles with soft spinous processes — *Pergularia*
- Follicles smooth or nearly so:
  - Flowers much longer than broad — *Ceropegia*
  - Flowers as broad as or broader than long:
    - Flowers yellow:
      - Corolla lobes short, triangular — *Gymnema*
      - Corolla lobes long, strap-shaped — *Cryptolepis*
    - Flowers not yellow:
      - Filaments usually free — *Hemidesmus*
      - Filaments connate into a tube:
        - Corona lobes tubercle-like, entirely adnate to the staminal column; corolla brownish — *Tylophora*
        - Corona lobes adnate to the staminal column below, free above; corolla pure green — *Marsdenia*

Hemidesmus indicus (Linn.) R. Br.

Fairly common and very variable in the shape and size of the leaves; on the slopes below Camp.

Santapau May & Sept. 1945.

Cryptolepis buchanani Roem. et Scult.

Fairly common on the slopes below Camp; the flowers are pale yellow; the older stems are dark brown almost black, and peel off in a typical manner.

Santapau 6154; *Blatt. Herb.* 21372.

Calotropis gigantea (Linn.) R. Br.

A common large shrub on the slopes below Camp, rare on the higher parts; it flowers and fruits quite readily.

Santapau Dec. 1944, 1945.

Calotropis procera R. Br.

Rare in the district; occasionally found in the drier parts at the foot of the hill. The corona processes are but about 5 mm. long, less than half as long as in the preceding species.

Kp. 392.

Cynanchum callialata Ham.

A rare plant; on the slopes below Camp. Flowers, at least the corona, white; fruit strongly two-winged.

Lesc. 647.

Gymnema sylvestre (Retz.) R. Br.

On the slopes below Camp, fairly conspicuous, though not common. The leaves remove the taste for sugar, but so far have not been proved to remove the sugar in the blood.

Santapau 6153, 7288.

Tylophora dalzellii Hook. f.

An occasional plant on the slopes below Camp; it is not easy to distinguish from *T. indica* Merr. (*T. asthmatica* Wt. & Arn.). From many years' experience I can state that the latter plant is very rare in Bombay State, the former rather common.

Santapau 7211.

Pergularia daemia (Forsk.) Blatt. et McC.

On the slopes below Camp, not common. This is a rather common plant all over Bombay State, in hedges; it is abundant in the drier districts.

Kp. 514.; *Lesc.* 644.

Marsdenia volubilis Cooke.

A very typical plant; flowers are pure green and come out in fairly large pendulous umbels. In scrub forest below Camp, not common.

Santapau 7245.

Asclepias curassavica Linn.

Along water courses at the foot of the hill; not seen in the Camp proper.

Kp. 370; *Lesc.* 556, 557.

Ceropegia lawii Hook. f.

An elegant, erect herb, growing among grasses about the paths towards the west of the Camp. Fairly abundant locally. In my field notes I find the following entry about this plant: "Erect, not climbing; flowers grey with a touch of purple on the nerves, corolla lobes yellow. Flowers are on either side of the petiole, not in the axils proper. The whole plant (tuber included) up to 27 in. long; tuber 1.5 in. diam., flattened, 0.5 in. thick. Gregarious among grasses." A specimen collected at Purandhar in August 1945 was planted in Bombay and flowered profusely in the monsoon of the following year.

Flowers: August and September.

Santapau 7125 – 7128; 7169, 7242; *Woodrow* ex Cooke; *Blatt. Herb.* 21990.

Ceropegia evansii McCann.

When first discovered the following specimens were taken to be *C. hirsuta* Wt. et Arn., or possibly *C. intermedia* Wt. All my specimens have been checked by H. Huber of Munich, who pronounced them to be *C. evansii* McC. From my field notes: "Twining; stems glabrous; tuber $\frac{3}{4}$ – 1 inch in diam., sub-spherical; leaves up to 8 x 1.25 in., tapering at both ends. Corolla tube about 1 in. long, greenish purple; lobes yellowish green, sometimes with a touch of purple at the edges. Tips of corona lobes deeply emarginate, purple, ciliate inside."

Santapau 7085 – 7089; 7121 – 7124; 7290.

Ceropegia oculata Hook.

A climber, found among grasses towards the west and of the Camp. Rare.

Santapau 7138.

Frerea indica Dalz.

During October 1950 I picked up several stems of this plant on the upper slopes just below the top of Vazirghad fort; after lying about on the floor of my room for about ten days, these stems were put in flower pots in Bombay; they came into flower in the second half of December of the same year. The plant has been thriving ever since (up to Jan. 1956).

Santapau 11364.

Loganiaceae

Budleia asiatica Lour.

In the whole of Purandhar I have only seen a few shrubs near Pilon No. 14, from the Hospital end of the Camp. Flowers white and sweet-scented.

Santapau 7120, 8189, 8405.

Gentianaceae

Ovary 2-celled — *Exacum*

Ovary 1-celled:

Corolla lobes without pits, depressions or glands at the base:

Corolla regular, flowers red, pink or white — *Centaurium*

Corolla irregular; flowers generally pink, rarely white — *Canscora*

Corolla lobes with one or two pits, depressions or glands at the base. — *Swertia*

Exacum pedunculatum Linn.

The specimens in Blatter Herbarium from Purandhar are the typical variety, i.e. *E. pedunculatum* proper, not the variety *petiolare*. Occasional about Camp.

Santapau 8383; *Blatt. Herb.* 21429.

Exacum pumilum Griseb.

A small herb with deep blue flowers, rather showy among grasses. Common from the middle of September.

Kp. 416.

Exacum lawii Clarke.

A very small, unbranched herb with small, pale blue or lilac flowers.

Very similar to *Swertia minor* Knobl. but without glands on the corolla lobes.

Santapau 7154.

Centaurium roxburghii (Don) Druce.

An erect, small herb, with red, pink or white flowers; found in cultivated fields during the winter months.

Ekl. 220.

Canscora diffusa R. Br.

One of the commonest of the Gentianaceae in Purandhar; abundant throughout the year, especially during the winter months. In the moister spots the plant has very large lower leaves, which, however, fall off later on.

Santapau 5584, 8196; *Blatt. Herb.* 21447.

Canscora pauciflora Dalz.

A small plant with corolla and calyx slightly larger than in the preceding species. Not common.

Santapau 8362.

Swertia minor (Griseb). Knobl.

Abundant in grass fields or on grassy slopes during the first half of the monsoon. Similar to *E. lawii.*

Santapau 7082.

Ehretiaceae

Cordia dichotoma Forst. f.

A small to middle-sized tree, with suborbicular leaves; fruits edible when ripe, but very mucilaginous. On the slopes below Camp, one or two trees above Camp.

Santapau 6194.

Boraginaceae

Ovary entire or slightly 4-lobed; style terminal, entire or shortly 2-lobed. *Heliotropium*

Ovary deeply 4-lobed; style usually gynobasic; nutlets usually 4:

Anthers usually connivent into a cone, subexserted *Trichodesma*

Anthers not connivent into a cone, included:
Bases of the nutlets produced downwards — *Cynoglossum*
Bases of the nutlets hardly produced downwards — *Adelocaryum*

Heliotropium indicum Linn.

A rank weed, common in waste lands at the base of the hill; flowers white or nearly so.

Kp. 114.

Trichodesma amplexicaule Roth.

This is the commoner species in Western India; it is distinguished from *T. indicum* R. Br. by the shape of the auricles at the base of the calyx; in *amplexicaule* the auricles turn inwards, in *indicum* they spread outwards. The present species is common at Purandhar.

Blatt. Herb. 21650; *Santapau, passim.*

Cynoglossum wallichii G. Don, Gen. Syst. 4: 354, 1838.

G. glochidiatum Wall. Cat. 922, 1828, nom. nud.; Lindl. in Bot. Reg. 27 : t. 15, 1841.

C. denticulatum DC. Prodr. 10: 150, 1846.

All my Purandhar specimens have been identified by Dr. S. K. Mukerjee at Calcutta; they were later checked at Kew Herb. and found to agree with the type of Wallich. The name, however, has been changed to the correct one acc. to the Rule of Priority.

Santapau 5751, 8324; *Blatt. Herb.* 21646, 21661.

Adelocaryum coelestinum (Lindl.) Brand.

A tall, gregarious plant, with rather large leaves; flowers pale bluish lilac, turning nearly white when old. Common on the upper part from the Camp upwards.

Santapau Oct. & Dec. 1944; *Ekl.* 74; *Kp.* 277.

Convolvulaceae

Parasitic leafless plants — *Cuscuta*

Not parasitic plants, leaves present:
Erect or procumbent herbs, not twining or climbing:
Styles 2, each 2-branched — *Evolvulus*
Style entire, stigmas usually 2 — *Convolvulus*

Climbing or twining plants:
- Flowers white:
  - Calyx much enlarged in fruit; corolla about 12 – 15 mm. long — *Porana*
  - Calyx not at all or only slightly enlarged in fruit; corolla 3 cm. long or longer — *Ipomoea maxima*
- Flowers blue when fresh, pinkish when old or fading — *Ipomoea nil*
- Flowers red, pink, purple or violet:
  - Leaves hastate at base — *Convolvulus*
  - Leaves not hastate at base:
    - Underside of leaves densely silky white pubescent — *Argyreia*
    - Underside of leaves not silky white pubescent, or not densely so:
      - Leaves broadly ovate, acute, cordate at base:
        - Calyx and corolla densely silky pubescent; corolla 3 cm. long — *Argyr. setosa*
        - Calyx and corolla glabrous or nearly so; corolla 6 cm. long or longer — *Ipom. soluta*
      - Leaves elliptic, acute, base cuneate or rounded — *Argyr. elliptica*
      - Leaves obovate, obtuse, base cuneate — *Argyr. cuneata*
      - Leaves ovate, oblong, acute; base cordate to subhastate — *Argyr. hispida*

Cuscuta reflexa Roxb.

Not seen on the hill itself; it is fairly common at the foot of the hill along the road sides.

Santapau Jan. and Aug. 1945.

Porana malabarica Clarke.

Flowers white; the calyx is accrescent in fruit and quite conspicuous. Not a common plant; seen on the slopes below Camp.

Santapau 8364, 8412.

Evolvulus alsinoides Linn.

Found occasionally during the dry months of the year on the slopes below Vazirghad fort in bare ground.

Flowers: May and October.
Santapau May 1945, October 1950.

Convolvulus arvensis Linn.

Occasional in Camp or on the slopes below it; seen also in cultivated fields at the base of the hill.

Santapau 8447, 11483; *Blatt. Herb.* 22348.

Ipomoea soluta Kerr.

Kerr, in *Kew Bull.* 1941: 18, has shown that the Linnean *Ipomoea campanulata* is not an *Ipomoea* at all, but *Thespesia populnea* (Linn.) Soland.; hence the change of name.

Fairly common about Purandhar fort, in the upper reaches above Camp; the leaves of this plant are very typical in that the lateral nerves are numerous, parallel among themselves and forming nearly a right angle with the midrib. An elegant plant.

Flowers: October.

Santapau 5675, 5676, 8286.

Ipomoea eriocarpa R. Br. Prodr. 484, 1810.

Convolvulus hispidus Vahl, Symb. Bot. 3 : 29, 1794.
Ipomoea hispida R. & S. Syst. 4 : 238, 1819; non Zuccagni 1809.

A fairly common plant on the slopes below Camp. In flower and fruit: October to December.

Santapau Oct. 1944; *Blatt. Herb.* 22341.

Ipomoea maxima (Linn. f.) Don.

In hedges, along the paths in Camp, or along the slopes below it; not common in Purandhar.

Lesc. 500.

Ipomoea nil (Linn.) Roth.

In most of our older floras this plant is listed under the name of *I. hederacea* Jacq.; the real *I. hederacea* Jacq. is an American plant, sometimes cultivated in gardens in India; our common plant is *I. nil* which to

judge from its distribution all about Bombay State, in far away places, must be considered native in our State. Very common all over Purandhar.

Flowers: August to December.

Santapau 11407.

Ipomoea grandiflora (Linn. f.) Lamk.

Among the plants of Purandhar which I have examined there is one that seems to fit the description given by Clarke in Hooker's Fl. Brit. Ind. 4 : 198; the specimen is not available at the time of writing, and so I am unable to check the identity of the plant.

Lesc. 84.

Ipomoea learii Paxt.

A large climber with very showy flowers; in my field notes for 13.10.50, against No. 11503 I find the following entry: "Flowers violet or gentian violet, the bands purple, not so blue as *I. nil*. Cultivated in gardens and a very showy plant. Note the calyx which here is typically glabrous."

Santapau 11503 11506.

Ipomoea calrica Sweet; Santapau in Journ. Bombay nat. Hist. Soc. 47 346

This plant in Cooke's Flora goes under the name of *I. palmata* Forsk.; for the change of name, see Santapau loc. cit.

In leaf only, on a fence in gardens in Camp.

Santapau Dec. 1956.

Argyreia setosa (Roxb.) Choisy.

A very elegant climber, with calyx and corolla densely covered with silvery stout hairs, the stems and particularly the inflorescence branches give out a thick white sap. On the slopes below Vaxirghad facing North, locally abundant.

Santapau 8313, 8378, 11413, *Blatt. Herb.* 22340.

Argyreia elliptica Choisy.

A common climber, with elliptic leaves which have conspicuous nerves on both sides, flowers are purplish and showy. Common below Camp on the slopes.

Santapau Oct. 1944.

ARGYREIA SETOSA CHOISY

Argyreia sericea Dalz.

A large climber with very beautiful leaves and large flowers; common on the slopes below Camp, and around Vazirghad.

Santapau 8264, 11412, 11497.

Argyreia cuneata Ker-Gawl.

An erect or nearly erect shrub, with distinctively shaped leaves; on the slopes below Camp, not common.

Blatt. Herb. 22325.

Convolvulus rottlerianus Choisy.

This plant is given with a good deal of uncertainty; there is a plant of my own collection that seems to agree with the description of the plant, and with the photos of the types from Kew; but my specimens have no flowers.

Santapau 8447.

Solanaceae

Calyx greatly enlarged in fruit — *Nicandra*

Calyx not at all or only slightly enlarged in fruit.

Fruit a berry:

Anthers opening by apical pores or by short slits — *Solanum*

Anthers dehiscing by longitudinal slits — *Lycopersicon*

Fruit a capsule:

Flowers axillary, solitary; corolla lobes plicate; embryo curved — *Datura.*

Flowers terminal, in panicles; corolla lobes induplicate valvate; embryo straight — *Nicotiana*

Fruit dry and indehiscent, berry-like — *Capsicum*

Fruit very rarely, if ever, present — *Petunia*

Solanum nigrum Linn.

Common about the Camp and slopes above it, flowers white, fruits finally black.

Fruits: October to December.

Santapau 5626, 5705; *Blatt. Herb.* 22462.

Solanum indicum Linn.

A very variable plant; usually an erect shrub, with fairly abundant spines all over. Common on the hill about the Camp and on the slopes below it.

Flowers and fruits: October to December.

Santapau 5609; *Blatt. Herb.* 22465.

Datura metel Linn.

For the identity and nomenclature of this plant, see Santapau in *Journ. Bombay nat. Hist. Soc.* 47: 657...Common on the plains below the hill, in waste lands and cultivated fields. Abundant from the foot of the hill to Saswad.

Santapau Aug. & Sept. 1945.

Lycopersicon esculentum Mill.

For the spelling of the generic name, see Luckwill, *Gen. Lycop.* 20, in *Aberdeen Univ. Stud.* No. 120, 1943.

Cultivated in many of the gardens of Purandhar and frequently found growing wild on the slopes below Camp.

Santapau May & Dec. 1945.

Nicandra physalodes (Linn.) Gaertn.

This is one of the commonest plants of Purandhar, growing wild in various parts of the hill, especially a little above the Camp. It is an erect herbaceous plant, growing to 1.5 m. in height, flowering and fruiting profusely during the monsoon. Dry fruits remain in the parent plant until the beginning of the following rainy season. A showy plant when in full bloom.

Santapau 5291; *Blatt. Herb.* 22464.

Nicotiana tabacum Linn.

A great favourite with gardeners in Purandhar, for the sake of the showy flowers of the plant; I have not seen the plant wild in the district.

Santapau 6195, 8221.

Petunia sp. (nyctaginiflora Juss.?).

Widely cultivated in gardens in Purandhar, where the plants are much appreciated on account of their bright colours. Not seen wild.

Santapau May 1945.

Capsicum annuum Linn. var. **acuminata** Fingerh.

Cultivated in some of the gardens at Purandhar, and in villages at the foot of the hill. This is the common *Chilli* of western India.

Lesc. 645.

Scrophulariaceae

Key to the Genera adapted from Gamble.

Leaves all alternate; corolla subregular, the tube short; large erect herbs; stamens 4 – 5 — *Verbascum.*

Leaves all or nearly all opposite; corolla tube usually elongate:

Corolla spurred in front at the base; capsule opening by pores — *Kickxia*

Corolla not spurred, capsule opening by valves:

Corolla distinctly bilabiate:

Stamens 4, included in corolla tube:

Calyx campanulate, corolla palate with two folds; anther cells stipitate; capsule loculicidal — *Lindenbergia*

Calyx 5–partite; corolla without folds; capsule both loculicidal and septicidal:

Anther cells stipitate — *Limnophila*

Anther cells contiguous, not stipitate — *Bacopa*

Stamens 2 perfect, the anterior ones reduced to staminodes, all inserted in the corolla tube — *Dopatrium*

Stamens, if 4 the anterior (or lower) pair, if 2 the staminodes, attached to the corolla throat; the posterior or only perfect pair of stamens inserted within the corolla tube; capsule septicidal — *Lindernia*

Corolla lobes flat, spreading, subequal; stamens 2 — *Veronica*

Corolla tube elongate, the lobes spreading; stamens 4, didynamous; anther cells distinct, equal or one imperfect or wanting; calyx tubular, ribbed, 5–lobed; semiparasitic herbs:

Corolla tube straight or nearly so; the lobes subequal — *Buchnera*

Corolla tube abruptly incurved near the middle, the 2 upper lobes the smaller — *Striga*

Corolla tube straight or curved; anthers 1-celled	*Rhamphicarpa*
Corolla tube straight; anthers 2-celled	*Sopubia*

Verbascum chinense (Linn.) Santapau, comb. nov.

Scrophularia chinensis Linn. Mant. 2: 250, 1771.

Celsia chinensis Druce in Rep. Bot. Soc. & Exch. Club. 1916, Suppl. 2: 612, 1917.

Celsia coromandeliana Vahl, Symb. Bot. 3: 79, 1794.

Verbascum coromandelianum O.K. Santapau in Rec. Bot. Surv. India 16(1). 200, 1953.

Normally this plant is listed under *Celsia* in our floras; for a discussion of the problem see Santapau in *Journ. Bombay nat. Hist. Soc* 49: 25, 1950.

Common all over the hill, about the Camp and on the slopes above it. Flowers bright yellow, subregular.

Flowers and fruits August to December.

Santapau 5597, *Blatt. Herb.* 21645.

Kickxia ramosissima (Wall.) Janchen.

"Wettstein in Eng. & Prantl, Pflanzenfam. 4 (3 b): 58, 1891, separated the Indian *Linaria ramosissima* Wall. from the genus *Linaria*, and placed it under *Elatinoides* (Chav.) Wettst. The oldest name for the genus is *Elatine* Hill, Brit. Herb. 113, 1756, but the name is already preoccupied by *Elatine* Linn., Sp. Pl. 267, 1753, which is applied to quite a different genus. The oldest valid name is then *Kickxia* Dumort Fl. Belg. 35, 1827, and this is the name proposed by Pennell, in spite of the fact of the existence of *Kickxia* Blume, 1826, for a genus of the Apocynaceae." (Santapau in *Journ. Bombay Nat. Hist. Soc.* 49. 26-27, 1950). It is clear that the complications in the generic name of the present plant will only be solved by the proper ruling of the Nomenclature Commission of a future Intern. Bot. Congress.

This is a common plant on the walls of the upper parts of the fort at Purandhar, usually it grows in dense tufts, with twining or pendulous branches. Flowers yellow.

Flowers September to December.

Blatt. Herb. 23802.

Kickxia incana (Wall.) Pennell.

I have united *Linaria incana* Wall. with *Linaria ramosissima* Benth., following Pennell. Cooke (2. 283) places *L. ramosissima* among the *Rectoidei*

Species on the plea that there is no evidence of its occurrence within the boundaries of Bombay State; Perrottet, according to Bentham in DC. Prod. 10 : 270, found the plant on the walls of Deccan forts; in Purandhar it is a rather striking plant, and a common one, too, but is only found on the highest parts of the hill.

Santapau 5307, 5582, 7193, 8184; *Blatt. Herb.* 22512.

Bacopa monnieri (Linn.) Pennell.

For the complicated nomenclature of this plant see Santapau, *loc. cit.* 20. The plant is only found at the foot of the hill, in some ditches.

Kp. 295; *Lear* 527.

Limnophila indica (Linn.) Druce

I have united *L. racemosa* with *L. gratioloides* under the present name, for a discussion of the subject see Santapau, *loc. cit.* 34. Fairly common at the foot of the hill.

Santapau 8442; *Blatt. Herb.* 22538.

Dopatrium junceum (Roxb.) Buch.-Ham.

A succulent or subsucculent plant, with small leaves and inconspicuous bluish flowers. In tanks and water-logged soil.

Santapau 8379.

Lindernia crustacea (Linn.) F. Mueller.

Common along the paths, on the slopes below Camp, abundant during the monsoon.

Lear 350.

Lindernia parviflora (Roxb.) Haines.

Occasional on Purandhar hill during the monsoon; flowers small, white. Along paths, in cultivated fields.

Santapau 8093.

Lindernia ciliifera (Benth.) Wettst.

A small, elegant erect herb, with broad leaves (which are ovate and serrate) and fruits in which the seeds are plainly visible through the capsule walls. Common and abundant below Vazirghad fort. The plant is not mentioned by Cooke in his Flora, and this seems strange considering that the plant is rather common all over Bombay State.

Santapau 7167, 7168.

Sutera dissecta Walp.; Santapau in Journ. Bombay nat. Hist. Soc. 49: 28, 1950.

A very typical plant with minute white flowers and glandular hairy stems. The plant has been collected for the first time in Dec. 1956, on two or three spots in Purandhar.

Santapau 21718.

Stemodia viscosa Roxb.

An erect or suberect herb, with glandular hairs all over the stem and with deep gentian blue flowers. Collected for the first time along the lower path round Vazirgadh in Dec. 1956. Rare on Purandhar Hill.

Santapau 21752.

Veronica anagallis Linn.

Not common about Purandhar; an erect or suberect herb, with branched inflorescence and small white flowers. In moist spots, on the higher hills of Bombay State; upper parts of Purandhar.

Santapau 8418; *Blatt. Herb.* 22517.

Buchnera hispida Buch.-Ham.

Common among grasses on the slopes above Camp; in Purandhar stems are generally unbranched or nearly so; flowers of a deep dark blue.

Santapau 5614; *Blatt. Herb.* 22504.

Striga gesneroides (Willd.) Vatke.

Very common all over Purandhar, parasitic on the roots of *Lepidagathis cuspidata* Nees; the host plant forms dense banks of vegetation on the upper parts of Purandhar and Vazirghad forts, and is seldom to be found without the parasite; when so affected the host plant grows quite freely, but often fails to produce flowers or fruits. *Striga* grows to about 40 cm. high, and is usually extensively branched from below; its stems and inflorescence are deep purple when fresh, drying black.

Flowers and fruits: October to December.

Santapau 5286, 5633; *Blatt. Herb.* 22500.

Striga densiflora Benth.

Very common in cultivated fields at the foot of the hill, where the plant grows parasitically on the roots of cultivated crops; it does much damage to crops of the family Graminese, inhibiting their growth and

generally preventing their flowering and fruiting. In a field of *Pennisetum typhoides*, where the parasite was abundant, practically none of the host plants was more than 50 cm. high, whilst in a neighbouring field, from which the parasite had been carefully removed, plants reached 1.5 – 2 m. high and had plenty of flowers and fruits.

Santapau 5692; *Blatt. Herb.* 22541.

Rhamphicarpa longiflora (Arn.) Benth.

A very pretty herb with white flowers, which open at nightfall and remain open during the whole night and the early part of the morning. Flowers and fruits only during the monsoon. Common on grassy slopes below Camp.

Santapau 7218.

Sopubia delphinifolia G. Don, var. **parviflora** Benth. Scroph. Ind. 49, 1835.

For many years I have been troubled in the field about the identity of the present variety; the common typical species has flowers up to 25 mm. long, and deep purple in colour; the Purandhar plants have flowers only 10-12 mm. long. These plants definitely come under the var. *parviflora* of Bentham, which has a "corolla 5 – 6 lines long", i.e. up to 12 mm. long.

Very common in cultivated fields and on grassy slopes during the second half of the monsoon and most of October; the whole plant grows from 8 cm. to 15 cm. high only. Noted in Purandhar from the base of the hill to the very top.

Santapau Oct. 1944, 1950, 1957; *Blatt. Herb.* 22513.

Sopubia trifida Buch.-Ham.

The identification of this plant has always bothered me considerably. Cooke in his Flora (2: 306) quoting Trimen says that the colour of the corolla is yellow with a purple "eye". For many years I have been finding in Bombay a herb, with purple (not yellow) flowers; all the other characters as mentioned in our floras agree with the Purandhar plant. At any rate it is here given provisionally as belong to the present species.

Flowers: December 1956.
Santapau 21684.

Lindenbergia indica (Linn.) O. Kuntze.

The two plants given by Cooke as *L. urticaefolia* and *L. polyantha* have been fused into one, following Blatter and Hallberg in *Journ. Bombay*

nat. Hist. Soc. 25: 424, where these two plants and their many intermediate varieties are discussed. Common on the upper parts of the hill from the Camp to the very highest point, on old walls, on rocky slopes, etc.

Santapau 5636, 7192, 8216, 11316; *Blatt. Herb.* 22535.

Antirrhinum maius Linn.

Commonly cultivated in gardens and sometimes found as an escape; a favourite plant with gardeners in the Camp.

Santapau May 1945.

Russelia equisetiformis Sch. & Cham.

Cultivated in gardens, not seen wild in the district. Flowers are bright red or scarlet. In flower during December.

Santapau 7251, 8256.

Scoparia dulcis Linn.

An American plant introduced in India and gradually spreading all over the country. Common at the foot of Purandhar hill or near villages; not seen on the hill itself.

Santapau Oct. 1944.

Orobanchaceae

Christisonia lawii Wt.

The occurrence of this plant in Purandhar is given on the authority of Woodrow; I have not seen the plant in the district, nor have any of my assistants. In other parts of Bombay State I have found the plant parasitic on the roots of *Carvia callosa* Bremek.

Woodrow ex Cooke.

Lentibulariaceae

Utricularia striatula Sm.

A very common plant in Purandhar during the early part of the monsoon, growing on tree trunks, rocks etc. Flowers are purplish, occasionally white.

Santapau 7207.

Bignoniaceae

Heterophragma quadriloculare (Roxb.) Schum.

An erect tree, found on the slopes of Purandhar, especially from the

Camp downwards; nowhere abundant.

Santapau Oct. & Dec. 1944; May & Dec. 1945.

Tecoma stans (Linn.) H. B. K.

Occasionally cultivated in gardens in Purandhar; not seen wild in the district.

Blatt. Herb. 22596, 22597.

Pedaliaceae

Sesamum indicum Linn.

Occasionally cultivated in fields at the base of the hill, frequently found wild. Flowers purplish or white.

Kp. 369; *Lesc.* 502.

Martiniaceae

Martinia annua Linn.

An erect, grogarious herb, with large leaves and showy bright flowers; the fruits are typical. Roadsides at the base of the hill, occasional.

Kp. 402.

Acanthaceae

Climbers; seeds not supported on hard retinacula; calyx minute, annular, of 10-15 teeth — *Thunbergia*

Erect or prostrate, not climbing; seeds supported on hard retinacula; corolla 2-lipped or with 5 subequal lobes:

- Corolla lobes twisted to the left in bud:
  - Ovules more than 2 in each cell; capsule 6- or more-seeded.
    - Corolla distinctly 2-lipped:
      - Inflorescence spinous — *Asteracantha*
      - Inflorescence not spinous — *Hygrophila*
    - Corolla subequally 5-lobed; inflorescence more or less elongate in simple spikes with one uniform colour of bracts. — *Hemigraphis*
  - Ovules 2 in each cell; capsule 4- or fewer seeded:
    - Anthers spurred at base; stamens 4 — *Dyschoriste*
    - Anthers not spurred at base
      - Corolla tube slender, long linear; stamens 2 — *Eranthemum*

Corolla tube infundibuliform; stamens 4 "*Strobilanthes*"
Corolla lobes imbricate in bud:
Ovules 3–10 in each cell; capsules 6- or more-seeded:
Flowers in panicled, often unilateral racemes without axillary cladodes *Andrographis*
Flowers clustered in the midst of axillary cladodes *Haplanthus*
Ovules 2 (or 1) in each cell:
Corolla lobes 5, subequal; anthers 2-celled:
Calyx 4-partite, lobes unequal; stamens 2 only perfect *Barleria*
Calyx 2-lipped, 5-lobed; stamens 4 *Neuracanthus*
Calyx segments 5, subequal, small:
Stamens 4; corolla tube inflated above *Asystasia*
Stamens 2; corolla tube long, slender *Pseuderanthemum*
Corolla distinctly 2-lipped:
Stamens 4, anthers 2-celled *Lepidagathis*
Stamens 2, anthers 2-celled:
Placentas separating elastically from the valves, from the base upwards:
Bracts in unilateral spikes *Rungia*
Bracts clustered in leaf axils or laxly cymose *Dicliptera*
Placentas not separating elastically from the valves:
Anther cells one higher than the other:
Anther cells, at least the lower ones, with a white basal spur *Justicia*
Anther cell not spurred at base:
Anther cells apiculate *Adhatoda*
Anther cells not apiculate:
Bracts and bracteoles small, subequal; corolla white *Rhinacanthus*

Bracts larger than bracteoles, in opposite, valvate pairs; corolla rose purple *Peristrophe*

Anther cells parallel, subequal; bracts large, imbricate *Ecbolium*

Thunbergia laevis Nees in Wall. Pl. As. Rar. 3: 77, 1832; Santapau & Panthaki in Journ. Bombay nat. Hist. Soc. 53: 500, 1956.

T. fragrans var. *laevis* Clarke in Fl. Brit. India 4: 391, 1884.

T. fragrans auct. pro parte, non Roxb. nisi pro parte.

A fairly common climber on the slopes about or below Camp; flowers white and scentless; the fruits are very often attacked by insects, so that it is somewhat difficult to find fruits in good condition.

Santapau 7237.

Thunbergia coccinea Wall.

A garden plant; large climber with flowers in long pendulous racemes. A showy plant, with deep orange to scarlet flowers. Seen in gardens in 1951.

Santapau 13870 13872.

Thunbergia erecta (Benth.) T. Anders.

"Erect shrub, 1 – 2 m. high, with many and showy flowers on. Limb of corolla deep violet, tube white; Numerous plants in gardens." (Field notes for 7.11.51).

Santapau 13873 - 13876.

Blepharis asperrima Nees.

All along the higher line of the Ghats this plant is common and at times very abundant; in Purandhar it is fairly common, but nowhere as abundant as e.g. in Khandala.

Santapau Oct. 1944, 1945, 1950.

Asteracantha longifolia Nees.

Not seen on the hill itself; common in pools at the foot of Purandhar;

occasional in cultivated fields.

Santapau 8403; *Blatt. Herb.* Dec. 1917.

Hemigraphis latebrosa Nees var. **beyneana** Bremek.

Occasionally found in the undergrowth on the slopes below the Camp; at first the flowers are bright blue, with age they turn nearly white.

Santapau Jan. & Dec. 1945.

Dyschoriste dalzellii (Anders.) O. Kuntze.

A gregarious erect shrub, up to 1 m. high; flowers white with purplish or lilac spots. On the upper parts of the hill particularly abundant near Vazirghad fort.

In Dec. 1956 the plant was found abundantly distributed on the northern side of "Paradise" hill; it was growing among grasses, and was a subereet plant, or prostrate below, erect in the inflorescence part, and none of the plants was more than about 20 cm. high.

Santapau 5649, 5749, 8218; *Blatt. Herb.* 23177, 23181.

Eranthemum roseum (Vahl) R. Br.

Common in Purandhar on the slopes below Camp, particularly where the forest has been allowed to grow unhindered; it grows towards the edges of the forest; flowers are of a beautiful blue colour.

Santapau 5673, 8422; *Blatt. Herb.* 23169, 23175.

Carvia callosa (Wall.) Bremek.

In Cooke's Flora this plant is listed under the name of *Strobilanthes callosus*. The common *Karvi* of western India, one of the commonest and most abundant plants on the western Ghats. An erect, gregarious shrub, flowering but once in several years and then dying out. There was a more or less general flowering in Purandhar during the years 1944 and 1945.

Santapau 5624, 7233; *Blatt. Herb.* 23022, 23070, 23178; *A.G. Cane* ex Cooke.

Thelepaepale ixiocephala (Benth.) Bremek.

In Cooke's Flora this plant goes as *Strobilanthes ixiocephalus* Benth. Not quite as common or as abundant as the preceding plant either in Purandhar or in western India.

For the changes in nomenclature concerning the group of plants hitherto known as *Strobilanthes*, please see Santapau, in *Bombay Univ.*

Bot. Mem. No. 2.

Blatt. Herb. 23096.

Andrographis echioides (Linn.) Nees.

A rare plant at Purandhar, growing usually on poor soil on the slopes below Camp, in the more open or exposed parts; the shape of the inflorescence is unmistakable.

Kp. 519.

Haplanthus verticillatus (Roxb.) Nees.

A common plant of little beauty, found about the Camp and on the slopes near it. At the beginning of the monsoon when the plant is with full foliage, it is a passably beautiful plant; during the dry season it has a savage look.

Santapau 5631, 8323; *Blatt. Herb.* 23088.

Barleria prionitis Linn.

A common shrubby plant, at times growing gregariously; during the rainy season and the first part of winter this is an elegant plant; during the hot season it sheds all its larger leaves and their place is taken by much smaller and silvery ones; these two types of leaves correspond to the two varieties, *histrix* and *heteroclada* of O. Kuntze in Rev. Gen. Pl. 483; these are but two seasonal forms of the same plant. The spines of the plant are very conspicuous during the dry season, and may vary from deep yellow through pale yellow to nearly white in colour.

Santapau 5706; *Blatt. Herb.* 23035, 23077.

Barleria cristata var. dichotoma Prain.

Rare in Purandhar; I have only seen one specimen from the hill collected by one of my assistants.

Lasc. 543, 564.

Baleria gibsoni Dalz.

This species often is mixed up and confused with *B. montana* and *B. prattensis:* the present species has a much stouter inflorescence (terminal spike) than the other two species. For a full discussion on these three species, see Santapau, in *Bombay Univ. Bot. Mem.* No. 2; *B. gibsoni* is common and fairly abundant in Purandhar; the other two species have not been seen there.

Flowers: October 1950.

Santapau 5758, 5777, 8282, 8365; *Blatt. Herb.* 23179.

Neuracanthus sphaerostachyus (Nees) Dalz

An erect shrubby herb, gregarious, a plant of little beauty. The dry stems with the remains of the inflorescence keep standing on bare slopes until the following monsoon, and at times are not destroyed even when the fields are set on fire during the hot season. For a full description of the plant, and particularly concerning the fruiting of the same, see Bole and Santapau in *Journ. Bombay nat. Hist. Soc.* 50: 428 - 430.

Santapau Oct. & Dec. 1944; *Blatt. Herb.* 22069.

Asystasia dalzelliana Santapau.

This is the plant that goes under the name of *A. violacea* Dalz. ex Clarke, 1884, it is not *A. violacea* Dalz. 1850. For the differences between this plant and *A. gangetica* T. Anders. see my monograph on the Acanthaceae of Bombay p 68.

Common in the undergrowth all over Purandhar, especially on the slopes below the Camp.

Santapau 7112, 7238

Lepidagathis mitis Dalz

This species is very closely allied to *L. cristata* and *L. trinervis*, my specimens from Purandhar seem to belong to the present species, although I must confess that I am far from satisfied about the identification of the plants.

Common on the upper slopes of Purandhar, common also in bare rocky ground at the foot of the hill.

Santapau 5229, 5712, 8284, 8290, 8302, 11479; *Blatt. Herb.* 22082, 22083.

Lepidagathis cuspidata (Wall.) Nees

A very common and abundant plant on the upper slopes above the Camp; it is a gregarious plant covering large areas, and is very often parasitized by *Striga gesnerioides* Vatke. After the fall of the large monsoon leaves, the plant has quite a different aspect, and might well be taken for an altogether different species.

Santapau 5236, 5823, 8279, *Blatt. Herb.* 20943, 22080.

Rungia pectinata (Linn.) Nees

This species covers the two so-called varieties of C. B. Clarke, *pectinata* and *parviflora*: in my opinion, confirmed from observations of many years

in the field, these are but two seasonal forms of the same plant. Very common all over Purandhar in flower practically throughout the year.

Santapau 5579, 6188; *Blatt. Herb.* 23027, 23096

Rungia repens (Linn.) Nees.

A prostrate plant, glabrous or nearly so, very similar to *R. elegans* Dalz., with which it is often confused; corolla blue, and strikingly beautiful. When growing among grasses this plant is often erect or suberect in habit. On the upper slopes.

Santapau 8276, 8289, 8413, *Blatt Herb.* 23094

Dicliptera micranthes Nees.

A rare plant in Purandhar; only seen at the base of the hill in waste lands.

Santapau 8314, *Blatt Herb* 23024.

Dicliptera zeylanica Nees.

Tolerably common along the paths in the Camp, or about the altitude of the Camp, the stems are nearly glabrous, and in this they differ considerably from the Khandala specimens which are densely tomentose.

Santapau 8281, 8199.

Justicia betonica Linn.

Gamble and Talbot fuse the variety *ramosissima* with the typical plant. I have examined large numbers of sheets from all over India in Kew Herbarium, and have failed to see a constant character by which these two so-called varieties can be separated. Occasional in Purandhar.

Flowers From October to the end of the cold season.

Santapau 8402, 8441

Justicia diffusa Willd

This may actually be *J. procumbens*, at the time of collection I took them to be *J. diffusa*; but whilst preparing my monograph on the Acanthaceae, re-examined many species from Purandhar, and was left in doubt. For the separation of this plant from *J. simplex* and other allied species, see my monograph p. 98.

Santapau October 1944, 1945, 1950.

Justicia quinqueangularis Koen.

A rare plant in Purandhar, common about Poona, bracts are not

ciliate with long stout hairs.

Blatt. Herb 22065.

Justicia simplex D Don.

Fairly common at Purandhar, very similar to *J. procumbens* from which among other things differs by the width of its bracts which in the present species are over 2.5 mm. broad.

Santapau 7269, 7278, 8215

Justicia micrantha Heyne.

"Diffuse and prostrate, except for the end of the branchlets, flowers paler in colour than in *J. simplex*; bracteoles and calyx green along the midrib, scarious at edges, ending in two strong spines." This plant is not found on Purandhar proper; it has been seen at the foot of the hill in the plains.

Flowers Oct 1944

Santapau 8358.

Adhatoda vasica Nees.

Planted in gardens as a hedge plant and occasionally run wild in Purandhar and in the villages at the foot of the hill. I have not seen the plant in fruit in Bombay State.

Santapau 5681, *Blatt Herb.* 22033.

Rhinacanthus nasuta (Linn.) Kurz.

A rank herb, erect with a large paniculate inflorescence. Occasionally seen along the sides of the path going from the Camp all along the hill.

Santapau 5680; *Blatt. Herb.* 22034.

Peristrophe bicalyculata (Retz.) Nees.

A very common plant all over Purandhar, there are two forms of the plant depending on the season of the year. During the rainy and early winter seasons, the plant has large erect stems, with bright flowers. In the hot season it is almost prostrate, often adpressed to the ground, practically leafless with numerous congested purple flowers.

Santapau 6182.

Verbenaceae

Herbs:

Flowers minute, in globose or cylindric heads *Phyla*

Flowers not in globose or cylindric heads — *Verbena*

Trees or shrubs

Stems armed with spines or prickles:

Prickles recurved, numerous; flowers red or orange or yellow or white, several colours in the same inflorescence — *Lantana*

Spines straight, flowers white or blue — *Duranta*

Stems unarmed:

Calyx bladder-like, greatly enlarged in fruit — *Tectona*

Calyx not at all or only slightly enlarged in fruit, not bladder-like.

Leaves generally 3-5-foliolate — *Vitex*

Leaves simple, entire or divided

Calyx large, persistent, purplish-blue — *Petrea*

Calyx small, green or greenish:

Flowers brownish yellow; stamens included; a tree — *Gmelina*

Flowers blue or white or lilac, not yellow; stamens long-exserted; shrubs — *Clerodendrum*

Lantana camara Linn var. **aculeata** (Linn.) Mold.

The real *L. camara* of Linne is an entirely unarmed shrub, and is very rare, if at all found, in Bombay State. The var. *aculeata* is very abundant on some of the lower slopes of Purandhar; scratches by the spines of this plant often lead to nasty infection unless properly and soon treated. One of my few painful experiences of Purandhar was trying to cut through a slope covered with this plant

Specimens Oct. & Dec 1944, May & Dec. 1945.

Phyla nodiflora (Linn.) Green.

A prostrate plant, growing in moist soil and creeping; leaves thick, deep green, flowers at first in globose heads, finally in elongated cylindric dense spikes. Not common.

Specimens Oct. 1944.

Tectona grandis Linn. f

This tree is not found on the hill itself, there are a few specimens on the slopes below Camp, possibly planted.

Specimens Dec. 1944, 1945.

Gmelina arborea Roxb.

Occasional on the western slopes below Camp; rare. I have seen the tree in fruit in May.

Santapau 6166.

Vitex negundo Linn.

A common shrub, possibly planted in gardens as a hedge plant; growing wild all over the hill.

Santapau Dec. 1944, 1945.

Clerodendrum serratum (Linn.) Moon.

Common on the hill, in open places, during the monsoon and post-monsoon periods; generally it is a plant of little beauty, rank and wild-looking.

Woodrow ex Cooke; *Santapau* Dec. 1944, Sept. & Dec. 1945.

Clerodendrum phlomidis Linn. f.

Occasional in gardens; not seen wild in the district.

Santapau 8385.

Verbena spec.

This is a small herb, cultivated in gardens as a border plant; not seen wild in the district.

Santapau Dec. 1944.

Duranta repens Linn.

A common hedge plant, often seen in gardens in Purandhar; flowers are pure blue or white, without intermediate colours. Fruits bright yellow.

Santapau Oct. 1950.

Petrea volubilis Linn.

A large climber with showy inflorescence; it has been noted in flower in Purandhar gardens.

Labiatae

Key to the Labiatae of Purandhar based on that of Gamble.

Stamens 4, all perfect and declinate; anther cells at length confluent.

Attachment of nutlets basilar:

Lip of corolla declinate, flat or slightly concave, generally narrower, but hardly longer than the 3–4-lobed upper lip; calyx deflexed in fruit; upper lobe widest, large, ovate, recurved, the margins decurrent on the tube; corolla tube short; lower lip flat: stigma 2-fid. *Ocimum*

Lower lip of corolla deflexed, concave, boat-shaped or saccate, much longer than the upper lip:

Calyx equally 5-toothed or somewhat 2-lipped, the upper 3-, the lower 2-toothed, or with upper lip large, rounded, reflexed, the other narrow, subulate:

Filaments free *Plectranthus*

Filaments connate in a sheath at their bases round the style *Coleus*

Calyx very oblique, 2-lipped, the upper lip large, entire, and nearly or quite closing the mouth, the lower truncate, obscurely 4-toothed, or calyx 1-lipped, 5-toothed, not quite closing the mouth *Aniseochilus*

Attachment of nutlets slightly oblique to the outer side; calyx lobes subequal; corolla 2-lipped; stamens included in the tube *Lavandula*

Stamens erect or spreading or ascending:

Stamens 4 perfect:

Corolla lobes 4; stamens equal or subequal:

Calyx 5-toothed; stamens exserted; corolla lobes unequal; whorls in glomerate or paniculate or solitary interrupted spikes; bearded or naked *Pogostemon*

Calyx 5 partite, the lobes plumose, filaments naked, included *Colebrookea*

Corolla lobes 5, 2-lipped; stamens didynamous:

Anterior pair of stamens the longer:

Upper lip of corolla short, nearly flat,

stamens exserted, the cells of the upper pair dimidiate, of the lower pair transverse	*Anisomeles*
Upper lip of corolla hooded, densely woolly; calyx 6–10-toothed; stamens included, anther cells divergent	*Leucas*
Posterior pair of stamens the longer; calyx tubular, 15-ribbed, 5-toothed; stamens not exserted	*Nepeta*
Stamens 2, anterior pair only perfect; anther cells linear, separated by an elongated connective or one cell abortive; calyx 2-lipped	*Salvia*

Ocimum sanctum Linn.

Occasionally cultivated by Hindu servants in the Camp; not seen wild in the district.

Lesc. 72.

Ocimum americanum Linn.

A rare plant in Purandhar, only occasionally seen on the slopes below Camp.

Santapau 8440.

Plectranthus stocksii Hook. f.

I find it rather difficult to separate this species from the following, nor do I find much help in the literature. From examination of large numbers of sheets in Kew Herbarium, I consider the grounds for the separation to be the following:

P. stocksii	*P. costus*
30 – 60 cms. high	1 – 2.5 m. high
Le. conspicuously gland-dotted; acute, glabrous or sparsely hairy	Le. not at all or only obscurely gland-dotted; pubescent or glaborate; acuminate
Calyx with minute red glands	Calyx without such glands
Stamens exserted.	Stamens included.

In general the fruiting calyx seems to be larger in *stocksii* than in *costus*; *stocksii* is very common at the sides of paths in moist ground, in the

undergrowth of carvi and other plants. In flower in October onwards.

Santapau 8194, 8399.

Plectranthus coetsa Buch.-Ham.

This is a much more robust plant than the preceding species. It is also much more common on the slopes above Camp to the higher parts of the fort.

Santapau 5313, 5578, 5742, 8170, 8262, 8400.

Plectranthus mollis (Ait.) Spreng.

This is the commonest species of the genus in Purandhar and in other parts of Bombay State. On the slopes from the Camp to the base of the hill; gregarious with pale blue flowers, often seen in waste lands and by the sides of paths.

Santapau 8322.(1)

Coleus forskohlii (Poir.) Briq.

This plant is listed as an annual in our floras; I have seen fresh leaves and inflorescence coming from a rootstock which showed remains of the previous season's flowering; the plant, therefore, must be classed at least as a biennial. This is one of the most elegant and beautiful plants in Purandhar; flowers of a bright blue. Fairly abundant and gregarious on the South West spur of Purandhar hill.

Santapau 7115, 7235, 11422.

Anisochilus carnosus (Linn.) Wall.

This seems to be a rare plant in Purandhar; I have only seen on the slopes above Camp.

Santapau 8359.

Anisochilus verticillatus Hook. f.

In one of my field entries I read the following on this plant: "Flowers white in closely packed terminal spikes up to 6" long. Shrubby, 2 ft. high, with large and thick stem at ground level. A beautiful plant." It is much stouter than the preceding plant, and also much more common. On the higher parts from the Camp to the very top of the Purandhar fort.

Santapau 5310, 5744, 8343, 11425.

(1) *Plectranthus*

Mollis: waste places; upto camp.

Forskohlii: undergrowth moist places, herb. about, camp.

Coetsa: Much taller, above camp to top.

Mollis & forskohlii near about camp.

Lavandula perrottetii Benth.

In our floras the name of this plant is given as *L. gibsoni* Grah; in my opinion this name is scarcely correct. Graham gives a very brief description of his plant and seems to be doubting of the standing of the same; he writes: "Herbaceous; leaves lyrate. The hill Fort of Pundooghur; requires examination." For this reason I have thought it best to follow Bentham or Dalz. and Gibs.

An erect, herbaceous plant, up to 150 cm. high; the whole plant is glandular-pubescent, and sweetly scented; flowers pale blue or lilac. On the slopes above the Camp, common; lower slopes, occasional.

Flowers: September and October. *Fruits:* December.

Santapau 5282, 5586, 5604, 8186; *Blatt. Herb.* 23431.

Lavandula bipinnata var. **rothiana** O. Kuntze.

In Cooke's Flora this plant is listed under *L. burmanni*. Not as common as the preceding species; on the upper parts of the hill.

Santapau 8376, 8414.

Pogostemon plectranthoides Desf.

The odour of this shrub is far from agreeable. Common all over the hill slopes particularly above the Camp.

Santapau 8228.

Pogostemon parviflorus Benth.

The difficulty of the identification of this plant is great; interested readers are referred to my Flora of Khandala (p. 244) where the problem has been discussed.

Noted for Purandhar for the first time in Dec. 1956.

Santapau: 21773.

Colebrookea oppositifolia Smith.

A common and very conspicuous shrub all over Purandhar particularly on the slopes below Camp. Not seen in flower in Purandhar; the shrub flowers in March-April in other parts of Bombay State and probably in Purandhar.

Santapau Oct. & Dec. 1944, May & Dec. 1945.

Anisomeles heyneana Benth.

A rank herb, often reaching 2 m. in height, with a wild look. Flowers

Aniseomeles malabarica R. Br.
on slopes of Vazirghad Fort.

are white with a touch of pink or lilac. Common above Camp.

Santapau 5284, 5688, 6190.

Anisomeles malabarica R. Br.

Abundant on the eastern slopes below Vasirghad fort, at about the height of the Camp. Flowers large and purple, occasionally white, showy; when the plant is full bloom with full foliage, it is an elegant one.

Flowers: October to December.

Santapau 8267 - 8271; 8272 (white firs.); 11515.

Leucas lavandulaefolia Rees.

This is *L. linifolia* Spreng. of our floras. Common in rice fields at the foot of the hill and elsewhere on the slopes during the winter months.

Ekl. 39; *Lasc.* 74.

Leucas martinicensis (Swartz) R. Br.

Rare in Purandhar; on the slopes below Camp.

Santapau 8397, 8417.

Leucas longifolia Benth.

Leaves narrowly linear, more than ten times longer than broad, a typical plant; calyx strongly ribbed, truncate, teeth very small. Rare in Purandhar.

Santapau 8372.

Leucas stelligera Wall.

The name of this plant probably refers to the beautiful spreading calyx teeth. Common about Camp.

Santapau 5576, 8181.

Leucas biflora R. Br.

A procumbent or struggling plant, often more or less pendulous from walls etc. Flowers often 2 in each of the higher whorls; calyx long, strongly nerved and not oblique at the mouth. A very distinct species, occasional in Purandhar.

Santapau 8393.

Leucas montana Spreng.

A shrubby plant, up to 120 cm. high, densely woolly all over, and with white flowers. Fairly common on the slopes above or just below

Camp.

Flowers: October.

Cooke; *Woodrow* ex Cooke; *Santapau* 5309, 5616, 6178, 8171.

Nepeta hindustana Haines var. **woodrowii** (Cooke) Santapau, comb. nov.

Nepta ruderalis var. *woodrowii* Cooke, Fl. Pres. Bombay 2: 473, 1906.

This species is not easy to differentiate from *N. bombaiensis* except perhaps by the aristae of the calyx teeth. An erect or ascending plant, with flowers in long-peduncled cymes. On the slopes about the Camp at Purandhar.

Santapau 5324, 5577, 8174, 11351.

Salvia plebeia R. Br.

A gregarious herb, growing in moist or sheltered places. On Dec. 31st, 1956, I noticed a large clump in the streets of the small village near the bus stand at the base of the hill.

Santapau 21841.

Salvia splendens Sellow.

Cultivated in some gardens in Purandhar; the flowers are showy, and the calyces retain plenty of colour for a long time. Not seen wild.

Lasc. 249.

Salvia officinalis Linn.

A European garden plant, often cultivated in gardens.

Lasc. 319.

Coleus spec.

Cultivated in gardens, not seen wild.

Santapau May 1945.

Nyctaginaceae

Boerhavia diffusa Linn.

A common, procumbent, erect or suberect or straggling herb with long branches and small reddish or purplish flowers. Common on the lower parts of the hill, abundant in waste lands.

Santapau 8425.

Boerhavia repanda Willd.

Not as common as the preceding species; distinguished by the length of the pedicels and the structure of the leaves. At the foot of the hill,

in waste land.

Kp. 364, 524.

Bougainvillea spectabilis Willd.

A great favourite with Purandhar gardeners; commonly cultivated; it is definitely *B. spectabilis*, but I am unable to say which is the variety.

Santapau Dec. 1944, 1945.

Amarantaceae

Anthers 4-celled:

- Leaves alternate; perianth not hardened:
  - Seeds several — *Celosia*
  - Seeds solitary:
    - Flowers hermaphrodite, capitate — *Allmania*
    - Flowers unisexual, spicate — *Amarantus*
- Leaves opposite; perianth segments, bracts and bracteoles hardened — *Achyranthes*
- Leaves alternate or fascicled, or opposite and alternate mixed, perianth not hardened — *Aerva*

Anthers 2-celled;

- Flowers in small, sessile, whitish heads — *Alternanthera*
- Flowers in large, white or crimson heads on long peduncles — *Gomphrena*

Celosia argentea Linn.

One of the commonest plants in flower after the rains all over the hill, among grasses. Flower heads are at first pink, then more or less white.

Santapau 11355.

Allmania nodiflora (Linn.) R. Br.

My only authority for the inclusion of this plant is Bhiva ex Cooke. I have often searched for this plant on the hill and failed to find it.

Bhiva ex Cooke.

Amarantus spinosus *Linn.*

A common spiny plant found in waste lands during the second half and after the monsoon.

Santapau Sept. 1945.

Amarantus gracilis Desf.

This is *A. viridis* Linn, *pro parte*. For a discussion on the identity and nomenclature of this plant, please see Flor. Males. I 4(2): 76.

An erect, glabrous herb, found occasionally in gardens as a weed in Camp or on the slopes below Camp.

Santapau 8317.

Aerva sanguinolenta (Linn.) Blume.

This seems to be the commonest species of the genus in western India; it is very common in Purandhar all over the hill slopes.

Santapau 5589, 7156, 7241, 8172, 8344.

Achyranthes aspera L. var. **porphyristachya** Hook. f.

The typical variety with its small, rounded leaves and small flowers and fruits has not been seen in Purandhar. The present variety had large leaves, which are ovate, acute or acuminate and glabrous or nearly so. In flowers and fruit through the greater part of the year.

Santapau 11373.

Alternanthera sessilis (Linn.) DC

Fairly common in moist spots specially at the base of the hill; the plant is procumbent in the lower parts, erect higher up.

Santapau 8428.

Alternanthera repens (Linn.) Steud.

Urban in Symb. Antil. 4: 21, 1905, makes this plant native of the Central American Islands, of the American mainland, and its distribution is extended from America to the Canary Islands. Kew Herbarium shows specimens from the Azores, Canary Islands, Madeira, Cadiz in the South of Spain, the Balearic Islands; in Kew there are no specimens from places between the Balearic Islands and India. It is a recent importation into India, and the plant seems to be spreading rapidly all over the country. It is very abundant from the foot of Purandhar hill to the slopes of Diva Ghat in waste land.

Santapau 7075, 7224.

Gomphrena globosa Linn.

Cultivated in gardens, not seen wild in the district. Flowers of a deep red or purple, or pure white.

Santapau Dec. 1944.

Polygonaceae

Polygonum plebeium R. Br.

A very common, and very variable plant, the so-called forms and varieties depending to a large extent on the amount of shade and moisture available. Common in Purandhar.

Santapau 6196.

Polygonum glabrum Willd.

An erect, usually unbranched herb, growing gregariously in pools or by the sides of streams, etc. Common at the foot of Purandhar Hill.

Kp. 363.

Polygonum nepalense Meisn.

The name of this plant is usually given as *P. alatum* Ham. in our Indian floras; Hamilton, however, gave the name merely as a synonym, and this method of naming plants has been specifically condemned by the Intern. Code of Bot. Nomencl., Art. 37. Gamble in Fl. Madr. 1190 gives *P. punctatum* Ham. as the valid name for the plant, but this name has been pre-occupied by that of Elliot, 1817, for a different plant.

A common small herb, all over the Camp and the slopes above it up to the very top; common and abundant during the monsoon.

Santapau 7101, 7162, 7182, 7199, 7200, 7221.

Antigonon leptopus Hook. & Arn.

Commonly cultivated in gardens in Camp; it has also been seen wild in the district. Flowers of a pale rosy pink.

Santapau 6211.

Piperaceae

Peperomia pellucida (Linn.) H.B.K.

Planted in gardens as a border plant, and often run wild in the Camp.

Blatt. Herb. 28285.

Proteaceae

Grevillea robusta A. Cunn.

This is the *Silver Oak* of our Indian gardens; it grows so well in Purandhar gardens that it is easily the largest tree in Camp; it flowers

and fruits profusely in Purandhar. Flowers bright orange in colour. The tree has run wild in the neighbourhood of the Camp. During the time of the Internment Camp, this tree was credited with causing much *Hay Fever* among the inmates of the Camp.

Santapau 6181.

Thymeleaceae

Lasiosiphon eriocephalus Decne.

A common shrub usually about 1.5–2 m. high, seldom larger in Purandhar; common and abundant particularly on the slopes below Camp on the East side.

Santapau 5618.

Loranthaceae

"The only genus bearing rightly the name *Loranthus* is nowadays called *Psittacanthus* and is restricted to tropical America". (Danser, New Syst. Loranth. & Nomencl., p. 65).

Dendrophthoe falcata (Linn. f.) Etting.

Rare in Purandhar; the only host of this parasite noticed in Purandhar is *Mangifera Indica* Linn.; seen at about half way between the Camp and the foot of the hill.

Santapau 8300.

Scurrula philippinensis (Cham. et Schl.) G. Don.

In Hooker's Fl. Brit. Ind. 5: 206, and in Cooke's Flora 2: 546, this is given as *L. scurrula* Linn., but wrongly.

Seen in one of the gardens in Camp, parasitic on *Vitex negundo* Linn; the parasite has been noticed for several years on the same plant.

Santapau 6199.

Taxillus cuneatus (Roth) Danser.

Seen on *Vitex negundo* Linn., the same individual plant parasitised by the preceding species, and on *Terminalia* spec. It is not abundant in Purandhar.

Santapau 6170, 6200.

Viscum angulatum Heyne.

Parasitic on *Carissa congesta* Wt. and *Flacourtia indica* Merr.; flowering and fruiting in December rather profusely.

Santapau 5682, 6171, 8258.

Santalaceae

Osyris wightiana Wall.

In Fl. Brit. Ind. and Cooke's Flora this plant is listed under *O. arborea* Wall. In my Flora of Khandala (*Rec. Bot. Surv. Ind.* 16 (1): 269) I have written on the nomenclature of this plant: "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." The other name, *O. arborea*, was only taken up by DeCandolle in his Prodromus 14: 633, 1857.

Fairly common all over the hill, particularly on the slopes about the Camp, and flowering and fruiting most of the year with the exception of the beginning of the monsoon.

Santapau 5692, 7188, 8227.

Euphorbiaceae

Key to the Euphorbiaceae of Purandhar adapted from Gamble.

Cells of the ovary 2-ovuled (except in *Euphobia*):

Inflorescence of many pedicelled bracteolate stamens as male flowers surrounding a single pedicelled female flower, the whole contained in 4-5 lobed involucre:

Involucre regular or nearly so — *Euphorbia*

Involucre obliquely zygomorphic — *Pedilanthus*

Inflorescence of distinct flowers, not contained in an involucre:

Petals small, fruit a drupe — *Bridelia*

Petals O:

Fruit a dry capsule; calyx lobes 5 in all the flowers; stamens 3 — *Phyllanthus*

Fruit a drupe, large; calyx lobes 5-6, stamens 3 — *Emblica*

Fruit dry or fleshy with 6 cocci; stamens 5 — *Securinega*

Cells of the ovary 1-ovuled:

Filaments inflexed in bud; male calyx imbricate, valvate or nearly open; pistillode O — *Croton*

Filaments erect, rarely inflexed, but the pistillode conspicuous:

Calyx in male flowers valvate:

Filaments not branched:

Anthers not vermiculiform or linear; fruit a capsule; styles plumose — *Mallotus*

Anthers vermiculiform or linear; styles laciniate — *Acalypha*

Filaments much branched; staminal bundles indefinite; leaves palmatilobed — *Ricinus*

Calyx in male flowers imbricate:

Petals free:

Flowers glomerate-spicate or racemose; female flowers with no or very minute petals — *Codiaeum*

Flowers paniculate, the panicles branching dichasially; leaves palmativerned — *Jatropha*

Petals connate, leaves palmatinerved, fruit a drupe — *Aleurites*

Euphorbia fusiformis Buch.-Ham. (1825).

Cooke correctly states that the oldest name for this plant is *E. acaulis* Roxb., 1814, but Roxburgh's name is without any description or reference to a previously published one; according to the rules the name of Roxburgh is not valid. The oldest validly published name is that of Hamilton, *E. fusiformis*, 1825.

Tolerably common on some of the slopes at about the height of the

Camp ; it is abundant on the spur below Camp at the extreme South West of Purandhar.

Santapau 6168, 7132.

Euphorbia neriifolia Linn.

Cooke seems to have mixed this and allied species to a very considerable extent; herewith I append part of the key given by Gamble for the genus *Euphorbia*:

Leaves large, oblanceolate usually at least 6 inches long; involucres usually in threes on a short fleshy peduncle, the lobes imbricate, the glands transversely oblong:

Branches cylindric with pairs of straight spines inserted on flat corky bases, arranged in vertical lines; leaves obtuse — *nivulia*

Branches more or less angular with small pairs of spines on small corky bases, arranged in spiral lines; leaves shortly acute — *neriifolia*

Leaves small, usually very early deciduous; branches angular:

Styles simple; branchlets 3-winged with straight spines in pairs; leaves obovate, spathulate, mucronate, up to 2 in. long, .75 in. broad; bracteoles sheathing, laciniate — *trigona*

Styles bifid at apex; branchlets thick and broad 3-5-winged, with sharp spines; leaves few, very small glands fleshy, thick, spongily pitted, bracteoles sheathing, deeply laciniate — *antiquorum*

Based on Gamble's key, the plants of Purandhar belong definitely to *E. neriifolia* L.; *E. nivulia* replaces *neriifolia* in the drier parts of Bombay and Saurashtra. *E. neriifolia* is very abundant all over Purandhar Hill, particularly in the more exposed parts to the South of the hill.

Santapau 6197.

Euphorbia tirucalli Linn.

Commonly planted as a hedge plant at the foot of the hill; not seen in Purandhar proper.

Santapau January and May 1945.

Euphorbia hirta Linn.

A very common weed on paths, waste lands, etc., flowering and fruiting most of the year. Particularly abundant in waste lands at the foot of the hill.

Santapau May, Aug., Sept. & Dec. 1945.

Euphorbia parviflora Linn.

An erect or suberect, elegant herb, with bright green leaves; the plant is generally unbranched, at times profusely branched. In grass fields on the slopes from the base of the hill to the very top of the fort.

Barnes ex Cooke; Santapau 5306, 8234, 8311, 8410.

Euphorbia thymifolia Linn.

A prostrate and elegant herb, common during the rains all over the hill especially on paths etc.

Santapau Dec. 1945.

Euphorbia pycnostegia var. **zornioides** (Boiss.) Santapau in Bull. Bot. Soc. Bengal 8: 11, 1956

E. zornioides Boiss. in DC. Prodr. 15(2): 19, 1862.

Very similar to *E. pycnostegia*, from which it is separated by the non-tuberculate seeds. Occasional on the slopes about Camp.

Lesc. 145.

Euphorbia pycnostegia Boiss.

The resemblance between this and the preceding species is such that I feel justified in merging both plants under one name. Occasional in Purandhar, on grassy slopes and hedges.

Blatt. Herb. 13530, 13540.

Euphorbia heterophylla Linn.

Abundant in a cultivated field at the foot of the hill; growing in a dense patch, flowering and fruiting profusely. Common all over the hill among grasses.

Santapau 5710, 5711.

Euphorbia pulcherrima Willd.

The common *Poinsettia* of our gardens; commonly cultivated in Purandhar gardens, occasionally found wild in the district.

Santapau Dec. 1945.

Pedilanthus tithymaloides (Linn.) Poir.

Cultivated in some gardens, and occasionally run wild; it is a plant of little beauty.

Santapau May 1945.

Bridelia squamosa Gehrm.

In the *Journ. Bombay nat. Hist. Soc.* 50: 307-309 I have discussed the question of the identity of the common Indian plant, and following Gehrmann have shown that the real *retusa* of Sprengel has flowers in clusters on leafless branches, whilst *squamosa* has flowers in clusters in the leaf axils; *retusa* is not found in Purandhar; *squamosa* is found scattered in secondary jungles all over Purandhar, but is nowhere abundant.

Santapau 8434.

Emblica officinalis Gaertn.

Scattered in secondary jungles on Purandhar slopes, not abundant.

Santapau May, Dec. 1945.

Phyllanthus maderaspatensis Linn.

Occasionally found on the slopes below Camp down to the foot of the hill, in grass fields, not common.

Santapau 5694, 8303.

Phyllanthus niruri Linn.

An annual, slender erect herb, common all over Purandhar particularly just after the rains.

Santapau 7170, 7171.

Phyllanthus urinaria Linn.

An inconspicuous herb, often unbranched; fruits clearly though faintly echinulate, seeds with rough irregular transverse ridges. Rare. Found in Purandhar for the first time in Dec. 1956, on the Western slopes of Vasirghad Fort. Rare.

Flowers and fruits: Dec. 1956.
Santapau Dec. 1956.

Securinega virosa (Roxb.) Pax et Hoffm.

Common on Purandhar slopes. Examination of the specimens in Kew Herbarium of *Flueggea microcarpa* and *F. leucopyrus* has failed to re-

veal any constant character by which these two so-called species can be separated from each other.

Santapau 6152, 6209

Croton spec.

This is a favourite with many gardeners in the Camp; it does not grow wild in the district

Bk. 386.

Mallotus philippensis (Lamk.) Muell.-Arg.

The name of this plant is often given as *M. philippinensis* erroneously. A small erect tree with inconspicuous flowers and bright orange fruits; scattered in secondary forests on Purandhar slopes.

Santapau 8265, 8266

Acalypha brachystachya Hornem

A very typical plant; the bracts are three-lobed and fairly large It is rather frequent among grasses at about the altitude of the Camp; common from the Hospital end to the extreme west corner of the fort, also below Vasirghad fort

Santapau 6323, 6610, 7102, 7137, 7179

Acalypha malabarica Muell.-Arg

A common herb among the grasses during the monsoon about the Camp or along the various roads from the Camp.

Santapau 7100, 7190, 7291

Jatropha gossypifolia Linn

Cultivated in gardens or used as a fence plant, and occasionally found as an escape About the Camp, and in waste lands at the foot of the hill.

Santapau May 1945.

Jatropha curcas Linn.

Cultivated as a hedge plant; abundant along the road from the foot of the hill to Saswad.

Santapau Jan 1945.

Ricinus communis Linn.

Found as an escape from cultivation in the neighbourhood of the Camp, and near villages at the foot of the hill

Santapau Oct. & Dec. 1944.

Codiaeum variegatum Blume

A garden plant, cultivated for the sake of its ornamental leaves; common in gardens in Purandhar, but not seen wild.

Nasnapur May 1945

Ulmaceae

Trema orientalis (Linn.) Blume

A small tree, common on the slopes below the Camp, it seldom reaches over 3 m in height in Purandhar.

Nasnapur 8164, 11490. *Bhide* 1023

Urticaceae

Key to the Urticaceae of Purandhar, adapted from Gamble

Plants with stinging hairs, at least on the inflorescence
- Slender annual flexuous herbs, stipules small or 0, stinging hairs weak, flower clusters small — *Fleurya*
- Coarse perennial erect herbs or undershrubs, stipules large, foliaceous, stinging hairs stout, flower clusters large — *Girardinia*

Plants without stinging hairs
- Flowers, at least the female ones, aggregated on a fleshy receptacle, normal leaves opposite; receptacles long-peduncled — *Leucosyke*
- Flowers not aggregated on a fleshy receptacle
  - Leaves stipulate
    - Flowers cymose, cystoliths of leaves linear
      - Leaves opposite, serrate — *Pilea*
      - Leaves alternate entire — *Pellionia*
    - Flowers in sessile clusters, cystoliths of leaves punctiform, leaves usually entire, stigma filiform, caducous — *Pouzolzia*
  - Leaves exstipulate — *Parietaria*

Fleurya interrupta (Linn.) Gaud

An erect branched herb, with long interrupted inflorescences and heart-shaped fruits. Common on old walls, on the slopes among grasses.

Nasnapur 7297

Girardinia zeylanica Decne.

During the time of the Internment Camp at Purandhar, this rank herb or undershrub was known to European children under the name of "Generals". Common in secluded corners of the Camp; an unpleasant stinger.

Santapau 11496.

Lecanthus peduncularis (Wall.) Wedd.

As I have stated elsewhere, I have followed Merrill in fusing under one name the two species mentioned by Cooke in his Flora. A somewhat succulent plant, up to 30 cm. high, usually much less; peduncles up to 3 cm. long. Common on the upper parts of the hill, on old walls, tree trunks, etc. during the monsoon.

Santapau 7158, 7159; *Bhide* Sept. 1907.

Pouzolzia indica (Linn.) Gaud.

A variable herb, often found in grass fields, on old walls at Purandhar; flowers in small axillary clusters. An inconspicuous herb of no beauty.

Santapau 7098, 7099.

Pilea microphylla (Linn.) Liebm.

Common as a weed in gardens all over the Camp; it is a succulent small herb, with bright green leaves and minute flowers.

Santapau Sept. 1945.

Pellionia spec.

Seen in some of the gardens in Camp; possibly cultivated; also seen wild in the neighbourhood of gardens.

Santapau May 1945.

Moraceae

Ficus gibbosa Blume.

Among the collections of plants from Purandhar there are several specimens that belong to some of the varieties of this species; *Blatt. Herb.* 25374 has been identified at Kew by C. E. C. Fischer as *F. gibbosa* Blume; 25413 as var. *cuspidifera*; *Santapau* 5778 is var. *parasitica*; all these specimens are without receptacles and identification rests only on the leaves.

Ficus bengalensis Linn.

The Banyan tree, usually planted by the road sides or near villages at the foot of the hill.

Santapau May 1945.

Ficus retusa Linn.

In Blatter Herbarium there is one specimen identified by Fischer of Kew as belonging to this species; I have not seen the plant in the district.

Blatt. Herb. 25414.

Ficus nervosa Heyne.

This tree is common in many parts of western India; in Purandhar it is occasionally found at the foot of the hill.

Santapau Oct. 1944, May 1945.

Ficus religiosa Linn.

Commonly planted in villages at the foot of the hill, rare in Camp.

Santapau Dec. 1944.

Ficus heterophylla Linn. f.

A rare tree, only seen near the top of Vazirgadh hill in May 1945.

Ficus arnottiana Miq.

Common on the Ghats; occasionally seen on the slopes below Camp, especially towards the western side.

Santapau 6193.

Ficus arnottiana var. **courtallensis** King.

Very similar to the typical variety but with smaller leaves. The plant mentioned below has been identified by Fischer at Kew.

Blatt. Herb. 25423.

Ficus glomerata Roxb.

One of the commonest species of *Ficus* in the district; on the slopes below Camp, particularly along the SW. spurs.

Santapau Oct. & Dec. 1944.

Ficus tsiela Roxb.

At the foot of the hill there is a large tree by the road side; it is some distance from Purandhar itself, but it forms a clear landmark.

Ficus carica Linn.

Cultivated in some of the villages at the foot of the hill; I have not been able to see the trees, but have seen the specimens collected by some of my assistants.

Lasc. 185.

Artocarpus integra (Thunb.) Merr.

Cultivated in Camp and in some of the villages at the base of the hill; not seen wild in the district.

Santapau Oct. 1944.

Casuarinaceae

Casuarina equisetifolia Linn. ("equisefolia")

In gardens in Camp, where it flowers and fruits quite readily. In Purandhar and other parts near Poona, the tree is very badly affected by some fungus that produces very unsightly lumps on the stem and eventually kills the tree.

Santapau 6208.

Coniferae

Cupressus sempervirens Linn.

Planted in some of the gardens; it is a sombre but elegant tree.

Santapau Dec. 1944.

Orchidaceae

Key to the Orchidaceae of Purandhar

Epiphytic orchids:

Rhizome short; stemless with a simple pseudobulb, or pseudobulbs plurinodal; leaves thin — *Dendrobium*

Stem long and slender, leaves very thick and coriaceous — *Aeridas*

Ground orchids:

Flowers bright yellow — *Eulophia*

Flowers not bright yellow:

Leaf usually solitary, membranous, away from the ground — *Nervilia*

Leaves usually several, thick, along the stem; or if solitary or in pairs, adpressed to the ground:
Sepals subequal, more or less connivent — *Peristylus*
Sepals unequal, the lateral ones more or less spreading, stigmas more or less distinctly stalked — *Habenaria*

Dendrobium microbulbon Rich.

Common on a number of trees in Camp, in fruit in Oct. 1944. A gregarious plant.

Santapau Oct. 1944, Sept. 1945.

Dendrobium mabelae Gammie.

Very similar to the preceding species from which it can be separated thus:

Lip pink with dark-red lines — *microbulbon*
Lip yellowish-green — *mabelae*

Rare in Purandhar.

Santapau Sept 1945

Dendrobium barbatulum Lindl.

Epiphytic on several trees in Camp and its neighbourhood. In flower during the winter and early part of the spring months, in leaf during the rains.

Santapau May 1945.

Eulophia ochreata Lindl.

Root tuberous, tubers several in a line; leaves large, strongly nerved, erect from the ground. Flowers bright yellow. Occasional in grass fields.

Santapau 7256.

Aerides maculosum Lindl.

Epiphytic; leaves very thick and leathery, often spotted with purple dots; leaf apex lobed, the lobes unequal, rounded.

Santapau May 1945.

Peristylus stocksii (Hook. f.) Kranz.

An inconspicuous orchid of little beauty, found in the undergrowth of several shrubs; the whole plant is green, the flowers whitish.

Kp. 155.

Habenaria hollandiana Santapau, nomen novum.

Habenaria affinis Wight, Icon. t. 1707, 1851; FBI. 6: 149, 1890; (non *H. affinis* Don. 1825; vide Hooker in FBI. 6: 166. 1890).

The oldest name for this plant is that of Wight's of 1851, but the name is pre-occupied by that of Don of 1825; our plant, then, needs a new name. I have chosen the new name to commemorate the constant help and encouragement received in the course of the present work from Mr. and Mrs. A. S. Holland.

Woodrow found the plant at Purandhar, but he seems to be the only collector who has found the plant in this locality; there are no plants in Blatter Herb.

Woodrow ex Blatt. & McCann.

Habenaria commelinifolia Wall. ex Lindl.

A rare plant in Purandhar; its occurrence is given on the authority of Blatter & McCann.

Bhide ex Blatt. & McCann.

Habenaria crassifolia Rich.

The oldest specific name for this plant is *brachyphylla* Lindl. 1835 (under *Platanthera*); in the genus *Habenaria* the name is preoccupied by *H. brachyphylla* Aitch. 1882.

One of the commonest and most abundant species of the genus in Purandhar; found in the undergrowth on the higher parts from the Camp upwards.

Santapau 5333, 7077, 7106, 7153, 7272.

Habenaria digitata Lindl.

The flowers are green or greenish, or mixed green and white, and have a strong and penetrating odour especially in the evening and night, but are scentless during the day time.

Barnes ex Cooke; *Santapau* 7061, 7178, 7296.

Habenaria gibsoni Hook. f.

The flowers are green and white and have none of the strong scent of the preceding species.

Santapau 7293, 7294.

Habenaria grandiflora Lindl.

Common in open ground at the beginning of the monsoon, with one leaf closely adpressed to the ground; occasionally it has two leaves.

Woodrow ex Cooke; *Santapau* 7261.

Habenaria grandifloriformis Blatt. et McCann.

Similar to the preceding species, from which it can be separated thus:

Lip 22 mm. long	*grandifloriformis*
Lip 12 mm. long	*grandiflora*

Rare in Purandhar and in western India.

Santapau 7261 (bis).

Habenaria heyneana Lindl.

In my Flora of Khandala, *Rec. Bot. Surv. Ind.* 16(1): 306-309, I have discussed the identity of this plant, and shown that *H. subpubens* Rich., *H. candida* Dalz. and *H. cerea* Blatt. & McC. are all synonymous; there is no constant point on which all these species can be separated from one another. This orchid is often referred to as the "Tooth-brush" orchid, on account of the secund nature of the floral spikes.

Santapau 7083, 7197, 7271 (A-E).

Habenaria longecalcarata Rich.

Occasional in Purandhar growing among grasses. The plant is noticeable on account of the length of the spur, which often reaches 10 cm. or more.

Kanitkar ex Cooke.

Habenaria marginata Coleb.

The leaves of this orchid are marked by a clear yellowish or whitish border or margin; otherwise the plant is rather similar to *H. rariflora*. Common in Purandhar during the rains.

Woodrow ex Cooke; *Santapau* 8380, 8432, 8436.

Habenaria rariflora Rich.

Scentless or nearly so; one of the first orchids to appear at the beginning of the rains in open ground. Common in grass fields.

Barnes and *Woodrow* ex Cooke; *Santapau* 7079, 7161, 7275.

Nervilia aragoana Gaud.

This orchid is not included in Cooke's Flora; for a description of the same, see Blatt. & McC. in *Journ. Bombay nat. Hist. Soc.* 35: 729. Occasional in Purandhar on the slopes just below Camp towards the extreme West of the Camp; in undergrowth with plenty of decayed leaves etc.

Santapau 7130, 7246, 7263 A-B, 8254.

Satyrium nepalense Don.

In Blatter Herbarium there is a specimen collected in Dec. 1917 which was identified when relatively fresh by Blatter as belonging to this species; the specimen is now too poor for critical identification.

Blatt. Herb. 25964.

Zingiberaceae

Lateral staminodes broad	
Connective not spurred at base; corolla-tube long, slender	*Hitchenia*
Connective spurred at the base; corolla-tube funnel-shaped	*Curcuma*
Lateral staminodes small or 0; corolla-tube cylindric	*Zingiber*

Hitchenia caulina (Graham) Baker.

For a good illustration of the plant, see *Journ. Bombay. nat. Hist. Soc.* 2: 140, where Lisboa describes the plant from Mahableshwar.

In my excursions in Purandhar during the years 1944-46, I was often informed by people who resided more or less permanently in the Camp that *Arrowroot* was abundant on the slopes of Purandhar; I could not trace the plant myself, for it seems to have disappeared from the locality. I showed my assistants the tubers and spikes of *Curcuma pseudomontana* but they said that Arrowroot was different. This seemed to point to *Hitchenia caulina*.

In general *Hitchenia* and *Curcuma* are very similar; the latter has a clear spur at the base of the anther; the former shows also a small structure that may be taken as a spur. *Curcuma* has no stem or a very short one; *Hitchenia* has a clear stem and its floral scapes are up to 60 cm long.

Curcuma pseudomontana Graham.

Abundant and common in Purandhar; at the beginning of the rainy season this plant has a large spike coming out from the side of the leaves.

Gradually by the beginning of August this lateral spike decays and a central one appears surrounded by leaves. One and the same plant shows the two types of spikes. Flowers are yellow; coma bracts may be green, pink or rosy, purple or pure white; the rhizome has a number of stout tubers, each at the end of a fibrous root.

Santapau Oct. 1944.

Curcuma spec. (inodora Blatt.?).

This species is more common than *pseudomontana*; from the colour of the flowers I am inclined to put it down to *C. inodora* Blatt.; but none of my specimens has any underground parts.

Santapau 7109, 7139.

Zingiber macrostachyum Dals.

An erect, herbaceous plant; stems leafy; flowers yellow in a spike which is dense and elongates up to 40 cm., the peduncle reaching up to 1 m. Floral spikes are borne on leafless peduncles. Common all over the higher parts of Purandhar from the Camp upwards.

Santapau Oct. 1944, Aug. & Sept. 1945.

Cannaceae

Canna flaccida Salisb.

Planted in gardens in Camp; the Commandant's garden for many years was a beautiful sight on account of the many varieties of this plant cultivated there. This plant is often called *Canna indica* Linn., but this is due to a wrong identification; *C. indica* has rather narrow petals and is seldom seen in cultivation.

Santapau Dec. 1944, May & Dec. 1945.

Musaceae

Ensete superbum (Roxb.) Cheesm.

This is the common wild banana of western India; it is common all over the hill, especially on the upper parts above the Camp; common also on the western slopes below Camp. The fresh inflorescence is eaten as a vegetable, the fresh fruits are curried.

Santapau Oct. & Dec. 1944; May, Aug., Sept. & Dec. 1945.

Hypoxidaceae

Hypoxis aurea *Lour.*

A small herb with bright yellow flowers; leaves narrow, grass-like, up to 30 cm. long. Common on the upper parts of the hill from the Camp upwards during the rains.

Santapau 7093, 7282.

Curculigo orchioides Gaertn.

Flowers yellow, very similar to those of *Hypoxis*; leaves broad and long, strongly plaited. Not as common as the preceding species.

Lesc. 211.

Amaryllidaceae

Crinum spec.

This is a garden plant with bright crimson flowers, said to have been introduced into Purandhar from Belgaum. Common in gardens.

Santapau passim.

Pancratium parvum Dals.

There is much confusion in the genus *Pancratium*; the characters of the length of the neck, etc. seem rather doubtful in the field. The present species is given on the authority of Woodrow as cited by Cooke; I have not seen any specimen that could be placed unreservedly under the present species.

Woodrow ex Cooke.

Pancratium spec.

During the first part of the monsoon there is a plant that is common all over the hill, but which does not seem to agree with the previous species; until the genus is properly revised, it is impossible to tell for certain which species this may be.

Kp. 129; *Lesc.* 260; *Ekl.* 288, 369.

Agaveaceae

Leaves greyish green, dull, up to about 10 cm. at their broadest — ***Agave***

Leaves bright green, shining, up to about 20 cm. broad — ***Furcroya***

Agave angustifolia Haw. Syn. Pl. Succ. 72, 1812; Berger, Die Agaven 240, 1915.

A. wightii Drummond & Prain in Agric. Ledg. 1906: 91.

The plants of Purandhar have been identified from the monograph on the genus *Agave* by Berger; the identification is only provisional, the genus being very difficult on account of the insufficient materials found in herbaria, on which most monographs have been built.

On the eastern side of the hill and elsewhere throughout the whole of Purandhar this is a very common plant; it is particularly abundant on the South side of Purandhar Fort, on the upper side of the main path. They seem to have been first introduced as a garden or hedge plant, but now grow wild in very great profusion and flower more or less regularly; in place of flowers most plants, however, show numerous bulbils, which on falling from the parent plant soon take root in the soil and widely spread the species on the hill sides. Locally no use is made of the plant, which on the other hand has a well earned reputation as being very good for harbouring snakes; Russel's vipers are common in the neighbourhood of Agave, as I have found in several very narrow escapes.

Santapau 5687, 6210, 22081.

Fourcroya gigantea Vent.

The spelling of the generic name is variously given in the literature on the subject: *Fourcraea* Vent., *Fourcroea* Haw., *Furcroya* Raf., *Furcraea* Benth.; the name adopted in these pages is that of Pax and Hoffmann in Engler and Prantl, Pflanzenfam. ed. 2. 15A: 422.

On the slopes before the R. C. Church and near the path from the hospital end of the Camp, there are several large specimens of this plant which in October 1957 showed large inflorescence scapes, 5 – 7 m. high; the scape was in several cases strongly bent down by the weight of the many bulbils on it; no flowers were noted. The leaves are much larger than those of the common Agave, and are bright green in colour and shining. A rare plant, only noted in Purandhar in October 1957.

Santapau 22060, October 15th, 1957.

Dioscoreaceae

Dioscorea pentaphylla Linn.

Common on the slopes below Camp; flowers and fruits profuse and showy on account of their abundance. Flowers are used locally as

vegetables.

Santapau Oct. 1944; Aug., 1945, Dec. 1956.

Dioscorea bulbifera Linn.

Not common; on slopes below Camp. It is possible that some of my specimens, which have not been preserved, contained some *D. wallichii*; the two plants are rather similar in appearance and at the time of my collection I was not aware of the existence of the second species in Bombay.

Santapau 1944.

Liliaceae

Climbing herbs or undershrubs:

Aerial stems leafless, with cladodes, perennial	*Asparagus*
Areal stems leafy, without cladodes, annual	*Gloriosa*

Erect herbs or undershrubs:

Undershrubs with thick fleshy leaves	*Aloe*
Herbs with ± thick, but not fleshy leaves	
Underground stem a solid corm covered with brown sheaths, flowers solitary or corymbose	*Iphigenia*
Underground stem a short rootstock with many fascicled roots; flowers spicate or racemose	*Chlorophytum*
Underground stems a tunicated bulb.	
Inflorescence scape	
Inflorescence scape up to 10 cm. long appearing at the same time as or just before the leaves	*Scilla*
Inflorescence scape more than 15 cm. long, often much more, appearing long before the leaves	*Urginea*

Asparagus racemosus var. javanica Baker

Common on the slopes below Camp, practically throughout the year; flowers during the rains.

Santapau 7114.

Gloriosa superba Linn.

This is a rare plant in Purandhar; found occasionally on the slopes below Camp towards the east of the hill. In flower during September.

Santapau 8366.

Iphigenia pallida Baker.

In my field book I find the following entry on this plant; "No. 7252. Small, tunicate bulb. Flowers pale or light purple, or occasionally pure white. (Colour: Purple, near Ridgway 65 a)." In general this species is considerably smaller than *I. indica*, but the petals are much broader. An elegant plant found in open country on the upper parts of the hill.

Santapau 7252, 7257, 7258 (white flowered).

Scilla hyacinthina (Roth) Macbride.

This plant in our floras goes under the name of *S. indica* Baker, 1870; the name, however, is illegitimate, since it is preoccupied by *S. indica* Roxb., 1814 & 1832, which is the basonym of *Urginea indica* Kunth.

Fairly common towards the end of June, on slopes practically all over the hill; disappears very soon after flowering.

Santapau 7260.

Urginea indica (Roxb.) Kunth.

Fairly common all over the hill on the upper parts above Camp; it is particularly abundant on the slopes just below Vasirghad fort. During the hot season just before the rains flowers appear on long scapes. In December 1945 I collected a large number of bulbs from Purandhar and kept them on my *laboratory shelves*; they flowered on March 3rd, 1946.

Santapau 6157, 6160, 6189, 8349.

Chlorophytum tuberosum (Roxb.) Baker.

A large and striking plant, with a scape at times reaching 60 cm. high. Flowers white. In flower and fruit during the monsoon. Common on the higher slopes.

Santapau 7080, 7247, 7286.

Aloe variegata Linn.

Cultivated in some gardens, and run wild over the hill particularly towards the base near villages. Rare.

Kp. 409; *Leor* 630.

Commelinaceae

Fertile stamens 3; staminodes 1 3:

Cymes 1-2, arising from a spathaceous bract	*Commelina*
Cymes panicled, bracts not spathaceous	*Murdannia*

Fertile stamens 3, staminodes 0; cymes scorpioid, formed by biseriate, foliaceous bracteoles *Cyanotis*

Commelina subulata Roth.

One specimen was found in a cultivated field at the very foot of Purandhar, just where the upward path begins, or near the old bus stand. I have checked the identity of this plant carefully and am satisfied that, inspite of Cooke's remark on the subject, this species *does* occur in Bombay State.

Santapau 7208.

Commelina nudiflora Linn. 1753.

Rare in Purandhar; this is quite a different plant from *C. nudiflora* Linn. 1767.

Lesc. 397.

Commelina benghalensis Linn.

About the commonest species of the genus in Purandhar. During the rains it is found among grasses, on hedges etc. Underground flowers and fruits abundant; exposed flowers usually sterile.

Santapau Oct. 1944, Sept. 1945.

Commelina obliqua Buch.-Ham.

Very common all over the hill, with bright blue flowers, that decay very soon after collection. Shape and size of leaves typical.

Santapau Oct. 1944; *Woodrow* ex Cooke.

Murdannia semiteres Santapau.

Fairly common on Purandhar Hill especially on rocky ground; stems are green to dark purple, the flowers deep purplish blue, occasionally white.

Santapau Aug. 1945.

Cyanotis tuberosa (Roxb.) Schult. f.

The roots are thick fusiform tubers; the leaves and stems are the biggest in the genus for Purandhar. Common on grassy slopes through the rains.

Santapau 7281, 7299; *Bhide* 26624.

Cyanotis fasciculata Schult. f.

Fairly common on the upper parts of the hill; flowers deep blue or occasionally white.

ARISAEMAS OF PURANDHAR

A. A. MURRAYI HOOK.

B. A. NEGLECTUM SCHOTT.

Santapau Oct. 1944, Aug. & Sept. 1945.

Cyanotis cristata (Linn.) Schult. f.

Common and abundant in the cultivated fields at the foot of the hill; not seen high on the hill.

Santapau Aug 1945.

Cyanotis axillaris (Linn.) Schult. f.

Fairly common in cultivated fields at the foot of the hill Flowers at most of the axils, and this clearly typifies this species.

Santapau 7220.

Rhoeo discolour (L'Her.) Hance.

This is the so-called *Tradescantia* of our gardens; cultivated in Purandhar and in other parts of India mainly on account of the colourful leaves.

Lee. 346.

Araceae

Spathe usually white in colour and bent in the middle	*Arisaema*
Spathe purplish or dirty-white or yellowish in colour, not bent in the middle	*Sauromatum*

Arisaema murrayi (Grah.) Hook.

This seems to be the commonest among the species of this genus in Purandhar; fairly common and striking, through the first half of the monsoon. The "Cobra Lily"

Santapau 7243, 7250, 7266.

Arisaema neglectum Schott.

The sterile appendix of the spadix is about half as long again or even longer than the spathe, and tapering very gradually to a very fine point. The spathe is generally green. Occasional in Purandhar.

Santapau 7240, 7268, 7298.

Arisaema tortuosum (Wall.) Schott.

I have only seen two specimens from Purandhar, of which one was only in leaf, the other in flower, their identification is only provisional.

Santapau 7160; *Kp.* 81.

Sauromatum guttatum (Wall.) Schott.

Flowers come out just before the monsoon; leaves at the beginning of the rains. The leaf is about as large as a common umbrella, that is to say, about 1 m. in diam., up to 1.75 m. high; fruits are supported on a very short peduncle and are just above the ground. Fairly common about Purandhar slopes.

Santapau 6191.

Potamogetonaceae

Potamogeton indicus Roxb.

For several years I did not see this plant in Purandhar itself; the water tanks were kept too clean for this plant to thrive therein. In 1951 the plant covered most of the tank in FitzClarence Gardens; in 1954 it was covering the whole of the tank near the Hospital at the W. end of the Camp.

Santapau 13865.

Eriocaulaceae

Eriocaulon nepalense Presc.

The only specimen from the genus from Purandhar is the one mentioned below; it was identified by Dr. N. H. Moldenke in Aug. 1949 and is referred to in *Phytologia* 3(6): 336.

Santapau 8388.

Cyperaceae

NOTE: All my Cyperaceae from Purandhar have been checked by Mr. E. Nelmes of Kew Herb., to whom I render sincere thanks for his ever ready and kind help.

Cyperus aristatus Rottb.

Bhide 988.

Cyperus cuspidatus H. B. K.

Santapau 7213, 7253 on the lower slopes below Camp.

Cyperus cyperoides var. **subcompositus** (Clk.) Kuekenth.

Blatt. & McC. 5572, *Bhide* ex Blatt. & McC.

Cyperus difformis Linn.

Blatt. & McC. 5574.

Cyperus exaltatus Retz.

Ekl. 174.

Cyperus exaltatus var. **dives** Clarke.

Blatt. & McC. C. 135.

Cyperus flavescens Linn.

Blatt. & McC. 5584.

Cyperus globosus All.

Blatt. & McC. 5575, 5576, 5577.

Cyperus Iria Linn.

Santapau Oct. 1944; *Blatt & McC.* 5583, 5585, 5577.

Cyperus malabaricus (Clarke) Cooke.

Santapau 7212.

Cyperus rotundus Linn.

Santapau 5704. *Blatt & McC.* 5569, C 217.

Cyperus tricepa (Rottb.) Endl.

Santapau 7285.

Fimbristylis dichotoma Vahl.

Blatt & McC. 5588; *Lesr.* 263.

Bulbostylis capillaris Kunth.

Blatt ex Blatt. & McC.

Scirpus supinus Linn

Blatt. & McC. 5579, 5581.

Gramineae

This is a very important family for Purandhar; it is represented by about 60 different species belonging to 30 genera. Bamboos are found at the foot of the hill on the western side, on the northern side at the foot of the hill is the village of Bairawadi, where extensive collections were made by C. McCann in 1917 and beginning of 1918. During the monsoon and most of the cold season the hill of Purandhar is covered with grasses, most of which disappear in the hot season.

Many of the specimens mentioned in the following pages have been described by Blatter and McCann in their monograph "The Bombay Grasses"; the specimens on which this monograph was based are preserved in Blatt. Herb., Bombay, and, together with various sheets of my own collection, have been examined in Kew by Dr. N. L. Bor and Mr. C. E. Hubbard; as a result of this examination a number of changes heave been introduced in the nomenclature of Purandhar grasses.

When this Enumeration was being prepared, I had a complete key to the Grasses of Purandhar ready for publication, but in the end I was moved to leave it out on account of its length and complexity; interested readers are referred to the key supplied by Blatter and McCann in their monograph.

Andropogon pumilus Roxb.

McCann 5035, 5061, 5602.

Apluda aristata Linn.

Santapau 5659, top of Vazirghad, *Bhide* ex Blatt. & McC.; *Blatt. Herb.* 5008, 5018, 5024, 5060, 5519.

Aristida funiculata Trin. & Rupr.

Blatt. Herb. 5062, 5066.

Aristida redacta Stapf.

Blatt. Herb. 5063, 9762.

Arthraxon hispidus (Thunb.) Makino.

Blatt. Herb. 1003; *Sedgw. Herb.* 1830/11.

Arthraxon inermis Hook.f

Santapau 8240, 11361, top of Vazirgadh, *Blatt. Herb.* 5012, 5040, 5613; *McCann* 5592.

Arthraxon lancifolius (Trin.) Hochst.

Santapau 11448, on walls of upper fort of Purandhar, common.

Arthraxon meeboldii Stapf.

A. purandharensis Bharucha.

The identity of these two plants is given on the authority of Dr. N. L. Bor, who has examined the types of both.

McCann 5003., *Bharucha* 501

Arthraxon quartinianus (Rich.) Nash.

Blatt. Herb. 5077.

Arthraxon santapaui Bor in Kew Bull. 1951 446 447, 1952.

"Bombay, Purandhar Fort, 10 Oct. 1950, *H. Santapau* 11450a... This graceful species was gathered in the roots of a specimen of *Ischaemum impressum* Hack. collected by Father Santapau in Purandhar Fort, Bombay. It is distinguished from other Indian species of the genus by the long exserted, pilose, curved peduncle and large spikelets..." (Bor. loc. cit.)

Arundinella metzii Hochst. ex Miq. in Verh. Nederl. Inst. 3(4): 31, 1851; Bor in Kew Bull. 1955 408.

A. lawii Hook. f. in Trim. Hand. Fl. Ceylon 5: 180, 1900.

A. pygmaea Hook. f. in Fl. Brit. India 7: 72, 1896.

For the nomenclature of this species, see the revision of the genus by Bor, l. c. The present species seems to be fairly common in Purandhar during the post-monsoon months.

Blatt. Herb. 5023, 5052, 5055, 5596; *Sedgw Herb.* 3572; *McCann* 5067.

Arundinella pumila Steud.

Santapau 8247, on the slopes of Vazirghad fort. *McCann* 5013, *Sedgw. Herb* 3559.

Arundo spec.

This very ornamental grass was cultivated in some of the gardens during the days of the Internment Camp, the whole inflorescence is whitish and very showy. Seen only in gardens

Santapau May 1945.

Bambusa arundinacea (Retz.) Willd Sp. Pl 2 245, 1799, Holttum in Taxon 5: 67, 1956.

For a full discussion on the nomenclature of this plant, which is rather complex, see Holttum The plant has only been noticed at the foot of the hill near a village.

Santapau, Jan 1945.

Brachiaria eruciformis Grueb

Blatt. Herb 5028, 5036, 9568.

Capillipedium filiculme Stapf.

Santapau 8237, 8239, 8242, 8243; *McCann* 5612. Fairly abundant on the slopes of Vazirgadh Fort and elsewhere.

Capillipedium hugelii Camus.

On the slopes below Vazirgadh Fort, fairly common.

Santapau 5661; *Blatt. Herb.* 5593.

Chionachne koenigii Thw.

Santapau Sept. 1945, just outside Bini Gate of Purandhar Fort.

Coix lachryma-jobi Linn.

Santapau Oct. & Dec. 1944, Sept. 1945; *McCann* 5005.

Cymbopogon martini (Roxb.) Watts.

Santapau 5663 8244; *Blatt. Herb.* 5010.

Cynodon dactylon (Linn.) Pers.

Blatt. Herb. 5026; *McCann* 5604, A 184, 5042.

Dichantium annulatum (Forsk.) Stapf.

McCann 5016, 9421, 9674.

Dichantium aristatum (Poir.) Hubb.

Santapau 5697, 11478; *McCann* 5014, 5020, 5570, 5597, 9966.

Dichantium caricosum (Linn.) Camus.

McCann 5075.

Digitaria spec.

Santapau 5698, 8309; *McCann* 5017, 5606.

Dinebra retroflexa (Vahl) Panzer.

Santapau 5700, 8309(1); *McCann* 5050; *Blatt. Herb.* 5029.

Echinochloa colonum (Linn.) Link.

Santapau 8309(3); 7135, 7136 (specimens infected with *Ustilago trichophora* O. Kuntze); *Blatt. Herb.* 5520; *Bhide* ex Blatt. & McC.

Eragrostis cilianensis (All.) Link.

Santapau 5701, 5722, 8309(2), 8309(5); *McCann* 5039; *Blatt. Herb.* 5596; *Sedgw. Herb.* 3561.

Eragrostris diarrhena (Schult.) Steud.

Santapau 5703; *McCann* 5056, 5047; *Blatt. Herb.* 5030, 5049.

Eragrostis japonica Trin.

Blatt. Herb. 5072, 5973, 5079.

Eragrostis pilosa (Linn.) Beauv.

Blatt. Herb. 5068, 5070, 5076.

Eragrostis poaeoides Beauv.

Santapau 5702; *McCann* 5601.

Eragrostis unioloides (Retz.) Nees.

McCann 5071, 5078; *Blatt. & McC.* 8739.

Eragrostis viscosa (Retz) Trin.

Blatt. Herb. 5038.

Heteropogon contortus (Linn.) Beauv.

Santapau 8245; *McCann.* 5059.

Heteropogon ritchiei Blatt. & McC.

Santapau 11359.

Isachne pulchella Roth.

Blatt. Herb. 5032.

Ischaemum impressum Hack.

Santapau 11450.

Isellema laxum Hack.

Sedgw. Herb. 5521.

Melanocenchris jacquemontii Jaub. & Spach.

On the spur leading from the main path round Vasirghad Fort to Bottle Hill, abundant and rather showy on rocky groud; first noted for Purandhar in October 1957.

Oryza sativa Linn.

Santapau Oct. 1954; *Blatt. Herb.* 5521.

Panicum paliopodium Trin.

McCann 9918(8).

Pennisetum hohenackeri Hochst.

Santapau 11477; *McCann* 5031, 5045, 5051.

Pennisetum typhoides (Burm.) Stapf & Hubb.

Kp. 12; *Lesc.* 202.

Pseudanthistiria heteroclita (Roxb.) Hook. f.

Santapau 5660, 8246.

Pseudanthistiria hispida Hook. f.

Santapau 8238; *McCann* 5037; *Gammie* 1010.

Pseudodichanthium serrafalcoides Bor.

Santapau 11360.

Rottboellia exaltata Linn. f.

Blatt. Herb. 5591.

Saccharum officinarum Linn.

Santapau seen under cultivation at the foot of the hill.

Sehima nervosum (Rottl.) Stapf.

Santapau 11358, 11451; *McCann* 5106; *Bhide* ex Blatt. & McC.

Setaria glauca (Linn.) Beauv.

Santapau 5696, 8241; *McCann* A 148; *Blatt. Herb.* 5599.

Setaria intermedia R. & Sch.

McCann 5022, 5595; *Bhide* ex Blatt & McC.

Sorghum glabrescens (Steud.) Schweinf. Aschers.

Blatt. Herb. 5044; *Santapau* 5720 (infected with *Sphacelotheca cruenta* Clit.).

Spodiopogon rhizophorus (Steud.) Pilger.

McCann 5004.

Thelepogon elegans Roth.

McCann 5053.

Themeda quadrivalvis (Linn.) O. Kuntze.

McCann 5041, 5069.

Themeda subglobosa Stapf.

McCann 5571; *Blatt. Herb.* 5074.

Triplogon spathiflorus (Hook. f.) Bor in Kew Bull. 1954: 54, ff, 1-2, 1954.

Ischaemum spathiflorum Hook. f. in FBI. 7: 138, 1896.

Sehima spathiflorum Blatt. & McCann in JBHNS 32: 23, 1927 *McCann* 5054.

Tripogon bromoides Roth.

Santapau 11362.

Tripogon jacquemontii Stapf.

Sedgw. Herb. "3550 leg. Blatt."

Tripogon lisboae Stapf.

Santapau 5648, 8335, 11452; *McCann* 5009.

Triticum spec.

Blatt. Herb. 5608 "cultivated at the foot of the hill".

Urochloa panicoides Beauv.

Santapau 5699.

Appendix I

List of Herbarium Specimens cited in this Flora.

Bharucha: 501.

Bhide: 988, 1023.

Bhive: 26624.

Blatter & McCann: C 135, C 217, 5569, 5572, 5574 — 5577, 5579, 5581, 5583 — 5585, 5588, 8739.

Blatter Herbarium: 1003, 3305, 5006, 5010, 5012, 5018, 5023, 5024, 5026, 5028, 5029, 5030, 5032, 5036, 5038, 5040, 5044, 5049, 5052, 5055, 5060, 5062, 5063, 5063, 5066, 5068, 5070, 5072, 5073, 5074, 5076, 5077, 5079, 5519, 5520, 5521, 5591, 5592, 5596, 5598, 5599, 5606, 5613, 9506, 9762, 10001, 10017, 10019, 10021, 10022, 10027, 10029, 10032, 10131, 10757, 10764, 10767 — 10773, 10775, 10776, 10777, 10780, 11676, 11679, 11681, 11684, 11686, 11688, 11694, 11720, 11746, 11750, 11752, 11753, 11755, 11758, 11762, 11765, 11767, 12575, 12576, 12577, 12579, 12580, 13530, 13540, 17420, 17429 — 17433, 17471, 17662, 17825, 17831, 17849, 17854, 17866, 17873, 17879, 17902, 17905, 17924, 17926, 18213, 18346, 18636, 18662, 19130, 19131, 19206, 19280, 19367, 20230, 20242, 20243, 20450, 20769, 20774, 20777, 20781, 20875, 20897, 20899, 20932, 20936, 20960, 20962, 20968, 20977, 20978, 21000, 21224, 21333, 21334, 21372, 21429, 21447, 21448, 21451, 21645, 21646, 21650, 21661, 21990, 22325, 22340, 22341, 22348, 22462, 22464, 22465, 22500, 22502, 22504, 22512, 22512, 22517, 22535, 22541, 22546, 22597, 23022, 23022, 23024, 23027, 23053, 23054, 23055, 23065, 23069, 23070, 23077, 23086, 23088, 23092, 23093, 23094, 23096, 23169, 23177, 23178, 23179, 23181, 23431, 24423, 25414, 25084, 27404, 28285, 80009.

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