

FLORA OF
KANUR, DURG & RAJNANDGAON

E. N. VENKA, P. C. PANT, M. I. HANFI

BOTANICAL SURVEY
OF INDIA

**FLORA OF
RAIPUR, DURG AND RAJNANDGAON**

FLORA OF INDIA

Series 3

FLORA OF RAIPUR, DURG AND RAJNANDGAON

**D. M. VERMA
P. C. PANT
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F O R E W O R D

Botanical Survey has taken up printing of District Floras which ultimately would form the base work for whole State Floras. In this direction Flora of Raipur, Durg and Rajnandgaon covers three districts.

There are large number of virgin forest pockets in Madhya Pradesh including the regions covered in this work and as such the richness of the Flora is substantiated by the presence of about 1032 species covered under 568 genera. All the specimens are housed in the Central Circle of Botanical Survey of India at Allahabad for reference purposes by the Botanists of the region.

From the climatic point of view the three districts present three different types of topography, with partially xerophytic environment, a rich agricultural fertile land mass and a dense moist forest region. Its flora therefore would give three distinct types of vegetational set up showing a variety of species adapted to above climatic conditions.

The authors' study of this region would be very interesting for students, scientists and industrial houses dealing with plant products as raw materials. I do hope that the present work would provide a comprehensive coverage of floristics of this vast region and I am sure that the authors would welcome any suggestions for the improvement of the publication in its future editions.

Dated : 27.10.84
P.O. Botanic Garden
Howrah 711103.

M. P. Nayar
Director
Botanical Survey of India

PREFACE

Madhya Pradesh in Central India, one of the larger states of the country, does not have a Flora of its own. This region with innumerable patches of rich tropical forests somehow got left out as a central pocket while all around it major Indian Regional Floras were published for the Upper Gangetic Plains (Duthie, 1903–1929), Bombay Presidency (Cooke, 1901–1908), Madras Presidency (Gamble, 1915–1936) and Bihar and Orissa (Haines, 1921–1925). However, considering the time involved in proper exploration, processing the collections, identification and writing a Flora of Madhya Pradesh by a team of professional botanists, it was decided to take up smaller regions for intensive studies. The present composite Flora of the three districts, Raipur, Durg and Rajnandgaon is an outcome of this thought. Although floristic studies are generally accepted as part of the activities of an enlightened society, and publication of a Flora an academic achievement, its immense utility is portrayed in teaching, and in identification of plants by botanists, foresters, geologists, economic botanists, agriculturists, vaidyas, plant-based industries, and inquisitive plant-hunters. It is hoped that the present Flora would meet the needs of these people working in the region, and its vicinity. We are equally hopeful that it would also accelerate botanical activities in the region, and generate public interest in wild plants, leading to recognition and protection of rare and threatened species.

The three districts with a total area of about 45,000 sq. km lie between $80^{\circ} 38'$ and $82^{\circ} 70'$ E longitude and $19^{\circ} 79'$ and $22^{\circ} 48'$ N latitudes, in the south-eastern part of Madhya Pradesh. The Flora deals with 1032 species, spread out in 568 genera and 127 families of Angiosperms. It is based mainly on our own collections which were started in 1972. Subsequently, eight more exploration tours were undertaken, yielding a total collection of 3092 field numbers. The specimens are deposited in the Herbarium of the Botanical Survey of India, Central Circle, Allahabad (BSA). A few species which have earlier been reported from the region but not collected by us have also been included, with references to the concerned publication.

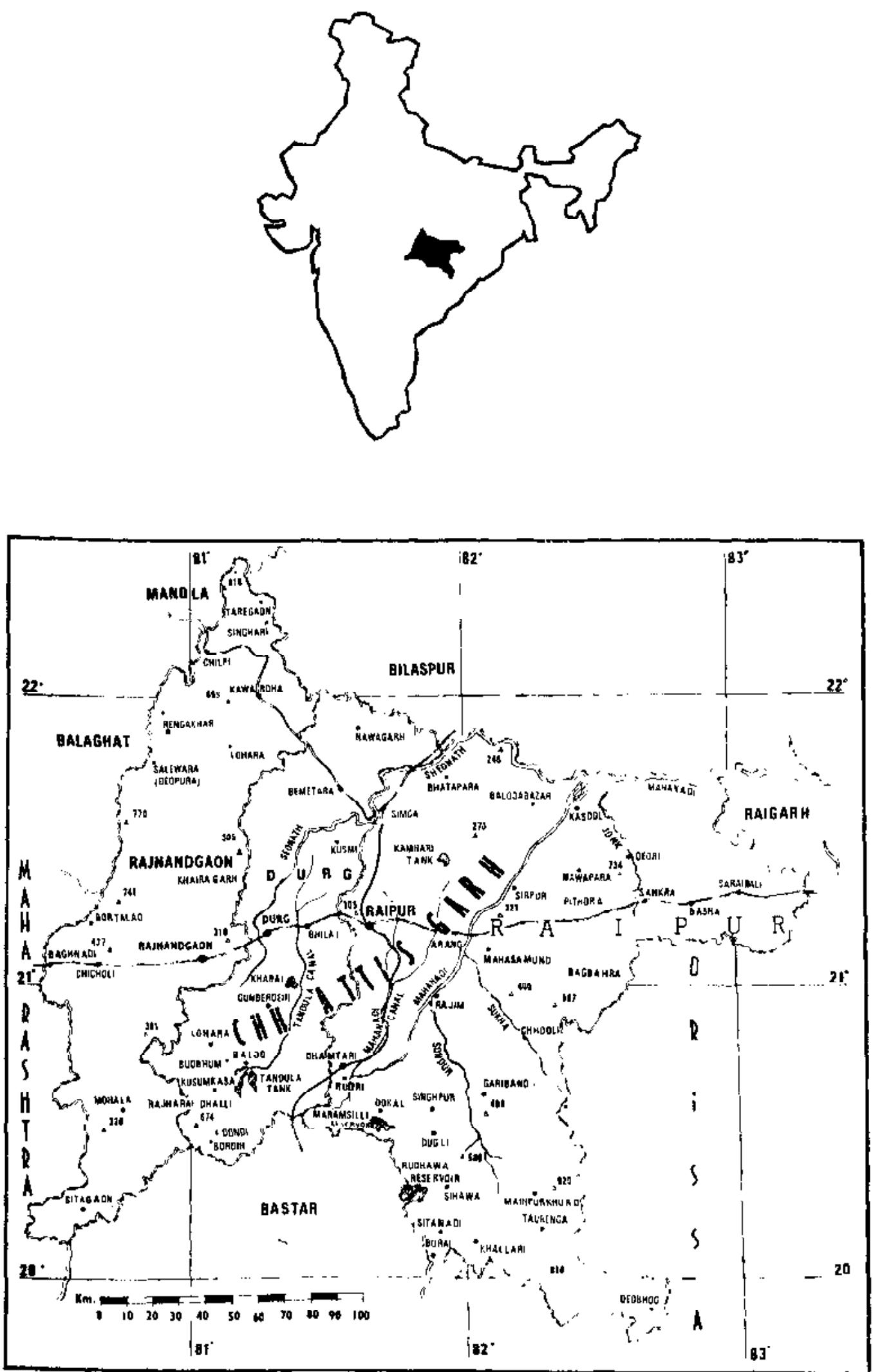
Starting with a short introduction and key to the families, the Flora chiefly includes keys to genera and species, correct botanical names and some selected synonyms, with citations, local names (when available), short description of the species, and notes on habitat, phenology, distribution and economic/medicinal uses, if any.

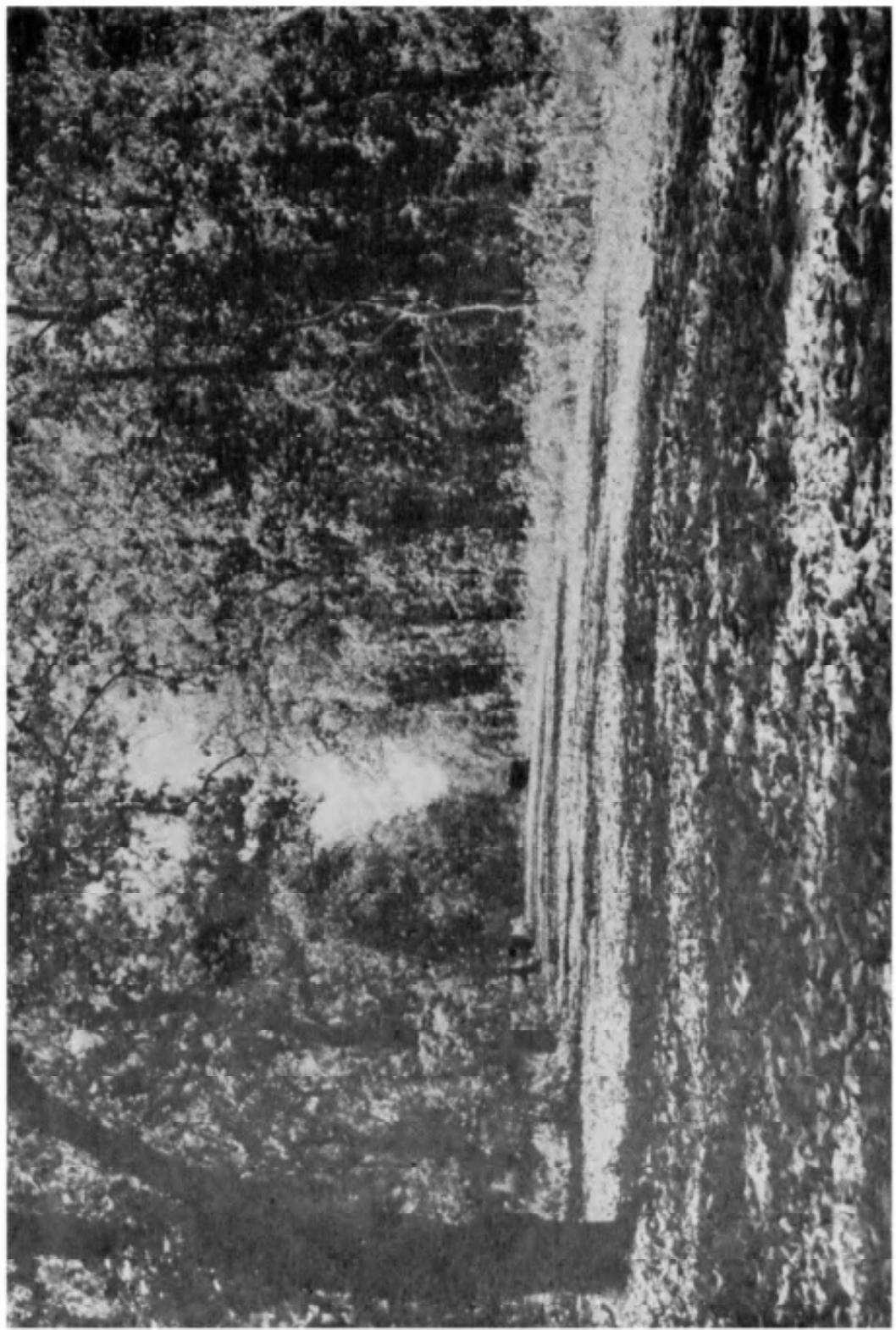
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To Dr. M. P. Nayar, Director, Botanical Survey of India, Howrah, we owe a great degree of gratitude for facilities, constant encouragement, and his personal interest in seeing through its early publication. We are also indebted to Dr. K. Thothathri, Joint Director, Dr. N. P. Balakrishnan, Deputy Director, and Dr. V. S. Agarwal, Editor of Publications, Botanical Survey of India, for their valuable help and suggestions at various stages. The officers of the Forest Department, Raipur Circle, particularly Sri M. Dixit and Sri D. P. Sangar, were of immense help during our exploration work, and to them, as well as their staff also, we would like to record here our sincere thanks. The acknowledgement would be incomplete without a mention of our own field-staff who have laid a very deserving claim on a word of thanks for their assistance in collection and processing of specimens. Our thanks are also due to our photographer, Sri M. A. Siddiqui, for the photographs included in the present Flora.

Botanical Survey of India
Allahabad
26th October, 1984

D. M. VERMA
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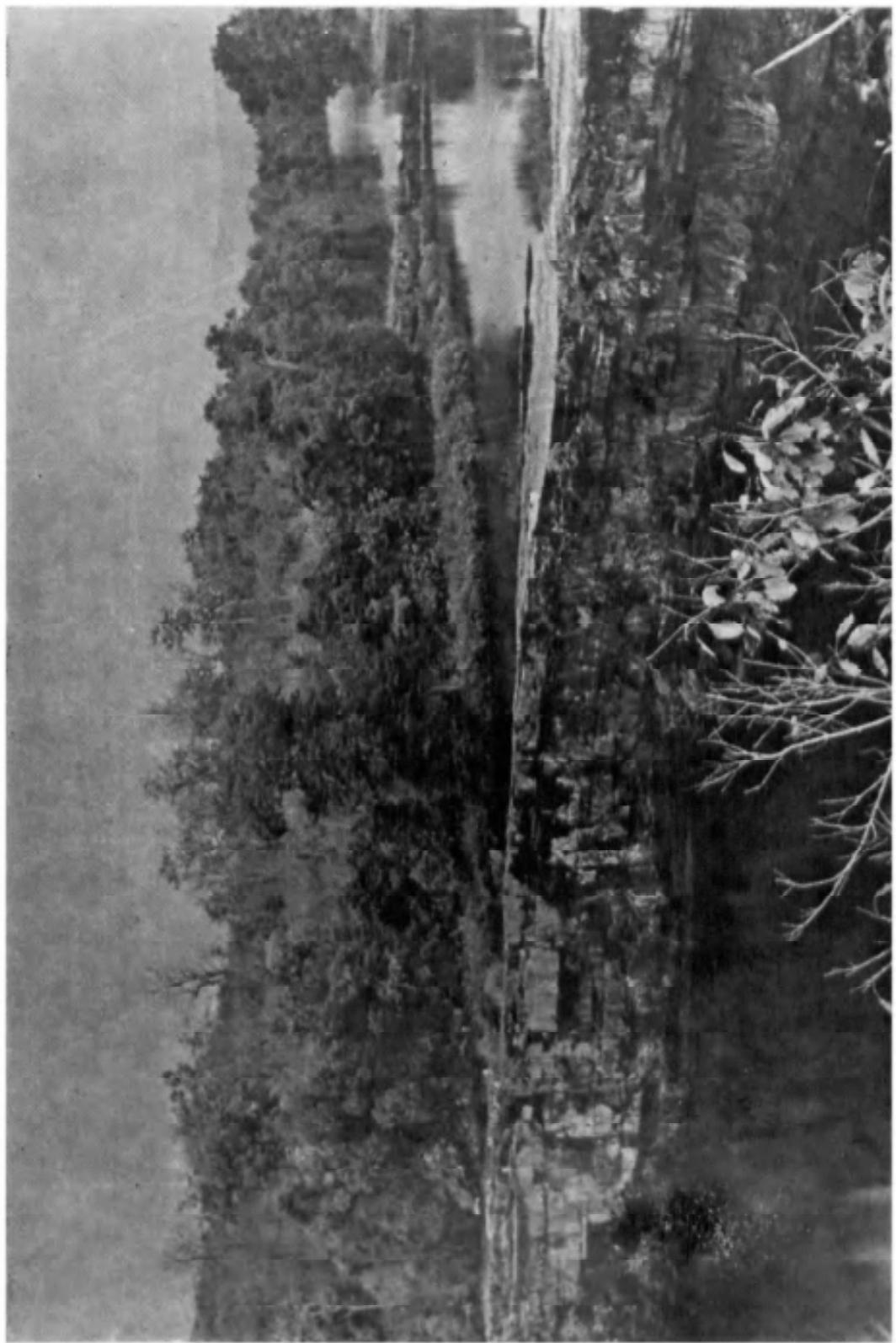




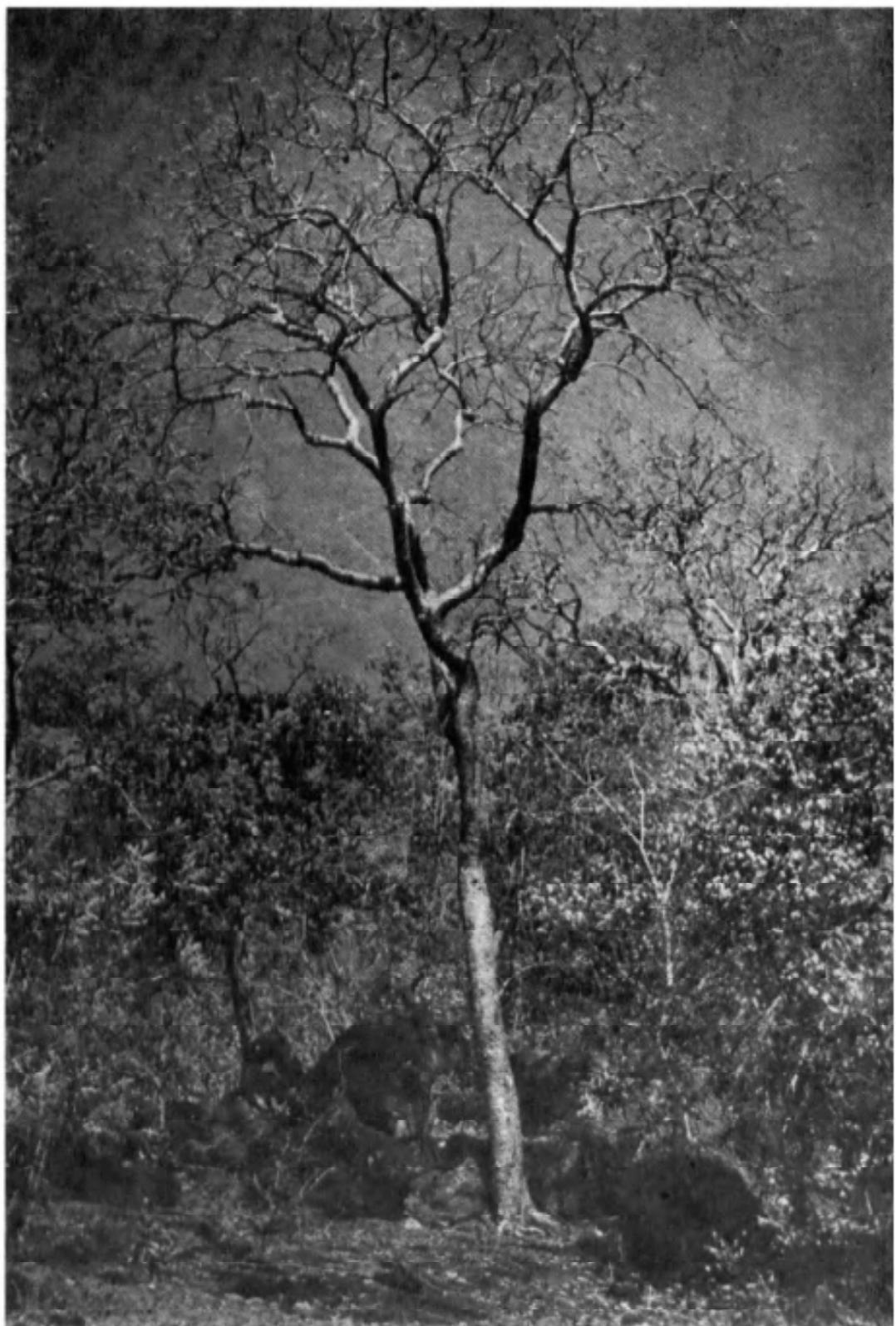
Sal forests (Nagri).



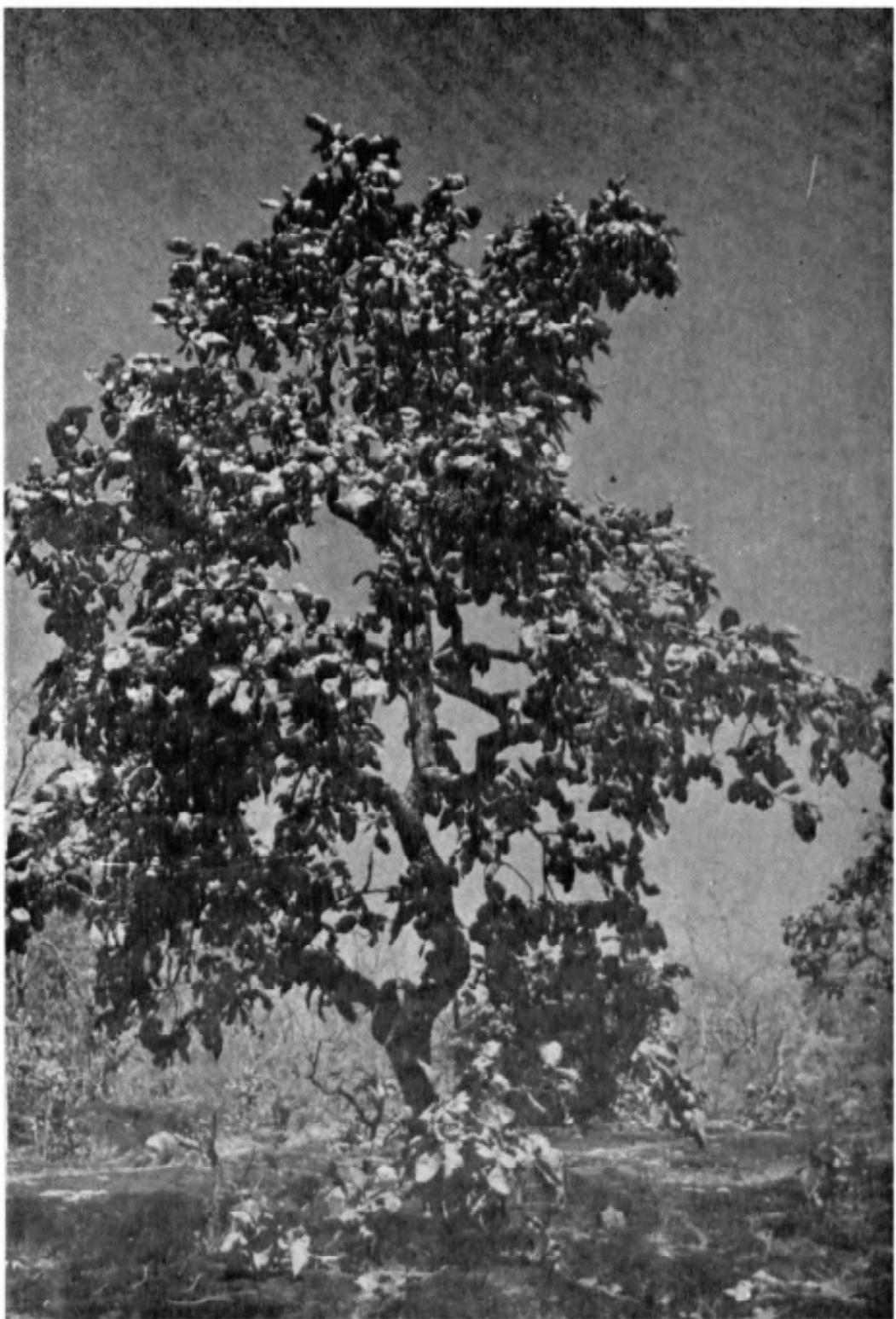
Sal mixed forests (Bar-nawapara).



Miscellaneous forests (Deodhara, Taurenaga).



Miscellaneous forests on hill-tops (Nagri).



Diospyros melanoxylon (Nagri).



Tribal's imagination (Bar-nawapara).

INTRODUCTION

(D. M. Verma, P. C. Pant & M. I. Hanfi)

PHYSIOGRAPHY

Raipur, Durg and Rajnandgaon are three adjacent districts of Madhya Pradesh, in Central India, lying within $80^{\circ}38'$ and $82^{\circ}70'$ E longitudes and $19^{\circ}79'$ and $22^{\circ}48'$ N latitudes, comprising of an area of about 45,000 sq. km. It is in the northern part of the Deccan Peninsula, in south-east Madhya Pradesh, bounded on the south-west by Maharashtra state, on the east by Orissa state, on the north by Balaghat, Mandla, Bilaspur and Raigarh districts and on the south by Bastar district of Madhya Pradesh. Of the three districts, Raipur, with an area of about 25,000 sq. km is larger than even the combined areas of Rajnandgaon and Durg. Rajnandgaon, which was formerly a part of Durg district, was constituted as a separate district on 26th January, 1973. The maximum length and width of the three combined districts are 273 km and 225 km respectively.

The area is approachable through the National/State High-ways from Bilaspur, Jabalpur, Nagpur, Vishakhapatnam and Sambalpur. There are only two main railway-lines from Nagpur to Bilaspur and from Nagpur to Vishakhapatnam, both passing through Rajnandgaon, Durg and Raipur and a branch-line from Raipur to Dhamtari. Hence, movements are mainly through roads which are motorable in fair-weather, and well spread out. However, during rainy season, a lot of hurdles are created by the numerous over-flowing rivers and streams, and all approaches, particularly to interiors in the hilly terrains in west, south and east, are virtually cut off.

Topographically, the region can easily be divided into the Chhattisgarh Plains in the centre, flanked by a hilly and plateau tract on its west, south and east. On the north, the Chhattisgarh Plains continue into Bilaspur district. In general, the area slopes towards north-east.

The Chhattisgarh plains which occupies more than half the area of the region, has a general altitude between 250 - 350 m. It is a fertile alluvial region, mostly under cultivation. In history, it was also known as Mahakosala, or Dakshini Kosala (to distinguish it from the country of the same name in the north). The drainage is mainly provided by the

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Mahanadi river which originates in the Sihawa hills of south Raipur. It first flows northwards and then eastwards, and then through Orissa to the Bay of Bengal. Its major tributary is Seonath river which flows through Rajnandgaon and Durg, collecting water from the western parts. Other tributaries, though numerous, are smaller streams descending from the adjoining hills. Thus, Hanp, Sakri, Karua and Dotu from the Maikal Range in the west, Kharkhara, Tandula, Sitanadi, Sondur, Pari, Sukha and Jounk from the southern hills and plateaus, and many others, all contribute to the waters of Mahanadi.

However, it is the hilly regions in the western, southern and eastern parts which are floristically rich and more interesting. The area is sparsely populated, well forested, much less cultivated, and even though human pressures are operating, it is in these places that most of the reserved forests and Game Sanctuaries with good vegetation and diverse flora are found. In the western part of Rajnandgaon is the Maikal Range of rather deep sloping hills which continue northwards towards Satpura hills. With a general range of 600-800 m, its highest elevation of 918 m is found at the northern end. The southern and the eastern hilly regions are in continuation with the Eastern Ghats through Bastar and Orissa. Higher elevations are found along the south-eastern boundary of Raipur, with highest elevation of 929 m at Mainpur Khurd. This Raipur Plateau is locally divided into Shishupal hills, Sihawa hills and Atang hills. A few reservoirs like Tandula, Maramsilli and Dudhawa have been built for irrigating the large expanse of Chhattisgarh Plains.

GEOLOGY AND SOIL

The area forms part of the northern limit of the well known geological division of India the Deccan Peninsula. Like other parts of the Peninsula, our region also was never submerged under the sea. It is generally composed of horizontal rock-beds on a firm and immovable foundation, and has remained so except for some fracturing due to vertical, downward or upward, movement of some large segments within it. The present day hills in the region were formed due to unequal weathering that has been going on for ages on the Deccan Plateau, cutting down deeper on the land surrounding the hills. The region contains the oldest rocks of the world belonging to Archaean System. Almost equally old, and more common, are the metamorphosed Archaean sedimentary rocks grouped under the name of Dharwar System, and the two are scarcely distinguishable. After a long interval of time during which these were eroded, sometimes almost to the base-level, the next rock-system began to be deposited. This is known as the Cuddapah System. The

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Archaean System consists of gneissic rocks (frequently granite), crystalline metamorphosed sediments and schists. The rocks of Dharwar System are often highly metalliferous, containing ores of iron and manganese. The bulk is formed of phyllites, schists and slates. There are different kinds of schists, quartzites, granites, limestones and brilliantly coloured jaspers. The Cuddapah System is mainly composed of hard Chandrapur sandstones, shales, slates, quartzites and limestones. Besides, they contain cherts, jaspers and some manganese and iron ores.

The rocks of Archaean and Dharwar Systems, chiefly consisting of granites, schists, quartzites, slates and limestones, are frequently found exposed in the hilly regions in the western, southern and eastern parts of our area. These are usually overlaid with Chandrapur sandstones and shales of the Cuddapah System. The Chilpi series of the Dharwar, in the north western part, includes a great thickness of highly disturbed slates and phyllites, with quartzite and basic trappean intrusions. In the Chhattisgarh plains, the Cuddapah System is represented by the stratified rocks of two series. The lower are known as the Chandrapur series, consisting of sandstones, and the upper one known as Raipur series, consisting of purple shales and limestones. The Chandrapur series is exposed only along the rim of the basin.

In addition to the above, towards close of the Cretaceous, the volcanic outbursts in the Peninsula resulted in the eruption of thick layers of lava and associated pyroclastic materials. It resulted in thick horizontally bedded sheets of basalts known as the Deccan Traps. It is found in the Chilpi hills in the north-west. The Lateritic deposits, formed due to metasomatic replacement of Dharwar slates and schists by manganese bearing solutions are of irregular distribution and occur as caps on the out crops of the Dharwar rocks. The laterite is a comparatively recent Pleistocene formation.

The soil produced by the Archaean, Dharwar and Cuddapah rocks is shallow, stony, sandy loam or clayey loam, generally called the 'residual soil'. This has been grouped as Red soil. However, the colour, though generally red, often grades into brown, chocolate, yellow, grey or even black. This is generally found in the hilly regions and its neighbourhoods. Another kind, known as the Black cotton soil or the Regur, is also found in areas around Chilpi, Rajolidih, Borai, Gariaband etc. Its origin is ascribed to long-continued surface action on rocks like the Deccan Trap and gneisses of basic nature. It is extremely sticky when wetted and retains large proportion of moisture for a long time. It is dark, blackish, rich in humus and iron, and very fertile. The lateritic soil found in patches throughout the districts are generally poor and locally called 'Bhata' lands. In addition to these there are large deposits of

alluvial soil in the basins of the several rivers in the Chhattisgarh Plains. These are light yellow loamy soil with a high degree of productiveness, and locally called '*Matasi*'. This is generally under paddy cultivation. The black soil is also sometimes locally called '*Kanhar or Dorsa*'.

CLIMATE

The climate of the region is broadly divisible into summer season from March to June, rainy season from July to October and cold season from November to February. Of these, the post-monsoon period in October - November is most pleasant. At times frost may be experienced in December - January but it is harmless and hangs around valleys and river-courses. Hail-storms also sometimes occur in late winters. Thunderstorms is a common phenomenon during May - June.

The mean temperature data for Raipur (305 m) is given in Table 1. The highest temperature reaching in the afternoons of May - June has been recorded as 47.2°C and the lowest in the pre-dawn period of December - January has been recorded as 3.9°C. These conditions more or less prevail throughout the Plains of Chhattisgarh. The hilly terrain in the west, south and east, with an elevation of up to 929 m certainly has a few degrees lower temperature, though proper records are not available.

The average monthly rainfall for three representative areas is given in Table 2. The average annual rainfall in general varies from 1100 mm (in Pithora) to about 2000 mm in the southern hilly tract. About 90% of it falls in the rainy season between June - September. These are often torrential, causing much soil erosion. The shallow bedded streams and rivers, with almost dry beds or little water between November - June, suddenly swell up cutting off most of the communication, particularly in the interiors. The rainfall in the remaining months is reduced to a few irregular showers. The wettest parts are its southern hills and plateau while northwards, the Chhattisgarh Plains are comparatively drier.

PEOPLE

The three districts combined together have a population of about 50 lakhs, mainly belonging to '*Gond*' tribe. Of these, about 85% live in rural areas. Here again, a larger proportion is settled in the Chhattisgarh Plains as compared to the hill ranges and plateaus. Raipur city, which is the most developed city in eastern Madhya Pradesh with several professional colleges, institutes, offices, factories, and business centres, has the highest population of over 3 lakhs.

INDUSTRIES

The whole tract was pretty backward till about 1960 when industrial development picked up at a rapid pace. Now there are several oil mills,

Table 1—MEAN TEMPERATURE IN RAIPUR (°C)

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Mean max.	27.6	30.0	35.1	39.3	41.8	36.6	30.4	30.9	31.2	31.4	28.7	26.7
Mean min.	13.2	14.5	20.0	24.6	27.8	26.2	23.9	23.8	23.9	20.9	15.9	12.6
MEAN	20.4	22.3	27.6	32.0	34.8	31.4	27.2	27.3	27.6	26.2	22.3	19.5

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Table 2—RAINFALL (mm)

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Balod	8	16	15	14	65	316	365	454	390	184	11	5	1863
Dhamtari	8	18	13	23	20	231	385	355	209	57	13	4	1336
Raipur	10	22	18	16	22	227	375	358	192	54	13	5	1312

rice mills, soap mills, cotton mills and factories making cement, utensils, lac, bidis, and furniture etc. Rice, timber wood, bamboo and bidi leaves are exported in large quantities.

Surpassing all these is the Bhilai Steel Plant established with Indo Russian collaboration, celebrating its silver-jubilee. Situated in Durg dist. on the highway between Raipur and Durg, it has developed its own township. As expected, it is causing plenty of air pollution and this problem is very much worth further investigation. The pollution could be felt even while breathing. A general observation revealed several dust covered retarded roadside trees speaking of ill health. Trees of *Cassia fistula*, *Pongamia pinnata* and *Peltophorum pterocarpum* appeared to be more susceptible as compared to *Ficus religiosa*, *Pithecellobium dulce*, *Mangifera indica*, *Dalbergia sissoo* and spp. of *Albizia*, *Manilkara* and *Eucalyptus*.

EARLIER COLLECTIONS AND PUBLICATIONS

The contributions of Clarke (1898), Blatter (1911), Haines (1916), Mooney (1942), Hewetson (1951), Santapau (1958) and Burkill (1965) were all looked into in search of earlier collections from our area. The earliest record of a very few stray collections are those of Watt (ca 1894) and Marten (1898) in Raipur, and Lowrie (1908-09) in Raipur and Durg (incl. Rajnandgaon). It is obvious that this region remained unrepresented in J.D. Hooker's Flora of British India.

The credit for the first serious attempt at botanising the area should go to Henry Haselfoot Haines, a British Forest Officer, and a reputed botanist who later published Botany of Bihar & Orissa (1921-1925). His collections, from 1912 onwards, from ours and the adjoining regions, resulted in the publication of his *Descriptive List of trees, shrubs and economic herbs of the Southern Circle, Central Provinces* (1916). It includes about 350 species from Raipur, Durg and Rajnandgaon districts. Unfortunately, his collections could not be consulted while writing the present Flora since most of these are housed in foreign herbaria (A, ABD, K, NY, WRSL etc.). Hemant Sharma made some collections in Raipur city around 1980-82 in connection with his pollen studies, and his unpublished list was made available to us by Prof. V.B. Sharma, Botany Department, Government Science College, Raipur. Mention may also be made of a few publications on aquatic vegetation of Raipur (D.K. Tiwari, 1960a, b; Unni, 1967a), Compositae of Raipur (Unni, 1967b) and Cyperaceae of Madhya Pradesh (Verma & Chandra, 1981). A few collections of R.M. Singhal (1951) and S.D.N. Tiwari (1948 onwards) have also been reported from Raipur in some floristic publications on Madhya Pradesh.

S.K. Jain (1961-62) and G. Panigrahi (1963) also collected a few specimens from Raipur while going to Bastar district.

PRESENT COLLECTIONS

Plant collection in the region on which the present Flora is mainly based was started with the first exploration tour, in May-June, 1972, to Raipur district by D.M. Verma. During a total field stay of 25 days, the party camped at Dhamtari, Sitanadi, Khallari, Taurenga, Gariaband, Pithora and Kasdol. From there, movements and collections were made both on foot and by Jeep. Naturally, the camping places were more intensively collected though efforts were always made to cover as much of area as possible. A total of 554 field numbers were collected. More or less the same pattern was followed during subsequent field trips. A total of five collection tours were undertaken to Raipur district by D.M. Verma during May-June, 1972 (25 days), by D.M. Verma & M.I. Hanfi in January, 1976 (16 days), and August, '76 (13 days), by D.M. Verma in October, '76 (13 days) and by D.M. Verma & M.I. Hanfi in February, '84 (7 days) and in all 1784 field numbers were collected. The camping places were Borai, Dhamtari, Dugli, Gariaband, Kasdol, Khallari, Nagri, Pithora, Raipur, Sitanadi and Taurenga. In Rajnandgaon district P.C. Pant & M.I. Hanfi collected in April, 1974 (8 days), October, '74 (12 days), September, '76 (13 days) and August, '78 (5 days) with camps at Baghnadi, Chilpi, Deopura, Rajnandgaon, Singhari and Taregaon, and a total collection of 907 field nos. In Durg district P.C. Pant and M.I. Hanfi collected in April 1974 (6 days) and August, '78 (13 days) with camps at Balod, Budbhumi, Durg, Kamteli, Khargaon, Malaiddah and Rajolidih, and a total collection of 401 field nos. Thus, in the three districts of Raipur, Rajnandgaon and Durg, 131 days were spent in field work and a total of 3092 field numbers were collected. All these specimens are housed in the herbarium of the Botanical Survey of India, Central Circle, Allahabad (BSA).

VEGETATION

The climatic, edaphic, altitudinal and biotic variations with their complex interrelationships and species composition have resulted in different kinds of vegetation cover in the area which needs a much more detailed study than attempted during the present Flora-oriented project. The following account, based on field-notes during movements to different parts, is not very comprehensive, and is aimed only at giving a general idea of the vegetation in the region. The forests cover about 40% of the area, of which about 60% are reserved forests and the remaining protected forests or under Forest Corporation.

The Chhattisgarh Plains has long been under cultivation and at present only small patches of degraded tropical dry deciduous forests have been left, if at all. It is rather more characterised by scattered stunted and crooked trees and shrubs of *Butea monosperma*, *Lagerstroemia parviflora*, *Albizia* spp., *Acacia leucophloea*, *A. nilotica* spp. *indica*, *Mangifera indica*, *Terminalia* spp., *Ficus racemosa*, *F. benghalensis*, *F. religiosa*, *Azadirachta indica*, *Pithecellobium dulce*, *Syzygium cumini*, *Mitragyna parvifolia*, *Aegle marmelos*, *Diospyros melanoxylon*, *Bauhinia* spp., *Calotropis* spp., *Caesalpinia bonduc*, *Ipomoea carnea* and *Mimosa himalayana*, with several climbers like *Ziziphus oenoplia*, *Celastrus paniculatus*, *Cryptolepis buchananii*, *Ampelocissus* spp., *Mukia maderaspatana*, *Ipomoea* spp., *Atylosia scarabaeoides* and *Cissampelos pareira*. Particular mention may be made of the 'mahua' trees, *Madhuca longifolia* var. *latifolia*, which are considered sacred and stay unlopped. In addition, *Albizia* spp., *Dalbergia sissoo*, *Delonix regia*, *Cassia fistula*, *Peltophorum pterocarpum*, *Pongamia pinnata*, *Eucalyptus* hybrids, and *Pterocarpus marsupium* are frequently planted on the roadsides. The ground flora, during rainy and post rainy season, consists of several annual or perennial species of grasses, sedges and other herbs and creepers, but by the middle of winter it is completely grazed and presents a bare desolate spectre. Mention may be made of two epiphytic orchids, *Vanda tessellata* and *V. testacea* which grow freely on *Mangifera indica*, *Butea monosperma*, *Madhuca longifolia* var. *latifolia*, *Diospyros melanoxylon* and *Terminalia* spp. The former with large brown banded flowers immediately catches the eye.

In contrast to the Chhattisgarh Plains, the western regions like Taregaon, Chilpi, and Rengakhar, the southern regions like Rajhara dhalli, Borai, Sitanadi, Khallari and Taurenge and the eastern regions like Deori, Bagbahara, Barnawapara and Chhoora harbour several extremely rich reserved forests of sal, teak and mixed kinds. According to Champion & Seth (1968) these have been broadly grouped into Tropical Moist Deciduous Forests and Tropical Dry Deciduous Forests. These may be of mixed type (Tropical Moist Deciduous Mixed Forests and Tropical Dry Deciduous Mixed Forests), or with predominating *Shorea robusta* (Tropical Moist Deciduous Peninsular Sal forests and Tropical Dry Deciduous Peninsular Sal forests), or with predominating *Tectona grandis* (Tropical Moist Deciduous Teak Forests and Tropical Dry Deciduous Teak Forests). A short account of the two major groups is given below :

I. Tropical Moist Deciduous Forests :

A good development of these forests with a fair amount of sal (*Shorea robusta*) can be observed in the reserved forests around Chilpi,

Rangakhar, Borai, Sitanadi, Khallari and Taurenga. It has tall trees of *Shorea robusta*, *Terminalia* spp., *Pterocarpus marsupium*, *Dalbergia paniculata*, *Adina cordifolia*, *Stereospermum chelonoides*, *Schleichera oleosa*, *Garuga pinnata*, *Lannea coromandelica*, *Bombax ceiba*, *Soymida febrifuga* and *Boswellia serrata*, and smaller trees like *Lagerstroemia parviflora*, *Briedelia squamosa*, *Mallotus philippensis*, *Diospyros melanoxylon*, *Anogeissus latifolia*, *Buchanania lanza*, *Gmelina arborea*, *Antidesma ghaesembilla*, *Ficus* spp., *Grewia tiliifolia* and *Cassia fistula*, and shrubs like *Breynia vitisidaea*, *Embelia tsjeriam cottam*, *Chloroxylon swietenia*, *Holarrhena antidysenterica*, *Casearia graveolens*, *Helicteris isora*, *Seme-carpus anacardium*, *Ochna obtusata*, *Indigofera cassioides*, *Woodfordia fruticosa* and species of *Leea* and *Desmodium*. The common Madhya Pradesh bamboo, *Dendrocalamus strictus*, forms dense thickets. The conspicuous climbers and ramblers in these forests are *Millettia extensa*, *Smilax zeylanica*, *Bauhinia vahlii*, *Olax scandens*, *Combretum roxburghii*, *Ventilago denticulata*, *Ichnocarpus frutescens*, *Dioscorea pentaphylla*, *D. puber*, *D. oppositifolia* and *D. bulbifera*.

The undergrowth in dense forests is often sparse, and not much varied. The common species are *Eruanthemum purpurascens*, *Perilepta edgeworthiana*, *Nelsonia canescens*, *Phoenix acaulis*, *Chlorophytum tuberosum*, *Globba racemosa*, *G. bulbifera*, *Curcuma* spp., *Zingiber* spp., *Tacca leontopetaloides*, *Carex speciosa*, and a few ground orchids like *Eulophia* spp., *Habenaria* spp., *Geodorum densiflorum*, and *Peristylus* spp. The edges of the forests have a very luxuriant growth of numerous annual and perennial species of *Cleome*, *Desmodium*, *Alysicarpus*, *Tephrosia*, *Crotalaria*, *Blumea*, *Cynoglossum*, *Barleria*, *Leucas*, *Phyllanthus*, *Euphorbia*, *Pupalia*, *Aerva*, *Commelina*, *Cyanotis*, and sedges and grasses. The species diversity and undergrowth in forests with high proportion of *Shorea robusta* (sal forests) is comparatively poorer than in the mixed forests. Sal is generally absent on hill slopes.

The degraded forests of the tropical moist deciduous type also have a composition somewhat similar to that described above but for the conspicuous absence or scarcity of species like *Shorea robusta*, *Dalbergia paniculata*, *Adina cordifolia*, *Lannea coromandelica*, *Garuga pinnata*, *Bombax ceiba*, *Leea* spp., *Ochna obtusata* and *Bauhinia vahlii*. Instead, these forests are mainly composed of *Terminalia alata*, *T. bellirica*, *Lagerstroemia parviflora*, *Anogeissus latifolia*, *Cleistanthus collinus*, *Diospyros melanoxylon*, *Briedelia squamosa*, *Butea monosperma*, *Cordia obliqua*, *Buchanania lanza*, *Emblica officinalis*, *Helicteres isora* and species of *Ziziphus*, *Acacia*, *Gardenia* and *Xeromphis*. The common climbers are *Celastrus paniculatus*, *Ventilago denticulata*, *Cocculus hirsutus*, *Cissampelos pareira*, *Rhynchosia minima*, *Atylosia scarabaeoides*, *Mukia maderaspatana*, *Diplocycrus palma-*

tus, *Ampelocissus latifolius*, *A. tomentosa*, *Ziziphus oenoplia*, *Pergularia daemia* and *Cryptolepis buchananii*. There is also a corresponding change in the ground flora with more intrusion of grasses, sedges and Asteraceae members.

Teak (*Tectona grandis*) is usually absent in these forests except where plantations of this timber species have been raised by the Forest Department, some of which are more than 50 years old. Only in a few places teak has been found to be naturally(?) occurring in association with other trees and shrubs.

Sometimes *Terminalia alata* becomes extremely dominant and forms almost pure patches.

II. Tropical Dry Deciduous Forests :

These are found in comparatively drier areas, generally in and around the Chhattisgarh Plains. Though not always conspicuously different from the moist deciduous forests, since transitional stages are not uncommon, dry deciduous forests are dominated by *Legerstroemia parviflora*, *Butea monosperma*, *Diospyros melanoxylon*, *Albizia* spp., *Anogeissus latifolia*, *Terminalia* spp., *Aegle marmelos*, *Acacia catechu* *A. torta*, *A. pennata*, *Cordia obliqua*, *Emblea officinalis*, *Madhuca longifolia* var. *latifolia*, *Bauhinia* spp., *Nyctanthes arbor-tristis*, *Ziziphus mauritiana*, *Z. xylopyrus*, *Heliocetes isora*, *Lannea coromandelica* and *Boswellia serrata*. The shrubby layer is usually formed of *Holarrhena antidysenterica*, *Grewia hirsuta*, *Mimosa himalayana*, *Flacourtie indica*, *Capparis zeylanica*, *Kirganelia reticulata*, *Securinega virosa*, *Casearia elliptica*, *Woodsfordia fruticosa*, *Clerodendrum serratum* and *Solanum anguivi*. The common climbers are *Ziziphus oenoplia*, *Smilax zeylanica*, *Celastrus paniculatus*, *Ampelocissus latifolius*, *A. tomentosa*, *Asparagus racemosus*, *Hemidesmus indicus* and *Ichnocarpus frutescens*. A few other climbers like *Rhynchosia minima*, *Atylosia scarabaeoides*, *Ipomoea* spp., *Mukia maderaspatana*, *Diplocycrus palmatus*, *Cryptolepis buchananii* and *Pergularia daemia* become more common in open forest pockets or its margins. *Hyptis suaveolens*, *Anisomeles indica*, *Alysicarpus* spp., *Tephrosia purpurea*, *Plectranthus mollis*, *Cassia tora*, *Pavetta tomentosa*, species of *Indigofera*, *Crotalaria*, *Leucas*, *Euphorbia* and a large variety of grasses and sedges are common along forest margins.

It may also be mentioned that sometimes *Anogeissus latifolia*, *Butea monosperma*, *Boswellia serrata*, *Aegle marmelos* and *Acacia catechu* almost individually dominate small patches of dry deciduous forests, and such forests are often named after these individual species.

Terminalia arjuna and *Syzygium heyneanum* are commonly found along banks of the rivers and streams. While the former is also found elsewhere, the latter is very specific in its habitat. Bushes of *Tamarix ericoides* and *Rotula aquatica* are frequent in river-beds.

The rock boulders in the dry uplands bear in their crevices only a few species like *Polycarpaea aurea*, *P. corymbosa*, *Indigofera astragalina*, *I. glabra*, *Cassia absus*, *Anisochilus carnosus*, *Trichurus monsoniae*, *Arthraxon prinodes*, *Chrysopogon verticillatus*, *Digitaria stricta*, *Dimeria ornithopoda*, *Perotis indica* and *Polygonatherum crinitum*.

AQUATIC PLANTS

The numerous rivers, streams, drains, ponds and ditches harbour a number of water-loving species, in and around it, and these are generally grouped together as aquatic plants. However, the exact interpretation or circumscription of this group is debatable since there are numerous borderline species which grow both in marshy lands and water, and still others which grow in drains and ditches which are temporarily filled up during rains. The 85 species mentioned below have been chosen as aquatic in a more strict sense and have been classified into six categories on the basis of their general habit. The wetland hydrophytes, pretty large in number, have been excluded.

I. Free-floating hydrophytes :

Azolla pinnata, *Wolffia globosa*, *Lemna perpusilla*, *Spirodela polyrhiza*, *Pitca stratiotes*, *Trapa natans* var. *bispinosa* and *Eichhornia crassipes*.

II. Suspended submerged hydrophytes :

Ceratophyllum demersum, *Utricularia aurea* and *U. exoleta*.

III. Anchored submerged hydrophytes :

Polypleurum stylosum, *Myriophyllum oliganthum*, *Blyxa aubertii*, *B. octandra*, *Hydrilla verticillata*, *Vallisneria natans*, *Nechamandra alternifolia*, *Cryptocoryne retrospiralis*, *Najas graminea*, *N. indica*, *Aponogeton crispus*, *Potamogeton crispus*, *P. mucronatus* and *P. pectinatus*.

IV. Anchored hydrophytes with floating shoots :

Neptunia oleracea, *Ludwigia adscendens*, *Ipomoea aquatica*, *Alternanthera philoxeroides*, *Hygroryza aristata* and *Cyperus platystylis*.

V. Anchored hydrophytes with floating leaves :

Marsilea minuta, *Nelumbo nucifera*, *Nymphaea pubescens*, *N. nouchali*, *N. rubra*, *Nymphoides hydrophylla*, *N. indica*, *Ottelia alismoides* *Monochoria*

vaginalis, *Sagittaria guayanensis* ssp. *lappula*, *Caldesia parnassifolia*, *Limnophyton obtusifolium*, *Tenagogcharis latifolia*, *Aponogeton natans* and *Potamogeton nodosus*.

VI. Emergent amphibious hydophytes :

Aeschynomene aspera, *A. indica*, *Ammania baccifera*, *A. multiflora*, *Rotala densiflora*, *R. indica*, *R. rotundifolia*, *Ludwigia octovalvis*, *L. perennis*, *L. prostrata*, *Enhydra fluctuans*, *Limnophila indica*, *L. sessiliflora*, *Hygrophila auriculata*, *Polygonum barbatum*, *P. dichotomum*, *P. glabrum*, *P. hydropiper* spp. *microcarpum* var. *triquetrum*, *P. limbatum*, *Crinum defixum*, *Typha angustata*, *Cyperus distans*, *C. nutans* var. *eleusinoides*, *C. pangorei*, *Eleocharis acutangula*, *E. congesta*, *E. dulcis*, *Fimbristylis schoenoides*, *F. tetragona*, *Scirpus articulatus*, *S. juncoides*, *S. lateriflorus*, *S. maritimus*, *Brachiaria reptans*, *Coix aquatica*, *Echinochloa colona*, *E. stagnina*, *Hymenachne pseudointerrupta*, *Ophiuros exaltatus* and *Phragmites karka*.

FERNS AND FERN ALLIES

While the main efforts were concentrated on the collection of flowering plants, a few ferns and fern allies were also collected, and these are listed below:

Azolla pinnata R. Br., *Ophioglossum nudicaule* L.f., *O. reticulatum* L., *Marsilea minuta* L., *Isoetes coromandelina* L., *Equisetum debile* Roxb., *E. diffusum* D. Don, *Selaginella bryopteris* (L.) Baker, *S. repanda* (Desv.) Spring, *Ceratopteris thalictroides* (L.) Brongn., *Lygodium flexuosum* (L.) Sw., *Adiantum caudatum* L. and *A. lunulatum* Burm.

SANCTUARIES

In keeping with Wild Life Conservation three sanctuaries were established in Raipur district during the last decade. These are :

1. **Bar-Nawapara Sanctuary** with an area of 244.66 sq. km. in the northern part of Raipur district, established in 1975.
2. **Sitanadi sanctuary** with an area of 566.53 sq. km. in the southern part of Raipur district, established in 1974.
3. **Udanti Sanctuary** with an area of 247 sq. km. in the southern part of Raipur district along Udanti river, established in 1979.

All these areas were formerly Reserved Forests with generally a high proportion of *Shorea robusta*. Sitanadi area is particularly extremely rich in species composition. Tigers, panthers, bisons, sambhars, cheetals, wild

boars, monkeys, bears and neel-gai are the common animals. These sanctuaries would also go a long way in conserving the flora, especially its herbaceous elements which unknowingly escape the attention of conservationists or foresters. In addition to the above sanctuaries a part of the Chilpi area in western Rajnandgaon has now been included under Kanha National Park.

ECONOMIC BOTANY

Leaving aside urban population the majority of the people still depend to a large extent on wild plants for their various needs. During field trips some efforts were also diverted towards collection of information on local uses of plants. These were mainly gathered by talking to tribals inhabiting the interiors of the southern parts of Raipur who are still partly dependant on surrounding native plants, to village elders and forest staff, and also by having a look at the local weekly markets. Whenever possible, this information was cross-checked. Still, errors might have crept in since some people were not readily prepared to divulge their *secret knowledge* and might have given wrong information under persuasion, while still others were over-jealous to leave a good impression and came out with some or the other uses of most of the plants enquired into. The following names have been sorted out in this background, and broadly categorized according to their uses.

I. Edible Plants.

- (a) Rhizomes/tubers (cooked) of *Nelumbo nucifera*, *Nymphaea pubescens*, *N. rubra*, *Dioscorea bulbifera*, *D. glabra*, *D. pentaphylla*, *D. puber* and *Tacca leontopetaloides*.
- (b) Leaves and tender shoots (cooked) of *Cleome gynandra*, *Cocculus hirsutus*, *Melochia corchorifolia*, *Corchorus capsularis*, *C. olitorius*, *Bauhinia malabarica*, *B. purpurea*, *Cassia tora*, *Cordia obliqua*, *Polygonum glabrum*, *Amaranthus hybridus* spp. *incurvatus* var. *paniculatus*, *A. spinosus*, *A. tricolor*, *Basella alba*, *Amorphophallus sylvaticus* and *Dendrocalamus strictus*.
- (c) Flowers (cooked) of *Sesbania grandiflora*, *Bauhinia purpurea*, *B. racemosa*, *Semecarpus anacardium*, *Celastrus paniculatus*, *Woodfordia fruticosa*, *Madhuca longifolia* var. *latifolia*, *Nelumbo nucifera* (carpels) and *Hibiscus subdariffa* (calyx).
- (d) Fruits (raw, cooked or pickled) of *Dillenia pentagyna*, *Annona squamosa*, *Mangifera indica*, *Buchanania lanzan*, *Grewia abutilifolia*, *G. hirsuta*, *Aegle marmelos*, *Ziziphus mauritiana*, *Z. rugosa*, *Moringa oleifera*, *Trapa natans* var. *bispinosa*, *Pithecellobium*

dulce, *Tamarindus indica*, *Terminalia bellirica*, *Momordica dioica*, *Xeromphis uliginosa*, *Flacourtie indica*, *Embelia tsjeriam-cottam*, *Diospyros malabarica*, *D. melanoxylon*, *Carissa opaca*, *Cordia obliqua*, *Gmelina arborea*, *Syzygium cumini*, *Emblica officinalis*, *Ficus racemosa*, *F. virens*, *Phoenix acaulis* and *P. sylvestris*.

- (e) Seeds (cooked or roasted) of *Semecarpus anacardium*, *Sterculia urens*, *Indigofera glandulosa*, *Vigna aconitifolia*, *V. trilobata*, *V. umbellata*, *Bauhinia vahlii*, *Cassia occidentalis*, *Coix aquatica*, *Eleusine coracana*, *Oryza rufipogon*, *Panicum sumatrense* and *Paspalum scrobiculatum*.

II. Timber Wood (for construction, agricultural implements, furniture, carts etc.)

Shorea robusta, *Tectona grandis*, *Pterocarpus marsupium*, *Schleichera oleosa*, *Ougeinia oogeensis*, *Terminalia alata*, *Lagerstroemia parviflora*, *Boswellia serrata*, *Acacia catechu*, *Emblica officinalis*, *Albizia procera*, *Anogeissus latifolia*, *Grewia tiliifolia*, *Soymida febrifuga* and *Cleistanthus collinus*. These are the commonly used forest species. Several more tree species are also used as per availability. In addition, wood from several planted species like those from *Dalbergia sissoo*, *D. latifolia*, *Mangifera indica* and *Syzygium cumini* and poles from the common bamboo, *Dendrocalamus strictus* are in frequent use.

III. Medicinal Plants

It has not been possible to get conclusive details on diseases and plant parts used, mixture of different species, methods of application etc. Information on these aspects, if locally available, has been given in the text under individual species. Only a selected list of 54 spp. is presented below for reference. However, most of these are established medicinal plants and details can be found in literature.

Cissampelos pareira var. *hirsuta*, *Nymphaea pubescens*, *Abutilon indicum*, *Thespesia lampas*, *Helicteres isora*, *Azadirachta indica*, *Celastrus paniculatus*, *Aegle marmelos*, *Ziziphus oenoplia*, *Pongamia pinnata*, *Psoralea corylifolia*, *Pterocarpus marsupium*, *Uraria picta*, *Bauhinia vahlii*, *Cassia fistula*, *C. occidentalis*, *C. tora*, *Mimosa pudica*, *Terminalia arjuna*, *T. bellirica*, *T. chebula*, *Diplocyclos palmatus*, *Momordica charantia*, *Centella asiatica*, *Peucedanum nagpurensis*, *Eclipta alba*, *Blepharispermum subsessile*, *Tridax procumbens*, *Embelia tsjeriam-cottam*, *Catharanthus roseus*, *Holarrhena antidysenterica*, *Rauvolfia serpentina*, *Gymnema sylvestre*, *Strychnos nux-vomica*, *S. potatorum*, *Argyreia striigosa*, *Cuscuta reflexa*, *Datura metel*, *Solanum xanthocarpum*, *Bacopa monnieri*, *Adhatoda vasica*,

Andrographis echiooides, *A. paniculata*, *Barleria cristata*, *B. prionitis*, *Vitex negundo*, *Ocimum sanctum*, *Boerhavia diffusa*. *Achyranthes aspera*, *Girardinia zeylanica*, *Costus speciosus*, *Curculigo orchoides*, *Asparagus racemosus* and *Cyperus rotundus*.

IV. Other Economic Plants

- (a) Beverages and drinks from *Cassia occidentalis*, *Tamarindus indica* and *Madhuca longifolia* var. *latifolia*
- (b) Brooms from *Thysanolaena maxima* and *Phoenix acaulis*.
- (c) Cotton from *Bombax ceiba*, *Gossypium hirsutum*, *Calotropis gigantea* and *C. procera*.
- (d) Dyes from *Butea monosperma*, *Nyctanthes arbor-tristis*, *Mallotus philippensis*, *Lawsonia inermis*, *Woodfordia fruticosa* and *Curcuma* spp.
- (e) Fibres generally from *Bauhinia vahlii* but also from *Bauhinia purpurea*, *Abutilon indicum*, *Hibiscus cannabinus*, *Grewia serrulata*, *Triumfetta rhomboidea*, *Soymida febrifuga* and *Eulaliopsis binata*.
- (f) Fish poisons from fruit pulp of *Gardenia turgida*, *Xeromphis spinosa*, *Cleistanthus collinus* and *Casearia elliptica* and roots of *Millettia extensa*.
- (g) Gums & resins from *Sterculia urens*, *Lannea coromandelica*, *Boswellia serrata*, *Butea monosperma*, *Acacia catechu*, *A. leucocephala*, *A. nilotica* ssp. *indica*, *Anogeissus latifolia*, *Gardenia gummifera* and *Eulophia nuda*.
- (h) Match sticks from *Bombax ceiba* and *Boswellia serrata*.
- (i) Oils (for animal feed, medicine, soaps, burning or flavouring, messaging, as also for frying and pickles) from *Shorea robusta*, *Madhuca longifolia* var. *latifolia*, *Pongamia pinnata*, *Schleichera oleosa*, *Cochlospermum religiosum*, *Buchanania lanza*, *Azadirachta indica*, *Casearia graveolens*, *Ventilago dentata*, *Jatropha curcas*, *Celastrus paniculatus*, *Eucalyptus* spp., *Cymbopogon martinii* and *Vetiveria zizanioides*.
- (j) Paper pulp from *Dendrocalamus strictus*.
- (k) Plates and bowls mainly from leaves of *Butea monosperma* and *Bauhinia vahlii*.
- (l) Rolling tobacco (*bidi*) for smoking. Leaves of *Diospyros melanoxylon* for industries. Tribals use leaves of *Bauhinia* spp.

- (m) Thatching & mat-making from *Phoenix acaulis*, *P. sylvestris*, *Imperata cylindrica*, *Saccharum spontaneum* and *Typha angustata*.
- (n) Washing from seeds of *Sapindus emarginatus*.
- (o) Weighing. Seeds of *Abrus precatorius* used by jewellers.

V. Crop Plants

Rice (*Oryza sativa* L.) cultivated in rainy season, is the main crop of the region. The villagers usually boil it with plenty of water till it is turned into a liquid form. This is their staple food and is called 'Pef'. Because of water scarcity usually only one crop is possible. However, irrigation facilities are being developed through tube-wells, and dams like Rudri, Maramsilli, Dindhawa, Sondur, Saroda, Pipariya Ruse, and Tandula etc., with a net-work of canals.

Besides rice (*Oryza sativa* L.) of which one of the finest variety 'Yuvraj' is being cultivated around Nagri (in Raipur) the other common crops are bajra (*Pennisetum americanum* (L.) Leeks), bhutta (*Zea mays* L.), jowar (*Sorghum* spp.), kodo (*Paspalum scrobiculatum* L.), wheat (*Triticum aestivum* L.), maria (*Eleusine coracana* (L.) Gaertn.), chana (*Cicer arietinum* L.), matar (*Pisum sativum* L.), moongphali (*Arachis hypogaea* L.) alsij (*Linum usitatissimum* L.) rai (*Brassica nigra* (L.) Koch), sarson (*Brassica juncea* (L.) Czern. & Coss.), til (*Sesamum orientale* L.) and pulses like teori (*Lathyrus sativus* L.), arhar (*Cajanus cajan* (L.) Millsp.) and urd (*Vigna mungo* (L.) Hepper). Besides, several seasonal vegetables are also grown.

FLORISTIC ANALYSIS

The Flora of Raipur, Durg and Rajnandgaon districts deals with 1032 species in 568 genera and 127 families of flowering plants. Out of these 287 species in 136 genera and 25 families belong to Monocots and 745 species in 432 genera and 102 families belong to Dicots. The proportion of Monocots to Dicots is 1 : 2.8 and total genera to species is 1 : 1.8. Taking into account the entire Indian subcontinent, Hooker (1904) gives the proportion of Monocots to Dicots as 1 : 2.3 and genera to species as 1 : 7.

The ten dominant families in the present Flora have been listed below and a comparison has been made with the list given by Hooker (1904) for Flora of British India. Fabaceae, Caesalpiniaceae and Mimosaceae though treated separately in the present Flora have been combined below for the sake of comparison only.

TABLE : LARGEST FAMILIES

Flora of Raipur, Durg
and Rajnandgaon

1. Leguminosae (129 spp.)
2. Poaceae (122 spp.)
3. Cyperaceae (67 spp.)
4. Asteraceae (58 spp.)
5. Euphorbiaceae (43 spp.)
6. Acanthaceae (43 spp.)
7. Convolvulaceae (27 spp.)
8. Malvaceae (25 spp.)
9. Scrophulariaceae (24 spp.)
10. Rubiaceae (23 spp.)

Flora of British India

1. Orchidaceae
2. Leguminosae
3. Poaceae
4. Rubiaceae
5. Euphorbiaceae
6. Acanthaceae
7. Asteraceae
8. Cyperaceae
9. Lamiaceae
10. Urticaceae

The Flora contains about 140 tree spp., 71 shrubby spp., 75 climbing or sarmentose spp., and the remaining, almost equally divided, annual or perennial herbs or undershrubs. As per the list given before there are 83 aquatic spp. Epiphytes are poor, being represented only by *Dendrophthoe falcata*, *Scurrula parasitica*, *Viscum nepalense*, *V. orientale*, *Vanda tessellata* and *V. testacea*. The insectivorous plants are two spp. of *Drosera* and eight spp. of *Utricularia*.

RARE AND THREATENED SPECIES

Recent spread in developmental activities, urbanisation, and additional land requirements for farming and grazing etc. are resulting in severe damage to natural habitats, thus threatening the very survival of several species. The necessity of conserving these and others that are being over-exploited for their miscellaneous utilities is now well recognised. Various Organisations like International Union for Conservation of Nature and Natural Resources (IUCN), National Committee on Environmental planning and Coordination (NCEPC) and National Committee on Man and Biosphere (MAB) are interested in listing of species threatened with extinction and measures for their conservation. Recently, Jain & Sastry (Howrah, 1983) have published 'Materials for a catalogue of threatened plants of India.' This has provided an essential basis for critical appraisal, additions and deletions, for finalising an account of such species. It may be emphasised that in a country like India where the flora is insufficiently known, the number of Botanic Gardens are limited, and the masses are not yet awakened to the needs of conservation, cordoning off of representative areas with rare and threatened species appears to be the most effective and practical measure.

Analysing the flora of Raipur, Durg and Rajnandgaon districts in this background, after consulting major Indian Herbaria and publications, it is found that the following species endemic to Indian sub-continent have not been collected/rarely collected from any part of the country during the last thirty years.

Crotalaria notonii, *Acacia donaldi*, *Rotala fysonii*, *Rauvolfia serpentina*, *Alstonia venenata*, *Tylophora macrantha*, *Utricularia baouleenis*, *Vitex peduncularis*, *Polypleurum stylosum*, *Eulophia explanata*, *E. herbacea*, *Theriophorum minutum*, *Amorphophallus sylvaticus* and *Oropetium villosulum*.

Some of the other rare species only for Madhya Pradesh flora are : *Leea robusta*, *Myriophyllum oliganthum*, *Coffea benghalensis*, *Blumea hieracifolia*, *Blepharispermum subsessile*, *Cuscuta campestris*, *C. santapaui*, *Cryptolepis elegans*, *Ceropegia hirsuta*, *C. tuberosa*, *Rhinacanthus nasutus*, *Peperomia pellucida*, *Elatostema cuneatum*, *Eulophia flava*, *E. graminea* and *Potamogeton mucronatus*.

STYLE OF PRESENTATION

The Flora starts with a key to the families following Bentham & Hooker (1862 1883) system of classification, with some modifications as per our recent knowledge. Under each family is given a key to genera, and under each genus a key to species. The keys to families, genera and species are artificial, formed by the senior author (DMV). In formation of keys preference has been given to use of macroscopic characters and to a combination of vegetative, floral and fruiting characters particularly while dealing with spp. where these phases are known to be widely separated. Genera and species under each family are arranged alphabetically. For each species correct botanical name and basionym, if any, have consistently been given. If the species has been described under some other name in major Indian Floras, such names have also been given under synonymy. The literature references have been usually confined to original citation, though it may be mentioned that numerous publications, including Floras from India and adjacent countries, monographs and scattered notes in various journals have been consulted in writing the present Flora. Local names, whenever known, are given at the end of citations. The species have been briefly described, generally excluding the characters given in the keys. Data on habitat, altitude, flowering (*fl.*) and fruiting (*fr.*) time are all based on our own collections unless the species has been included on the basis of some other publication. Under each district, collection localities have been given with reference to better known places given in the map. Collection

numbers are not given since, unless mentioned otherwise, all the specimens are deposited in the Herbarium of the Central Circle, Botanical Survey of India, Allahabad (BSA).

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TAXONOMIC ACCOUNT

KEY TO FAMILIES

(D.M. VERMA)

- 1a. Leaves usually reticulately-veined. Flowers usually 4- 5 -
merous. Cotyledons usually 2. Vascular bundles of the stem
usually arranged in a circle.
- 2a. Perianth present, two - several - seriate.
- 3a. Petals all free or only some united.
- 4a. Ovary fully superior, or at least one whorl of
the perianth hypogynous, or stamens hypogynous
or inserted on the top of a hypogynous disc in
which the ovary may be immersed.
- 5a. Stamens more than twice as many as the
petals.
- 6a. Aquatic plants with rotundate peltate
leaves. Pistils many, embedded in fleshy
turbinate receptacle ... NYMPHAEACEAE 5
- 6b. Plants not as above.
- 7a. Stamens all united by filaments.
- 8a. Trees. |Leaves digitately
compound. Styles as many as
the carpels. Fruit a woody
capsule ... BOMBACACEAE 19
- 8b. Plants not as above ... MALVACEAE 18
- 7b. Stamens all free, or in five phalanges
of three stamens each.
- 9a. Stamens in five phalanges of
three stamens each ... STERCULIACEAE 20
- 9b. Stamens all free.
- 10a. Pistils more than one.
- 11a. Sepals deciduous.
Perianth 3-seriate, 3-
merous ... ANNONACEAE 3

- 11b. Sepals persistent. Perianth 2-seriate, 5-merous ... DILLENIACEAE 2
- 10b. Pistil one.
- 12a. Stamens arising from hypanthium (perigynous) ... LYTHRACEAE 50
- 12b. Stamens arising from receptacle (hypogynous.)
- 13a. Ovary stipitate, on a gynophore ... CAPPARACEAE 8
- 13b. Ovary sessile.
- 14a. Flowers unisexual ... EUPHORBIACEAE 98
- 14b. Flowers bisexual.
- 15a. Leaves palmately - nerved.
- 16a. Flowers small, axillary,
up to 1.5 cm across;
placentation axile ... TILIACEAE 21
- 16b. Flowers large, terminal,
more than 7.0 cm across;
placentation parietal. ... COCHLOSPER-
MACEAE 10
- 15b. Leaves pinnately-nerved.
- 17a. Herbs. Sepals 2 ... PAPAVERACEAE 6
- 17b. Trees or shrubs. Sepals 5.
- 18a. Leaves 3-foliolate,
with pellucid, aro-
matic glands ... RUTACEAE 27
- 18b. Leaves simple, with-
out pellucid, aromatic
glands.
- 19a. Flowers *ca* 1
cm across, in
panicles; anthers
dehiscing by lon-
gitudinal slits.
Fruits winged ... DIPTEROCA-
RPACEAE 17
- 19b. Flowers *ca* 3 cm
across, in sub-
corymbose race-
mes; anthers
dehiscing by
pores. Fruits
not winged ... OCHNACEAE 29

- 5b. Stamens fewer, at the most twice as many as the petals
- 20a. Leaves scale-like ... TAMARICACEAE 15
- 20b. Leaves well developed, expanded.
- 21a. Leaves simple.
- 22a. Ovary one-celled.
- 23a. Climbers. Flowers 3-merous, unisexual ; ovule solitary, marginal ... MENISPERMACEAE 4
- 23b. Plants not as above.
- 24a. Placentation free-central.
- 25a. Sepals 2, jointed, the free part deciduous. Capsule circumsciss ... PORTULACACEAE 14
- 25b. Sepals and capsules not as above.
- 26a. Stamens alternate with the petals ... CARYOPHYLLACEAE 13
- 26b. Stamens opposite the petals.
- 27a. Shrubs. Leaves alternate, gland-dotted ... MYRSINACEAE 66
- 27b. Herbs. Leaves opposite, not gland-dotted ... PRIMULACEAE 65
- 24b. Placentation parietal or marginal.
- 28a. Ovules marginal, on one ventral placenta.
- 29a. Leaves twice-pinnate, rarely phyllodic. Corolla actinomorphic ; petals valvate ; stamens four-many. Seed with a U-shaped lateral line ... MIMOSACEAE 42

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29b. Leaves simple, digitate or once - twice - pinnate. Corolla zygomorphic ; petals imbricate, rarely absent ; stamens ten (—five). Seed usually without a lateral line, rarely with a closed line.

30a. Adaxial petal interior (ascending imbrication) or petals absent

... CAESALPINIA-
CEAE 41

30b. Adaxial petal exterior (descending imbrication)

... FABACEAE 40

28b. Ovules parietal, on two or more placentas

31a. Plants insectivorous, covered with glandular hairs

DROSERACEAE 44

31b. Plants neither insectivorous, nor covered with glandular hairs.

32a. Ovary stipitate, on elongated gynophore

... CAPPARACEAE 8

32b. Ovary sessile or subsessile.

33a. Slender herbs. Anther connectives produced beyond cells ...

VIOLACEAE 9

33b. Shrubs. Anther connectives not produced. ...

FLACOURTIA-
CEAE 11

22b. Ovary two - or more celled.

34a. Stamens tetrodynamous, 4 long and 2 short

... BRASSICACEAE 7

34b. Stamens not tetrodynamous.

35a. Flowers irregular.

- 36a. Flowers large, more than 1.5 cm long ; sepals 3, posterior petaloid, usually spurred : stamens 5 ; ovary 5 - celled ... BALSAMINACEAE 26
- 36b. Flowers small, less than 1.0 cm long ; sepals 5, inner 2 petaloid ; stamens 8 ; ovary 2-celled ... POLYGALACEAE 12

35b. Flowers regular.

37a. Leaves opposite.

38a. Slender herbs.

- 39a. Style 1 ; ovules free-central ... LYTHRACEAE 50
- 39b. Styles 2 - 5 ; ovules axile ... ELATINACEAE 16

38b. Woody shrubs or climbers.

- 40a. Stamens 2 ... OLEACEAE 69
- 40b. Stamens 10 ... MALPIGHIAEAE 23

37b. Leaves alternate.

41a. Flowers all unisexual.

- 42a. Pistil 1 ... EUPHORBIACEAE 98
- 42b. Pistils 3 - 6 ... MENISPERMACEAE 4

41b. Flowers all bisexual or intermixed with unisexuals.

- 43a. Plants climbing or creeping, with tendrils ... VITACEAE 35

43b. Plants of various habits, without tendrils.

- 44a. Leaves with pellucid, aromatic glands. ... RUTACEAE 27

44b. Leaves without pellucid, aromatic glands.

- 45a. Petals 3, of which 2 are deeply bifid; fertile stamens 3, opposite the petals, staminodes 6, bifid ... OLACACEAE 32

45b. Flowers not as above.

- 46a. Sepals and petals 5, imbricate or contorted; stamens alternating with staminodes; filaments conuplicate at the base; ovary 3 - 5 - celled but spuriously 6 - 10 - celled due to secondary placentae ... LINACEAE 22
- 46b. Plants not as above.
- 47a. Stamens opposite the petals ... RHAMNACEAE 34
- 47b. Stamens alternating with the petals.
- 48a. Venation pinnate ... CELASTRACEAE 33
- 48b. Venation palmate.
- 49a. Stamens united below ... STERCULIACEAE 20
- 49b. Stamens free ... TILIACEAE 21
- 21b. Leaves compound.
- 50a. Ovary one-celled.
- 51a. Styles 3 - 4; ovule one, basal ... ANACARDIACEAE 38
- 51b. Style 1; ovules usually two or more.
- 52a. Trees with 2 - 3 - pinnate leaves. Stamens 5; staminodes 5 - 7. Fruit a ribbed cylindrical 3 - valved capsule ... MORINGACEAE 39
- 52b. Plants not as above.
- 53a. Leaves twice - pinnate, rarely phyllodic. Corolla actinomorphic; petals valvate; stamens four - many. Seed with a U - shaped lateral line. ... MIMOSACEAE 42
- 53b. Leaves simple, digitate or once - twice - pinnate. Corolla zygomorphic; petals imbricate, rarely absent; stamens ten (- five). Seed usually without a lateral line, rarely with a closed line.
- 54a. Adaxial petal interior (ascending imbrication) or petals absent ... CAESALPINIACEAE 41
- 54b. Adaxial petal exterior (descending imbrication) ... FABACEAE 40
- 50b. Ovary two - or more - celled.
- 55a. Plants herbaceous.
- 56a. Leaves biternately compound ... SAPINDACEAE 37
- 56b. Leaves ternately or pinnately compound.

- 57a. Leaves opposite, pinnately compound ... ZYGOPHYLLACEAE 24
- 57b. Leaves alternate, ternately or pinnately compound ... OXALIDACEAE 55
- 55b. Plants woody.
- 58a. Climbers or creepers, with tendrils ... VITACEAE 35
- 58b. Trees or shrubs, without tendrils.
- 59a. Leaves with pellucid, aromatic glands ... RUTACEAE 27
- 59b. Leaves without pellucid, aromatic glands.
- 60a. Flowers regular, at least some unisexual; stamens appendaged by scales at the base ... SIMAROUBACEAE 28
- 60b. Flowers and stamens not as above.
- 61a. Flowers often irregular; disc extrastaminal ... SAPINDACEAE 37
- 61b. Flowers regular; disc intrastaminal.
- 62a. Stamens twice as many as the petals; filaments free, or connate at the base only ... BURSERACEAE 30
- 62b. Stamens either less than twice as many as the petals, or the filaments united into a tube ... MELIACEAE 31
- 4b. Ovary fully inferior, or perianth and stamens perigynous.
- 63a. Stamens more than twice as many as the petals.
- 64a. Aquatic plants ... NYMPHAEACEAE 5
- 64b. Terrestrial plants.
- 65a. Flowers unisexual; styles 2 - 4 ... BEGONIACEAE 54
- 65b. Flowers bisexual; style 1.
- 66a. Plants spiny, succulent, almost leafless. Petals many ... CACTACEAE 55
- 66b. Plants unarmed, woody, leafy. Petals four - ten.

- 67a. Leaves opposite, gland - dotted ... **MYRTACEAE 47**
- 67b. Leaves alternate, not gland - dotted ... **LECYTHIDACEAE 48**
- 68b. Stamens twice as many as the petals, or less.
- 68a. Aquatic plants. Leaves upper simple, linear, lower pectinately dissected. Flowers in axillary fascicles ; stigmas 2 - 4, plumose, sessile ... **HALORAGACEAE 45**
- 68b. Plants not as above.
- 69a. Aquatic plants. Floating leaf c rhomboid. Fruits 2 - spined ... **TRAPACEAE 52**
- 69b. Plants not as above.
- 70a. Herbs. Inflorescence um- bellate. Styles 2. Fruit of two mericarps ... **APIACEAE 58**
- 70b. Plants not as above.
- 71a. Fruits winged ... **COMBRETACEAE 46**
- 71b. Fruits not winged.
- 72a. Ovary one -several - celled; ovules on axile, parietal or central placenta.
- 73a. Leaves basal or opposite, palmately nerved. Stamens geniculate ; anthers opening by pores ... **MELASTOMATACAE 49**
- 73b. Leaves cauline, alternate, pinnately nerved. Stamens not geniculate ; anthers opening by slits ... **ONAGRACEAE 51**
- 72b. Ovary one - two - celled ; ovules pendulous.
- 74a. Slender herbs. Ovules many in each cell ... **VAHLIACEAE 43**
- 74b. Trees or shrubs. Ovule solitary in each cell ... **ALANGIACEAE 59**

3b. Petals all united, at least at the base.

75a. Stamens more than the corolla lobes.

76a. Ovary inferior ... CACTACEAE 55

76b. Ovary superior.

77a. Leaves usually compound. Ovary of one carpel with marginal placentation. Fruit a legume, sometimes indehiscent or lomentoid.

78a. Leaves twice-pinnate, rarely phyllodic. Corolla actinomorphic, petals valvate ... MIMOSACEAE 42

78b. Leaves simple, digitate or once-pinnate. Corolla zygomorphic, petals imbricate ... FABACEAE 40

77b. Leaves always simple. Ovary of two or more carpels with axillary placentation. Fruit a berry.

79a. Flowers usually unisexual corolla urceolate, 3-5-lobed EBENACEAE 68

79b. Flowers always bisexual ; corolla rotate or campanulate, usually 8-lobed ... SAPOTACEAE 67

75b. Stamens as many as the corolla lobes, or less.

80a. Ovary partly or wholly inferior.

81a. Creepers or climbers with tendrils ... CUCURBITACEAE 53

81b. Plants of various habits, without tendrils.

82a. Anthers united around the style (syngenesious).

83a. Flowers in involucrate heads ; ovary one-celled ... ASTERACEAE 61

83b. Flowers not in heads ; ovary two-or more-celled.

84a. Stamens 2 ... STYLIDACEAE 62

84b. Stamens 4 - 6 ... CAMPANULACEAE 63

- 82b. Anthers free.
- 85a. Leaves opposite or apparently whorled due to foliaceous stipules ... RUBIACEAE 60
- 85b. Leaves alternate ... CAMPANULACEAE 63
- 80b. Ovary superior.
- 86a. Stamens opposite the corolla lobes.
- 87a. Ovary one - celled ; placentation free - central.
- 88a. Flowers long - tubular ; calyx with stalked glands ; styles 5 ... PLUMBAGINACEAE 64
- 88b. Flowers rotate ; calyx not glandular ; style 1.
- 89a. Shrubs. Leaves alternate. Perianth gland - dotted. Fruits fleshy ... MYRSINACEAE 66
- 89b. Herbs. Leaves usually opposite. Perianth not gland - dotted. Fruits circumscissile ... PRIMULACEAE 65
- 87b. Ovary two - many - celled ; placentation axile.
- 90a. Leaves compound. Stamens united by filaments ... LECACEAE 36
- 90b. Leaves simple. Stamens free.
- 91a. Flowers bisexual ; corolla rotate, usually 8 - lobed ; stamens epipetalous ... SAPOTACEAE 67
- 91b. Flowers unisexual ; corolla urceolate, 3 - 5 - lobed ; stamens free from the corolla lobes ... EBENACEAE 68
- 86b. Stamens alternate with the corolla lobes.
- 92a. Corolla irregular ; stamens 2 or 4.
- 93a. Inflorescence usually with conspicuous bracts. Fruits elastically dehiscent ; seeds often on upcurved processes ... ACANTHACEAE 84
- 93b. Plants not as above.
- 94a. Ovules and seeds few.
- 95a. Ovary 4-lobed ; style arising from between the lobes of the ovary ... LAMIACEAE 86
- 95b. Ovary not lobed ; style terminal
- 96a. Plants viscid hairy ... PEDALIACEAE 83
- 96b. Plants not viscid hairy ... VERBENACEAE 85

- 94b. Ovules and seeds many.
- 97a. Leaves compound. Seeds winged ... **BIGNONIACEAE 82**
- 97b. Leaves simple or dissected. Seeds not winged.
- 98a. Plants of aquatic or wet places, typically with small insectivorous bladders.
 Placentation free - central ... **LENTIBULARIACEAE 80**
- 98b. Plants of various habitats, never insectivorous. Placentation parietal or axile.
- 99a. Plants root - parasites. Leaves scale - like, never green ... **OROBANCHACEAE 79**
- 99b. Plants free - living. Leaves green, expanded.
- 100a. Placentation axillary, solid and unbranched ... **SCROPHULARIACEAE 78**
- 100b. Placentation parietal, sometimes intruded and meeting below middle of locule but branched or winged.
- 101a. Perianth 4 - 5 - merous ; corolla contorted ... **GENTIANACEAE 73**
- 101b. Perianth 5 - merous ; corolla imbricate or valvate ... **GESNERIACEAE 81**
- 92b. Corolla regular ; stamens usually 5
- 102a. Leaves alternate.
- 103a. Flowers in scorpioid cymes or the calyx with appendaged sinuses ; style terminal or gynobasic.
- 104a. Style terminal. Fruit a capsule, usually many seeded ... **HYDROPHYLLACEAE 74**
- 104b. Style usually gynobasic. Fruit of 4 nutlets, rarely a drupe ... **BORAGINACEAE 75**

103b. Flowers neither in scorpioid cymes (though often in dichasia) nor the calyx appendaged ; style always terminal.

105a. Placentation parietal ... GENTIANACEAE 73

105b. Placentation axile.

106a. Ovules numerous in each cell ... SOLANACEAE 77

106b. Ovules one - two in each cell.

107a. Sepals free ; corolla lobes contorted and infolded. Fruit a capsule ... CONVOLVULACEAE 76

107b. Sepals connate ; corolla lobes imbricate. Fruit dry with 4 nutlets or drupaceous with 1 - 4 - celled pyrene BORAGINACEAE 75

102b. Leaves opposite.

108a. Stamens two ... OLEACEAE 69

108b. Stamens four or more.

109a. Carpels united only at the stigmatic disc ; pollen in pollinia ... ASCLEPIADACEAE 71

109b. Carpels and pollen not as above.

110a. Plants with milky sap. Corolla lobes contorted in bud. Fruit often of two follicles and seeds with silvery appendage APOCYNACEAE 70

- 110b. Plants with clear sap. Corolla lobes contorted or not. Fruits never follicular.
- 111a. Hairy herbs. Anthers connate into a cone, connectives produced and twisted around each other. Fruit of 4 nutlets ... **BORAGINACEAE 73**
- 111b. Plants not as above.
- 112a. Flowers zygomorphic ... **VERBENACEAE 85**
- 112b. Flowers actinomorphic.
- 113a. Placenta axile ... **LOGANIACEAE 72**
- 113b. Placenta parietal ... **GENTIANACEAE 73**
- 2b. Perianth absent, or if present then uni-seriate.
- 114a. Plants submerged.
- 115a. Plants thalloid, attached to rocks in streams ... **PODOSTEMACEAE 92**
- 115b. Plants leafy, free floating ... **CERATOPHYLLACEAE 102**
- 114b. Plants not submerged.
- 116a. Perianth absent.
- 117a. Flowers in cyathia; a naked female flower surrounded by several male flowers each of a single jointed stamen - the whole cluster subtended by often sepaloid or petaloid involucral bracts and forming a bisexual pseudoflower ... **EUPHORBIACEAE 98**
- 117b. Flowers in spikes **PIPERACEAE 94**
- 116b. Perianth present.
- 118a. Ovary inferior or half-inferior.
- 119a. Plants stem-parasites **LORANTHACEAE 96**
- 119b. Plants free living or root-parasites (in *Santalaceae*).
- 120a. Plants herbaceous, erect or creeping.
- 121a. Leaves alternate.
Flower showy, ca 1 cm or more long, unisexual ... **BEGONIACEAE 54**

- 121b. Leaves opposite. Flowers minute, 2 - 5 mm long, bisexual.
- 122a. Leaves subsessile. Perianth calycine LYTHRACEAE 50
- 122b. Leaves petiolate. Perianth corolline ... NYCTAGINACEAE 87
- 120b. Plants woody, usually trees or shrubs.
- 123a. Perianth 2 - 3 - lobed ; ovary 6 - celled, ovules many ... ARISTOLOCHIACEAE 93
- 123b. Perianth 4 - 5 - lobed ; ovary 1 celled, ovules 1 - 3.
- 124a. Stamens 4 - 5, as many as the calyx lobes ... SANTALACEAE 97
- 124b. Stamens 8 - 10, twice as many as the calyx lobes ... COMBRETACEAE 46
- 118b. Ovary superior.
- 125a. Anthers opening by 2 or 4 upcurled lids ... LAURACEAE 95
- 125b. Anthers not opening as above.
- 126a. Pistils two or more (carpels free).
- 127a. Trees ... STERCULIACEAE 20
- 127b. Herbs or climbing bushes RANUNCULACEAE 1
- 126b. Pistil solitary (carpels solitary or united).
- 128a. Ovary 2 - 5 - celled.
- 129a. Ovules many in each cell ... MOLLUGINACEAE 57
- 129b. Ovules one three in each cell.
- 130a. Ovules axile ... EUPHORBIACEAE 98
- 130b. Ovules all or mostly basal.
- 131a. Slender herbs.
Capsules circumscissile ... AIZOACEAE 56
- 131b. Trees, shrubs or climbers
Fruit not circumscissile.

- 132a. Plants armed. Leaves simple, 3 - nerved ... RHAMNACEAE 34
- 132b. Plants unarmed. Leaves compound or if simple then not 3 - nerved ... SAPINDACEAE 37
- 128b. Ovary 1 - celled.
- 133a. Plants twining. Female flower with a single petal ; male flower with a corolline cupule ... MENISPERMACEAE 4
- 133b. Plants not as above.
- 134a. Herbs with ochreate stipules ... POLYGONACEAE 91
- 134b. Plants not as above.
- 135a. Plants herbaceous.
- 136a. Perianth and bracts scarious, stamens often connote below ... AMARANTHACEAE 88
- 136b. Perianth and bracts not scarious ; stamens free.
- 137a. Leaves 3 - nerved from the base. Flowers unisexual ; style unbranched ... URTICACEAE 99
- 137b. Leaves pinnately nerved. Flowers bisexual ; style branched.
- 138a. Twining herbs. Bracteoles adnate to the perianth ; anthers versatile ... BASELLACEAE 90
- 138b. Erect herbs. Bracteoles free from the perianth ; anthers erect or incurved ... CHENOPodiACEAE 89
- 135b. Plants woody.
- 139a. Stipules absent ... FLACOURTIACEAE 11
- 139b. Stipules present.
- 140a. Style branched.
- 141a. Anthers inflexed and reversed in bud ; ovule 1, apical ... MORACEAE 101

- 141b. Anthers erect in bud ; ovules 1 - 2, apical or basal.
- 142a. Ovule 1, apical ... ULMACEAE 100
- 142b. Ovules 2, basal ... EUPHORBIACEAE 98
- 140b. Style unbranched.
- 143a. Placentation parietal ... FLACOURTIACEAE 11
- 143b. Placentation otherwise.
- 144a. Ovule apical ... MORACCEAE 101
- 144b. Ovule basal ... URTICACEAE 99
- 1b. Leaves usually parallel-veined. Flowers usually 3-merous. Cotyledon 1. Vascular bundles of the stem scattered.
- 145a. Free - floating thallus - like small aquatic herbs. Flowers minute, unisexual, naked, borne in pouches or cavities ... LEMNACEAE 119
- 145b. Plants not as above.
- 146a. Trees, shrubs or scramblers with plicate or pinnately divided leaves. Flowers 3 - merous, in fleshy spikes or panicles with spathe - like bracts ... ARECACEAE 115
- 146b. Plants not as above.
- 147a. Dioecious spiny trees or shrubs with long linear leathery leaves, often supported by stilt roots. Perianth rudimentary. Fruit a syncarp ... PANDANACEAE 116
- 147b. Plants not as above.
- 148a. Inflorescence a spadix of inconspicuous flowers subtended by a spathe which is usually large and showy. Fruit a berry ... ARACEAE 118
- 148b. Plants not as above.
- 149a. Tall aquatic monoecious herbs. Leaves basal, striate, cylindrical above the sheath. Flowers in two cylindrical superposed spikes ... TYPHACEAE 117
- 149b. Plants not as above.

150a. Inflorescence a head subtended by an involucre of bracts. Flowers unisexual; perianth typically biserrate, 2-3 - merous, though sometimes petals absent ... **ERIOCAULACEAE 125**

150b. Plants not as above.

151a. Flowers inconspicuous, subtended by glumaceous bracts and arranged in variously disposed spikelets; perianth absent, or represented by bristles, scales or lodicules.

152a. Stems usually solid and 3 - angled. Leaf - sheaths usually closed. Flower subtended by a single glume; anthers basifixd ...

CYPERACEAE 126

152b. Stems usually with hollow internodes and terete. Leaf - sheaths usually open. Flower enclosed by two glumes (sometimes one or both absent), lemmas and palea; anther mostly dorsifixd and versatile ...

POACEAE 127

151b. Plants not as above.

153a. Ovary superior.

154a. Submerged aquatic herbs with linear denticulate leaves auriculately sheathing at the base. Flowers inconspicuous, unisexual ...

NAJADACEAE 122

154b. Plants not as above.

155a. Carpels several, free.

156a. Inflorescence spicate.

157a. Perianth segments 1 - 3; stamens 6 or more; carpels 3 - 6 **APONOGETONACEAE 123**

157b. Perianth segments, stamens and carpels each 4 **POTAMOGETONACEAE 124**

156b. Inflorescence various but never spicate.

158a. Inflorescence mostly an umbel. Ovules many in reticulately branched parietal placenta. Fruiting carpel 9 - 12 mm long, dehiscent ...

BUTOMACEAE 121

158b. Inflorescence a panicle, a raceme or a raceme of whorled flowers. Ovule solitary, basal. Fruiting carpels 1 - 5 mm long, indehiscent ...

ALISMATACEAE 120

155b. Carpels solitary or united.

159a. Perianth biserrate with the outer whorl sepaloid and inner whorl petaloid ...

COMMELINACEAE 114

159b. Perianth uniserrate, or if biserrate then the inner and the outer whorls similar, often petaloid or united into a tube below.

160a. Rootstock usually a bulb. Leaves radical and mostly linear. Flowers arranged in a scapose umbel subtended by membranous spathaceous bracts ...

AMARYLLIDACEAE 107

160b. Plants not as above.

161a. Aquatic herbs. Inflorescence subtended by a spathe like leaf-sheath ...

PONTEDERIACEAE 113

161b. Dry - land herbs or climbers. Inflorescence not subtended by a spathe-like leaf - sheath.

162a. Leaves 3 - 5 - nerved, with reticulate venation. Flowers mostly dioecious ; anthers one - celled ...

SMILACACEAE 112

162b. Leaves mostly with parallel nerves and veins. Flowers mostly bisexual ; anthers usually two - celled

LILIACEAE 111

153b. Ovary inferior or half - inferior.

163a. Climbers. Flowers unisexual. Capsules winged

DIOSCOREACEAE 110

163b. Plants not as above.

164a. Aquatic herbs. Flowers mostly unisexual, solitary or the male several within two - folded or one bristly bract

HYDROCHARITACEAE 103

164b. Terrestrial or epiphytic herbs. Flowers bisexual.

165a. Inflorescence umbellate with spathaceous bracts and an involucre of filiform bracteoles ...

TACCACEAE 109

165b. Inflorescence not as above.

166a. Flowers actinomorphic.

167a. Delicate annual herbs. Leaves usually reduced to a few scales. Ovary with elliptic - obovate wings

BURMANNIACEAE 104

167b. Rather stout perennial herbs. Leaves well developed, plicate. Ovary not winged

HYPoxidaceae 108

166b. Flowers zygomorphic, with a conspicuous lip.

168a. Lip formed by modification of the median petal ; staminodes absent ; stamen united with the stigma-bearing column ; pollen usually in pollinia

ORCHIDACEAE 105

168b. Lip formed by modification of the staminodes ; two additional petaloid staminodes often present ; stamen not borne on a column ; pollen not in pollinia

ZINGIBERACEAE 106

ENUMERATION

1. RANUNCULACEAE
(D.M. Verma & M.I. Hanfi)

- 1a. Climbing shrubs. Leaves caudate, opposite.
 - 2a. Leaf terminated by leaflet. Petals absent ... *Clematis* 1
 - 2b. Leaf terminated by tendril. Petals present ... *Naravelia* 2
- 1b. Herbs. Leaves radical or if caudate then alternate.
 - 3a. Sepals sepaloid ; petals 4 - 5 ... *Ranunculus* 4
 - 3b. Sepals petaloid ; petals absent or nectarial.
 - 4a. Flowers panicled, ca 5 mm across ... *Thalictrum* 5
 - 4b. Flowers solitary, 20 - 25 mm across ... *Nigella* 3

1. CLEMATIS L.

Clematis gouriana Roxb. ex DC. Syst. 1 : 138. 1818. *C. javana* DC. Syst. 1 : 152. 1818.

Climbing shrubs with hairy grooved branches. Leaves pinnately compound ; leaflets ovate lanceolate, acuminate, 3 - 6 cm long, entire or toothed. Panicles large, trichotomously branched. Flowers white or yellowish, scented ; sepals ca 8 mm long, ciliate ; stamens and carpels many.

On hedges ; 300 m.

Fl. & Fr. : October January.

RAIPUR : Raipur.

2. NARAVELIA DC.

Naravelia zeylanica (L.) DC. Syst. 167. 1818. *Atragene zeylanica* L. Sp. Pl. 542. 1753.

Climbing shrubs with pubescent branches and tuberous roots. Leaves 3 - foliolate, lateral leaflets ovate orbicular, 10 - 15 x 6 - 8 cm, terminal leaflet modified into a branched tendril. Flowers in 10 - 20 cm long

panicles, yellowish white or greenish, 1 - 2 cm across ; petals linear. Achenes villous.

In drains ; 300 m.

Fl. & Fr. : September.

RAIPUR, *Sharma* 001021 (Herb. Sci. Coll. Raipur).

3. NIGELLA L.

Nigella sativa L. Sp. Pl. 584. 1753.

Erect annual herbs, 30 - 50 cm high. Leaves pinnately dissected, 3 - 5 cm long, segments linear lanceolate. Flowers solitary, terminal, long peduncled, *ca* 2 cm across, pale blue ; sepals clawed ; petals 8, geniculate. Fruit sub capsular, *ca* 1 cm long.

In cultivated fields ; 300 m.

Fl. & Fr. : February.

RAIPUR : Raipur.

4. RANUNCULUS L.

Ranunculus sceleratus L. Sp. Pl. 551. 1753.

Erect annual herbs, 10 - 50 cm high. Leaves radical and caudate, lower long petioled, 3 parted, with the segments again variously lobed, upper sessile, uppermost frequently simple, linear lanceolate. Flowers numerous, terminating the branchlets and in the forks of the branchlets, *ca* 7 mm across : petals white. Achenes numerous, apiculate.

Along ponds ; 300 m.

Fl. & Fr. : January.

RAIPUR : Raipur.

5. THALICTRUM L.

Thalictrum javanicum Bl. Bijdr. 2. 1825.

Slender erect fern-like herbs, *ca* 40 cm high. Leaves ternately decompound ; leaflets roundish, lobulate, 3 - 25 mm long. Panicles

terminal, large and lax. Flowers small ; filaments rather club shaped : carpels many. Achenes with a prominent hooked beak.

Among boulders ; 800 m.

Fl. & Fr. : September.

RAJNANDGAON : Chilpi.

2. DILLENIACEAE

(D.M. Verma & M.I. Hanfi)

1. DILLENNIA L.

1a. Flowers white. Fruits 8 - 10 cm across ... *D. indica* 2

1b. Flowers yellow. Fruits 1.5 - 3.0 cm across.

2a. Flowers 2 - 3 cm across. Fruits ca 1.5 cm across ... *D. pentagyna* 3

2b. Flowers 10 - 12 cm across. Fruits ca 3 cm across ... *D. aurea* 1

1. *Dillenia aurea* J.E. Smith in Exot. Bot. 2 : 65. t. 92 - 93. 1805.-
'*Kala Karmath*'.

Small deciduous crookedly branched trees. Leaves 20 - 40 x 10 - 25 cm, entire or denticulate. Flowers solitary on leafless branches ; anthers opening by apical pores : carpels 10 - 12. Fruits subglobose, orange yellow.

In sal forests ; 450 - 500 m.

Fl. : April ; *Fr.* : March - January.

RAIPUR : Khallari, Tautenga.

2. *D. indica* L. Sp. Pl. 535. 1753.

Large evergreen trees. Leaves 15 - 30 x 5 - 12 cm, dentate. Flowers solitary, 15 - 20 cm across ; sepals fleshy ; inner stamens with reflexed tips ; carpels 14 - 20. Fruits yellowish green : seeds spinulous.

Sometime planted.

Fr. : September.

RAJNANDGAON : Rajnandgaon.

3. *D. pentagyna* Roxb. Pl. Corom. 1 : 21. t. 20. 1795.

Deciduous trees. Leaves 20–50 x 10–20 cm, entire or denticulate. Flowers two to several together on short leafless branches; anthers opening by longitudinal slits; carpels 5. Fruits orange red.

Fl. : March–April; *Fr.* : May.

RAIPUR : Sonakhan range n. v. (*cf.* Haines, Descr. List of trees, shrubs & econ. herbs, Southern Circle, C.P. 2. 1916).

3. ANNONACEAE (D.M. Verma & P.C. Pant)

(*Annona reticulata* L., *Artobotrys hexapetalus* (L. f.) Bhandari, and *Polyalthia longifolia* (Sonner.) Thw. are found planted in the gardens).

- | | |
|--|------------------|
| 1a. Flowers greenish white; connectives broad and overlapping, concealing the anther cells. Carpels sub-connate, ultimately forming a syncarpous fruit ... | <i>Annona</i> 1 |
| 1b. Flowers purple; connectives narrow, not concealing the anther cells. Carpels always free. ... | <i>Miliusa</i> 2 |

I. ANNONA L.

***Annona squamosa* L.** Sp. Pl. 537. 1753. ‘*Sitaphal, Shareesa*’.

Small trees. Leaves oblong lanceolate, 5–10 cm long. Flowers on extra-axillary peduncles, 2–3 cm long, greenish white; tepals in two series; carpels 1 ovuled. Fruit of numerous fused carpels, fleshy, sub-globose, areolate, 4–8 cm across, glaucous green, drying black.

Cultivated for its edible fruits, also running wild; 300–700 m.

Fl. : April–May;

Fr. : August–September.

DURG : Balod, Budbhum. RAIPUR : Borai, Dhamtari. RAJNANDGAON : Baghnadi.

2. MILIUSA Leschm. ex DC.

***Miliusa tomentosa* (Roxb.) Sinclair** in Gard. Bull. 14 : 378. 1955.

Uvaria tomentosa Roxb. Pl. Corom. t. 55. 1795. *Saccopetalum tomentosum* Hook. f. & Thom. Fl. Ind. 152. 1855.

Moderate sized deciduous trees, young branches tomentose. Leaves ovate oblong, 7-15 x 5-7 cm, deciduously tomentose beneath. Flowers ca 2 cm across, long pedicelled, on short leaf-opposed peduncle : tepals of the outer two series small, those of the innermost third series petaloid, saccate at the base. Ripe carpels 5-15, subglobose, ca 2 cm long, purple.

In mixed forests. RAIPUR (cf. Haines, Descr. list of trees, shrubs & econ. herbs, Southern Circle, C.P. 3. 1916).

4. MENISPERMACEAE

(D.M. Verma & M.I. Hanfi)

1a. Leaves orbicular - reniform, peltate, glaucous beneath.

Male sepals and petals 4 each. Female flowers with foliaceous bracts ...

Cissampelos 1

1b. Leaves ovate - oblong or lanceolate, neither peltate nor glaucous. Male sepals and petals 6 each. Female flowers

without foliaceous bracts ...

Cocculus 2

1. CISSAMPELOS L.

1. *Cissampelos pareira* L. var. *hirsuta* (Buch. Ham. ex DC.) Forman in Kew Bull. 22 : 356. 1968. *C. hirsuta* Buch. Ham. ex DC. Syst. 1 : 535. 1818. *C. pareira* auct., Hook. f. & Thom. in Hook. f. Fl. Brit. Ind. 1 : 103. 1872 ; non L. 1753. 'Gaypar'.

Slender climbing shrubs. Leaves 4-10 cm long and equally broad, subcordate, mucronulate. Flowers unisexual, ca 1 mm long ; female sepal, petal and carpel all solitary. Fruits globose, ca 3 mm across, red.

Common on roadside and forest trees and shrub ; 300-800 m.

Fl. & Fr. : August January.

DURG : Bordih. RAIPUR : Borai, Dhamtari, Sitanadi, Taurenga. RAJNANDGAON : Chilpi, Taregaon.

Roots and leaves medicinal.

2. COCCULUS DC.

Cocculus hirsutus (L.) Diels in Pflanzenrch. heft 46 : 236. 1910
Menispermum hirsutum L. Sp. Pl. 341. 1753. *C. villosus* DC. Syst. 1 : 525. 1818.

Climbing shrubs, young parts villous. Leaves 3 6 × 1 4 cm, mucronulate. Flowers unisexual, ca 1 mm long ; carpels 3. Fruits globose, ca 3 mm across, deep purple.

On roadside trees and shrubs ; 300 500 m.

Fl. & Fr. : May January.

RAIPUR : Raipur, Sitanadi. RAJNANDGAON : Rajnandgaon.

5. NYMPHAEACEAE
(D. M. Verma)

- | | |
|---|-------------------|
| 1a. Leaves palmately - nerved, retuse at the base. Carpels free,
sunk into pits of the obconic spongy torus ... | <i>Nelumbo</i> 1 |
| 1b. Leaves pinnately - nerved, cordate or sagittate at the
base. Carpels more or less connate into a syncarpous
ovary ... | <i>Nymphaea</i> 2 |

1. NELUMBO Adans.

Nelumbo nucifera Gaertn. Fruct. 1 : 73. t. 19. f. 2. 1788. *Nelumbium speciosum* Willd. Sp. Pl. 2 : 1258. 1799. 'Kamal, Padma'.

Perennial aquatic herbs. Leaves usually slightly emerged, orbicular, peltate, up to 35 cm across, glaucous above ; petioles and peduncles sparsely prickly. Flowers solitary, pinkish white with darker tips ; petals several 4 - 12 cm long.

In ponds ; 300 400 m.

Fl. : May August.

RAIPUR : Dhamtari, Gariaband.

Rhizomes and carpels eaten cooked.

2. NYMPHAEA L.

- | | |
|---|----------------------|
| 1a. Leaves glabrous beneath. Stamens appendaged ... | <i>N. nouchali</i> 1 |
| 1b. Leaves pubescent or villous beneath. Stamens not
appendaged, | |

- | | | |
|---|-----|-----------------------|
| 2a. Flowers white or outer few petals purple tinged at
the tips ; stamens yellow | ... | <i>N. pubescens</i> 2 |
| 2b. Flowers carmine red ; stamens purple. | ... | <i>N. rubra</i> 3 |

1. *Nymphaea nouchali* Burm. *f.* Fl. Ind. 120. 1768. *N. stellata* Willd. Sp. Pl. ed. 4, 2 : 1154. 1799.

Perennial aquatic herbs with a small corm. Leaves rotundate, *ca* 10 cm across, entire or sinuate margined, glabrous beneath. Flowers *ca* 5 cm across, pink ; stamens appendaged.

In shallow ponds ; 450 m.

Fl. : June.

RAIPUR : Taurenga.

2. *N. pubescens* Willd. Sp. Pl. ed. 4, 2 : 1154. 1799 ; van Royen in Nova Guinea 8 : 110. 1962. *N. nouchali* auct. *non* Burm. *f.* 1768. '*Safed ratalu*'.

Aquatic rhizomatous herbs. Leaves oblong or rotundate, hastate, entire or sinuate margined, villous beneath ; petioles and peduncles smooth, purplish. Flowers purple white ; petals *ca* 5 cm long ; stamens and stigmas pale yellow.

In ponds ; 300 m.

Fl. : October.

RAIPUR : Raipur.

3. *N. rubra* Roxb. *ex* Andrews in Bot. Rep. 8 (104). t. 503. 1808 ; Mitra & Subramanyam in Bull. Bot. Surv. Ind. 24 : 83 86. 1982. *N. lotus* auct. *non* L. ; Hook. *f.* & Thoms. in Hook. *f.* Fl. Brit. Ind. 1 : 114. 1872. '*Lal ratalu*'.

Aquatic rhizomatous herbs ; petioles and peduncles smooth. Leaves rotundate, denticulate, *ca* 20 cm across, purplish, villous beneath. Flowers carmine red ; petals linear oblong, 5 7 cm long ; anthers purplish black.

In ponds ; 400 500 m.

Fl. : October January.

RAIPUR : Pithora, Raipur, Sihawa.

Rhizomes eaten cooked.

6. PAPAVERACEAE

(M. I. Hanfi)

ARGEMONE L.

Argemone mexicana L. Sp. Pl. 508. 1753. 'Tal makhar'.

Perennial glaucous green prickly herbs, 30–50 cm high. Leaves sinuately lobed, 5–12 × 2–5 cm, with white stripes along the nerves. Flowers yellow; petals biseriate, soon falling; stigmas red. Capsules ca 3 cm long; seeds black.

In wastelands, 300–500 m.

Fl. & Fr. : January–September.

DURG : Durg. RAIPUR : Raipur, Sitanadi. RAJNANDGAON : Rajnandgaon.

7. BRASSICACEAE

(D. M. Verma & P. C. Pant)

- | | | |
|---|-----|-------------------|
| 1a. Flowers white or pinkish. Fruits broadly elliptic or suborbicular, compressed | ... | <i>Lepidium</i> 2 |
| 1b. Flowers yellow. Fruits elongated, subcylindric. | | |
| 2a. Lateral sepals saccate at the base. Fruits with a seedless indehiscent beak | ... | <i>Brassica</i> 1 |
| 2b. Sepals not saccate. Fruits mucronulate, not beaked | ... | <i>Rorippa</i> 3 |

1. BRASSICA L.

- | | | |
|--|-----|--|
| 1a. Upper leaves amplexicaul and auricled at the base | | <i>B. rapa</i> ssp. 2
<i>campestris</i> |
| 1b. Upper leaves not amplexicaul, narrowed at the base | ... | <i>B. juncea</i> 1 |

1. *Brassica juncea* (L.) Czern. & Coss. in Czern. Conspl. Pl. Chark. 8. n. 5. 1859 et in Bull. Soc. France 6 : 609. 1859. *Sinapis juncea* L. Sp. Pl. 668. 1753. 'Rai'.

Annual, slender or rather stout herbs, 10–30 cm high. Lower leaves long petioled, lyrate-pinnatifid, upper sessile, subentire, margins dentate. Flowers ca 5 mm across. Siliquae 2–4 cm long.

Cultivated for its oilseeds, sometimes found as escape ; 300 - 400 m.

Fl. & Fr. : January.

RAIPUR : Dugli.

2. *B. rapa* L. ssp. *campestris* (L.) Calpham in Fl. Brit. Isles, ed. 2 : 124. 1962. *B. campestris* L. Sp. Pl. 666. 1753. 'Sarson'.

Annual herbs. Lower leaves lyrate - pinnatifid, 10 - 30 cm long, upper entire or subentire, smaller. Flowers 5- 7mm across, congested at the tips of the elongating racemes. Siliqua beak about one half to one - third as long as the valves.

Cultivated for its oilseeds, sometimes found as escape, 300 - 350 m.

Fl. & Fr. : August - September.

RAIPUR : Dhamtari.

2. LEPIDIUM L.

1. *Lepidium sativum* L. Sp. Pl. 644. 1753.

Annual glabrous or pubescent herbs, 30 - 60 cm high. Leaves 4 - 10 cm long, lower pinnatisect, upper entire or subentire. Flowers 2 - 3 mm across, in elongating racemes. Siliculae 4 - 6 mm long, narrowly winged.

A weed of cultivated fields ; 300 m.

Fl. & Fr. : January.

RAIPUR : Raipur.

3. RORIPPA Scop.

Rorippa indica (L.) Hiern, Cat. Afr. Pl. Welw. 1 : 26, add. & corr. 1896. *Sisymbrium indicum* L. Mant. 1 : 93. 1771. *Nasturtium indicum* DC. Syst. 2 : 199. 1818 ; Hook. f. & Anders. in Hook. f. Fl. Brit. Ind. 1 : 134. 1872, p.p.

Annual or biennial herbs, 30 - 50 cm high. Leaves lyrate pinnatifid to almost entire, toothed. Flowers racemed, ca 2 mm across. Siliquae on slender pedicels, linear or linear oblong, 10 - 15 mm long.

In wastelands ; 300 m.

Fl. & Fr. : January.

RAIPUR : Raipur.

8. CAPPARACEAE

(D. M. Verma)

- 1a. Shrubs. Fruits oblong - globose, indehiscent ... *Capparis* 1
- 1b. Herbs. Fruits narrow, subcylindric, dehiscing by two valves ... *Cleome* 2

1. CAPPARIS L.

Capparis zeylanica L. Sp. Pl. ed. 2, 720. 1762. 'Karawa'.

Sarmentose shrubs with short recurved spines, young parts fuscous tomentose. Leaves coriaceous, ovate oblong, $3\frac{1}{2} \times 2\frac{1}{2}$ cm. Flowers pinkish white, 4-5 cm across. Fruits hanging on long woody stalks, bright red.

Along roadside and forest margins ; 300 - 500 m.

Fl. : April ; Fr. : May August.

RAIPUR : Dhamtari, Gariaband, Raipur.

2. CLEOME L.

- 1a. Leaves simple ... *C. monophylla* 3
- 1b. Leaves digitately compound.
- 2a. Plants glabrous. Petals ca 20 mm long, rose - purple ... *C. chelidonii* 1
- 2b. Plants, at least on the younger parts, glandular hairy. Petals 7-10 mm long, white, yellow or purplish.
- 3a. Petals white or purplish ; stamens and carpel borne on a long stalk (gynandrophore), much above the insertion of the perianth ; stamens 6. Pedicel of the capsule jointed ... *C. gynandra* 2
- 3b. Petals yellow ; stamens and carpel borne just above the insertion of the perianth ; stamens many. Pedicel of the capsule not jointed ... *C. viscosa* 4

1. *Cleome chelidonii* L. f. Suppl. 300. 1781.

Annual herbs, 40-80 cm high. Leaves 3-7-foliolate ; leaflets 10-30 \times 2-8 mm. Flowers on 2.5-3.5 cm long pedicels ; sepals ca

3 mm long ; stamens numerous ; filaments swollen at the tips, anthers purplish black. Capsules beaked, 7 - 9 cm long.

Locally abundant in paddy fields ; 300 m.

Fl. & Fr. : August.

RAIPUR : Dhamtari.

2. *C. gynandra* L. Sp. Pl. 671. 1753. *Gynandropsis pentaphylla* DC. Prodr. 1 : 238. 1824. *G. gynandra* (L.) Brig. Ann. Cons. Jard. Bot. Geneve 17 : 382. 1914.

Foetid smelling herbs, 30 - 80 cm high. Leaves 3 - 5 foliolate ; leaflets unequal, obovate, larger ones 2 - 3 × 1 - 2 cm. Flowers in elongating corymbiform racemes ; sepals 2 - 3 mm long ; petals clawed, gynandrophere 1 - 2 cm long ; stamens purple. Capsules 4 - 7 cm long.

In wastelands ; 300 m.

Fl. & Fr. : September - January.

RAIPUR : Raipur. RAJNANDGAON : Chichola.

Tender parts sometimes eaten cooked,

3. *C. monophylla* L. Sp. Pl. 672. 1753.

Glandular hairy herbs, 30 - 60 cm high. Lower leaves long petioled, 3 - 5 × 0.5 - 1.5 cm, upper subsessile, shorter. Flowers pale purple, in elongating corymbiform racemes ; sepals ca 4 mm long ; petals clawed, ca 6 mm long ; stamens 6. Capsules 5 - 7 cm long.

In wastelands ; 400 - 500 m.

Fl. & Fr. : May - October.

RAIPUR : Sitanadi. RAJNANDGAON : Deopura.

4. *C. viscosa* L. S. Pl. 672. 1753.

Annual herbs, 10 - 100 cm high. Leaves usually 3 - sometimes 5 foliolate ; leaflets obovate or oblanceolate, 1.5 - 3.5 × 0.7 - 1.5 cm. Flowers in elongating corymbiform racemes ; sepals 5 - 8 mm long ; anthers blackish. Capsules 4 - 8 cm long, beaked, sometimes curving upwards.

In wastelands, forest margins & sandy river beds ; 300 - 700 m.

Fl. & Fr. : May - January.

DURG : Balod. RAIPUR : Borai, Kasdol, Raipur, Risgaon. RAJNANDGAON : Deopura, Taregaon.

9. VIOLACEAE

(M. I. Hanfi)

HYBANTHUS Jacq.

Hybanthus enneaspermus (L.) F. V. Muell. *Fragm.* 10 : 81. 1876 ; Tenant in *Kew Bull.* 16 : 431. 1963. *Viola enneasperma* L. *Sp. Pl.* 937. 1753. *V. suffruticosa* L. *Sp. Pl.* 937. 1753. *Ionidium enneaspermum* Vent, *Jard. Malm.* Sub. t. 27. 1803 ; *Dalz. & Gibbs.*, *Bombay Fl.* 12. 1861. *I. suffruticosum* R. & S. *Syst.* 5 : 394. 1819. *Hybanthus suffruticosus* Baill. *Bot. Med.* 2 : 841. 1884.

Perennial diffuse herbs, branches ascending, 5-20 cm long. Leaves linear lanceolate, 7-40 × 2-7 mm. Flowers solitary axillary on slender pedicels, ca 5 mm long, violet, blue, mauve or orange red ; lower petal spurred. Capsules globose, stramineous, ca 5 mm across.

In wastelands & forest floors ; 250-350 m.

Fl. & Fr. : August November.

DURG : Balod. RAIPUR : Dhamtari, Raipur, RAJNANDGAON : Chichola, Baghnadi, Singhari.

10. COCHLOSPERMACEAE

(M. I. Hanfi)

COCHLOSPERMUM H. B. K.

Cochlospermum religiosum (L.) Alston in Trimen, *Handb. Fl. Ceylon* 6 : 14. 1931. *Bombaria religiosa* L. *Sp. Pl.* 552. 1753. *Cochlospermum gossypium* DC. *Prodri.* 1 : 527. 1824. 'Gengal'.

Small deciduous soft wooded trees. Leaves palmately 3-5-lobed, 8-20 cm broad. Flowers in few-flowered panicles, 9-12 cm across, bright yellow ; petals 5 ; stamens many. Capsules pendulous, ca 10 × 5 cm, purplish black.

In miscellaneous forests ; 450-550 m.

Fl. & Fr. : January - June.

DURG : Admabad. RAIPUR : Gariaband, Taurenga. RAJNAND-GAON : Takajee.

11. FLACOURTIACEAE (D. M. Verma)

- | | | |
|---|-----|---------------------|
| 1a. Plants unarmed. Flowers bisexual. Fruit an ellipsoid capsule, 15 - 25 mm long | ... | <i>Casearia</i> 1 |
| 1b. Plants usually thorny. Flowers unisexual. Fruit a globose berry, 5 - 10 mm long | | <i>Flacourtie</i> 2 |

1. CASEARIA Jacq.

- | | | |
|----------------------|-----|------------------------|
| 1a. Leaves tomentose | ... | <i>C. elliptica</i> 1 |
| 1b. Leaves glabrous | ... | <i>C. graveolens</i> 2 |

1. *Casearia elliptica* Willd. Sp. Pl. 2 : 628. 1799. *C. tomentosa* Roxb. Fl. Ind. 2 : 421. 1832. 'Bhairon'.

Shrubs with young branches deciduously grey tomentose. Leaves distichous, elliptic oblong, 10-16 x 3-6 cm, subentire or crenulate. Flowers axillary, ca 5 mm across ; stamens 6-10. Capsules usually in leafless axils, 20-25 mm long ; seeds yellow, aril scarlet.

Frequent in degraded sal forests ; 300-500 m.

Fl. & Fr. : May - June.

DURG : Bordih dam. RAIPUR : Gariaband, Pithora.

Fruits used as fish poison.

2. *C. graveolens* Dalz. in Hook. J. Bot. 4 : 107. 1852. 'Gulchi.'

Shrubs or trees. Leaves distichous, elliptic oblong or ovate, 5-18 x 3-9 cm, crenulate. Flowers clustered in leafless axils, ca 5 mm across ; stamens 6-8. Capsules 15-18 mm long, yellow ; seeds arillate.

Locally common in sal and miscellaneous forests ; 450-670 m.

Fl. & Fr. : May - June.

RAIPUR : Borai, Sitanadi.

2. FLACOURTIA L' Herit.

1. *Flacourtia indica* (Burm. f.) Merr. Interpr. Rumph. Herb. Amb. 377 1917. *Gmelina indica* Burm. f. Fl. Ind. 132. t. 39. f. 5. 1768. *Flacourtia ramontchi* L'Herit. Strip. Nov. 3 : 59. t. 30 & 30B. 1785. *F. sepiaria* Roxb. Pl. Corom. t. 68. 1795.

Trees or shrubs. Leaves elliptic obovate or suborbicular, usually crenate - serrate, 1 - 7 cm long. Flowers almost clustered in short racemes or solitary, ca 5 mm across. Berries with 6 - 7 pyrenes, red.

In deciduous forests ; 400 - 450 m.

Fl. & Fr. : March - May.

DURG. Bubhum. RAJNANDGAON : Baghnadi, Bor Talao.

12. POLYGALACEAE
(D. M. Verma)

- | | | |
|---|-----|--------------------|
| 1a. Flowers pedicellate ; two inner sepals larger, forming wings ; stamens 8 | ... | <i>Polygala</i> 1 |
| 1b. Flowers sessile ; all sepals subequal, none forming wings ; stamens 5 - 8 | ... | <i>Salomonia</i> 2 |

1. POLYGALA L.

- | | | |
|---|-----|----------------------|
| 1a. Wing sepals clawed at the base ; lower petal (keel) crested with two flap - like appendages ; style urceolate at the apex. Capsules truncate at the apex. | ... | <i>P. furcata</i> 3 |
| 1b. Wing sepals not clawed at the base ; lower petal (keel) with several filiform or flattened appendages ; style not urceolate at the apex. Capsules not truncate at the apex. | | |
| 2a. Racemes up to 2 cm long ; wing sepals sparsely pubescent outside ; style apex hooked. Capsules symmetric, ovate - oblong. | ... | <i>P. arvensis</i> 1 |
| 2b. Racemes 4 - 5 cm long ; wing sepals glabrous, or sometimes sparsely puberulus only along the margins ; style - apex horse - shoe shaped. Capsules asymmetric, rhomboid | ... | <i>P. elongata</i> 2 |

1. *Polygala arvensis* Willd. Sp. Pl. 3 (2) : 876. 1802. *P. chinensis* auct., Bennett in Hook. f. Fl. Brit. Ind. 1 : 204. 1872 ; non L. 1753.

Annual erecto patent hairy herbs, branches 2-20 (40) cm long. Leaves subsessile, elliptic, obovate or suborbicular, 5-20 mm long. Flowers solitary or in up to 2 cm long lateral racemes, yellow, or sometimes pink. Capsules 3-5×2-4 mm, ciliate on the margins; caruncle with three tooth-like appendages.

Common in wastelands; 200-320 m.

Fl. & Fr.: August-September.

DURG : Balod. RAIPUR : Balodabazar, Dhamtari, Simga.
RAJNANDGAON : Baghnadi.

2. *P. elongata* Klein ex Willd. Sp. Pl. 3(2) : 879. 1802; Bennett in Hook. f. Fl. Brit. Ind. 1 : 203. 1872, *p.p.*

Slender annual herbs, branches 10-50 cm long. Leaves linear-lanceolate, mucronate, 5-50×1-8 mm. Racemes slender, usually terminal, sometimes lateral, lax-flowered. Flowers yellow. Seeds appressed-hairy; caruncle 3-lobed, lobes linear.

In forest floors and clearings; 300-500 m.

Fl. & Fr.: August-September.

DURG : Balod. RAIPUR : Dhamtari. RAJNANDGAON : Baghnadi.

3. *P. furcata* Royle, Ill. t. 19B. 1839; Mukherjee in Bull. Bot. Soc. Beng. 12 : 34. 1958. *P. triphylla* Buch. Ham. ex D. Don var. *glaucescens* Bennett in Hook. f. Fl. Brit. Ind. 1 : 201. 1872, *excl. syn. Semeiocardium hyalinum* Hassk. *P. triphylla* Haines, Bot. Bihar & Orissa 2 : 42. 1921.

Slender annual herbs, 10-25 cm high. Leaves ovate-elliptic, glaucous, 2-6×1-3 cm; petioles 3-6 cm long. Racemes 2-8 cm long; flowers yellow or mauve. Capsules winged; caruncle hood-shaped.

On shady slopes; 500-800 m.

Fl. & Fr.: September-October.

RAIPUR : Taurenaga. RAJNANDGAON : Chilpi.

2. SALOMONIA Lour.

Salomonia ciliata (L.) DC. Prodr. 1 : 334. 1824; Bennett in Hook. f. Fl. Brit. Ind. 1 : 206. 1872. *Polygala ciliata* L. Sp. Pl. 705. 1753. *S. oblongifolia* DC. Prodr. 1 : 354. 1824; Bennett, I.c. 207.

Slender annual herbs, 10–20 cm high. Leaves sessile, elliptic or ovate lanceolate, ca 5 mm long. Flowers in dense terminal spikes, ca 2 mm across, pink. Capsules dentate margined; seeds black, not strophioliate.

Along cultivated fields : 300 m.

Fl. & Fr. : September.

RAJNANDGAON : Baghnadi.

13. CARYOPHYLLACEAE

(D.M. Verma & M.I. Hanfi)

- | | | |
|--|-----|----------------------|
| 1a. Leaves linear. Sepals uniformly white or orange-red; style toothed | ... | <i>Polycarpaea</i> 1 |
| 1b. Leaves oblong-spathulate. Sepals green with broad white margins; style with slender branches | ... | <i>Polycarpon</i> 2 |

1. POLYCARPaea Lamk.

- | | | |
|----------------------------|-----|-----------------------|
| 1a. Cymes orange-red | ... | <i>P. aurea</i> 1 |
| 1b. Cymes glistening white | ... | <i>P. corymbosa</i> 2 |

1. *Polycarpaea aurea* Wt. & Arn. in An. Nat. Hist. ser. I. 3 : 91. 1839. *P. corymbosa* var. *aurea* Wt. Ill. 2 : 44. t. 110. 1850.

Profusely branched herbs, 20–40 cm high, young branches white floccose. Leaves opposite, 5–10 × 1 mm, some with a few axillary leaves. Flowers at the tips of the branches, ca 3 mm long. Capsules ellipsoid, ca 3 mm long, 3-valved.

In crevices of rock boulders ; 500 m.

Fl. & Fr. : October.

RAIPUR : Risgaon - Deodhara.

2. *P. corymbosa* (L.) Lamk. Encyl. 2 : 129. 1797. *Achyranthes corymbosa* L. Sp. Pl. 205. 1753.

Annual or perennial herbs, 10–40 cm high, branches glabrous or with scattered tomentum. Leaves opposite, 5–15 × 1 mm, mostly with

3b. Calyx without the above tomentum.

- 4a. Epicalyx lobes free to the base or almost so,
frequently with a subulate appendage near the
apex from the inner surface. Calyx eglandular ...
H. radiatus 4
- 4b. Epicalyx lobes adnate to the calyx for about one
third way up, never appendaged. Calyx lobes
outside with a gland on the costae ...
H. subdariffa 5

1. ***Hibiscus cannabinus*** L. Syst. Nat. ed. 10, 2 : 1149. 1759.
'Kudrung'.

Annual herbs, 0.5-1.5 m high. Lower leaves usually unlobed,
upper palmately divided into 5-7 narrow serrate lobes, a few topmost
sometimes linear, undivided. Flowers 5-7 cm across, white or yellow
with a purple eye; calyx lobes with a large sessile gland. Capsules ovoid
beaked, ca 1.5 cm long, tomentose.

Cultivated along paddy fields for its fibre ; 330-480 m.

Fl. & Fr. : October.

RAIPUR : Gariaband, Rajim.

2. ***H. lobatus*** (J. A. Murray) O. Ktze. Rev. Gen. Pl. 3, 2 : 19
1898. *Solandra lobata* J. A. Murray in Comm. Soc. Reg. Sci. Goetting.
6 : 20. t. 1. 1785. *H. solandra* L'Herit, Stirp. Nov. 1 : 103. t. 49. 1788 ;
Mast. in Hook. f. Fl. Brit. Ind. 1 : 336. 1875.

Annual herbs, 40-80 cm high. Leaves broadly ovate or lanceolate,
crenate, 1.5-7.0 cm long, upper few usually 3-partite. Flowers white,
1.5 cm across. Capsules ovoid, ca 1 cm long, hairy ; seeds black.

In sal and mixed forests : 250-800 m.

Fl. & Fr. : August-October.

DURG : Balod. RAIPUR : Pithora. RAJNANDGAON : Baghnadi,
Chilpi.

3. ***H. panduriformis*** Burm. f. Fl. Ind. 151, t. 47, f. 2. 1768.

Perennial herbs, 0.5-1.5 m high. Stems with stiff shining stellate
hairs. Leaves orbicular or broadly ovate oblong, cordate, crenate, 5-15
cm long, lower palmately lobed. Flowers 2-3 cm across, yellow with a purple
eye. Capsules ovoid, 1.5 cm long, hairy.

In wastelands and along paddy fields ; 330 - 500 m.

Fl. & Fr. : September - January

RAIPUR : Dhamtari, Gariaband. RAJNANDGAON : Deopura, Rajnandgaon.

4. **H. radiatus** Cav. Diss. 3 : 150. t. 54. f. 2. 1787.

Annual somewhat prickly herbs, 0.5 - 1.0 m high. Leaves ovate orbicular, upper palmately 3 - 5 - lobed. Flowers 6 - 8 cm across, (ours) purplish - red ; epicalyx lobes with a subulate subapical appendage, together with the calyx, stellately hairy. Capsules ovoid globose, ca 1.5 cm long.

Along paddy fields ; 350 m

Fl. & Fr. : October.

RAIPUR : Pithora.

5. **H. subdariffa** L. Sp. Pl. 695. 1753. '*Kudrung, Patwa*'.

Annual reddish green herbs, 0.5 - 1.5 m high. Leaves mostly suborbicular, palmately 3 - 5 - lobed, serrate dentate. Flowers yellow, ca 4 cm across ; calyx fleshy, lobes with a sessile subapical gland. Capsules ovoid, ca 1.5 cm long, hairy.

Cultivated along paddy fields for its edible leaves and preparation of a jelly from its fleshy calyx ; 400 m.

Fl. & Fr. : October.

RAIPUR : Mahasamund.

6. **KYDIA** Roxb.

Kydia calycina Roxb. Pl. Corom. 3 : 11. t. 215. 1811. '*Baranga*'.

Rather slender deciduous trees up to 10 m high, with smooth greyish bark and pinkish blaze. Leaves suborbicular, sinuately 3 - lobed, 5 - 15 cm broad. Flowers white, in large attractive bunches. Capsules globose, 5 - 7 cm dia. enclosed within calyx and subtended by a whorl of unequal, spatulate, 10 - 15 cm long epicalyx lobes.

Common in mixed sal forests ; 440 - 600 m.

Fl. : September October ; *Fr.* : November January

RAIPUR : Dugli, Mainpur. RAJNANDGAON : Chilpi, Salewara, Taregaon.

7. MALACHRA L.

Malachra capitata (L.) L. Syst. Nat. ed. 12, 2 : 458. 1767. *Sida capitata* L. Sp. Pl. 685. 1753.

Hirsute perennial herbs, *ca* 1 m high. Leaves ovate orbicular, cordate, 2-9 cm long, crenate. Flower heads few to several together on long axillary peduncles ; bracts navicular, 1-2 cm long ; flowers yellow *ca* 1 cm across. Schizocarps obpyriform, *ca* 5 mm across.

An American weed found in the cities, not yet common :
280-320 m.

Fl. & *Fr.* : August January.

DURG : Durg. RAIPUR : Raipur.

8. MALVASTRUM A. Grey

Malvastrum coromandelianum (L.) Garcke in Bonplandia 5 : 295. 1857. *Malva coromandeliana* L. Sp. Pl. 687. 1753.

Strigosely hairy herbs or undershrubs, 20-70 cm high. Leaves ovate lanceolate, serrate, 2-6×1-3 cm, sparsely hairy on both the surfaces. Flowers solitary, 10-15 mm across, yellow ; bracteoles 3, linear ; sepals ovate, acuminate, connate for about half-way up. Mericarps cuspidate.

In wasteland ; 300 m.

Fl. & *Fr.* : October.

RAIPUR : Raipur.

9. PAVONIA Cav.

Pavonia repanda (Roxb. ex J.E. Smith) Spreng. Syst. 3 : 98. 1826. *Urena repanda* Roxb. ex J.E. Smith in Rees, Cyclop. 37, n. 6. 1819.

Densely hairy undershrubs, 50–100 cm high, profusely flowering. Leaves unequally denticulate, lower suborbicular, sinuately lobed with acute angles, upper narrower, almost unlobed. Flowers solitary axillary on stems and numerous short axillary branches; epicalyx cupular.

On roadsides; 400–480 m.

Fl. & Fr. : October

RAIPUR : Indagaon, Taurenga.

10. SIDA L.

- 1a. Petioles 2–6 mm long, much shorter than the blade; stipules as long as or longer than the petiole.
 - 2a. Leaves hoary or stellate beneath, lower usually rhomboid or obovate ... *S. rhombifolia* 4
 - 2b. Leaves glabrous beneath, linear-lanceolate or oblong. ... *S. acuta* 1
- 1b. Petioles frequently much longer, about half to as long as the blade; stipules of at least the larger leaves shorter than the petiole.
 - 3a. Flowers white or creamy. Mericarps 8–10-awned; awns more than half as long as the main body ... *S. cordifolia* 3
 - 3b. Flowers yellow. Mericarps 5, with acute tips or short awns scarcely one-third as long as the main body.
 - 4a. Leaves broadly ovate-orbicular with a broad cordate or subcordate base, hairy on both the surfaces with about 1 mm long hairs, 5-7-nerved at the base. ... *S. cordata* 2.
 - 4b. Leaves oblong or oblong-lanceolate with a narrow acute or slightly rounded base, tomentose on the lower surface, glabrescent above, 3-nerved at the base ... *S. spinosa* 5

1. *Sida acuta* Burm. *f. Fl. Ind.* 147. 1768. *S. carpinifolia* Mast. in *Hook. f. Fl. Brit. Ind.* 1 : 323. 1875; *non L. f.* 1781.

Woody herbs or undershrubs, 30–100 cm high. Leaves 2–8 cm long, crenate. Flowers solitary or 2–3 together, yellow, ca 1 cm across. Mericarps 5–6, aristulate, ca 2.5 mm long.

Common in wastelands, ditches and cultivated fields; 300–450 m.

Fl. & Fr. : August January.

DURG : Balod. RAIPUR : Dhamtari, Dugli, Raipur. RAJNANDGAON : Singhari.

Sometimes used for brooms.

2. *S. cordata* (Burm. f.) Borss. in Blumea 14 : 182. 1966. *Melochia cordata* Burm. f. Fl. Ind. 143. 1768. *S. humilis* Cav. Diss. 5. t. 134. f. 2. 1788 ; Mast. in Hook. f. Fl. Brit. Ind. 1 : 322. 1875. *S. humilis* var. *veronicaefolia* Mast. l.c.

Slender, trailing or suberect diffusely branched herbs, branches 3-70 cm long. Leaves crenate, on slender petioles about half to as long as the blade. Flowers solitary, few together, or loosely panicled, 5-8 mm across. Mericarps ca 2.5 mm long, acute.

Common in wastelands, cultivated fields and forests ; 300 - 450 m.

Fl. & Fr. : throughout the year.

DURG : Budbhurn, Kamteli. RAIPUR : Dhamtari, Dugli, Raipur. RAJNANDGAON : Baghnadi, Chichola, Singhari.

3. *S. cordifolia* L. Sp. Pl. 684. 1753.

Softly tomentose undershrubs, 50-150 cm high. Leaves ovate, shallowly cordate, 2-6 cm long, crenate ; petioles half to about as long as the blade. Flowers solitary or 2-5 together, 10-15 mm across. Mericarps 3.0-3.5 mm long with a pair of retrorsely hairy awns.

Along forest margins and cultivated fields ; 350 - 480 m.

Fl. & Fr. : August October.

DURG : Bordih dam. RAIPUR : Mainpur, Taurenga.

4. *S. rhombifolia* L. Sp. Pl. 684. 1753.

Erect undershrub, 50-120 cm high. Leaves lanceolate or ovate-oblong, acute or obtuse, 1-8×0.5-5.0 cm, serrate. Flowers yellow, ca 15 mm across ; peduncle jointed in the middle. Mericarps muticous or shortly awned.

Along roadsides ; 800 m.

Fl. & Fr. : September.

RAJNANDGAON : Chilpi.

5. *S. spinosa* L. Sp. Pl. 683. 1753.

Undershrubs, 50 - 100 cm high. Leaves 1 - 4 cm long, serrate; petioles 2 - 15 mm long. Flowers solitary or 2 - 5 together, small, yellow. Mericarps 2 - 3 mm long, with a pair of short horns, reticulately veined.

Rather rare, in paddy fields ; 330 m.

Fl. & Fr. : October.

RAIPUR : Dhamtari.

11. *THESPESIA* Soland. ex Correa

- | | |
|---|----------------------|
| 1a. Shrubs or undershrubs. Leaves 3 - 5 - lobed (except a few uppermost which are sometimes sinuate or entire), tomentose beneath ... | <i>T. lampas</i> 1 |
| 1b. Trees. Leaves entire, glabrous or puberulous beneath. ... | <i>T. populnea</i> 2 |

1. *Thespesia lampas* (Cav.) Dalz. & Gibbs. Bombay Fl. 19. 1861.

Hibiscus lampas Cav. Diss. 3 : 154. t. 56. f. 2. 1787. 'Bhindikanda, Junglee Kapas'.

Little branched shrubs or undershrubs, 0.5 - 2.0 m high. Leaves ovate orbicular, 10 - 20 cm long. Flowers infundibuliform, solitary or few, 8-12 cm across, yellow with a purple blotch in the mouth ; calyx cupular with 5 subulate teeth. Capsules ovoid, ca 3 cm long, black.

Frequent in forests ; 320 - 480 m.

Fl. : October. *Fr.* : January - May.

RAIPUR : Dhamtari, Dugli, Gariaband, Raipur.

The flowers droop down in a day or so. Used for some digestive ailments.

2. *T. populnea* (L.) Soland. ex Correa in Ann. Mus. Hist. Nat. Paris 9 : 290. 1807. *Hibiscus populneus* L. Sp. Pl. 694. 1753.

Trees, 3 - 10 m high. Leaves ovate cordate, acuminate, 7 - 20 cm long. Flowers solitary axillary, campanulate, hanging on up to 10 cm long pedicels, yellow with a purple centre when fresh, becoming orange

purplish in age, 5 - 7 cm long. Fruits subglobose 2 - 3 cm dia., almost indehiscent.

Fl. & Fr. : October.

RAIPUR : Pithora.

Avenue tree, ornamental as well as shade giving.

12. URENA L.

Urena lobata L. Sp. Pl. 692. 1753.

Much branched undershrubs, 0.5 - 1.5 m high. Lower leaves usually orbicular, 3 - 12 cm long, the upper ones frequently narrower, all usually deeply incised with sinuate lobes. Flowers solitary or 2 - 3 together, rotate. Schizocarps globose, 6 - 8 mm dia.

In wastelands and forest margins ; 300 - 750 m.

Fl. & Fr. : August - May.

RAIPUR : Gariaband, Raipur, Sitanadi, Taurenga. RAJNAND-GAON : Baghnadi, Chilpi, Singhari.

19. BOMBACACEAE

(M. I. Hanfi)

BOMBAX L.

Bombax ceiba L. Sp. Pl. 511. 1753. *B. malabaricum* DC. Prodr. 1 : 479. 1824. *Salmalia malabarica* Schott & Endl. Melet. Bot. 35. 1832. 'Semar kanda'.

Large deciduous trees. Trunk and branches with bulbous prickles when young, greyish, blaze pink. Leaves digitately 5 - 7 - foliolate ; petioles pulvinate, 10 - 15 cm long ; leaflets elliptic, 8 - 15 × 3 - 7 cm. Flowers ca 8 cm across, scarlet. Capsules 5 valved ; seeds bearing cotton.

Along roadsides and in mixed forests ; 250 - 500 m.

Fl. : March ; *Fr.* : May - June.

RAIPUR : Pithora, Sitanadi.

Cotton used for stuffing pillows and mattresses.

20. STERCULIACEAE

(D. M. Verma & M. I. Hanfi)

- 1a. Trees. Leaves palmately lobed. Flowers unisexual ; petals absent.
- 2a. Leaves tomentose beneath. Foliicles woody ... *Sterculia* 6
- 2b. Leaves sparsely hirsute beneath. Foliicles membranaceous ... *Firmiana* 3
- 1b. Trees, shrubs or herbs. Leaves simple. Flowers bisexual ; petals present.
- 3a. Trees or shrubs. Flowers 2 - 4 cm long. Fruits 2 - 6 cm long.
- 4a. Petioles 4 - 7 cm long. Flowers yellow, actinomorphic. Fruits ovoid, capsular ... *Eriolaena* 2
- 4b. Petioles 0.5 - 1.0 cm long. Flowers scarlet, zygomorphic. Fruits cylindrical, twisted, follicular ... *Helicteres* 4
- 3b. Herbs or undershrubs. Flowers 0.2 - 0.5 cm long. Fruits 0.3 - 0.5 cm long.
- 5a. Leaves velvety on both the surfaces. Capsules 2 - valved ... *Waltheria* 7
- 5b. Leaves glabrous or hirsute below and glabrous above. Capsules 5 - valved.
- 6a. Flowers and fruits on slender pedicels, solitary, or in open cymes. Petals with a hooded base and filiform tip. Capsules echinate ... *Byttneria* 1
- 6b. Flowers and fruits sessile, in capitate clusters. Petals oblong - spatulate. Capsules smooth ... *Melochia* 5

1. BYTTNERIA Loefling

Byttneria herbacea Roxb. Pl. Corom. t. 29. 1795.

Perennial herbs or undershrubs, 30 - 80 cm high. Leaves ovate lanceolate, 2 - 6 cm long, dentate. Flowers minute, in axillary cymes, pinkish, petals with bifid appendages. Capsules on slender pedicels, ca 5 mm dia., prickly.

In mixed forests ; 440 - 480 m.

Fl. & Fr. : May June.

DURG : Bordih. RAIPUR : Gariaband, Singhpur, Taurenga.

2. ERIOLAENA DC.

Eriolaena candollei Wall. Pl. Asiat. Rar. 1 : 51. t. 64. 1830. *E. hookeriana* Wt. & Arn. Prod. I : 70. 1834.

Shrubs, 1.5 - 2.0 m high. Leaves rotundate, serrulate, grey tomentose beneath. Sepals lanceolate, stellately spreading ; petals yellow with green bulbous base, reflexed, ultimately drying and splitting into white fibres ; stamens numerous, yellow. Capsules oblong, dehiscing stellately by valves ; valves inside with a cotton band.

In sal and mixed forests, rather scarce ; 450 - 550 m.

Fl. : June ; *Fr.* : throughout the year.

RAIPUR : Gariaband, Khallari, Taurenga. RAJNANDGAON : Deopura.

3. FIRMIANA Marsili

Firmiana colorata (Roxb.) R. Br. in Bennet & Brown. Pl. Jav. Rar. 235. 1844. *Sterculia colorata* Roxb. Pl. Corom. t. 25. 1795.

Deciduous trees with grey brown rough bark. Leaves 15 - 30 cm long, three or more lobed, sparsely stellate hairy beneath, lobes caudate. Flowers panicled ; calyx *ca* 2 cm long, stellately tomentose, orange-scarlet, 5 toothed ; gynandrophore long exserted, black ; anthers yellow. Follicles membranaceous.

In deciduous forest.

Fl. & Fr. : February May.

RAIPUR, n. v. (*cf.* Haines, Descr. list of trees, shrub & econ. herbs. Southern Circle, C.P. 20. 1916).

4. HELICTERES L.

Helicteres isora L. Sp. Pl. 963. 1753.

Deciduous shrubs, 1 - 3 m high with rough and greyish branches. Leaves broadly oblong or rotundate, 7 - 15 cm long, serrate, usually oblique, sometimes lobed, palmi-nerved. Flowers zygomorphic, 20 - 35 mm long, pink red or scarlet. Fruit of five spirally twisted hairy follicles, ultimately black.

Common in mixed forests ; 240 - 750 m.

Fl. : August ; *Fr.* : October - June.

DURG : Balod. RAIPUR : Chhoora, Dhamtari, Pithora, Sitanadi.
RAJNANDGAON : Baghnadi, Malaiddah.

The roots, bark and fruits are considered highly medicinal for colic pains and bowel complaints.

5. MELOCHIA L.

Melochia corchorifolia L. Sp. Pl. 675. 1753.

Perennial herbs or undershrubs, 15 - 40 cm high. Leaves ovate oblong, 2 - 6 cm long, serrate, plaited. Flowers small, in dense clusters, pink, subtended by 4 - 5 bracteoles. Capsules depressed globose, hirsute, 5 valved, green turning reddish brown.

In wastelands and along canals ; 350 - 800 m.

Fl. & *Fr.* : May - September.

DURG : Balod. RAIPUR : Dokal, Khallati, RAJNANDGAON : Baghnadi, Chilpi.

Leaves eaten cooked.

6. STERCULIA L.

- | | | |
|--|-----|---------------------|
| 1a. Bark papery. Leaves 5 - lobed, lobes entire | ... | <i>S. urens</i> 1 |
| 1b. Bark not papery. Leaves 3 - 7 - lobed, lobes mostly again
3 - lobed | ... | <i>S. villosa</i> 2 |

1. *S. urens* Roxb. Pl. Corom. t. 24. 1795.

Large or medium sized deciduous trees with chlorophyll beneath the thin greyish - white bark ; branches with leaf scars. Leaves long petioled, 20 - 40 cm broad, cordate, lobed to less than half - way down. Flowers in 10 - 12 cm long viscidly pubescent panicles, ca 5 mm across, red - brown tomentose outside, yellowish green inside. Follicles with pungent bristles.

On exposed hills ; 400 m.

Fl. : January - February ; *Fr.* : April ; leafless : December - May.

DURG : Talgaon.

Yields gum.

2. *S. villosa* Roxb. Fl. Ind. 3 : 153. 1832.

Large deciduous trees with grey and brown bark ; branches with leaf scars. Leaves long petioled, 20–40 cm broad, cordate, usually lobed to the middle. Flowers in 20–30 cm long rusty pubescent panicles, ca 1 cm across, yellowish with pink centre. Follicles tomentose, scarlet inside.

Fl. : January March ; *Fr.* : May June ; leafless : December May

RAIPUR, n. v. (*cf.* Haines, Descr. list of trees, shrubs & econ. herbs, Southern Circle, C. P. 19. 1916).

7. *WALTHERIA* L.

Waltheria indica L. Sp. pl. 673. 1753. *W. americana* L. Sp. Pl. 673. 1753.

Glaucous green tomentose undershrubs, 70–150 cm high. Leaves oblong lanceolate, subplicate, 3–6 × 1–3 cm, serrate. Flowers in capitate cymes and leafless spikes, yellow or pink, 5–7 mm across ; petals long clawed. Capsules villous, 1 seeded.

In wastelands and exposed rock crevices ; 315–480 m.

Fl. & Fr. : June October.

DURG : Balod. RAIPUR : Gariaband, Singhpur, Taurenga. RAJ-NANDGAON : Deopura.

21. TILIACEAE

(D. M. Verma & P. C. Pant)

1a. Fruits covered with hooked bristles all over the surface ...	<i>Triumfetta</i>	3
1b. Fruits unarmed or horned only at the tip.		
2a. Trees or shrubs. Fruit a subglobose drupe ...	<i>Grewia</i>	2
2b. Herbs or undershrubs. Fruit a subglobose or subcylindric capsule ...	<i>Cochchorus</i>	1

1. *CORCHORUS* L.

1a. Capsules depressed globose ...	<i>C. capsularis</i>	2
1b. Capsules subcylindric.		

- 2a. Capsules with three spreading horns at the tip ... *C. aestuans* 1
- 2b. Capsules with a solitary erect beak (splitting along with the valves and not to be confused with the horns).
 - 3a. Capsules 7 - 13 mm long, pilose ... *C. fascicularis* 3
 - 3b. Capsules 35 - 65 mm long, glabrous, hispidulous or scabrous.
 - 4a. Leaves all or mostly with a pair of tails near the base. Capsules glabrous or hispidulous *C. olitorius* 4
 - 4b. Leaves usually without tails. Capsules scabrous ... *C. trilocularis* 5

1. *Corchorus aestuans* L. Syst. ed. 10, 2 : 1079. 1759. *C. acutangulus* Lamk. Encycl. 2 : 104. 1786.

Erect or diffuse herbs. Leaves broadly ovate or ovate lanceolate, 1 - 7 cm long, crenate, sometimes tailed at the base. Flowers yellow. Capsules 10 - 25 mm long, 6 angled, more or less 3 winged.

Along cultivated fields ; 300 - 350 m.

Fl. & Fr. : August September.

DURG : Balod. RAIPUR : Raipur.

2. *C. capsularis* L. Sp. Pl. 529. 1753. 'Cheja.'

Annual erect herbs, 20 - 50 cm high. Leaves oblong lanceolate, 3 - 10 cm long, acuminate, serrate, sometimes tailed at the base. Capsules ribbed, muricate, 5 valved.

In wastelands ; 300 - 450 m.

Fl. & Fr. : June November.

RAIPUR : Gariaband. RAJNANDGAON : Taregaon.

Found only in wild condition. Leaves locally cooked and eaten. Cultivated in eastern India for its valuable fibre 'Jute'. The cultivated forms are much more robust.

3. *C. fascicularis* Lamk. Encycl. 2 : 104. 1786.

Annual herbs, 20 - 70 cm high. Leaves linear oblong or narrowly lanceolate, 1.5 - 6.0 cm long, acute, serrate. Capsules in leaf-opposed clusters, subterete, shortly beaked, 3 celled.

In wastelands ; 300 - 350 m.

Fl. & Fr. : October April.

DURG : Kamteli. RAIPUR : Dhamtari. RAJNANDGAON : Singhari.

4. *C. olitorius* L. Sp. Pl. 529. 1753.

Herbs or undershrubs, 20 - 70 cm high. Leaves elliptic or broadly ovate oblong, 5 - 10 cm long, serrate. Flowers yellow, buds obovoid, cuspidate. Capsules usually 2 - 3 together, green with purple angles, young hispidulous.

Along paddy fields ; 450 - 750 m.

Fl. & Fr. : September October.

RAIPUR : Gariaband, RAJNANDGAON : Chilpi.

Slender parts eaten cooked.

5. *C. trilocularis* L. Mant. 77. 1771.

Annual herbs. Leaves linear oblong, 2 - 7 cm long, serrate, usually pubescent. Flowers yellow ; stamens 15 - 20. Capsules very slender, 5 - 6 cm long, 3 - 5 angled.

In wastelands ; 520 m.

Fl. & Fr. : November.

RAJNANDGAON : Deopura.

2. GREWIA L.

1a. Leaves broadly ovate or orbicular.

2a. Leaves stellate hairy on both the surfaces ... *G. abutilifolia* 1

2b. Leaves glabrous ... *G. tiliifolia* 6

1b. Leaves linear, lanceolate or oblong - lanceolate.

3a. Lower surface of the leaves greyish white throughout with silky pubescence of simple hairs. ... *G. rothii* 4

3b. Lower surface of the leaves not as above.

4a. Trees. Leaves glabrous or with a few simple hairs along the midrib beneath. Sepals 12 - 15 mm long ... *G. serrulata* 5

4b. Plants not as above.

5a. Hairs on the twigs long persistent. Fruits mostly 2 - 4 - lobed, on slender, ca 0.5 mm thick peduncle ... *G. heterrifolia* 1

5b. Hairs on the twigs soon deciduous.		
Fruits not lobed, on rather stout, <i>ca</i> 1 mm thick peduncle	...	<i>G. hirsuta</i> 3

1. *Grewia abutilifolia* Vent. ex Juss. in Ann. Mus. Nat. Hist. Paris 4 : 92. 1804. 'Bhansuri'

Shrubs, 0.5-1.5 m high; branches stellate hairy. Leaves orbicular, usually shallowly 3-lobed at the top, 5-18 x 4-16 cm, bidentate; petioles 1-4 cm long. Flowers yellow turning purplish brown; peduncles *ca* 3 mm long; bracteoles villous outside. Fruits depressed globose, *ca* 1 cm across, almost unlobed, hairy.

Common in sal and mixed forests; 450-600 m.

Fl. : May August; *Fr.* : persisting throughout the year.

RAIPUR : Borai, Dugli, Sitanadi.

Fruits eaten.

2. *G. helectrifolia* Wall. ex G. Don, Gen. Syst. 1 : 548. 1831. *G. polygama* auct., *non* Roxb. 'Ban-sulai'.

Shrubs with about 1.0-1.5 m long slender branches. Leaves linear lanceolate, 5-10 x 1-2 cm, dentate; petioles *ca* 5 mm long. Flowers white; peduncles 15-25 mm long. Fruits depressed globose, 6-8 mm across, faintly 4-lobed, hairy or glabrous.

In sal forests; 320-500 m.

Fl. & *Fr.* : August November.

DURG : Balod. RAIPUR : Taurenga. RAJNANDGAON : Singhari.

3. *G. hirsuta* Vahl, Symb. 1 : 34. 1790. 'Gur sukri'.

Shrubs with 1.0-1.5 m long slender hairy branches. Leaves oblong lanceolate, serrate. Flowers white turning yellow and finally brown; peduncles short, subequaling the petioles. Fruits depressed globose, deeply 2-lobed, each half again slightly 2-lobed, red purple.

In mixed forests; 400-500 m.

Fl. : September; *Fr.* : December June.

DURG : Budbhumi. RAIPUR : Dugli, Taurenga.

Fruits eaten.

4. *G. rothii* DC. Prodr. 1 : 509. 1824. *G. excelsa* auct., non Vahl
‘*Bhansuli*’.

Shrubs, 0.3–1.5 m high. Leaves oblong-lanceolate, 5–15 × 2–6 cm, serrate; petioles ca 5 mm long. Flowers yellow turning brownish; peduncles 2–5 cm long. Fruits globose, ca 5 mm across, hairy, usually unlobed, purple.

In sal and mixed forests; 500–800 m.

Fl. : May–September; *Fr.* : October–June.

RAIPUR : Borai, Sitanadi. RAJNANDGAON : Chilpi.

5. *G. serrulata* DC. Prodr. 1 : 510. 1824. *G. disperma* Rottl.
ex Spreng. Syst. 2 : 579. 1825. *G. laevigata* auct. non Vahl. — ‘*Bhansuli*’.

Small trees. Leaves ovate-lanceolate, 7–15 × 3–5 cm; petioles 5–8 mm long. Peduncles 20–25 mm long; petals ca 3 mm long, quadrate. Fruits subglobose, ca 8 mm long, 2–4 lobed.

In mixed sal forests; 450–500 m.

Fl. : June–October; *Fr.* : January.

RAIPUR : Sitanadi, Taurenga.

Bark used for making ropes.

6. *G. tiliifolia* Vahl, Symb. 1 : 35. 1790. (‘*tiliaeefolia*’). ‘*Dhman*,’

Small trees. Leaves broadly ovate or orbicular, oblique, 5–15 × 4–12 cm, crenate, 5–7 ribbed, young sometimes with simple hairs; stipules sagittate; petioles 15–25 mm long. Flowers yellowish brown; peduncles 10–15 mm long. Fruits ca 7 mm across, deeply bilobed.

In sal and mixed forests; 450–750 m.

Fl. : May–June; *Fr.* : September.

RAIPUR : Khallari, Sitanadi. RAJNANDGAON : Chilpi.

Wood used for agricultural implements.

3. TRIUMFETTA L.

ia. Leaves lanceolate or ovate-lanceolate, tapering towards the apex

...

T. pilosa 2

- 1b. Leaves, some or all, orbicular, 3 - lobed or rounded at the apex.
- 2a. Leaves greyish white beneath ... *T. rotundifolia* 4
- 2b. Leaves green beneath.
- 3a. Bristles on the fruit hispid ciliate ... *T. pentandra* 1
- 3b. Bristles on the fruit glabrous ... *T. rhomboidea* 3

1. *Triumfetta pentandra* A. Rich. in Guill., Perr. & A. Rich. Pl. Seneg. Tent. 3 : 93. t. 19. 1831. *T. neglecta* Wt. & Arn. Prodr. 1 : 75. 1834.

Perennial herbs, 10 - 50 cm high. Leaves ovate or rhomboid, mostly 3 lobed in the upper part, sparsely to densely hairy beneath. Flowers yellow. Fruits ellipsoid, bristles straight or hooked.

In mixed forests ; 300 - 500 m.

Fl. & Fr. : September - January

RAIPUR : Dugli. RAJNANDGAON : Baghnadi.

2. *T. pilosa* Roth, Nov. Pl. Sp. 223. 1821.

Shrubs *ca* 2 m high with stellate hairy branches. Leaves ovate-lanceolate, subcordate, 7 - 15 × 3 - 6 cm, hairy on both sides with bulbous based stellate hairs. Flowers *ca* 1 cm across, yellow ; sepals linear, pubescent ; petals clawed, oblanceolate ; stamens 10. Fruits subglobose, *ca* 2 cm across, bristles hairy, hooked.

In wastelands ; 300 m.

Fl. & Fr. : October.

RAIPUR : Raipur.

3. *T. rhomboidea* Jacq. Enum. Syst. Pl. 22. 1760.

Herbs or undershrubs, 50 - 100 cm high, branches usually pubescent on one side. Leaves hairy beneath, lower suborbicular or rhomboid, 3 lobed, 5 - 10 cm long, upper smaller and narrower. Flowers yellow. Fruits ellipsoid subglobose.

Along forest margins ; 800 m.

Fl. & Fr. : September.

RAJNANDGAON : Chilpi.

4. *T. rotundifolia* Lamk. Encycl. 3 : 421. 1792.

Herbs or undershrubs, 30 - 70 cm high. Leaves suborbicular, not or

scarcely lobed, 1–4 cm broad, tomentose beneath. Flowers yellow. Fruits ellipsoid subglobose.

On roadsides and along paddy fields ; 300–350 m.

Fl. & Fr. : April–October.

DURG : Gunderdehi. RAIPUR : Balodabazar, Dhamtari.
RAJNANDGAON : Singhari.

22. LINACEAE

(M.I. Hanfi)

1a. Leaves sessile, linear-lanceolate. Flowers blue ... *Linum* 1

1b. Leaves petiolate, elliptic or ovate - oblong. Flowers yellow ... *Reinwardtia* 2

1. LINUM L.

Linum usitatissimum L. Sp. Pl. 277. 1753. 'Aisi'.

Annual diffusely branched herbs, 20–50 cm high. Leaves 10–30 × 3–4 mm. Flowers cymose, fugacious, 2–3 cm across. Capsules subcylindric, 10–15 mm long.

In wastelands ; as an escape ; 300 m.

Fl. & Fr. : December–February.

RAIPUR : Raipur.

Sometimes cultivated for its oil yielding seeds.

2. REINWARDTIA DUMORT.

Reinwardtia indica Dumort. Comm. Bot. 19. 1822. *Linum trigynum* Roxb. Asiat. Res. 6 : 357. 1799, non L., 1753. *R. trigyna* Planch. Lond. J. Bot. 7 : 522. 1848, nom. superfl.

Undershrubs. Leaves 2–10 × 1–6 cm, entire or serrate ; petioles 1–3 cm long. Flowers solitary, on 2–4 cm long slender pedicels ; petals oblong, ca 3 cm long. Capsules globose ; seeds reniform.

Fl. & Fr. : November–February.

RAIPUR : Sihawa, n.v. (cf. Haines, Descr. list of trees, shrubs & econ. herbs. Southern Circle. C.P. 30. 1916).

23. MALPIGHIACEAE

(D. M. Verma)

HIPTAGE Gaertn.

Hiptage benghalensis (L.) Kurz in J. Asiat. Soc. Bengal 43 : 136. 1874. *Banisteria benghalensis* L. Sp. Pl. 427. 1753. *H. madablotia* Gaertn. Fruct. 2 : 169, t. 116. 1791.

Climbing shrubs. Leaves coriaceous, elliptic-ovate, 10-20 × 5-10 cm, acute. Racemes silky. Flowers 20 - 25 mm across, pinkish or yellowish white ; calyx gland convex ; petals clawed, reflexed, crisped. Wings of the samaras oblong, median wing ca 3 cm long, lateral two wings ca 1.5 cm long.

Fl. : November March ; *Fr.* : May.

RAIPUR, n. v. (*cf.* Haines, Descr. list of trees, shrubs and econ. herbs, Southern Circle, C.P. 31, 1916).

24. ZYGOPHYLLACEAE

(M. I. Hanfi)

TRIBULUS L.

Tribulus terrestris L. Sp. Pl. 387. 1753.

Densely white hairy prostrate herbs with 10-40 cm long branches. Leaves pinnately compound ; leaflets oblong, 1-2 cm long. Flowers pale yellow, ca 1 cm across. Fruits with several cocci, each with two long and two short spines.

In wastelands; 500 m.

Fl. & Fr. : June.

RAIPUR : Sitanadi.

25. OXALIDACEAE

(D. M. Verma & P. C. Pant)

1a. Leaves pinnately compound	...	<i>Biophytum</i> 1
1b. Leaves digitately compound	...	<i>Oxalis</i> 2

BIOPHYTUM DC.

1a. Pedicels 4-6 mm long. Sepals shorter than or about as long as the pedicel	...	<i>B. reinwardtii</i> 1
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- 1b. Pedicels 1 - 2 mm long. Sepals 2 - 4 times longer than the pedicel ... *B. sensitivum* 2

1. **Biophytum reinwardtii** (Zucc.) Klotz. in Peters, Reise Mossamb. Bot. 1 : 85. 1862. *Oxalis reinwardtii* Zucc. in Abhand. Muensch. 1 : 274. 1830.

Slender herbs with a crown of pair pinnate leaves terminating 8 - 20 cm high stem. Leaves 5 - 8 cm long with 8 - 12 pairs of leaflets; leaflets oblong, upper 10 - 12 mm long, lower shorter. Flowers white or yellow; sepals 2.0 - 3.5 mm long.

In sal and mixed forests; 400 - 500 m.

Fl. & Fr. : September - October.

RAIPUR : Gariaband, Taurenga. RAJNANDGAON : Deopura.

2. **B. sensitivum** (L.) DC. Prodr. 1 : 690. 1824. *Oxalis sensitiva* L. Sp. Pl. 434. 1753.

Slender herbs. Stems 5 - 15 cm long, usually much shorter or about as long as the leaves, sometimes longer. Leaves whorled, 5 - 12 cm long; leaflets oblong, upper 7 - 12 mm long, lower shorter. Flowers yellow or orange yellow. Capsules ellipsoid, grooved.

In wastelands and miscellaneous forests; 250 - 300 m.

Fl. & Fr. : June - August.

DURG : Balod, Kusumkassa. RAIPUR : Balodabazar, Kasdot, Raipur. RAJNANDGAON : Singhari.

2. OXALIS L.

- | | | |
|---|-----|-------------------------|
| 1a. Plants caulescent with creeping stems. Flowers yellow | ... | <i>O. corniculata</i> 1 |
| 1b. Plants acaulescent. Flowers purple. | ... | <i>O. richardiana</i> 2 |

1. **Oxalis corniculata** L. Sp. Pl. 435. 1753.

Slender tuberous herbs with 5 - 15 cm long creeping stems. Leaflets 3, digitate, obovate, bilobed, 5 - 15 mm long and equally broad. Flowers ca 7 mm across, in axillary peduncled clusters; petals oblong oblanceolate, yellow. Capsules subcylindric, 8-20 mm long, pubescent.

In moist wastelands; 300 - 800 m.

Fl. & Fr. : September - May.

RAIPUR : Borai. RAJNANDGAON : Rajnandgaon.

2. *O. richardiana* Babu, Herb. Fl. Dehra Dun 104. 1977. *O. intermedia* A. Rich. Ess. Fl. Cuba 315. 1845, non Steud. 1841. *O. latifolia* auct.; Calder in Rec. Bot. Surv. Ind. 6 : 337. 1919, non H.B.K. 1821.

Perennial bulbous herbs. Leaves 3 foliolate; petioles 10–20 cm long; leaflets obovate, cuneate, with 2 glands below the notched apex, ca 3 cm long. Flowers umbellate, on 12–25 cm long peduncles; petals obtuse, ca 15 mm long, purple; styles glabrous.

In gardens; 300 m.

Fl. : December.

RAIPUR : Raipur, *Sharma* 034031H (Herb. Sci. Coll. Raipur).

26. BALSAMINACEAE

(M. I. Hanfi)

IMPATIENS L.

Impatiens balsamina L. Sp. Pl. 938. 1753. 'Gul - menhdi.'

Annual erect herbs, 20–30 cm high. Leaves alternate, lanceolate, 4–12 × 1.0–1.5 cm, acuminate, serrate; petioles usually glandular. Flowers purplish, axillary, 1–3 together; standard petaloid, orbicular, retuse; wing petals unequally 2 lobed, lip with 20–35 mm long incurved spur. Capsules tomentose.

In wastelands near habitations; 300–400 m.

Fl. & Fr. : August–September.

RAIPUR : Raipur. RAJNANDGAON : Baghnadi.

27. RUTACEAE

(D. M. Verma & M. I. Hanfi)

- 1a. Plants unarmed. Leaves paripinnate. Fruits dehiscent ... *Chloroxylon* 2
- 1b. Plants armed or unarmed. Leaves imparipinnate. Fruits indehiscent.

 - 2a. Plants unarmed. Leaflets alternate ... *Murraya* 4
 - 2b. Plants armed. Leaflets opposite.

 - 3a. Petioles and rachis with wings almost as broad as the leaflets. Ovule solitary in each cell. Fruits ca 1 cm across ... *Naringi* 5

- 3b. Petioles and rhachis not or narrowly winged.
Ovules several in each cell. Fruits 5 - 10 cm across.
- 4a. Leaves 3 - foliolate. Flowers hermaphrodite ;
ovary several - celled ... *Aegle* 1
- 4b. Leaves mostly 5 - 7 - foliolate, rarely a few
3 - foliolate. Flowers polygamous ; ovary ultimately one - celled ... *Feronia* 3

1 AEGLE Correa

Aegle marmelos (L.) Correa in Trans. Linn. Soc. 5 : 223. 1800.
Crataeva marmelos L. Sp. Pl. 444. 1753. 'Bel'.

Thorny deciduous medium sized trees. Leaves 3 foliolate ; leaflets petiolulate, ovate lanceolate, 5 - 10 cm long, subentire. Flowers in lateral or subterminal panicles, whitish, ca 2 cm across. Fruits globose or oblong with a woody rind, 5 - 10 cm long (larger in some cultivated forms) ; pulp slimy, yellow, aromatic.

Common in mixed forests ; 300 - 500 m.

Fl. : April May ; *Fr.* : ripening next year in April June.

DURG : Balod, Talgaon. RAIPUR : Dhamtari, Sitanadi.

Fruit juice is a reputed medicine for bowel complaints ; leaves used in worship of Lord Siva.

2 CHLOROXYLON DC.

(The genus is sometimes also placed in Meliaceae or Flindersiaceae.)

Chloroxylon swietenia DC. Prodr. 1 : 625. 1824. 'Bhirrah'.

Shrubs or medium sized trees. Leaflets 10 - 15 pairs, oblong lanceolate, oblique at the base, ca 3 x 1 cm, gland dotted, glaucous green beneath. Flowers white, panicled, ca 5 mm across. Capsules ovoid, trigonous, 3 - 4 cm long ; seeds compressed, winged above.

In sal forests ; 300 - 500 m.

Fl. & Fr. : May August.

DURG : Balod. RAIPUR : Taurenga.

3 FERONIA Correa

Feronia limonia (L.) Swingle in J. Washington Acad. Sci. 4 : 328. 1914. *Schinus limonia* L. Sp. Pl. 389. 1753. *Feronia elephantum* Correa in Trans. Linn. Soc. 5 : 224. 1800. 'Kaitha'.

Thorny medium sized trees with rough greyish black bark. Leaflets 5 or 7, elliptic obovate, 1-3 cm long with marginal glands; rhachis narrowly winged. Flowers racemed or panicled, ca 8 mm across, reddish. Fruits globose, 5-8 cm across with a rough greyish woody rind and white sour pulp.

Planted ; 200-500 m.

Fl. : April ; *Fr.* : September - October.

RAIPUR : Taurenga. RAJNANDGAON : Baghnadi, Sankar tola.

Fruit pulp is used for 'chutney'.

4 MURRAYA Koen. ex L.

Murraya koenigii (L.) Spreng. Syst. Veg. 2 : 315. 1825. *Bergera koenigii* L. Mant. 563. 1771. 'Meetha neem'.

Medium sized trees. Leaves 15-30 cm long, pinnate; leaflets obliquely lanceolate, 2-5 cm long, scented. Flowers in terminal short peduncled corymbs, ca 1 cm across, white, scented. Fruits ellipsoid, ca 1 cm long, pink turning black.

Planted ; 450 m.

Fl. : February ; *Fr.* : June - August.

RAIPUR : Khallari.

Leaves used for flavouring curries.

5 NARINGI Adans.

Naringi crenulata (Roxb.) Nicols. in Saldanha & Nicols. Fl. Hassan 387. 1976. *Limonia crenulata* Roxb. Pl. Corom. 86. 1798. *L. acidissima* auct., non L. *Hesperenthusa crenulata* Roem. Syn. Monogr. 1 : 38. 1846.

Thorny trees. Leaves pinnately 5 or 7 foliolate; petiole and rhachis articulate; leaflets elliptic obovate, 2-5 cm long, crenate, obtuse, usually notched. Flowers in short racemes, ca 8 mm across, yellowish white. Fruits globose, ca 1 cm diam., black.

In mixed forests ; 450 m.

Fl. : May.

RAIPUR : Sitanadi.

28 SIMAROUBACEAE

(M. I. Hanfi)

AILANTHUS Desf.

Ailanthus excelsa Roxb. Pl. Corom. I : 24. t. 23. 1795. 'Maharukh'.

Large deciduous foetid smelling trees with greyish stem and prominent leaf - scars. Leaves long petioled, pinnate, 0.2 - 1.0 m long ; leaflets 8 - 16 × 4 - 7 cm, coarsely toothed. Flowers in large lax panicles, unisexual, ca 3 mm across, greenish. Samaras 4 - 6 cm long, red.

In villages, usually planted ; 300 - 500 m.

Fl. & Fr. : January - March.

RAIPUR : Sitanadi.

29 OCHNACEAE

(P. C. Pant)

OCHNA L.

Ochna obtusata DC. in Ann. Mus. Hist. Nat. Paris 17 : 411. t. 1. 1811. *O. squarrosa* auct. pl. non L. 1762.

Trees or shrubs with greyish bark and pink red blaze. Leaves elliptic lanceolate or obovate, 7 - 17 × 3 - 7 cm, acute, serrate, closely nerved. Flowers in short lateral subcorymbose racemes, ca 3 cm across, yellow, fragrant ; sepals 5, persistent, purple in fruits ; stamens many, filaments persistent. Drupes seated on enlarged disc.

Locally common in mixed forests ; 480 m.

Fl. : June.

RAIPUR : Taurenga.

30 BURSERACEAE

(D. M. Verma & P. C. Pant)

1a. Leaflets acute or obtuse. Flowers in racemiform panicles ; disc annular. Fruits ellipsoid, dehiscent ; pyrenes winged...

Boswellia 1

- 1b. Leaflets caudate - acuminate. Flowers in much branched panicles ; disc campanulate or annular. Fruit globose, indehiscent ; pyrenes not winged.
- 2a. Leaflets 3 - 4 pairs, pubescent only along the nerves beneath. Flowers together with the leaves ; disc annular ... *Bursera* 2
- 2b. Leaflets 8 - 16 pairs, tomentose throughout on both the surfaces. Flowers when leafless ; disc campanulate ... *Garuga* 3

1 *BOSWELLIA* Roxb. ex Colebr.

Boswellia serrata Roxb. ex Colebr. *Asiat. Res.* 9 : 379. t. 5. 1807 ; Bennett in *Hock. f. Fl. Brit. Ind.* 1 : 528. 1875 (incl. *var. glabra*). *B. glabra* Roxb. *Pl. Corom.* t. 207. 1811. '*Salai, Salia*'.

Trees with greenish or pinkish white papery bark and pink red blaze, exuding yellowish droplets of resin. Leaves at the tips of branchlets, 30 - 45 cm long ; leaflets 9 - 16 pairs, 3 - 7 cm long, serrate, young brown tomentose. Racemes several clustered at the tips of branchlets, 10 - 20 cm long ; flowers white, ca 7 mm long. Drupes 3 - valved.

In miscellaneous forests, usually on hill slopes ; 350 - 450 m.

Fl. : January March ; *Fr.* : April June.

DURG : Budbhumi. RAIPUR : Pithora, Singhpur.

2 *BURSERA* Jacq. ex L.

Bursera serrata Wall. ex Colebr. in *Trans. Linn. Soc.* 15 : 361. t. 4. 1827. '*Lindwi*'.

Small or medium sized trees with greyish bark and brown blaze. Leaves 15 - 30 cm long ; leaflets oblong, shortly petiolulate, 7 - 15 cm long, entire or distantly serrulate. Flowers in lax axillary panicles, green, ca 3 mm across. Fruits globose, 1 - 2 cm across, red

In miscellaneous forests ; 500 m.

Fr. : June.

RAIPUR : Taurenga.

3 *GARUGA* Roxb.

Garuga pinnata Roxb. *Pl. Corom.* 3 : 5. t. 208. 1811. '*Kekad*'.

Large or medium sized trees. Leaves clustered at the tips of branchlets, 30-45 cm long; leaflets opposite, ovate-lanceolate, 7-10 × 3-4 cm, crenate. Panicles 10-15 cm long; flowers polygamous, ca 7 mm long, yellow. Drupes ca 2 cm across, yellow, slightly sour.

Common in mixed forests; 500 m.

Fl. : April ; *Fr.* : June.

RAIPUR : Taurenga.

31. MELIACEAE (D.M. Verma & M. I. Hanfi)

1a. Leaves twice - or thrice - pinnate	...	<i>Melia</i> 3
1b. Leaves once - pinnate.		
2a. Fruits dehiscent; seeds winged.		
3a. Leaflets lanceolate, apex caudate acuminate. Filaments free. Fruits 1.5-2.0 cm long	...	<i>Toona</i> 5
3b. Leaflets elliptic - oblong, apex retuse, obtuse or acute. Filaments united into a tube. Fruits 5-8 cm long		<i>Soymida</i> 4
2b. Fruits indehiscent; seeds not winged.		
4a. Leaflets oblique, the larger ones 1.5-2.0 cm broad Fruits ellipsoid, 10-15 mm long, one-seeded	...	<i>Azadirachta</i> 1
4b. Leaflets not oblique, the larger ones 3-5 cm broad. Fruits globose, ca 5 mm long, few seeded.	...	<i>Cipadessa</i> 2

1. AZADIRACHTA A. Juss.

Azadirachta indica A. Juss. in Mem. Mus. Hist. Nat. Paris 19 : t. 2, f. 5, 1830. *Melia azadirachta* L. Sp. Pl. 385, 1753. 'Neem.'

Evergreen trees, 4-15 m high; bark splitting into black flakes. Leaves odd-pinnate; leaflets 5-9 pairs, obliquely lanceolate, 4-6 cm long, serrate. Flowers in axillary panicles, white, scented, ca 15 mm across. Drupes yellow when ripe.

Commonly planted in villages and on roadsides; 250-450 m.

Fl. & *Fr.* : April - June.

DURG : Kamteli. RAIPUR : Sitanadi. RAJNANDGAON : Baghnadi.

All parts medicinally used; twigs used for cleaning teeth.

2. CIPADESSA Blume

Cipadessa baccifera (Roth) Miq. Ann. Mus. Lugd. Bat. 4 : 6. 1868
 69. *Melia baccifera* Roth, Nov. Pl. Sp. 215. 1821. *Cipadessa fruticosa* Blume, Bijdr. 162. 1825.

Sarmentose shrubs. Leaves odd pinnate, 10 - 30 cm long ; leaflets 7-11 pairs, opposite, 5-10 cm long, entire, serrate or gashed, usually hairy beneath. Panicles narrow, 7-10 cm long. Flowers ca 3 mm across ; sepals ciliate. Berries grooved.

In mixed sal forests ; 500 m.

Fl. : May ; *Fr.* : October.

RAIPUR : Taurenga.

3. MELIA L.

Melia azedarach L. Sp. Pl. 384. 1753. '*Bakain*'

Medium sized deciduous trees. Leaves mainly clustered at the tips of branches, 40-60 cm long, twice - (or thrice) pinnate ; leaflets lanceolate, 15-35 mm long, acuminate, serrate. Flowers in large axillary panicles, ca 7 mm across, lilac, scented. Drupes ellipsoid. ca 15 mm long.

Planted ; 800 m.

Fl. & Fr. : March April.

RAJNANDGAON : Chilpi.

4. SOYMIDA Juss.

Soymida febrifuga (Roxb.) A. Juss. in Mem. Mus. Hist. Nat. Paris 19 : 251. t. 22. f. 26. 1832. *Swietenia febrifuga* Roxb. Bot. Desr. Swietenia : 1. 1793, in Med. Facts Obs. 6 : 129. 1795 et in Pl. Corom. t. 17. 1795. '*Rohan*'.

Large or medium sized crookedly branched trees. Leaves clustered at the tips of branches, paripinnate, 20-45 cm long ; rachis and midrib red ; leaflets 3-6 pairs, obliquely elliptic, 5-10 cm long. Flowers in large terminal panicles, ca 8 mm across, white. Fruits pendulous, 5-8 cm long, 5-valved.

In mixed and sal forests ; 300 - 500 m.

Fr. : May.

RAIPUR : Dhamtari, Taurenga.

5. TOONA (Endl.) Roem.

(The genus is sometimes kept in Flindersaceae).

Toona ciliata Roem. Syn. Hesper, 139. 1846. *Cedrela toona* Roxb. ex Rottl. Ges. Nat. Fr. Berlin Neue Schr. 2 : 198. 1803.

Deciduous trees. Leaves even- or odd pinnate, 30 - 75 cm long ; leaflets 5 - 12 pairs, 6 - 15 cm long, entire or undulate ; petiolules ca 1 cm long. Flowers in suberect panicles, white, ca 5 mm long. Capsules ellipsoid, 5 - valved.

Near villages ; 600 m.

Fl. : April.

RAJNANDGAON : Gadha.

32. OLACACEAE

(M. I. Hanfi)

OLAX L.

Olax scandens Roxb. Pl. Corom. 2 : 2. t. 102. 1799.

Sarmentose shrubs with olive coloured, up to 7 m long, pubescent prickly branches, old branches thorny. Leaves oblong, 7 - 12 cm long. Racemes axillary, up to 5 cm long ; flowers ca 8 mm long, white ; calyx cupular persistent. Drupes oblong globose, ca 1 cm long, green with a darker spot at the tip.

Common in mixed forests and along roadsides ; 300 - 500 m.

Fl. & Fr. : April - October.

DURG : Balod, Budbhumi. Dondi. RAIPUR : Dhamtari, Sitanadi. RAJNANDGAON : Baghnadi, Chichola.

33. CELASTRACEAE

(D. M. Verma)

CELASTRUS L.

Celastrus paniculatus Willd. Sp. Pl. 1 : 1125. 1797. 'Apang, Malka-min, Pheng.

Sermentose shrubs with greyish lenticellate branches, 5–15 m high. Leaves obovate oblong, 4–10 × 3–7 cm, mucronate, serrulate. Flowers ca 5 mm across, greenish yellow, in 5–15 cm long terminal panicled cymes. Capsules globose, 3 lobed, ca 8 mm across; seeds with bright red aril.

Common in miscellaneous forests; 300–750 m.

Fl. & Fr. : April October.

DURG : Balod, Budbhumi. RAIPUR : Chhoora, Dhamtari, Gariaband. RAJNANDGAON : Malaidah, Singhari.

Oil from crushed ripe fruits considered very effective for skin diseases; also used for headache.

34. RHAMNACEAE

(D. M. Verma)

- | | |
|---|--------------------|
| 1a. Tendrils present. Fruiting calyx epigynous ... | <i>Helinus</i> 1 |
| 1b. Tendrils absent. Fruiting calyx hypogynous or perigynous. | |
| 2a. Plants unarmed. Leaves with a solitary midrib from the base. Fruits winged. ... | <i>Ventilago</i> 2 |
| 2b. Plants prickly. Leaves 3–5 ribed from the base. Fruits not winged ... | <i>Ziziphus</i> 3 |

1. HELINUS Meyer ex Endl.

Helinus lanceolatus Brandis, For. Fl. N.W. India. 574. 1874.

Slender unarmed climbing shrubs with some of the branchlets modified into tendrils. Leaves ovate lanceolate, 3–10 × 1–4 cm, acute, 3-nerved, glaucous beneath, upper much smaller. Flowers in slender cymes, ca 3 mm across, yellowish; petals folded. Fruits drupaceous, broadly obovoid, ca 8 mm long.

In mixed forests; 740 m.

Fl. & Fr. : April.

RAJNANDGAON : Malaidah.

2. VENTILAGO Gaertn.

Ventilago denticulata Willd. in Ges. Naturf. Fr. Neue Schr. 3 : 417. 1801. *V. maderaspatana* Roxb. Pl. Corom. 1 : 55. t. 76. 1796 98; non

Gaertn. 1788. *V. calyculata* Tulasne in Ann. Sc. Nat. ser. 4. 8 : 124.
 1857. *V. maderaspatana* var. *calyculata* King in J. As. Soc. Bengal 65 :
 378. 1896. 'Keonti, Lal bel.'

Sarmentose shrubs or lianas with grey bark having bright red furrows. Leaves bifarious, elliptic oblong, $7 - 15 \times 3 - 7$ cm, acuminate, sometimes serrate. Panicles interrupted. Flowers ca 3 mm across, yellowish. Fruit globose, ca 7 mm across, with a linear oblong 3 - 5 cm long green or stramineous wing at the top.

Common on roadsides, and in mixed forests ; 250 - 500 m.

Fl. : August September ; *Fr.* : October June.

DURG : Kusumkasa. RAIPUR : Gariaband, Sitanadi. RAJNAND-GAON : Singhari.

3. ZIZIPHUS Miller

- 1a. Straggling thorny shrubs becoming large climbers, the trunk armed with large conical spine tipped woody bosses. Leaves very oblique at the base, 2 - 5 cm long. Fruits globose, ca 5 mm dia., black ... *Z. oenoplia* 3
- 1b. Plants not as above.
 - 2a. Petals 5. Stone hard and thick, more or less rugose.
 - 3a. Leaves glabrous or sparsely hairy along the nerves beneath. ... *Z. glaberrima* 1
 - 3b. Leaves tomentose beneath.
 - 4a. Peduncles of the cymes mostly longer than the pedicels. Mature fruits globose, 2 - 3 cm dia., extremely hard, not edible. Wild ... *Z. xylopyrus* 5
 - 4b. Peduncle of the cymes absent or shorter than the pedicels. Mature fruits ellipsoid, or if globose then usually smaller, soft, edible. Wild or cultivated. ... *Z. mauritiana* 2
 - 2b. Petals absent. Stone crustaceous and thin walled, smooth. ... *Z. rugosa* 4

1. *Ziziphus glaberrima* (Sedgw.) Santap. in J. Bomb. Nat. Hist. Soc. 51 : 803. 1953. *Z. xylopyra* Willd. var. *glaberrima* Sedgw. in Ind. For. 45 : 71 - 72. 1919.~

Shrubs or small trees, sparsely prickly. Leaves elliptic oblong, $4 - 8 \times 3 - 4$ cm, acute, entire or serrulate. Cymes axillary, ca 1 cm long ;

peduncles usually longer than the pedicels. Fruits ellipsoid with an acute tip, *ca* 2.5 cm long, woody.

In mixed forests ; 400 - 500 m.

Fl. : May - June ; *Fr.* : June - August.

RAIPUR : Dhamtari Kanker, Khallari, Sitanadi.

2. *Z. mauritiana* Lamk. Encycl. 3 : 319. 1789. *Z. jujuba* Lamk. Encycl. 3 : 318. 1789, *non* Mill. 1768. 'Ber'.

Small spinescent trees. Leaves obliquely elliptic - oblong, 4 - 6 × 3 - 4 cm, white or brown tomentose beneath. Flowers in axillary tomentose cymes or fascicles, *ca* 5 mm across, greenish white. Fruits globose, *ca* 1.5 cm dia., red, succulent.

In mixed forests and villages ; wild and cultivated : 250 - 350 m.

Fl. : August - September ; *Fr.* : January - February.

RAIPUR. Raipur. RAJNANDGAON : Khargaon.

Fruits edible. Some cultivated varieties have drooping branches and green or yellow ellipsoid *ca* 4 cm long fruits.

var. fruticosa (Haines) Seb. & Balakr. in Ind. For. 89 : 525. 1963.
Ziziphus jujuba Lamk. *var. fruticosa* Haines. For. Fl. Chota Nagpur 270. 1910 *et* Bot. Bihar & Orissa 2 : 195. 1921.

Spiny profusely branched undershrubs, *ca* 70 cm high. Leaves 1.5 - 4.5 × 1.0 - 2.5 cm, pale brownish white beneath. Fruits globose, *ca* 7 mm dia.

In wastelands ; 230 m.

Fl. : August ; *Fr.* : October.

RAIPUR : Pithora, Simga.

3. *Z. oenoplia* (L.) Mill. Gard. Dict. ed. 8, 3. 1768. *Rhamnus oenoplia* L. Sp. Pl. 194. 1753. 'Makoya, Mokha.'

Evergreen climbing shrubs with brown tomentose branches. Leaves very obliquely elliptic - oblong, 2 - 5 × 1 - 3 cm, entire or crenulate, brown tomentose beneath. Cymes axillary, *ca* 1 cm long. Flowers greenish ; petals cucullate. Fruits succulent ; stone compressed, rugose.

Common in mixed forests ; 250 - 500 m.

Fl. : April - September ; *Fr.* : September - October.

DURG : Budbhumi. RAIPUR : Kasdol, Sitanadi, Taurenga.
RAJNANDGAON : Baghnadi, Singhari.

Roots of this and *Woodfordia fruticosa* crushed and mixed with cold water are given to increase lactation in women.

4. *Z. rugosa* Lamk. Encycl. 3 : 319. 1789. '*Churna, Pitondi.*'

Spinescent shrubs or small trees with scandent branches sometimes appearing almost like lianas, bark greyish, young parts tomentose. Leaves elliptic, 5 - 12 x 4 - 8 cm. obtuse, serrulate, usually cordate, brown tomentose or glabrescent beneath. Flowers in peduncled cymes, ca 5 mm across, greenish yellow. Fruits globose, 8 - 12 mm across, white fleshy.

Roadsides : 500 - 700 m.

Fl. & *Fr.* : April - May.

RAIPUR : Khallari. RAJNANDGAON : Malaiddah.

Fruits eaten.

5. *Z. xylopyrus* (Retz.) Willd. Sp. Pl. 1 : 1104. 1797. *Rhamnus xylopyrus* Retz. Obs. 2 : 11. 1781. '*Ghontol, Ghont, Ghontia.*'

Small spiny trees or shrubs with scandent branches. Leaves somewhat obliquely ovate elliptic, 3 - 8 cm long, serrulate, pubescent or tomentose beneath, apex rounded, base rounded or subcordate. Flowers ca 5 mm across. Fruits globose, green.

Common in mixed forests ; 250 - 450 m.

Fl. : June ; *Fr.* : August - January.

RAIPUR : Chhoora, Dhamtari, Dugli, Sitanadi. RAJNANDGAON : Baghnadi, Khargaon, Salewara.

35. VITACEAE

(D. M. Verma)

- 1a. Tendrils on the peduncles, opposite the inflorescence ... *Ampelocissus* 1
- 1b. Tendrils on the branches, opposite the leaves.

2a. Leaves simple. Berries 1 - seeded	...	<i>Cissus</i> 3
2b. Leaves compound. Berries 2 - 4 - seeded	...	<i>Cayratia</i> 2

1. AMPELOCISSUS Planch.

1a. Leaves glabrous beneath.	...	<i>A. latifolius</i> 1
1b. Leaves tomentose beneath	...	<i>A. tomentosa</i> 2

1. *Ampelocissus latifolia* (Roxb.) Planch. in J. Vigne Am. 8 : 374.
1884. *Vitis latifolia* Roxb. Fl. Ind. 2 : 474. 1824.

Extensive climbers with tuberous rootstock bearing long slender glaucous shoots. Leaves 3-7 angled or lobed, 10-20 cm long and equally broad, crenate dentate, cordate or retuse at the base. Flowers usually when leafless or with young leaves; petals ca 1.5 mm long, red, expanding. Berries ca 8 mm diam., black, succulent, sweet.

Common in mixed forests; 300-800 m.

Fl. & Fr.: May September

RAIPUR: Dhamtari. RAJNANDGAON: Chilpi, Salewara.

2. *A. tomentosa* (Heyne ex Roth) Planch. J. Vigne Am. 8 : 374.
1884. *Vitis tomentosa* Heyne ex Roth, Nov. Pl. Sp. 157. 1821. 'Dhotto'.

Extensive perennial climbers bearing tomentose branches. Leaves suborbicular, 3-5 lobed, 15-25 cm across, serrate, deeply cordate, brown tomentose beneath; basal lobes rounded. Petals ca 1.5 mm long, red, spreading. Berries globose, ca 8 mm diam.

Common in mixed and sal forests; 400-600 m.

Fl. & Fr.: August - November.

RAIPUR: Borai, Pithora. RAJNANDGAON: Baghnadi, Salewara.

2. CAYRATIA Juss.

1a. Leaves mostly 5-foliolate. Berries red	...	<i>C. auriculata</i> 1
1b. Leaves 3-foliolate. Berries black	...	<i>C. trifolia</i> 2

1. *Cayratia auriculata* (Wall.) Gamble, Fl. Madras Pres. 1 : 234.
1918. *Cissus auriculata* Wall. in Roxb. Fl. Ind. 430. 1820. *Vitis auriculata* Wt. & Arn. Prodr. 129. 1834.

Extensive climbers with spongy stems and 2-3 fid tendrils. Leaflets 5 (rarely 3), elliptic-obovate, 7-12 cm long, acuminate, crenate; stipules hemispherical. Flowers greenish white, ca 18 mm across, pedun-

cles and pedicels fleshy. Seeds obovate oblong, furrowed and transversely ridged on the back and pitted on the face.

In mixed forests ; 800 m.

Fr. : September.

RAJNANDGAON : Chilpi.

2. *C. trifolia* (L.) Domin, Biblioth. Bot. 89 : 371. 1927. *Vitis trifolia* L. Sp. Pl. 203. 1753. *Cayratia carnosa* Gagnep. Not. Syst. 1 : 347. 1911. *Cissus carnosa* Lamk. Encycl. 1 : 31. 1783. *Vitis carnosa* Wall. ex Wt. & Arn. Prodr. 127. 1834.

Creepers or climbers on bushes, young branches pubescent. Leaflets 5-10 × 3-6 cm, crenate, pubescent on both sides, terminal elliptic obovate, laterals ovate, somewhat cordate. Cymes 5-10 cm across, hairy ; flowers ca 2 mm across, greenish white. Berries 10-18 mm diam.

In wastelands & along cultivated fields ; 300-600 m.

Fl. & Fr. : August November.

DURG : Balod, Rajhara dhalli. RAIPUR : Borai. RAJNANDGAON : Chichola, Deopura.

3. CISSUS L.

Cissus repanda Vahl, Symb. 3 : 18. 1794. *Vitis repanda* Wt. & Arn. Prodr. 125. 1834. 'Dekra-bela'.

Extensive climbers, young branches tomentose, the tomentum usually ferruginous. Leaves broadly ovate or suborbicular, 12-20 cm across, cordate, toothed, deciduously villous. Cymes long peduncled, tomentose ; flowers ca 1.5 mm across. Fruits pyriform, ca 8 mm long, purplish black.

In miscellaneous forests ; 400-550 m.

Fl. & Fr. : May June.

RAIPUR : Gariaband, Taurenga.

The stems on cutting yields drinkable water.

36. LEEACEAE

(D. M. Verma)

LEEA van Royen ex L.

- | | | |
|--|-----|-------------------------|
| 1a. Petiolar stipule a narrow wing, 1.5-4.0 × 0.5 cm, scar
narrow | ... | <i>L. crispa</i> 1 |
| 1b. Petiolar stipule obovate, 2-6 × 1-4 cm, scar broad | | <i>L. macrophylla</i> 2 |

1. *Leea crispa* van Royen ex L. Syst. Nat. ed. 12, 2 : 627. 1767 et Mant. 1 : 124. 1771 ; Ridsdale in Blumea 22 : 88. 1975. *L. herbacea* Buch. Ham. in Trans. Linn. Soc. 14 : 228. 1823. *L. aspera* Edgew. in Trans. Linn. Soc. 20 : 36. 1846, nom. illeg. *L. pumila* Kurz in J. As. Soc. Beng. 41, 2 : 302. 1872. *L. edgeworthii* Santapau in Rec. Bot. Surv. Ind. 16 : 54. 1953. 'Hasia-dhapor.'

Herbs or shrubs. Stem sometimes crisply winged. Leaves usually once or twice pinnate, sometimes unifoliolate or trifoliolate ; leaflets ovate oblong, (4-) 10-18 (-28) × (2-) 5-12 (-16) cm, acuminate. Flowers greenish white ; anthers attached to the filament by a conspicuous boss. Fruits ca 12 mm diam., purple black.

Along roadsides, and in mixed and sal forests ; 250-750 m.

Fl. : May August ; *Fr.* : September October.

DURG : Balod. RAIPUR : Borai, Sitanadi. RAJNANDGAON : Chilpi, Khargaon.

2. *L. macrophylla* Roxb. ex Hernem. Hort. Hafn. 1 : 231. 1813 ; Laws. in Hook. f. Fl. Brit. Ind. 1 : 664. 1875 ; Ridsdale in Blumea 22 : 85. 1975. *L. integrifolia* Roxb. Fl. Ind. 2 : 472. 1824. *L. robusta* Roxb. Fl. Ind. 2 : 468. 1824. *L. cinerea* Laws. in Hook. f. I. c. 665. 1875. *L. coriacea* Laws. in Hook. f., I.c. *L. diffusa* Laws. in Hook. f., I.c. 667. *L. angustifolia* Laws. in Hook. f., I.c. 665. *L. parallela* Wall. ex Laws. in Hook. f., I.c. 666. *L. latifolia* Wall. ex Kurz in J. As. Soc. Beng. 44, 2 : 178. 1875. *L. venkobarowii* Gamble in Kew Bull. 1917 : 26. 1917.

Shrubs, more or less pubescent on all parts. Leaflets unifoliolate, trifoliolate, or once to thrice pinnate ; leaflets of unifoliolate specimens broadly ovate, 20-65 × 15-60 cm, of pinnate specimens elliptic lanceolate, 10-30 × 3-10 cm. Flowers greenish white ; anther walls thick, orange brown or dark brown. Fruits 10-15 mm diam.

In miscellaneous forests and along cultivated fields ; 250-500 m.

Fr. : November January.

RAIPUR : Sitanadi.

37. SAPINDACEAE

(D. M. Verma)

- 1a. Tendril climbers. Leaves biternate ; leaflets deeply toothed or lobed ... *Cardiospermum* 1
- 1b. Trees or shrubs. Leaves not biternate ; leaves or leaflets entire.
- 2a. Leaves simple. Fruits winged. *Dodonaea* 2
- 2b. Leaves pinnate. Fruits not winged.
- 3a. Leaflets tomentose beneath. Petals present. Fruits 2 - 3 - lobed. *Sapindus* 3
- 3b. Leaflets glabrous. Petals absent. Fruits not lobed. ... *Schleichera* 4

1. CARDIOSPERMUM L.

***Cardiospermum halicacabum* L. Sp. Pl. 366. 1753.**

Profusely branched annual slender climbers. Leaflets ovate lanceolate, 2.5×1.3 cm, acuminate. Inflorescence axillary, 3-branched, with a few racemose flowers at the tip ; the lowest pair of pedicels modified into tendrils. Flowers polygamous, *ca* 3 mm across, white. Capsules reddish green, inflated.

On roadside bushes ; 250 - 350 m.

Fl. & Fr. : April - January.

DURG : Durg. RAIPUR : Simga.

2. DODONAEA Mill.

***Dodonaea viscosa* Jacq. Enum. Cyst. Pl. Carib. 10. 1760 ; L. Mant. 228. 1771.**

Shrubs or small trees. Leaves light green, coriaceous, linear-ob lanceolate, $3.0 - 7.0 \times 0.5 - 1.5$ cm. Flowers in short axillary and terminal cymes, polygamous, greenish, sepals *ca* 2 mm long ; petals absent. Fruits membranaceous, $10 - 15$ mm long, 2 - 4 winged.

A common hedge - plant growing to a small tree if not pruned ; 250 - 350 m.

Fl. & Fr. : October - January.

DURG. RAIPUR. RAJNANDGAON.

3. SAPINDUS L.

Sapindus emarginatus Vahl, Symb. 3 : 54. 1794. *S. trifoliatus* Hiern in Hook. f. Fl. Brit. Ind. 1 : 682. 1815; non L. 'Reetha'.

Evergreen trees; young parts brown tomentose. Leaves 5-15 cm long with 2-3 pairs of subopposite, obtuse or emarginate elliptic oblong, 6-15 cm long leaflets. Flowers in short terminal panicles, ca 5 mm across, white; petals 5. Fruits ca 2 cm long.

Occasionally planted; 250-400 m.

Fl.: October; *Fr.*: January-May.

RAIPUR: Chhoora.

Fruits used for washing clothes and hairs.

4. SCHLEICHERA Willd.

Schleichera oleosa (Lour.) Oken, Allg. Naturgesch. 3 (2) : 1341. 1841.
Pistacia oleosa Lour. Fl. Cochinch. 615. 1790. *Schleichera trijuga* Willd. Sp. Pl. 4 : 1096. 1805. 'Kusum.'

A beautiful shade giving tree, 3-8 m high, bark thin, blaze pink. Leaves 20-30 cm long with 2-3 pairs of entire, opposite, elliptic oblong, 10-20 cm long leaflets which are usually acute or apiculate but sometimes rounded or notched at the tip. Flowers polygamous, small, yellowish, in 5-15 cm long tomentose racemes. Fruits oblong, 2.5-3.5 cm long, greyish green.

In miscellaneous forests; 400-450 m.

Fr.: May.

RAIPUR: Sitanadi.

Reputed for growing lac; yields good quality timber; seeds yield cooking oil. Recommended for roadside plantation.

38. ANACARDIACEAE
(D.M. Verma & P.C. Pant)

1a. Leaves simple. Flowers together with the leaves. Carpels solitary or 3, or if 5-6 then free.

2a. Leaves lanceolate, glabrous, narrowed to a shortly acuminate tip. Ripe fruits juicy ...

Mangifera 4

- 2b. Leaves oblong or obovate, glabrous or hairy beneath, rounded at the tip. Fruits never juicy.
- 3a. Leaves glabrous. Carpel solitary. Fruit a reniform nut ... *Anacardium* 1
- 3b. Leaves hairy beneath. Carpels 3 or 5 - 6. Fruit an ovoid or subglobose drupe.
- 4a. Carpels 3. Drupe ovoid, 2 - 3 cm long, on 5 - 6 mm long fleshy cupular hypanthium ... *Semecarpus* 5
- 4b. Carpels 5 - 6. Drupe sub-globose, ca 1 cm long, without the above hypanthium ... *Buchanania* 2
- 1b. Leaves pinnately compound. Flowers when the tree is leafless, or sometimes continuing with the newly sprouting leaves. Carpels 4 - 6, wholly or partially united.
- 5a. Leaflets with 10 - 30 secondary nerves on each side of the midrib, almost straight, meeting in an intra-marginal nerve. Carpels free above, united below. Drupes 3.0 - 3.5 cm long ... *Spondias* 6
- 5b. Leaflets with 5 - 7 secondary nerves on each side of the midrib, curving upwards, intra-marginal nerve absent. Carpels almost wholly united. Drupe ca 1 cm long ... *Lannea* 3

I. ANACARDIUM L.

Anacardium occidentale L. Sp. Pl. 383. 1753. 'Kaju'.

Dense - foliaged small crooked trees or shrubs. Leaves coriaceous, obovate, 7 - 18 cm long, apex rounded or emarginate. Panicles terminal or in upper leaf - axils. Flowers polygamous, ca 1 cm long, pinkish; torus ultimately fleshy, pyriform, 5 - 7 cm. long Nuts 2 - 3 cm long.

Sometimes planted ; 350 - 450 m.

Fl. : January ; *Fr.* : June.

RAIPUR : Dugli, Gariaband.

Seeds eaten raw and roasted.

2. BUCHANANIA Spreng.

Buchanania lanzen Spreng. in J. Bot. (Schrader) 2 : 234. 1800.
B. latifolia Roxb. Fl. Ind. 2 : 385. 1832.

Trees with rough greyish black bark. Leaves ovate oblong, 15–25 × 8–13 cm, obtuse, hairy on the nerves beneath; petioles swollen. Panicles dense, hairy. Flowers bisexual, ca 5 mm across, white, disc fleshy. Drupes black.

In miscellaneous forests; 380–500 m.

Fl. & Fr.: February–April.

DURG : Kamteli. RAIPUR : Sitanadi. RAJNANDGAON : Baghnadi.

3. LANNEA A. Rich.

Lannea coromandelica (Houtt.) Merrill in J. Arn. Arbor. 19 : 353. 1939. *Dialium coromandelicum* Houtt. in Nat. Hist. ser. 2, 2 : 39. t. 5, f. 2. 1774. *Odina wodier* Roxb. Fl. Ind. 2 : 293. 1832.

Large, deciduous, dioecious trees; young branches with smooth whitish bark and pink crimson blaze. Leaves clustered at the tips of branches; leaflets usually 7, obliquely ovate, 7–13 cm long, stellately hairy beneath. Flowers ca 3 mm across, greenish yellow, in 5–20 cm long racemes. Drupes oblong, ca 1 cm long.

In miscellaneous forests; 400–800 m.

Fl. & Fr.: March–May.

DURG : Budbhumi. RAIPUR : Nagri. RAJNANDGAON : Baghnadi, Chilpi, Malaidah.

4. MANGIFERA L.

Mangifera indica L. Sp. Pl. 200. 1753. ‘*Aam*.’

Evergreen trees with dense dark green foliage. Leaves lanceolate, 10–20 × 3–5 cm. Flowers polygamous, small, greenish white, in terminal panicles; pedicels jointed. Drupes with fleshy and fibrous juicy mesocarp.

Generally planted for its wholesome fruits, and for shade along roadsides; 250–500 m.

Fl.: February–March; *Fr.*: May.

RAIPUR : Sitanadi.

Several varieties are known in cultivation.

5. SEMECARPUS L.

Semecarpus anacardium L. f. Suppl. 182. 1781. ‘*Bhelwa*.

Shrubs or trees. Leaves generally clustered at the tips of branches, obovate oblong, 20–45 cm long, cuneate, lower surface grey and papillose between the strong hairy nerves. Flowers ca 6 mm across, greenish yellow, in large dense panicles. Drupes compressed, oblong or obliquely ovoid, ca 2.5 cm long, black.

In sal and miscellaneous forests ; 400–600 m.

Fl. : August–September ; *Fr.* : November–January.

DURG : Rajharadhalli. RAIPUR : Borai, Dugli. RAJNANDGAON : Baghnadi, Singhari.

6. SPONDIAS L.

Spondias pinnata (L. f.) Kurz, Pegu Report A. 44. 1875. *Mangifera pinnata* L. f. Suppl. 156. 1781. *Spondias mangifera* Willd. Sp. Pl. 2 : 754. 1799. ‘*Amera*.’

Large deciduous trees with thick smooth whitish bark and pink red blaze. Leaves crowded at the ends of branches, with mango like smell; leaflets 4–6 pairs, oblong, 5–20 × 3–8 cm, acuminate. Flowers polygamous, ca 7 mm across, white, in large pyramidal panicles. Drupes ellipsoid, yellow.

Sometimes planted ; 500 m.

Fl. : March–April ; *Fr.* : October–January.

RAIPUR : Taurenga.

39. MORINGACEAE

(P.C. Pant)

MORINGA Adans.

Moringa oleifera Lamk. Encycl. 1 : 398. 1785. *M. pterygosperma* Gaertn. Fruct. 2 : 314. 1791. ‘*Munga, Seliyan*.’

Small deciduous trees with corky greyish or pale brown bark and soft white wood. Leaves generally tri pinnate; leaflets opposite, elliptic obovate, 10–15 mm long. Flowers white, in large axillary panicles. Fruit an angular, cylindric, 3-valved capsule, up to 30 cm long, 10–15 mm thick, green outside, white and pitted inside.

Planted and running wild ; 250–320 m.

Fl. & *Fr.* : May–September.

RAIPUR : Kasdol, Raipur. RAJNANDGAON : Rajaandgaon.

Fruits and seeds eaten cooked ; seeds yield oil.

40 FABACEAE
(PAPILIONACEAE)
(D. M. Verma & M. I. Hanfi)

- 1a. Plants generally flowering when leafless, or sometimes also with the young leaves (all the genera repeated in the opposite arm).
 - 2a. Flowers 3 - 6 cm long.
 - 3a. Stem and branches smooth. Pods one - seeded ... *Butea* 5
 - 3b. Stem and branches prickly. Pods two - or more - seeded ... *Erythrina* 13
 - 2b. Flowers ca 1 cm long.
 - 4a. Climbers. Rhachis tomentose. Flowers sessile or on up to 3 mm long pedicels ... *Pueraria* 27
 - 4b. Trees. Rhachis glabrous or puberulus. Flowers almost all on 10 - 15 mm long pedicels ... *Ougeinia* 23
- 1b. Plants flowering along with the leaves.
 - 5a. Pods two - several - seeded, jointed.
 - 6a. Leaves two - foliolate ... *Zornia* 36
 - 6b. Leaves one - or three - many - foliolate.
 - 7a. Pods coiled ... *Uraria* 33
 - 7b. Pods not coiled.
 - 8a. Leaves one - foliolate.
 - 9a. Calyx scarious. Joints of the pod turgid ... *Alysicarpus* 3
 - 9b. Calyx herbaceous. Joints of the pod flat ... *Desmodium* 11
 - 8b. Leaves three - many - foliolate.
 - 10a. Leaves three - foliolate.
 - 11a. Trees. Pods 8 - 10 mm broad ... *Ougeinia* 23
 - 11b. Herbs or shrubs. Pods 2 - 4 mm broad ... *Desmodium* 11
 - 10b. Leaves five - many - foliolate.
 - 12a. Leaflets ciliate. Pods included

- within the calyx ... *Smithia* 30
- 12b. Leaflets glabrous. Pods protruding from the calyx ... *Aeschynomene* 2
- 5b. Pods one - seeded, or if more - seeded then not jointed.
- 13a. Leaves one - foliolate.
- 14a. Leaflets broadly ovate - orbicular, dentate, gland - dotted. Flowers purple, in long peduncled axillary heads. Pods one - seeded ... *Psoralea* 25
- 14b. Plants not as above.
- 15a. Pods one - seeded.
- 16a. Pods globose ... *Indigofera* 15
- 16b. Pods elliptic - obovate, compressed.
- 17a. Racemes very lax so that the rhachis is distinctly visible. Calyx glabrous or with a few hairs at the tip ... *Elettisia* 12
- 17b. Racemes dense so that the rhachis is almost invisible. Calyx villous throughout... *Desmodium* 11
- 15b. Pods two - several - seeded.
- 18a. Leaflets gland - dotted beneath. Flowers hidden within ca 25 mm broad conduplicate bracts ... *Flemingia* 14
- 18b. Leaflets eglandular. Flowers exposed, bracts narrow, flat, up to 5 mm broad ... *Crotalaria* 9
- 13b. Leaves two - many - foliolate.
- 19a. Tendrils present.
- 20a. Leaflets 2 or absent ... *Lathyrus* 17
- 20b. Leaflets 4 - 18 ... *Vicia* 34
- 19b. Tendrils absent.
- 21a. Pods coiled ... *Medicago* 19
- 21b. Pods not coiled.
- 22a. Leaves three - foliolate.

- 23a. Trees or lianas. Terminal leaflets 10 - 30 cm long.
Pods flat, 7 - 15 cm long, 2 - 5 cm broad, with a
solitary subapical seed ... *Butea* 5
- 23b. Plants not as above.
- 24a. Erect herbs. Leaflets with a rounded apex.
Pods 3 - 5 mm long.
- 25a. Flowers white or yellow. Pods subglobose.
- 26a. Leaflets digitate ... *Crotalaria* 9
- 26b. Leaflets pinnate ... *Melilotus* 20
- 25b. Flowers red. Pods linear - oblong ... *Indigofera* 15
- 24b. Plant not as above.
- 27a. Lower two leaflets alternate ... *Dalbergia* 16
- 27b. Lower two leaflets opposite.
- 28a. Pods one - two - seeded.
- 29a. Shrubs or stout erect herbs.
Pods turgid ... *Flemingia* 14
- 29b. Slender twiners. Pods compressed ... *Rhynchosia* 28
- 28b. Pods three - several - seeded.
- 30a. Leaflets gland - dotted beneath.
- 31a. Twiners. Seeds strophio-
late ... *Atylosia* 4
- 31b. Erect herbs or under-
shrubs. Seeds not stro-
phiolate ... *Cajanus* 6
- 30b. Leaflets eglandular.
- 32a. Trees.
- 33a. Stem and branches
prickly. Flowers *ca* 5
cm long ... *Erythrina* 13
- 33b. Stem and branches
smooth. Flowers *ca*
1 cm long ... *Ougeinia* 23
- 32b. Climbers or creepers.
- 34a. Nodes of the rac-
emes swollen.
- 35a. Flowers 3 - 4
cm long. Pods
clothed with
stinging hairs... *Mucuna* 22

- 35b. Flowers 0.5 - 1.5 cm long. Pods glabrous, or if hairy then the hairs not stinging.
- 36a. Leaflets silky tomentose beneath. Style glabrous ... *Pueraria* 27
- 36b. Leaflets not silky tomentose beneath. Style hairy.
- 37a. Style divided into a thin basal part and a thick upper part ... *Vigna* 35
- 37b. Style uniformly thick, uniformly thin or tapering, not divided into two distinct parts.
- 38a. Style distinctly thickened, conspicuous. Pollen grains smooth ... *Lablab* 16
- 38b. Style not distinctly thickened, often short and inconspicuous. Pollen grains tuberculate or spinulose ... *Macrotyloma* 18
- 34b. Nodes of the racemes not swollen ... *Teramnus* 32
- 22b. Leaves five - many - foliolate.
- 39a. Trees or shrubs. Leaflets alternate. Flowers panicled. Pods flat, 1 - 4 seeded.
- 40a. Pods with a broad circular wing ... *Pterocarpus* 26
- 40b. Pods not winged ... *Dalbergia* 10
- 39b. Plants not as above.
- 41a. Leaflets linear - oblong, 1 - 3 cm long. Pods linear, septate, 15 - 40 cm long ... *Sesbania* 29
- 41b. Plants not as above.
- 42a. Annual diffuse herbs. Leaflets toothed. Pods turgid. ... *Cicer* 7
- 42b. Plants not as above.
- 43a. Pods 1 - 3 cm broad.
- 44a. Leaflets 3 - 6 cm broad.
- 45a. Trees. Pods ellipsoid ... *Pongamia* 24
- 45b. Climbers. Pods strap-shaped.
- 46a. Flowers solitary, 3 - 5 cm long ... *Clitoria* 8
- 46b. Flowers racemose, ca 1 cm long ... *Millettia* 21
- 44b. Leaflets ca 0.5 cm broad ... *Abrus* 1

- 43b. Pods 0.1 - 0.5 cm broad.
- 47a. Pods flat, 2 - 4 cm long, 3 - 4 mm broad ... *Tephrosia* 31
- 47b. Pods turgid, frequently smaller and narrower ... *Indigofera* 15

1. ABRUS Adans.

Abrus precatorius L. Syst. Nat. ed. 12, 472. 1767 'Gumchi, Ratti'.

Slender climbing shrubs. Leaves 5 - 10 cm long; leaflets 10 - 20 pairs, linear, 15 - 25 × 4 - 6 mm, glabrous or pubescent beneath. Flowers in dense racemes, ca 8 mm across, pinkish white. Pods ca 4 cm long; seeds subglobose, shining, usually scarlet with a black eye, sometimes white.

Climbing on roadside trees and shrubs; 300 - 500 m.

Fl. : August - September ; *Fr.* : September - June.

RAIPUR : Gariaband, Taurenga. RAJNANDGAON : Baghnadi.

The seeds used as jeweller's weight.

2. AESCHYNOMENE L.

- 1a. Stem spongy. Calyx hispid ... *A. aspera* 1
- 1b. Stem not spongy. Calyx glabrous ... *A. indica* 2

1. **Aeschynomene aspera** L. Sp. Pl. 713. 1753.

Stout herbs, 1.5 - 3.0 m high. Leaves 8 - 15 cm long; leaflets numerous, linear, 10 - 15 × 2 mm; stipules setaceous. Racemes simple or branched, 4 - 8 cm long. Flowers ca 2 cm long, yellow. Pods 4 - 8 cm long, ca 8 mm broad, usually muricate.

In water or marshy places; 300 m.

RAIPUR : Raipur (cf. Unni in *J. Bomb. Nat. Hist. Soc.* 64 : 98. 1967).

2. **A. indica** L. Sp. Pl. 713. 1753.

Slender, erect, profusely branched herbs, 0.2 - 1.0 m high, branches with small warts or papillae. Leaves 2 - 8 cm long; leaflets numerous, sensitive to touch, linear, 4 - 6 × 2 mm. Racemes one - few - flowered. Flowers ca 1 cm long, creamy or pinkish yellow. Pods 3 - 6 cm long, ca 4 mm broad.

Near ponds ; 250 - 340 m.

Fl. & Fr. : August - September.

DURG : Balod. RAIPUR : Dhamtari. RAJNANDGAON : Deopura.

3. ALYSICARPUS Desv.

1a. Pods strongly transversely ribbed.

- 2a. Leaflets elliptic - oblong, 7 - 27 × 4 - 16 mm.
Racemes compact. Calyx densely ciliate ... *A. scariosus* 5
- 2b. Leaflets linear - lanceolate or oblong, 25 - 75 × 10 - 25 mm. Racemes lax. Calyx almost glabrous or sparsely ciliate ... *A. rugosus* 4

1b. Pods smooth or faintly reticulate.

- 3a. Calyx lobes imbricate at the base ... *A. bupleurifolius* 1
- 3b. Calyx lobes not imbricate at the base.
 - 4a. Pods moniliform ... *A. monilifer* 3
 - 4b. Pods not moniliform.
 - 5a. Stems with spreading hairs ... *A. hamosus* 2
 - 5b. Stems glabrous or appressed hairy ... *A. vaginalis* 9

1. *Alysicarpus bupleurifolius* (L.) DC. Prodr. 2 : 352. 1825.

Hedysarum bupleurifolium L. Sp. Pl. 745. 1753.

Annual slender herbs, 20 - 75 cm high. Leaflet 1, linear - elliptic, 2 - 9 × 2 - 8 cm, thinly pubescent beneath. Racemes 10 - 20 cm long with distant pairs of shortly pedicelled purplish red flowers ; calyx ca 6 mm long, ciliate. Pods 4 - 6 - jointed, long exserted, smooth or vaguely reticulately nerved.

In mixed forests ; 500 - 800 m.

Fl. & Fr. : September - October.

RAIPUR : Taurenga. RAJNANDGAON : Chilpi.

var. *gracilis* (Edgew.) Baker in Hook. f. Fl. Brit. Ind. 2 : 158. 1876.

Alysicarpus gracilis Edgew. in J. Linn. Soc. 9 : 312. 1866.

Calyx ca 4 mm long. Pods 1 - 2 - jointed, included or slightly exserted.

In mixed forests ; 300 - 500 m.

Fl. & Fr. : October - November.

RAIPUR : Taurenga. RAJNANDGAON : Machli Deo.

2. *A. hamosus* Edgew. in J. Asiatic Soc. Bengal 21 : 171. 1853.

Slender annual herbs, 30–50 cm. high; younger branches clothed with spreading hairs. Leaflet 1, broadly elliptic or sub-orbicular, 2–5 cm long. Racemes short, slender. Flowers mostly in pairs, yellow or pink. Pods compressed, 4–6-jointed, 10–18 × 2–4 mm.

On hill slopes and in wastelands ; 440–500 m.

Fl. & Fr. : September.

RAJNANDGAON : Baghnadi, Deopura.

3. *A. monilifer* (L.) DC. Prodr. 2 : 353. 1825. *Hedysarum moniliferum* L. Mant. 1 : 102. 1771.

Slender prostrate tufted herbs with 10–50 cm long branches. Leaflet 1, elliptic oblong, 5–15 × 7–10 mm, with rounded or subcordate base. Racemes dense, few flowered. Pods 3–6-jointed, 10–18 × 2 mm, joints globose, pubescent.

In wastelands ; 200–500 m.

Fl. & Fr. : August–May.

DURG : Balod. RAIPUR : Dharsinwan, Sitanadi. RAJNANDGAON : Baghnadi.

4. *A. rugosus* Willd. DC. Prodr. 2 : 353. 1825 ; Verdcourt in Kew Bull. 24 : 67. 1970. *Hedysarum rugosum* Willd. Sp. Pl. 3, 2 : 1172. 1803. *A. wallichii* Wt. & Arn. Prodr. 234. 1834.

Stout erect herbs, 0.5–1.0 m high. Leaflet 1, elliptic oblong, 2–7 × 1–3 cm, pubescent beneath, particularly along the nerves and the margins. Racemes dense, 3–7 cm long, elongating in fruits to 30 cm. Flowers pinkish yellow. Pods almost fully included within the calyx, joints oblate, ca 2.0 × 2.5 mm.

In wastelands ; 250–450 m.

Fl. & Fr. : January.

RAIPUR : Dugli, Raipur.

5. *A. scariosus* Grah. ex Thw. Enum. Pl. Zeyl. 88. 1858. *Alysicarpus rugosus* var. *stracifolius* Baker in Hook. f. Fl. Brit. Ind. 2 : 159. 1876.

Diffuse herbs, branches 10–20 cm long, pubescent. Leaflet 1, pilose beneath. Racemes dense, axillary, 10–20 mm long, rhachis pilose. Calyx glumaceous, 6–9 mm long, pale brown. Pods moniliform, 3-jointed, joints oblate, ca 2.0 × 2.5 mm., pubescent.

In fallow fields ; 350 - 450 m.

Fl. & Fr. : March - April.

DURG : Durg. RAJNANDGAON : Baghnadi.

6. *A. vaginalis* (L.) DC. Prodr. 2 : 353. 1825. *Hedysarum vaginalis* L. Sp. Pl. 746. 1753. *Alysicarpus vaginalis* var. *nummularifolius* Miq. Fl. Ind. Bat. 1, 1 : 232. 1855 ; Baker in Hook. f. Fl. Brit. Ind. 2 : 158. 1876.

Prostrate or ascending diffuse herbs with 15 - 40 cm long branches, sometimes erect, up to 1 m high. Petioles 2 - 12 mm long. Leaflet 1, lanceolate, oblong or broadly elliptic, 0.5 - 8.0 × 0.5 - 3.0 cm, pubescent beneath. Flowers purplish. Pods 6 - 8-jointed, 15 - 30 × 2 mm, reticulately nerved, hairy.

In wastelands and dried river beds ; 300 - 750 m.

Fl. : September - November ; *Fr.* : November - June.

RAIPUR : Dugli, Khallari, Pithora. RAJNANDGAON : Baghnadi, Chilpi, Deopura, Singhari.

4. ATYLOSLA Wt. & Arn.

Atylosia scarabaeoides (L.) Benth. in Miq. Pl. Jungh. 242. 1852.
Dolichos scarabaeoides L. Sp. Pl. 726. 1753.

Slender, copiously branched, greyish green pubescent climbers. Leaflets 3, elliptic or obovate oblong, strongly nerved, terminal 15 - 35 mm long. Flowers ca 8 mm long, yellow or reddish; calyx silky tomentose, almost as long as the corolla. Pods linear oblong, 20 - 25 mm long, hairy, with depressed lines between the seeds.

On roadside bushes and in miscellaneous forests ; 250 - 800 m.

Fl. : August - November ; *Fr.* : October - June.

DURG : Budbhumi, Lohara. RAIPUR : Chhoora, Taurenga. RAJNANDGAON : Chilpi, Taregaon.

5. BUTEA Koenig ex Roxb.

- 1a. Flowers ca 1 cm long, white or cream coloured. Pods ferruginous tomentose ... *B. parviflora* 2
- 1b. Flowers 4 - 6 cm long, orange - scarlet. Pods grey tomentose.

- 2a. Trees. Lowest calyx tooth much shorter than the side - ones ... *B. monosperma* 1
- 2b. Large woody climbers. Lowest calyx-tooth equal to the side ones. ... *B. superba* 3

1. *Butea monosperma* (Lamk.) Taub. in E. & P. Pflanzenfam. 3(3) : 336. 1894. *Erythrina monosperma* Lamk. Encycl. 2 : 391. 1786. *Butea frondosa* Roxb. in Asiat. Res. 3 : 469. 1792. 'Dhak, Palas.'

Deciduous trees up to 7 m high, though usually found cut and stunted. Leaflets ovate rhomboid, 80 - 20 cm long and equally broad, grey tomentose beneath. Racemes *ca* 10 cm long ; calyx coriaceous, velvety black. Pods *ca* 15 × 4 cm, obliquely rounded at the base.

Common in wastelands and secondary forests ; 350 - 500 m.

Fl. : March April ; *Fr.* : April June.

DURG : Budbhumi. RAIPUR : Sitanadi. RAJNANDGAON : Baghnadi.

Stems yield a red gum ; leaves used for taking meals.

2. *B. parviflora* Roxb. Fl. Ind. 3 : 248. 1832. *Spatholobus roxburghii* Benth. in Miq. Pl. Jungh. 238. 1852.

Large woody climbers. Leaflets subcoriaceous, 15 - 30 cm long, grey tomentose beneath, terminal obovate rhomboid. Panicles 20 - 40 cm long ; flowers subsessile, calyx grey velvety. Pods 7 - 10 × 2 - 3 cm, often constricted below the seed.

Fl. : October December ; *Fr.* : February March.

RAIPUR : Singhpur (*cf.* Haines, Desr. list of trees, shrubs and econ. herbs, Southern Circle, C.P. 69. 1916).

3. *B. superba* Roxb. Corom. Pl. 23. t. 22. 1795. 'Bela Palas, Bodla'

Large deciduous woody lianas up to 10 m high and with 40 - 60 cm thick trunk but sometimes when support is not available the branches are just spreading out and partly lying on the ground. Leaflets obovate - rhomboid, 20 - 40 cm long. Racemes 20 - 30 cm long. Pods 10 - 15 cm. long, base rather narrowed.

In miscellaneous forests ; 350 - 500 m.

Fl. : March ; *Fr.* : April June.

RAIPUR : Pithora. RAJNANDGAON : Kurajhar.

6. CAJANUS DC.

Cajanus cajan (L.) Millsp. in Publ. Field Mus. Nat. Hist. Bot. ser. 2, 53. 1900. *Cytisus cajan* L. Sp. Pl. 2 : 739. 1753. *Cajanus indicus* Spreng. Syst. Veg. 3 : 248. 1826, *nom. illeg.*; Baker in Hook. f. Fl. Brit. Ind. 2 : 217. 1876. 'Arhar'.

Shrubs, 1 - 3 m high, branches grey pubescent. Leaves trifoliolate; leaflets lanceolate, 3 - 10 × 2 - 3 cm, pubescent and glandular on both the surfaces. Flowers racemose or panicled, ca 2 cm long, yellow with reddish brown streaks. Pods linear oblong, 5 - 10 cm long, pubescent, with oblique depressions between the seeds; seeds globose.

Cultivated; 250 - 300 m.

Fl. & Fr.: August - January.

RAIPUR: Raipur.

Seeds used as pulse. The plants are perennial but usually grown as annuals.

7. CICER L.

Cicer arietinum L. Sp. Pl. 738. 1753. 'Chana'.

Annual, slender, glandular pubescent herbs. Leaflets elliptic, 10 - 15 × 5 - 7 mm, mucronulate, dentate. Flowers solitary, 10 - 15 mm long, white or purple. Pods oblong ellipsoid, inflated, 15 - 25 × 10 mm, glandular pubescent; seeds ovoid.

Cultivated; 250 - 350 m.

Fl. & Fr.: January - February.

RAIPUR: Simga.

Seeds eaten in cooked, fried, roasted, soaked or powdered form. Also fed to animals.

8. CLITORIA L.

Clitoria ternatea L. Sp. Pl. 753. 1753. 'Aparjita'.

Slender twiners. Leaves odd-pinnate; rhachis ca 5 cm long; leaflets elliptic, 20 - 30 × 16 - 20 mm, usually retuse. Flower solitary hanging on slender pedicels, blue or white; corolla 3 - 4 cm long, wings adherent to the keel. Pods compressed, 6 - 8 cm long.

On roadside hedges ; 300 m.

Fl. & Fr. : October.

RAIPUR : Raipur.

9. CROTALARIA L.

- 1a. Leaves simple.
 - 2a. Stem winged. ... *C. bialata* 2
 - 2b. Stem not winged
 - 3a. Corolla about half as long as the calyx ... *C. calycina* 3
 - 3b. Corolla about as long as or longer than the calyx.
 - 4a. Flowers 20 - 25 mm long ; calyx glabrous.
Pods 3 - 5 cm long ... *C. spectabilis* 11
 - 4b. Flowers 5 - 12 mm long ; calyx villous. Pods 0.8 - 1.7 cm long.
 - 5a. Racemes leaf - opposed ... *C. prostrata* 9
 - 5b. Racemes terminal.
 - 6a. Upper calyx lobes connate almost to the tip ... *C. linifolia* 5
 - 6b. Upper calyx lobes free or connate only at the base.
 - 7a. Plants with long spreading hairs.
Pods 15 - 20 - seeded ... *C. hirta* 4
 - 7b. Plants with short appressed hairs.
Pods 6 - 8 - seeded. ... *C. albida* 1
 - 1b. Leaves 3 - or 5 - foliolate.
 - 8a. Leaves mostly 5 - foliolate. Pods 5 - 6 cm long ... *C. quinquefolia* 10
 - 8b. Leaves always 3 - foliolate. Pods 0.3 - 1.2 cm long.
 - 9a. Pods cylindric, many - seeded ... *C. orixensis* 8
 - 9b. Pods subglobose, two - seeded.
 - 10a. Diffuse herbs, branches and leaflets white pubescent. Leaflets 5 - 10 mm long. Flowers ca 5 mm long. ... *C. medicaginea* 6
 - 10b. Erect undershrubs, branches and leaflets yellow pubescent. Leaflets 25 - 35 mm long. Flowers ca 10 mm long ... *C. notonii* 7

1. *Crotalaria albida* Heyne ex Roth, Nov. Sp. Pl. 333. 1821.
Herbs with several erect branches from a woody rootstock, 20 - 70

cm high. Leaves linear oblong, 20 - 70 × 5 - 10 mm. Racemes generally few flowered. Flowers on short slender pedicels; corolla 8 - 12 mm long, yellow. Pods oblong, ca 1 cm long, glabrous.

Common in forest - floors and along streams; 300 - 750 m.

Fl. & Fr. : August - April.

DURG : Balod, Bordih. RAIPUR : Dugli. RAJNANDGAON : Baghnadi, Chilpi, Malaiddah, Taregaon.

2. *C. bialata* Schrank, Pl. Rar. Hort. Monac. t. 13. 1817; Roxb. Fl. Ind. 3 : 274. 1832. *Crotalaria alata* Buch. Ham. & Roxb. ex D. Don, Prodr. 241. 1825.

Sub erect herbs 30 - 70 cm high; branches hairy. Leaves elliptic oblong or obovate, 2 - 7 cm long, silky pubescent beneath; stipules decurrent as wings on the branches. Racemes 7 - 10 cm long. Flowers ca 15 mm long. Pods oblong, ca 3 cm long.

In forest floors; 450 m.

Fl. & Fr. : October.

RAIPUR : Taurenga.

3. *C. calycina* Schrank, Pl. Rar. Hort. Monac. t. 12. 1817.

Erect annual herbs, 30 - 60 cm high; branches hairy. Leaves linear-lanceolate, 25 - 80 × 5 - 13 mm, silky beneath. Racemes terminal, several-flowered. Calyx 12 - 15 mm long, reddish brown, hairy; corolla yellow. Pods subcylindric, 20 - 25 × 8 mm, many-seeded.

In forest-floors; 400 - 500 m.

Fl. & Fr. : October - November.

RAIPUR : Taurenga. RAJNANDGAON : Taregaon.

4. *C. hirta* Willd. in Ges. Naturf. Fr. Neus Schr. 4 : 217. 1803.

Diffuse herbs with 20 - 30 cm long suberect hairy branches. Leaves linear-ob lanceolate, 1.5 - 4.0 × 0.3 - 1.0 cm, densely hairy. Racemes subcapitulate, few-flowered. Flowers ca 1 cm long, yellow. Pods oblong, ca 10 × 7 mm, many-seeded.

Weed in cultivated fields; 240 m.

Fl. & Fr. : November.

RAJNANDGAON : Khairagarh.

5. *C. limifolia* L. f. Suppl. 322. 1781.

Annual, scarcely branched, hairy herbs, 30-60 cm high. Leaves sessile, linear-ob lanceolate, 3-7 × 0.5-1.3 cm, mucronulate. Racemes terminal, several flowered. Flowers ca 8 mm long, yellow, drying black. Pods ovoid-ob long, ca 8 mm long, 8-10 seeded.

In wastelands ; 500 m.

Fl. & Fr. : September-October.

RAJNANDGAON : Deopura.

6. *C. medicaginea* Lamk. Encycl. 2 : 201. 1790.

Slender herbs, 10-20 cm high. Leaflets ob lanceolate, subtruncate, 5-10 × 2-5 mm, pubescent beneath ; stipules filiform. Racemes terminal and leaf-opposed, few flowered. Flowers ca 5 mm long, yellow. Pods subglobose, apiculate ca 3 mm diam., 2 seeded.

In wastelands ; 500 m.

Fl. & Fr. : September-November.

RAJNANDGAON : Deopura.

7. *C. notonii* Wt. & Arn. Prodr. 192. 1834.

Small shrubs or undershrubs ; branches and leaves yellow pubescent. Leaflets obovate, 2-4 cm long. Racemes 3-6 cm long, dense-flowered. Flowers ca 1 cm long, bright yellow ; keel with a long beak. Pods subquadrangular, ca 7 mm long, pubescent.

In mixed forest ; 450 m.

Fl. & Fr. : October.

RAIPUR : Taurenga, along forest road between Doomarpadav and Deodhara.

8. *C. orixensis* Rottl. ex Willd. in Ges. Naturf. Fr. Neue Schr. 4 : 217. 1803.

Perennial diffuse herbs with 30-40 cm long slender branches clothed with brown bulbous based hairs. Leaflets obovate-ob long, 2.0-3.5 cm long, hairy beneath. Racemes lax, few flowered ; bracts foliaceous. Flowers ca 7 mm long, yellow. Pods oblong, ca 1 cm long, several seeded.

In wastelands ; 250 m.

Fl. & Fr. : October-November.

RAJNANDGAON : Khairagarh.

9. *C. prostrata* Rottl. ex Willd. Enum. Hort. Berol. 747. 1809.

Diffuse herbs, 10–30 cm high; stems with silky yellowish brown hairs. Leaves rather obliquely obovate-oblong, 2–4 × 1–2 cm. Racemes long peduncled, 2–4-flowered. Flowers yellow; calyx 3–5 mm long; corolla scarcely exserted. Pods linear-oblong, 12–15 mm long, several seeded.

In forest floor, river beds and cultivated fields; 300–700 m.

Fl. & Fr.: October–June.

RAIPUR: Dhamtari, Gariaband, Khallari, Taurenga. RAJNANDGAON: Malaidah.

10. *C. quinquefolia* L. Sp. Pl. 716. 1753.

Annual erect herbs, 20–50 cm high; branches sulcate, pubescent. Leaflets usually 5, rarely 3, linear or narrowly oblanceolate, 5–10 cm long, silky beneath. Racemes terminal, 5–10 cm long; bracts reflexed. Flowers ca 15 mm long, yellow. Pods oblong, 3–5 cm long, many seeded.

In paddy fields; 450 m.

Fl. & Fr.: September.

RAJNANDGAON: Salewara.

11. *C. spectabilis* Roth, Nov. Pl. Sp. 341. 1821. *Crotalaria sericea* Retz. Obs. 5: 26. 1789, non Burm. f. 1768. ‘*Dhundhunia*, *Dhandhani*’.

Glaucous green herbs or undershrubs, 0.5–1.5 m high. Leaves obovate or oblanceolate, 5–15 cm long, pubescent beneath; petiole 15–30 mm long. Racemes terminal, 20–40 cm long, many-flowered; bracts foliaceous, 1–2 cm long. Flowers yellow. Pods linear-oblong, inflated, glabrous, many seeded.

In forest floors and wastelands; 300–500 m.

Fl. & Fr.: November–June.

RAIPUR: Raipur, Taurenga. RAJNANDGAON: Taregaon.

10. *DALBERGIA* L. f.

1a. Stamens 9, monadelphous, the staminal tube split along the upper side only.

2a. Leaflets 3–5, cuspidate. ... *D. sissoo* 3

2b. Leaflets 5–7, obtuse or emarginate ... *D. latifolia* 1

- 1b. Stamens 10, diadelphous, the staminal tube split throughout so that the stamens are in two bundles of 5 stamens each.
- 3a. Trees. Standard longer than broad ... *D. paniculata* 2
- 3b. Shrubby climbers. Standard as long as broad ... *D. volubilis* 4

1. ***Dalbergia latifolia*** Roxb. Pl. Corom. t. 113. 179. 1799.

Large trees. Leaves 10–15 cm long; leaflets 3–7, broadly elliptic obovate or suborbicular, 4–6 cm long, obtuse or rarely emarginate. Panicles lax, 5–10 cm long, axillary or from the axils of the leaf scars. Flowers white. Pods oblong lanceolate, 3.5–8.5 × 2.0 cm, 1–4 seeded.

Roadsides; 400 m.

Fl.: September; *Fr.*: November–January.

RAJNANDGAON: Taregaon.

The black heart wood with purple streaks is much valued for furniture.

2. ***D. paniculata*** Roxb. Pl. Corom. t. 114. 1799. ‘*Dhoban*’

Tall straight trees up to 20 m high with smooth whitish bark and yellowish blaze becoming brown on exposure. Leaflets 7–15, elliptic oblong, obovate or suborbicular, 10–35 mm long, sparsely hairy above. Panicles 5–8 cm long. Flowers ca 7 mm long, pinkish or bluish. Pods 5–8 cm long, 1–3 seeded.

Along roadsides and in sal forests; 350–500 m.

Fl.: April; *Fr.*: October–June.

DURG: Budbbum. RAIPUR: Pithora, Taurenga.

3. ***D. sissoo*** Roxb. Fl. Ind. 3: 223. 1832. ‘*Sheesham*’

Trees 3–5 m high with rough furrowed bark. Leaflets 3–5, broad ly ovate or suborbicular, long cuspidate, 3–6 cm long. Panicles dense, axillary. Flowers ca 7 mm long, yellowish. Pods strap shaped, 3–10 cm long, 1–4 seeded.

Commonly planted along roadsides; 300–430 m.

Fl.: April; *Fr.*: August–June.

DURG: Balod, Durg. RAIPUR: Dhamtari, Kasdol, Raipur.

RAJNANDGAON : Khairagarh, Rajnandgaon.

Wood highly valued for furniture, doors, carts etc.

4. *D. volubilis* Roxb. Pl. Corom. t. 191. 1805.

Large sarmentose shrubs with fluted stems. Leaflets 7 - 11, elliptic oblong, 2.5 - 3.5 × 2.0 cm, obtuse or emarginate. Panicles large, terminal; rhachis tomentose. Flowers ca 7 mm long, purplish blue. Pods oblong, 5 - 7 cm long, 1 - 2 seeded.

In sal forests ; 500 m.

Fl. : June.

RAIPUR : Taurenga.

11. DESMODIUM Desv.

- 1a. Leaflets usually 3, terminal 5 - 10 cm long, laterals conspicuously smaller, 1 - 2 cm long, or sometimes absent. Corolla 7 - 10 mm long. Pods 30 - 45 × 5 - 7 mm, dehiscing in a continuous line along the ventral suture, the 5 - 10 joints not separating. ... *D. motorium* 6
- 1b. Plants not as above.
- 2a. Leaves 1 - foliolate.
 - 3a. Leaflets elliptic, 1.5 - 3.5 cm long, rounded at the apex. Racemes 1.0 - 2.5 cm long. Pods 1 - 3 - jointed ... *D. brachystachyum* 1
 - 3b. Leaflets lanceolate, ovate or deltoid, generally 7 - 15 cm long, acute at the apex. Racemes 5 - 25 cm long. Pods 3 - 8 - jointed.
 - 4a. Stems angled, with white appressed hairs. Leaflets herbaceous, lanceolate or narrowly ovate, mostly about half as broad as long ... *D. gangeticum* 3
 - 4b. Stems terete, with yellowish brown spreading hairs. Leaflets coriaceous, broadly ovate or deltoid, about as broad as long ... *D. velutinum* 10
- 2b. Leaves 3 - foliolate.
 - 5a. Trailing herbs. Terminal leaflets 3 - 10 mm long ... *D. triflorum* 9
 - 5b. Erect shrubs or undershrubs. Terminal leaflets 1.5 - 15.0 cm long.
 - 6a. Flowers on special branches in which the lateral leaflets are rotundate, appressed, 7-15 mm long, appearing like foliaceous bracts and hiding 1 - 3 flowers, and terminal leaflet reduced to a bristle ... *D. pulchellum* 7

- 6b. Inflorescence not as above.
- 7a. Flowers in umbels. Pods silky white. ... *D. triangulare* 8
- 7b. Flowers in racemes or panicles. Pods not silky, green or brown.
- 8a. Joints of the pod twice or more as long as broad ... *D. laxiflorum* 5
- 8b. Joints of the pod about as long as broad.
- 9a. Stipules ovate-oblong, auricled. Flowers 2-3 mm long. Pods distinctly and equally indented along both the sutures. ... *D. dichotomum* 2
- 9b. Stipules subulate, not auricled. Flowers 5-7 mm long. Pods distinctly indented only along the ventral suture, the dorsal suture almost straight ... *D. heterocarpon* 4

1. **Desmodium brachystachyum** Grah. ex Benth. in Miq. Pl. Jungh. 223. 1852.

Undershrubs, 30-60 cm high; stems faintly angular, appressed hairy. Leaflets elliptic, reflexed, sericeous beneath. Racemes dense, axillary and terminal. Flowers purple; calyx white villous. Pods hairy, joints ca 3.0 × 1.5 mm.

In crevices of rock boulders; 500 m.

Fl. & Fr.: October.

RAIPUR : Taurenga.

2. **D. dichotomum** (Willd.) DC. Prodr. 2: 336. 1825; van Meeuwen in Reinwardt. 6: 248. 1962. *Hedysarum dichotomum* Willd. Sp. Pl. 2: 1180. 1803. *H. diffusum* Willd. *l. c.* *Desmodium diffusum* (Willd.) DC. Prodr. 2: 336. 1825. *nom. illeg., non* 335 *quae est D. laxiflorum* DC.

Diffusely branched herbs or undershrubs, 0.5-1.0 m high; stems angled, hairy. Leaflets ovate oblong, 5-8 cm long, strongly many nerved. Flowers minute, bluish, 2-3 together, in terminal panicles. Pods 5-6 jointed, joints sub-circular, hairy.

In wastelands and mixed forests; 300-500 m.

Fl. & Fr.: October - May.

RAIPUR : Gariahand, Sitanadi. RAJNANDGAON : Singhari.

3. **D. gangeticum** (L.) DC. Prodr. 2: 327. 1825; Baker in Hook. f. Fl. Brit. Ind. 2: 168. 1876, *incl. var. maculatum* (L.) Baker, *l. c.*; van Meeuwen in Reinwardt. 6: 249. 1962. *Hedysarum gangeticum* L. Sp. Pl. 746. 1753. *H. maculatum* L. Sp. Pl. 746. 1753.

Herbs or undershrubs, 0.3 - 0.7 m high. Leaflets 3 - 15 cm long, smooth or scabrid above, grey silky or glabrous beneath ; stipules subulate, aristate. Racemes panicled, 10 - 30 cm long. Flowers ca 15 mm long, white or mauve. Pods curved, 15 - 20 mm long, deeply indented on the lower suture.

In wastelands and mixed forests ; 250 - 500 m.

Fl. : April October. ; *Fr.* : October June.

DURG : Durg. RAIPUR : Khallari, Sitanadi, Taurenga.

RAJNANDGAON : Baghnadi, Singhari.

4. **D. heterocarpon** (L.) DC. Prodr. 2 : 335. 1825 ; van Steenis in Reinwardt. 6 : 95. 1962. *Hedysarum heterocarpon* L. Sp. Pl. 747. 1753. *D. trichocaulon* DC. Prodr. 2 : 335. 1825. *D. polycarpum* var. *trichocaulon* Baker in Hook. f. Fl. Brit. Ind. 2 : 172. 1876.

Perennial herbs or undershrubs, 20 - 80 cm high ; leaflets elliptic or oblanceolate, glaucous beneath, terminal 2 - 8 × 1 - 4 cm. Racemes or panicles dense, 2 - 8 cm long ; peduncles villous with appressed hairs which spread out on the upper part of the rhachis. Flowers ca 7 mm long, bluish purple. Pods 15 - 30 mm long with spreading hairs particularly on the margins.

Common in wastelands and forest floors ; 400 - 500 m.

Fl. : September October ; *Fr.* : October June.

RAIPUR : Khallari, Singhpur, Taurenga. RAJNANDGAON : Niwaspur.

5. **D. laxiflorum** DC. in Ann. Sc. Nat. Paris 4 : 100. 1825.

Undershrubs, 0.5 - 1.2 m high ; branches appressed hairy. Leaflets ovate lanceolate or rhomboid, hairy beneath, terminal 8 - 15 × 4 - 8 cm. Flowers ca 5 mm long, standard white, keel and wings blue. Pods 3 - 4 cm long, hairy, 6 - 8 - jointed.

On forest floors ; 400 - 500 m.

Fl. & *Fr.* : August - November.

DURG : Bordih. RAJNANDGAON : Taregaon.

6. **D. motorium** (Houtt.) Merr. in J. Arn. Arb. 19 : 345. 1938. *Hedysarum motorium* Houtt. in Nat. Hist. 2, 10 : 246. 1779. *H. gyrans* L. f. Suppl. 332. 1781. *Desmodium gyrans* DC. Prodr. 2 : 326. 1825.

Slender perennial herbs, ca 1 m high. Terminal leaflet elliptic oblong, rounded at both ends, usually glaucous beneath. Racemes 5–15 cm long. Flowers mauve; stamens diadelphous. Pods pubescent.

In sal forests; 750 m.

Fl. : September.

RAJNANDGAON : Chilpi.

Commonly called the telegraph plant. The lateral leaflets, when present, move by little jerks in warm humid weather.

7. *D. pulchellum* (L.) Benth. Fl. Hongk. 83. 1861. *Hedysarum pulchellum* L. Sp. Pl. 747. 1753. *Phyllodium pulchellum* Desv. J. Bot. (Desvaux). Ser. 2. 1 : 124. 1813.

Shrubs or undershrubs, 0.3–1.5 m high; branches grey hairy. Leaflets elliptic or ovate oblong, grey hairy beneath, terminal 6–12 cm long, laterals about half as long. Flowers umbellated, ca 5 mm long, yellowish white. Pods small, apiculate, usually 2 sometimes 1 or 3-jointed.

In sal and mixed forests; 400–500 m.

Fl. : October–November; *Fr.* : January–May.

RAIPUR : Dugli, Sitanadi, Taurenga.

RAJNANDGAON : Deopura.

8. *D. triangulare* (Retz.) Merr. in J. Arn. Arb. 23 : 170. 1942; van Meeuwan in Reinwardt. 6 : 261. 1962. *Hedysarum triangulare* Retz. Observ. Bot. 3 : 40. 1783. *H. cephalotes* Roxb. Fl. Ind. 3 : 360. 1832. *Desmodium cephalotes* Wt. & Arn. Prodr. 224. 1834.

Shrubs or undershrubs, 0.5–2.5 m high with triangular hairy branches. Leaflets elliptic or obovate, silky beneath when young, terminal 7–15 cm long. Flowers ca 8 mm long, reddish yellow, in several flowered short peduncled umbels. Pods white silky, 4–6-jointed.

In sal forests; 400–500 m.

Fl. & *Fr.* : September–January.

RAIPUR : Sitanadi, Taurenga.

9. *D. triflorum* (L.) DC. Prodr. 2 : 334. 1825. *Hedysarum triflorum* L. Sp. Pl. 749. 1753. *Desmodium triflorum* var. *minus* Wt. & Arn. Prodr. 229. 1834.

Slender trailing annual herbs, frequently rooting at the nodes; stems

patently hairy. Leaflets obovate, truncate or emarginate, sparsely hairy beneath. Flowers 1-4 together, axillary, *ca* 3 mm long, white, pink or blue. Pods on filiform pedicels, curved, 3-5-jointed, indented on the ventral sutures, glabrous or hairy.

In wastelands & paddy fields ; 250-500 m.

Fl. & Fr. : September-April.

RAIPUR : Pithora, Raipur, Sitanadi. RAJNANDGAON : Baghnadi, Deopura.

10. *D. velutinum* (Willd.) DC. Prodr. 2 : 228. 1825 ; van Meeuwen in Reinwardt. 6 : 264. 1962. *Hedysarum velutinum* Willd. Sp. Pl. 3, 2 : 117. 1803. *Desmodium latifolium* DC. Prodr. 2 : 328. 1825.

Shrubs, 0.7-1.7 m high ; branches rather slender, fulvous hairy. Leaflets 5-15 × 4-9 cm, strigose above, tomentose beneath, obtuse or rounded at the apex, truncate or slightly cordate at the base. Racemes or panicles 5-30 cm long, dense flowered. Flowers *ca* 5 mm long, purple. Pods hairy, 3-6-jointed.

In mixed forests ; 450-800 m.

Fl. & Fr. : September-January.

RAIPUR : Dugli, Sitanadi. RAJNANDGAON : Chilpi.

12. ELEIOTIS DC.

Eleiotis monophylla (Burm. f.) DC. Prodr. 2 : 348. 1825. *Glycine monophylla* Burm. f. Fl. Ind. 161. t. 50, f. 2. 1768. *Hedysarum sororium* L. Mant. 2 : 270. 1771. *E. sororia* DC. Prodr. 2 : 348. 1825.

Slender trailing herbs with triquetrous stems. Leaves suborbicular, 2-3 cm broad, obtuse or emarginate, hairy beneath. Racemes 5-8 cm long, patently hairy. Flowers minute, reddish, *ca* 2 mm long, pod of a solitary boat-shaped compressed joint, *ca* 7 mm long, reticulately veined.

In crevices of exposed rock boulders ; 500 m.

Fl. & Fr. : October.

RAIPUR : Taurenge.

13. ERYTHRINA L.

Erythrina suberosa Roxb. Fl. Ind. 3 : 253. 1832.

Small deciduous prickly trees with thick corky stramineous bark. Leaves trifoliolate 7-15 cm long, greyish white tomentose beneath, terminal broadly ovate, laterals obliquely deltoid. Flowers racemously fascicled at the tips of the branches, 4-5 cm long, scarlet. Pods 10-15 cm long, 2-3 seeded.

Roadsides ; 480 m.

Fl. : April.

DURG : Budbhumi.

A beautiful tree flowering when leafless, sometimes planted in gardens.

14. FLEMINGIA Ait. f.

1a. Leaves 1 - foliolate ... *F. strobilifera* 3

1b. Leaves 3 - foliolate.

2a. Stem almost absent. Flowering before the leaves ... *F. nana* 2

2b. Stem well developed. Flowering with the leaves ... *F. macrophylla* 1

1. **Flemingia macrophylla** (Willd.) Prain ex Merrill in Phillip. J. Sci. Bot. 5 : 130. 1910 ; Alston in Trimen, Handb. Fl. Ceyl. 6. Suppl. 85. 1931. *Crotalaria macrophylla* Willd. Sp. Pl. 3 : 982. 1803. *Flemingia congesta* Roxb. ex Ait. Hort. Kew ed. 2 (4) : 349. 1812.

Shrubs, 1-2 m high. Leaflets ovate oblong, 10-17 x 5-6 cm, acute or obtuse, sparsely silvery beneath. Racemes axillary, solitary or fascicled, shorter than the petiole. Flowers white with pink streaks, ca 12 mm long. Pods 4-12 mm long, pubescent, 2 seeded.

In sal forests ; 750 m.

Fl. : September.

RAJNANDGAON : Chilpi.

2. **F. nana** Roxb. Fl. Ind. 3 : 339. 1832. *Moghania nana* (Roxb.) Mukerjee in Bull. Bot. Soc. Bengal 6 : 20. 1953.

Undershrubs. Stems ca 15 cm long, brown tomentose, from a woody rootstock. Leaflets broadly elliptic or rhomboid, 10-17 cm long, laterals very oblique ; petioles winged. Racemes or panicles dense, 7-10 cm long, tomentose. Flowers ca 6 mm long, reddish. Pods 8-12 mm long.

Along forest roads ; 700 m.

Fl. & Fr. : March April.

RAJNANDGAON : Malaidah.

3. *F. strobilifera* (L.) Ait. Hort. Kew ed. 2 (4) : 350. 1812. *Hedysarum strobiliferum* L. Sp. Pl. 746. 1753. *Moghania strobilifera* St. Hill. ex Kuntze, Rev. Gen. 1 : 199. 1891.

Shrubs or undershrubs, 0.2 - 1.0 (- 3) m high, branches deciduously pubescent. Leaflets oblong-lanceolate, 8 - 20 × 3 - 6 cm, pubescent beneath, with 6 - 7 pairs of lateral nerves. Racemes 4 - 12 cm long ; bracts ca 2 cm long, deciduously villous, usually shortly cuspidate. Flowers hidden within the folded bracts, ca 1 cm long, yellowish white. Pods oblong, apiculate, ca 7 cm long, pubescent.

In sal and mixed forests ; 500 - 700 m.

Fl. : November ; *Fr.* : January April.

RAIPUR : Sitanadi. RAJNANDGAON : Deopura, Malaidah.

15. INDIGOFERA L.

1a. Leaves simple.	...	<i>I. linifolia</i> 6
1b. Leaves compound.		
2a. Leaves all three-foliate.		
3a. Pods oblong, ca 5 mm long	...	<i>I. glandulosa</i> 5
3b. Pods linear, 10 - 20 mm long	...	<i>I. trifoliata</i> 9
2b. Leaves all or almost all five - several - foliolate.		
4a. Prostrate herbs rooting at the lower nodes. Leaflets alternate. Pods 2 - 4 mm long	...	<i>I. tinctoria</i> 7
4b. Erect herbs or shrubs. Leaflets opposite. Pods 5 - 40 mm long.		
5a. Racemes 2 - 5 - flowered.	...	<i>I. glabra</i> 4
5b. Racemes many - flowered.		
6a. Leaflets 13 - 31. Flowers 10 - 15 mm long ; bracts exceeding the buds	...	<i>I. cassiodoides</i> 3
6b. Leaflets 5 - 13. Flowers 3 - 6 mm long ; bracts minute.		
7a. Pods moniliform. Leaflets 3 - 5	...	<i>I. angulosa</i> 1
7b. Pods not moniliform. Leaflets 5 - 13.		
8a. Pods quadrangular, densely hairy		<i>I. astragalina</i> 8
8b. Pods cylindrical, glabrous or puberulus	...	<i>I. tinctoria</i> 8

1. *Indigofera angulosa* Edgew. in J. Asiatic Soc. Beng. 21 : 168. 1853 ; Pant & Hanfi in Bull. Bot. Surv. Ind. 17 : 179. 1975.

Suffruticose, up to 2 m high ; branches appressed hairy. Leaflets 5 (rarely 3), oblong, 1.5–3.0 × 0.5–1.5 cm, mucronate, appressed silvery white hairy on both the surfaces. Racemes 10–15 cm long. Flowers ca 4 mm long, pink. Pods torulose, 5–10 mm long, 1–4 seeded.

In mixed forests on hill slopes ; 500 m.

Fl. & Fr. : September–November.

RAJNANDGAON : Mohgaon, Mukhiarighat.

2. *I. astragalina* DC. Prodr. 2 : 228. 1825 ; Gillett in Kew Bull. 24 : 500–501. 1970 ; Ali in Nasir & Ali, Fl. West Pakistan no. 100 : 79. 1977. *I. hirsuta* Baker in Hook. f. Fl. Brit. Ind. 2 : 48. 1876, p.p. ; non L.

Annual herbs, up to 1 m high ; branches hairy. Leaflets 5–11, oblong, 10–40 × 7–25 mm, pilose on both sides. Peduncles 10–20 mm long. Flowers 4–5 mm long, orange yellow or red. Pods tetragonal, 10–20 × 2–3 mm, hirsute, 4–6 seeded.

In wastelands, along forest roads & rock-crevices ; 350–500 m.

Fl. & Fr. : September–November.

RAIPUR : Taurenga. RAJNANDGAON : Baghnadi, Taregaon.

3. *I. cassiodoides* Rottl. ex DC. Prodr. 2 : 225. 1825 ; Ali in Nasir & Ali, Fl. West Pakistan, no. 100 : 83. 1977. *I. pulchella* auct. ; Baker in Hook. f. Fl. Brit. Ind. 2 : 101. 1876 ; non Roxb. ‘Ghirghol’.

Suffruticose shrubs, 1–3 m high. Leaves 10–25 cm long ; leaflets elliptic oblong 15–25 mm long, glaucous beneath. Racemes axillary, 3–8 cm long ; bracts, navicular, acuminate, caducous. Flowers 10–20 mm long, mauve pink. Pods turgid, reflexed, 3–5 cm long.

Common in mixed forests ; 400–500 m.

Fl. : August–January ; *Fr.* : April.

DURG : Bordih. RAIPUR : Dugli. RAJNANDGAON : Baghnadi, Deopura.

4. *I. glabra* L. Sp. Pl. 752. 1753 ; Ali in Bot. Notis. 3 : 573. 1958. *Indigofera pentaphylla* Murr. Syst. Veg. ed. 13 ; 564. 1774 ; Baker in

Hook. f. Fl. Brit. Ind. 2 : 95, 1876.

Slender diffusely branched annual herbs, 25–50 cm high. Leaflets 5–7, elliptic obovate, 5–20 × 2–10 mm; petioles and peduncles capillary. Flowers red, ca 3 mm long. Pods turgid, straight, 15–25 mm long, ca 1.5 mm thick, slenderly beaked.

In crevices of exposed rock boulders ; 500 m.

Fl. & Fr. : October.

RAIPUR : Taurenga.

5. *I. glandulosa* Roxb. ex Willd. Sp. Pl. 3 : 1227. 1803 ‘*Urdana*’.

Annual pubescent herbs, 20–50 cm high. Leaflets oblanceolate, 10–25 mm long, glaucous and glandular beneath. Flowers in 6–10 mm long dense clusters, ca 8 mm long, pink. Pods turgid, oblong, ca 5 mm long, hairy and with denticulate sutures.

In cultivated fields ; 250–450 m.

Fl. : September–November ; *Fr.* : October–April.

RAIPUR : Deori. RAJNANDGAON : Baghnadi, Khairagarh, Singhari.

Seeds eaten in times of scarcity.

6. *I. linifolia* (L. f.) Retz. Obs. 4 : 29. 1786. *Hedysarum linifolium* L. f. Suppl. 331. 1781.

Prostrate herbs ; branches slender, 10–50 cm long, 2 or 4 angled, grey pubescent. Leaves simple, linear oblong, 7–20 × 2–4 mm, apiculate, hairy on both surfaces. Flowers racemose, ca 3 mm long, red. Pods globose, ca 1.5 mm dia., silvery silky.

Common in wastelands & forest pockets ; 250–500 m.

Fl. & Fr. : August–May.

DURG : Balod, Durg, Rajhara Dhalli. RAIPUR : Dhamtari, Pithora, Raipur, Sitanadi. RAJNANDGAON : Baghnadi, Khairagarh.

7. *I. linnaei* Ali in Bot. Notis. 3 : 549. 1958. *Indigofera enneaphylla* L. Mant. 2 : 272, 571. 1771, *nom. illeg.* ; Baker in Hook f. Fl. Brit. Ind. 2 : 94. 1876.

Copiously branched trailing herbs ; branches 10–50 cm long. Leaflets 5–11, linear-ob lanceolate, 7–12 × 2–5 mm, pubescent on both the surfaces. Flowers in short sessile or peduncled spikes, ca 4 mm long, pink-red. Pods oblong, turgid, 3–6 × 2–3 mm, pubescent.

Common in wastelands ; 300–450 m.

Fl. & Fr. : August–January.

DURG : Balod. RAIPUR : Baloda Bazar, Raipur. RAJNANDGAON : Singhari.

8. *I. tinctoria* L. Sp. Pl. 751. 1753. — ‘*Neel*’.

Undershrubs, 0.3–1.0 m high ; branches angled, pubescent. Leaflets 7–13, elliptic oblong, 10–25 mm long, pubescent beneath. Racemes slender, axillary, subsessile, 5–12 cm long. Flowers ca 4 mm long, red or pink. Pods turgid, 20–40 mm long, ca 2.5 mm thick, straight or slightly curved.

In wastelands, 300–750 m.

Fl. : August–September ; *Fr.* : October–May.

RAIPUR : Dhamtari, Raipur, Rajim. RAJNANDGAON : Chilpi.

9. *I. trifoliata* L. Cent. Pl. 2 : 29. 1756.

Diffusely branched undershrubs 20–50 cm high ; branches deciduously hairy. Leaflets oblanceolate, mucronate, 10–25 × 5–10 mm, hairy on both the surfaces, glandular punctate beneath. Racemes sessile. Flowers ca 5 mm long, pink. Pods 12–20 mm long, narrowly 4-winged.

In wastelands ; 300–800 m.

Fl. & Fr. : September–October.

RAIPUR : Raipur. RAJNANDGAON : Chilpi.

16. LABLAB Adans.

Lablab purpureus (L.) Sweet, Hort. Brit. ed. 1. 481. 1927. *Dolichos purpureus* L. Sp. Pl. ed. 2, 1021. 1763. *D. lablab* L. Sp. Pl. 725. 1753. ‘*Seem.*’

Annual or perennial twining herbs. Leaves trifoliolate ; leaflets 5–12 × 4–10 cm, acuminate, glabrous or pubescent. Inflorescence axillary, peduncled. Flowers reddish purple or white ; vexillum 12–15 mm long. Pods up to 10 × 4 cm, 2–5 seeded ; seeds white, red or black.

Cultivated ; 300–500 m.

Fl. & Fr. : January.

RAIPUR : Sitanadi.

Pods eaten cooked.

17. LATHYRUS L.

- | | | |
|--|-----|--------------------|
| 1a. Leaves with all the leaflets reduced to tendrils. Flowers yellow | ... | <i>L. aphaca</i> 1 |
| 1b. Leaves with 2 or 4 leaflets and a terminal tendril. Flowers blue | ... | <i>L. sativa</i> 2 |

1. *Lathyrus aphaca* L. Sp. Pl. 729. 1753.

Slender annual herbs. Leaves completely reduced to tendrils at the base of which there is a large ovate hastate foliaceous stipule. Flowers 1-2, axillary, yellow. Pods sub falcate, ca 2.5 cm long; seeds compressed, black.

In cultivated fields; 300 m.

Fl. & Fr.: October.

RAIPUR : Raipur.

2. *L. sativa* L. Sp. Pl. 730. 1753.

Slender annual herbs; stems narrowly winged. Leaves paripinnate; leaflets 2, linear lanceolate, 2-10 cm long, 1-3 mm broad; stipules subsagittate; rhachis of upper and median leaves mostly ending in trifid tendrils. Flowers solitary, axillary, 1-2 cm long, blue. Pods winged.

In wastelands; 200 m.

Fl. & Fr.: August January.

RAIPUR : Raipur, Sitanadi.

18. MACROTYLOMA (Wt. & Arn.) Verdc.

Macrotyloma uniflorum (Lamk.) Verdc. in Kew Bull. 24 : 322. 1970.
Dolichos uniflorus Lamk. Encycl. 2 : 299. 1786. *D. biflorus* auct.; Baker in Hook. f. Fl. Brit. Ind. 2 : 210. 1876; *non* L.

Slender, climbing, pubescent herbs. Leaves trifoliolate; leaflets ovate rhomboid or elliptical, 2-4 cm long. Flowers axillary, solitary or in fascicles of 2-5, cream or greenish yellow, ca 8 mm long. Pods linear, compressed, 3-5 cm long, ca 5 mm broad.

Along roadsides; 500 m.

Fl. & Fr.: October. RAIPUR : Taurenga.

19. MEDICAGO L.

Medicago polymorpha L. Sp. Pl. 779. 1753. *M. denticulata* Willd.

Sp. Pl. 3 : 1414. 1802.

Annual slender herbs with somewhat spreading branches up to 30 cm long. Leaflets 3, obovate, 10-20 × 7-15 mm, toothed. Racemes 2-8 flowered. Flowers ca 4 mm long, yellow. Pods spirally twisted, ca 3 mm high, with two rows of short spines.

In moist wastelands ; 250 m.

Fl. & Fr. : January.

RAIPUR : Raipur.

20. MELILOTUS Juss.

Meliilotus alba Desr. in Lamk. Encycl. 4 : 63. 1796.

Annual slender herbs. Leaves 3 foliolate ; leaflets obovate or oblanceolate, ca 2.5 cm long. Racemes 7-10 cm long, elongating to 10-15 cm in fruits. Flowers white ; corolla ca 4 mm across. Pods usually 2 seeded.

In cultivated fields ; 300 m.

Fl. & Fr. : January April.

RAIPUR : Raipur, *Sharma* 053042 (Herb. Sci. Coll. Raipur).

21. MILLETTIA Wt. & Arn.

- | | | |
|---|-----|----------------------|
| 1a. Leaflets silky pubescent beneath. Standard auricled. Pods tomentose | ... | <i>M. extensa</i> 1 |
| 1b. Leaflets glabrescent beneath. Standard not auricled. Pods glabrous | ... | <i>M. racemosa</i> 2 |

1. *Millettia extensa* (Benth.) Baker in Hook. f. Fl. Brit. Ind. 2 : 109. 1876. *Otoesma extensa* Benth. in Miq. Pl. Jungh. 249. 1852. *M. auriculata* Baker ex Brandis, For. Fl. N. W. & C. India 138. 1874 ; Baker, l.c. 108. - 'Patani'.

Woody climbing shrubs, 2-6 m high. Leaves 20-30 cm long ; leaflets 7-9, obovate oblong, cuspidate, 8-15 cm long. Flowers ca 1 cm long, yellowish white ; calyx tomentose. Pods flat, woody, 10-15 × 3 cm.

Common in mixed forests ; 450-750 m.

Fl. : May - June ; *Fr.* : September January.

RAIPUR : Sitanadi, Taurenga. RAJNANDGAON : Malaidah, Salewara.

2. *M. racemosa* Benth. in Miq. Pl. Jungh. 249. 1852. 'Junjinar.'

Woody climbing shrubs, up to 15 m high with greyish branches. Leaves ca 30 cm. long; leaflets 11-17, obovate oblong, 5-8 cm long, young slightly silky beneath. Flowers 10-12 mm long, creamy white, reddish or blue (ours); calyx silky. Pods flat, linear, 10-15 × 2 cm.

In mixed forests ; 450-550 m.

Fl. : May ; *Fr.* : September November.

RAIPUR : Sitanadi. RAJNANDGAON : Baghnadi, Deopura.

22. MUCUNA Adans.

Mucuna pruriens (L.) DC. Prodr. 2 : 405. 1825. *Dolichos pruriens* L. in Stickm. Herb. Amb. 23. 1754 et Amoen. Acad. 4 : 132. 1759. *M. prurita* Hook. Bot. Misc. 2 : 348. 1831. 'Kenwanch'.

Rather slender extensive climbers, young branches pubescent. Leaflets 3, obovate, rhomboid or ovate, 5-15 × 3-12 cm, pubescent on both the surfaces. Racemes axillary, 10-20 cm long. Flowers 25-40 mm long, deep purple. Pods 5-6 cm long, clothed with brown stinging hairs.

On small trees & bushes, along roadsides, and in mixed forests ; 400-550 m.

Fl. : October - November ; *Fr.* : January May.

RAIPUR : Sitanadi, Taurega. RAJNANDGAON : Taregaon.

23. OUGEINIA Benth.

Ougeinia oogeensis (Roxb.) Hochr. in Ann. Cons. Jard. Bot. Geneve 13 & 14 : 51. 1909. *Dalbergia oogeensis* Roxb. Fl. Ind. 3 : 220. 1832. *O. dalbergioides* Benth. in Miq. Pl. Jung. 216. 1852. *Desmodium oogenense* Oshashi in Gikgodma 1 : 117. t. 146. 1973.

Small deciduous trees.; bark grey or pale brown, blaze streaked with red. Leaflets 3, elliptic obovate, $7\text{--}15 \times 4\text{--}9$ cm. Racemes axillary, fascicled. Flowers $10\text{--}12$ cm long, white or pink ; standard orbicular. Pods linear oblong, $5\text{--}10$ cm long, jointed ; seeds reniform.

Fl. : March April ; *Fr.* : May June.

RAIPUR : Sihawa.

(*cf.* Haines, Descr. list of trees, shrubs and econ. herbs, Southern Circle, C. P. 65, 1916).

Wood valued for building and agricultural implements.

24. PONGAMIA Vent.

Pongamia pinnata (L.) Pierre, Fl. For. Cochinch. sub. t. 385. 1899. *Cytisus pinnatus* L. Sp. Pl. 741. 1753. *P. glabra* Vent. Jard. Mal. t. 28. 1803. *Galedupa indica* Lamk. Encycl. 2 : 594. 1788. *Derris indica* Bennet, J. Bomb. Nat. Hist. Soc. 68 : 303. 1971 'Karanj.'

Medium sized trees with spreading branches forming dense canopy. Leaves $7\text{--}15$ cm long ; leaflets $5\text{--}7$, ovate oblong, cuspidate, $5\text{--}10$ cm long. Racemes axillary, shorter than the leaves. Flowers *ca* 12 mm long, pinkish. Pods woody, obliquely oblong, shortly cuspidate, $4\text{--}5$ cm long, 1 seeded.

Commonly planted on roadsides as a shade - tree ; 250–450 m.

Fl. : April ; *Fr.* : August January.

DURG : Balod, Durg. RAIPUR : Dugli, Mainpur, Raipur. RAJNANDGAON : Rajnandgaon.

Seeds yield oil commonly used for burning and for medicinal purposes.

25. PSORALEA L.

Psoralea corylifolia L. Sp. Pl. 764. 1753.

Annual herbs, 0.5–1.0 m high. Leaves alternate, unifoliolate, broadly ovate repand, $4\text{--}7 \times 3\text{--}5$ cm, toothed. Inflorescence a short and dense long peduncled raceme. Flowers *ca* 5 mm long, blue purple.

Pods ovoid, *ca* 5 mm long, black.

In wastelands ; 250 - 450 m.

Fl. & Fr. : October - April.

DURG : Durg. RAIPUR : Raipur. RAJNANDGAON : Khairagarh, Singhari.

Seeds are laxative and stimulant.

26. PTEROCARPUS Jacq.

Pterocarpus marsupium Roxb. Pl. Corom. t. 116. 1799. ‘*Bijasal, Pharri.*’

Tall, almost evergreen trees ; blaze ultimately red. Leaflets 5 - 7, elliptic oblong, 7 - 12 cm long, obtuse or retuse, glaucous beneath. Panicles terminal, 15 - 30 cm long ; flowers *ca* 1 cm long, yellow, mildly scented. Pods orbicular, winged, 25 - 40 mm dia.

Common in sal forests and along roadsides ; 300 - 550 m.

Fl. : October - November ; *Fr.* : April - June.

RAIPUR : Dhamtari, Pithora, Taurenga. RAJNANDGAON : Taregaon.

Wood valued for furniture and agricultural implements ; bark and gum medicinally used.

27. PUERARIA DC.

Pueraria tuberosa (Roxb. ex Willd.) DC. in Ann. Sci. Nat. 4 : 97. 1825. *Hedysarum tuberosum* Roxb. ex Willd. Sp. Pl. 3 : 1197. 1803. ‘*Patal Kumda.*’

Extensive woody climbers. Leaflets 3, rhomboid, 10 - 20 × 9 - 17 cm, white silky beneath, thinly hairy above, laterals very oblique. Racemes 15 - 30 cm long. Flowers when leafless ; calyx *ca* 8 mm long, silky, teeth subequal ; corolla *ca* 15 mm long, blue - purple. Pods 5 - 8 cm long, densely clothed with grey brown stinging hairs.

Along roadsides and in mixed forests ; 500 m.

Fl. & Fr. : April - June.

RAIPUR : Taurenga.

28. RHYNCHOSIA Lour.

Rhynchosia minima (L.) DC. Prodr. 2 : 385. 1825. *Dolichos minimus* L. Sp. Pl. 726. 1753.

Slender climbing or trailing herbs. Leaflets 3, ovate - rhomboid or orbicular, 1-3 cm long, pubescent, gland-dotted beneath. Racemes axillary, lax, few-flowered. Flowers ca 6 mm long, yellow. Pods flat 1-2 cm long, pubescent.

Along roadsides : 250 - 450 m.

Fl. & Fr. : August April.

DURG : Durg. RAIPUR : Raipur. RAJNANDGAON : Baghnadi, Khairagarh.

29. SESBANIA Scop.

- | | |
|---|-------------------------|
| 1a. Herbs. Flowers ca 1 cm long. Pods ca 3 mm broad ... | <i>S. bispinosa</i> 1 |
| 1b. Trees. Flowers 6-10 cm long. Pods ca 8 mm broad ... | <i>S. grandiflora</i> 2 |

1. **Sesbania bispinosa** (Jacq.) W. F. Wight in U.S. Dept. Bur. Pl. Ind. Bull. no. 137 : 15. 1909 ; Ali in Nasir & Ali Fl. West Pakistan no. 100 : 90. 1977. *Aeschynomene bispinosa* Jacq. Jc. Pl. Rar. 3 : 13. t. 564. 1792. *Coronilla aculeata* Willd. Sp. Pl. 3 : 1147. 1802, nom. illegit. *Sesbania aculeata* Poir. in Lamk. Encycl. 7 : 128. 1806, nom. illegit.

Annual or biennial herbs, 0.7-1.5 m high ; branches and leaf rhachis muricate or prickly. Leaves 15-30 cm long ; leaflets numerous, linear, 5-15 mm long. Racemes lax, 8-13 cm long, 3-12 flowered. Flowers pale yellow with violet streaks. Pods 15-25 cm long, many seeded.

In wastelands ; 450 m.

Fl. & Fr. : September October.

RAIPUR : Gariaband.

2. **S. grandiflora** (L.) Poir. in Lamk. Encycl. 7 : 127. 1806. *Robinia grandiflora* L. Sp. Pl. 722. 1753 'Gaachh munga'.

Small soft-wooded trees. Leaves 15-30 cm long ; leaflets 10-20 pairs, linear oblong, 18-30 × 5-10 mm. Racemes lax, axillary, 2-4 flowered. Flowers white (or red in one variety). Pods 30-45 cm long, slender, curved, many seeded, sutures markedly thick.

Cultivated ; 300 m.

Fl. : October November ; *Fr.* : January May.

RAIPUR : Kasdol.

Young leaves, flowers and pods eaten cooked.

30. SMITHIA Ait.

- | | |
|--|-----------------------|
| 1a. Flowers in subsessile heads with their supporting leaves ... | <i>S. conferta</i> 1 |
| 1b. Flowers in peduncled heads free of leaves ... | <i>S. sensitiva</i> 2 |

1. **Smithia conferta** J. E. Smith in Rees, Cyclop. 33. no. 2. 1816 ; van Steenis in Reinwardt. 5 : 445. 1961. *S. geminiflora* Roth, Nov. Pl. Sp. 352. 1821 ; Baker in Hook. f. Fl. Brit. Ind. 2 : 149. 1876, *incl. var. conferta* Baker, *l.c.*

Diffusely branched prostrate herbs with 20–40 cm long branches. Leaves 2–4 cm long with bristly rhachis ; leaflets linear oblong, 7–12 mm long. Flowers yellow with a brown rim at the base, *ca* 8 mm long. Pods moniliform, *ca* 8 mm long.

In wastelands ; 300–450 m.

Fl. & Fr. : October January.

RAIPUR : Dugli, Pithora. RAJNANDGAON : Singhari.

2. **S. sensitiva** Ait. Hort. Kew. 3 : 496. 1789.

Profusely branched prostrate herbs with 20–50 cm long branches. Leaves sensitive, 10–25 mm long ; rhachis bristly ; leaflets linear, bristly or ciliate on the midrib and the margins. Flower heads *ca* 8 mm across, on up to 25 mm long peduncles. Flowers bright yellow. Pods 4–6 jointed, papillose.

In wastelands ; 300 m.

Fl. & Fr. : October November.

RAIPUR : Raipur, Sharma 053232 (Herb. Sci. Coll. Raipur).

31. TEPHROSIA Pers.

- | | |
|---|---------------------|
| 1a. Mature pods reflexed, villous with <i>ca</i> 1 mm long spreading hairs ... | <i>T. villosa</i> 3 |
| 1b. Mature pods ascending or divaricate, glabrous, or pubescent with <i>ca</i> 0.2 mm long appressed hairs. | |

- 2a. Procumbent herbs. Racemes 1 - 3 - flowered ... *T. pumila* 1
 2b. Erect herbs. Racemes several - flowered ... *T. purpurea* 2

1. ***Tephrosia pumila* (Lamk.) Pers.** Syn. 2 : 230. 1806. *Galega pumila* Lamk. Encycl. 2 : 599. 1786. *G. procumbens* Buch. Ham. in Trans. Linn. Soc. (Bot.) 13 : 547. 1822. *T. purpurea* L. var. *pumila* Baker in Hook. f. Fl. Brit. Ind. 2 : 113. 1876. *T. procumbens* Drumm. ex Gamble, Fl. Madras Pres. 1 : 317. 1918 ; *non* Macfad. 1837.

Diffusely branched annual or perennial herbs with 15 - 40 cm long villous branches. Leaflets 7 - 13, oblanceolate, 10 - 20 × 5 - 10 mm, sericeous beneath. Racemes terminal and leaf - opposed. Flowers 6 - 8 mm long, white or pink purple. Pods ca 40 × 4 mm, curved at the tip only, nearly glabrous.

In paddy fields and in mixed forests ; 300 - 500 m.

Fl. & Fr. : August - October.

DURG : Bordih. RAIPUR : Dhamtari, Gariaband. RAJNANDGAON : Baghnadi, Deopura.

2. ***T. purpurea* (L.) Pers.** Syn. 2 : 329. 1807 ; Baker in Hook. f. Fl. Brit. Ind. 2 : 112. 1876 ; Gamble, Fl. Madras Pres. 1 : 320. 1918 ; All in Nasir & Ali, Fl. West Pakistan no. 100 : 63. 1977. *Cracca purpurea* L. Sp. Pl. 752. 1753. *Tephrosia hamiltonii* Drumm. ex Gamble, I. c. *T. purpurea* var. *pubescens* Baker in Oliver, Fl. Trop. Afr. 2 : 125. 1871 *et* in Hook. f. I.c. 113.

Annual or perennial herbs, 0.2 - 1.0 m high. Leaflets 9 - 21, obtuse, pubescent beneath. Racemes leaf - opposed, sometimes also with a few flowers in the upper leaf-axils. Flowers 6 - 9 mm long, usually pink red or purple, rarely white. Pods 3 - 4 cm long, nearly straight, pubescent.

Common in wastelands ; 250 - 550 m.

Fl. & Fr. : throughout the year.

DURG : Durg, Rajharadhalli. RAIPUR : Chhoora, Dhamtari, Raipur, Sitanadi, Taurenaga. RAJNANDGAON : Baghnadi, Singhari.

3. ***T. villosa* (L.) Pers.** Syn. 2 : 329. 1807. *Cracca villosa* L. Sp. Pl. 752. 1753.

Perennial, diffuse, erect herbs with slender hairy branches. Leaves 5 - 8 cm long ; leaflets 11 - 19, oblanceolate, mucronate, 10 - 20 × 5 - 8 mm. Racemes elongated, lower flowers fascicled, or some axillary. Flowers 10 - 15 mm long, red - purple. Pods 25 - 40 m long, 5 - 8 sceded.

In wastelands ; 330 m.

Fl. & Fr. : October.

RAIPUR : Rajim.

32. TERAMNUS P. Br.

Teramnus labialis (L. f.) Spreng. Syst. Veg. 3 : 235. 1826 ; Verdc. in Kew Bull. 24 : 266. 1970. *Glycine labialis* L. f. Suppl. 325. 1781.

Climbing or trailing twining herbs with pubescent branches. Leaflets 3, elliptic oblong, 2.0 - 6.0 × 1.5 - 3.5 cm, pubescent beneath. Racemes axillary, lax flowered, 1 - 5 cm long. Flowers ca 5 mm long, bluish white ; calyx villous, 5 toothed. Pods 40 - 55 × 3 mm, appressed hairy, with a horizontally curved beak.

Along roadsides ; 350 m.

Fl. & Fr. : October - November.

RAJNANDGAON : Singhari.

33. URARIA Desv.

- | | | |
|---|-----|---------------------------|
| 1a. Upper leaves 5 - 9 - foliolate ; leaflets linear | ... | <i>U. picta</i> 2 |
| 1b. All the leaves 1 - or 3 - foliolate ; leaflets ovate - oblong or suborbicular. | | |
| 2a. Inflorescence lax, the rachis distinctly visible. Calyx lobes subequal | ... | <i>U. rufescens</i> 3 |
| 2b. Inflorescence very dense, the rachis not visible. Lower three calyx lobes about thrice as long as the upper two | ... | <i>U. alopecuroides</i> 1 |

I. **Uraria alopecuroides** (Roxb.) Wt. Ic. t. 290. 1840. *Doodia alopecuroides* Roxb. Fl. Ind. 3 : 368. 1832. *U. lagopus* Baker in Hook. f. Fl. Brit. Ind. 2 : 156, p. p. ; non DC.

Erect or ascending hairy herbs, 20 - 40 cm high, usually woody at the base ; leaves all 1 - or 3 - foliolate, or the lower 1 - foliolate and the upper 3 - foliolate ; leaflets ovate elliptic or sometimes suborbicular, 3 - 9 × 2 - 8 cm. Inflorescence 3 - 10 cm long, ca 2 cm broad, dull or shining brown. Flowers ca 5 mm long, blue ; pedicel ca 5 mm long. Seeds glabrous or glabrescent.

In sal and mixed forests ; 450 - 800 m.

Fl. & Fr. : August - January.

RAIPUR : Dugli, Sitanadi. RAJNANDGAON : Chilpi, Khargaon.

2. *U. picta* (Jacq.) Desv. ex DC. Prodr. 2 : 324. 1825. *Hedysarum pictum* Jacq. Coll. Bot. 2 : 262. 1788. 'Vishnu - jadi.'

Perennial erect herbs or undershrubs, 0.5 - 1.0 m high. Leaflets 10 - 20 cm long, usually with yellowish or purplish green bands along the nerves. Inflorescence 7 - 12 cm long. Flowers ca 5 mm long, purplish red. Pods greyish.

In sal forests : 400 - 500 m.

Fl. & Fr. : August - September.

RAIPUR : Sitanadi. RAJNANDGAON : Baghnadi.

Root sap mixed with mother's milk is used for 'Churna' disease of the children.

3. *U. rufescens* (DC.) Schindl. in Fedde, Rep. 21 : 14. 1925. *Desmodium rufescens* DC. in Ann. Sci. Nat. 4 : 101. 1825. *Doodia hamosa* Roxb. Fl. Ind. 3 : 367. 1832. *Uraria hamosa* Wall. ex Wt. & Arn. Prodr. 222. 1834.

Perennial hairy herbs or undershrubs, 1.0 - 1.5 m high. Leaves 1 or 3 foliolate, terminal larger, elliptic ovate or oblong, 5 - 15 x 2 - 8 cm. Racemes lax, 10 - 20 cm long. Flowers ca 7 mm long, pink purple, on 3 - 6 mm long pedicels. Pods greyish brown, puberulus, 4 - 8 - jointed,

In mixed forests ; 450 m.

Fl. & Fr. : October.

RAIPUR : Gariahand.

34. Vicia L.

Vicia sativa L. Sp. Pl. 736. 1753. 'Akra.'

Slender, erect or climbing, annual herbs. Leaf - rhachis ending into 2 - 3 fid tendril ; leaflets 8 - 12, linear lanceolate, 10 - 30 x 2 - 8 mm ; stipules subsagittate. Flowers 1 - 3, axillary, 1 - 2 cm long, mauve. Pods linear, 3 - 7 cm long, deciduously pubescent, 6 - 10 seeded.

In moist wasteland ; 280 m.

Fl. & Fr. : October - January.

RAIPUR : Raipur, Simga.

35. VIGNA Savi

- 1a. Leaflets deeply lobed.
- 2a. Leaflets all 3 - lobed. ... *V. trilobata* 2
- 2b. Leaflets mostly 4 - 5 - lobed, sometimes a few 3 - lobed ... *V. aconitifolia* 1
- 1b. Leaflets entire or sinuate.
- 3a. Pods hirsute ... *V. vexillata* 4
- 3b. Pods glabrous ... *V. umbellata* 3

1. *Vigna aconitifolia* (Jacq.) Marechal in Bull. Jard. Bot. Nat. Belge 39 : 160. 1969 ; Verdc. in Kew Bull. 23 : 464. 1969. *Phaseolus aconitifolius* Jacq. Obs. Bot. 3 : 2. t. 52. 1768.

Prostrate or suberect herbs, branches clothed with yellowish spreading hairs. Leaflets palmately lobed, 3 - 6 cm long. Racemes axillary, long peduncled. Flowers yellow, ca 5 mm long. Pods 3 - 6 cm long, ca 4 mm broad, pubescent when young, ultimately glabrous, 5 - 8 - seeded.

In wastelands ; 350 m.

Fl. & Fr. : September.

DURG : Balod.

Seeds eaten in times of scarcity.

2. *V. trilobata* (L.) Verdc. in Taxon 17 : 172. 1968. *Dolichos trilobatus* L. Mant. 1 : 101. 1771. *Phaseolus trilobatus* Schreb. in Nova Acta Acad. Caes. Leop. Carol. Nat. Curios. 4 : 132. 1770. *P. trilobus* Baker in Hook. f. Fl. Brit. Ind. 2 : 201. 1876 ; *non* (L.) Ait.

Prostrate, glabrous or pubescent herbs. Leaflets 2 - 3 cm long, each 3 - lobed, the lobes spathulate, middle one largest. Racemes few - flowered, axillary, long peduncled. Flowers yellow, ca 6 mm long. Pods 3 - 5 cm long, ca 3 mm broad, 6 - 12 - seeded, glabrous or pubescent.

In wastelands : 250 - 500 m.

Fl. & Fr. : August - January.

RAIPUR : Dhamtari, Raipur. RAJNANDGAON : Deopura, Khairagath, Rajnandgaon.

Seeds eaten in times of scarcity.

3. *V. umbellata* (Thunb.) Ohwi & Ohashi in J. Jap. Bot. 44 : 31. 1969. *Dolichos umbellatus* Thunb. in Trans. Linn. Soc. 2 : 339. 1794. *Phaseolus calcaratus* Roxb. Fl. Ind. 3 : 289. 1832. *Vigna calcarata* Kurz in J. Asiatic.

Soc. Bengal 45 : 247. 1876.

Prostrate or climbing herbs, branches deciduously hairy. Leaflets 3, entire, sinuate, or sometimes 3 lobed, 2-10 cm long, tip acute acuminate. Racemes axillary, peduncled. Flowers ca 1 cm long, yellow. Pods 5-8 cm long, ca 4 mm broad, 8-12 seeded.

In wastelands ; 400 m.

Fl. & Fr. : November.

RAJNANDGAON : Taregaon.

Seeds eaten in times of scarcity.

4. *V. vexillata* (L.) A. Rich. Hist. Fis. Polit. Nat. 1. Cuba (Spanish ed.) 11 : 191. 1845. *Phaseolus vexillatus* L. Sp. Pl. 724. 1753. *Vigna capensis* auct. ; *non* (L.) Walp.

Prostrate or climbing herbs, branches glabrous or puberulus. Leaflets 3, entire, ovate lanceolate, acute or acuminate, 2-8 cm long, 0.5-2.5 cm broad. Inflorescence axillary, 2-6 flowered, subumbellate. Flowers 20-35 mm long, yellow or purplish. Pods 4-15 cm long, brown hairy, 10-18 seeded.

In wastelands ; 450 m.

Fl. & Fr. : September.

RAJNANDGAON : Baghnadi.

36. ZORNIA Gmel.

Zornia gibbosa Span. in Linnaca 15 : 192. 1841. *Z. diphylla* auct. ; Baker in Hook. f. Fl. Brit. Ind. 2 : 147. 1876 ; *non* (L.) Pers.

Slender, annual, prostrate or ascending herbs. Leaflets 2, linear lanceolate, 15-25 × 2 mm with black glands. Spikes lax, 3-6 cm long. Flowers hidden within a pair of foliaceous bracts, yellow with pinkish base. Pods 5-10 mm long, jointed, echinate.

In wastelands and forest floors ; 300-400 m.

Fl. & Fr. : August - November.

DURG : Balod. RAIPUR : Chhoora, Rajim. RAJNANDGAON : Baghnadi, Singhari.

41. CAESALPINIACEAE
(D. M. Verma & M. I. Hanfi)

- 1a. Primary leaf - rhachis and stipules modified into spines ; secondary rhachis flattened. Pods moniliform ... *Parkinsonia* 6
- 1b. Plants not as above.
 - 2a. Leaves simple or two - foliolate.
 - 3a. Petals present ... *Bauhinia* 1
 - 3b. Petals absent ... *Hardwickia* 5
 - 2b. Leaves compound, four - numerous - foliolate.
 - 4a. Leaves once - pinnate.
 - 5a. Trees. Leaflets 10 - 20 pairs, linear oblong, 10 - 25 mm long. Petals 3 well developed and 2 reduced to filamentous scales ; stamens 3 ... *Tamarindus* 8
 - 5b. Trees, shrubs or herbs. Leaflets not as above. Petals 5, subequal ; stamens 4 - 10... *Cassia* 3
 - 4b. Leaves twice - pinnate.
 - 6a. Sepals in bud valvate ... *Delonix* 4
 - 6b. Sepals in bud imbricate.
 - 7a. Erect or climbing shrubs, usually prickly. Pods not winged ... *Caesalpinia* 2
 - 7b. Trees, unarmed. Pods winged at both the sutures ... *Peltophorum* 7

1. BAUHINIA L.

- 1a. Stout tendril climbers ... *B. vahlii* 5
- 1b. Trees or shrubs ; tendrils absent.
 - 2a. Petals 4 - 5 cm long ; stamens 2 - 3 ... *B. purpurea* 2
 - 2b. Petals c. 1 cm long ; stamens 3 or 10.
 - 3a. Leaf at the apex entire or scarcely retuse. Stamens 3 ... *B. semia* 4

3b. Leaf at the apex distinctly bilobed. Stamens 10.

4a. Plants flowering between September - November. Pedicels of the lower flowers 10 - 25 mm long ; stigma sessile ... *B. malabarica* 1

4b. Plants flowering between April - June. Pedicels all 1 3 mm long ; stigma on slender style ... *B. racemosa* 3

1. ***Bauhinia malabarica*** Roxb. Fl. Ind. 2 : 321. 1832. *Piliostigma malabaricum* Benth. in Miq. Pl. Jung. 261. 1852. 'Koliari, Raini, Sampatta'.

Small bushy evergreen trees with greyish brown bark and pink red blaze. Leaves lobed from one-eighth to one-third way down, 3 10 cm broad, cordate at the base. Flowers in tomentose subcorymbose racemes, white, slenderly pedicelled ; petals 10 15 mm long. Pods 15 30 × 2 cm, beaked.

In mixed forests, sometimes planted ; 400 700 m.

Fl. : September November ; *Fr.* : January April.

RAIPUR : Dugli, Pithora, Taurenga. RAJNANDGAON : Malaidah, Salewara.

Young leaves eaten cooked.

2. ***B. purpurea*** L. Sp. Pl. 375. 1753. 'Kolar, Koliari, Schara.'

Small evergreen trees with greyish to dark brown rough bark and pink red blaze. Leaves lobed from about half-way down to almost to the base, 10 20 cm long. Panicles few flowered, terminal. Petals 4 - 5 cm long, purple or white with purple claws and mouth. Pods 15 25 × 2 cm.

Along roadsides and in mixed forests ; sometimes planted ; 350 500 m.

Fl. : October November ; *Fr.* : March.

RAIPUR : Pithora, Taurenga. RAJNANDGAON : Deopura.

Leaves eaten cooked ; bark yields a fibre.

3. **B. racemosa** Lamk. Encycl. 1 : 390. 1785. *Piliostigma racemosa* Benth. in Miq. Pl. Jungh. 262. 1852. 'Kathool, Phalesa'.

Small evergreen trees with irregularly breaking greyish black bark and deep red blaze. Leaves rotundate, lobed to about one third way down, 3–6 cm broad, glaucous beneath, shallowly cordate at the base. Flowers in 5–10 cm long racemes, white; petals ca 1 cm long. Pods compressed, 10–25 cm long, often twisted, green, drying black.

Common along roadsides and in mixed and sal forests; 300–600 m.

Fl. : April–June; *Fr.* : persisting throughout the year.

DURG : Balod, Budbhumi. RAIPUR : Dhamtari, Indagaon, Pithora, Sitanadi. RAJNANDGAON : Baghnadi, Khargaon, Taregaon.

4. **B. semia** Wunderlin in Taxon 25 : 362. 1976. *B. retusa* Roxb. Fl. Ind. 2 : 322. 1832; *non* Poir. 1811. *B. emarginata* Roxb. ex G. Don Gen. Syst. 2 : 462. 1832; *non* Mill. 1768. *Lasiobema retusa* de Wit in Reinwardt. 3 : 538. 1956. 'Sehra.'

Medium-sized evergreen trees with greyish brown bark and pale pink blaze. Leaves rotundate, 8–15 cm long, apex entire or retuse, base truncate or slightly cordate. Flowers in lax terminal panicles, ca 25 mm across; petals yellowish white, upper 3 purple mottled on the margins. Pods 12–17 × 3–4 cm.

In mixed forests; 400–500 m.

Fl. : October–November.

RAIPUR : Mainpur. RAJNANDGAON : Deopura.

Bark yields a gum used in medicine and sweetmeats.

5. **B. vahlii** Wt. & Arn. Prodr. 297. 1834. *Phanera vahlii* Benth. in Miq. Pl. Jungh. 263. 1852. 'Mahul.'

Huge tendril climbers, young branches and tendrils brown tomentose. Leaves orbicular, 10–40 cm long, lobed to about half-way down with a stout mucro in the sinus. Racemes subcorymbose. Flowers white or buff; petals 2–4 cm long. Pods woody, 20–30 × 4–7 cm, rusty velvety.

Common in mixed and sal forests; 400–800 m.

Fl. : April May ; *Fr.* : January.

RAIPUR : Sitanadi. RAJNANDGAON : Chilpi.

Bark yields fibre used for making ropes, leaves for cups and plates, and seeds eaten ; also medicinal.

2. CAESALPINIA L.

1a. Stamens 2 - 3 - times as long as the petals	...	<i>C. pulcherrima</i> 3
1b. Stamens about as long as the petals.		
2a. Pods prickly	...	<i>C. bonduc</i> 1
2b. Pods smooth	...	<i>C. decapetala</i> 2

1. *Caesalpinia bonduc* (L.) Roxb. Fl. Ind. 2 : 362. 1832. *Guilandina bonduc* L. Sp. Pl. 381. 1753. *C. crista* L. Sp. Pl. 380. 1753, p.p., Haines, Bot. Bihar & Orissa. 1922. (repr. ed. 2 : 331. 1961.) *C. bonducella* (L.) Fleming in As. Res. 11 : 159. 1810 ; Baker in Hook. f. Fl. Brit. Ind. 2 : 254. 1878. *G. bonducella* L. Sp. Pl. ed. 2, 545. 1762.

Very spiny climbing shrubs. Leaves 20 - 60 cm long ; pinnae 5 - 9 pairs, 7 - 20 cm long ; leaflets 10 - 24 pairs, elliptic oblong, 2.0 - 6.0 × 0.8 - 2.2 cm ; stipules pinnately compound, consisting of 3 - 5 ovate rhomboid, ca 5 mm long leaflets. Flowers ca 1 cm across, yellow ; bracts spreading. Pods 5 - 7 × 3 - 5 cm, clothed with 5 - 10 mm long prickles ; seeds 2.

Along roadsides : 300 - 500 m.

Fl. & *Fr.* : August October.

RAIPUR : Balodabazar, Raipur. RAJNANDGAON : Baghnadi, Deopura.

2. *C. decapetala* (Roth) Alston in Trimen, Handb. Fl. Ceylon 6. Suppl. 89. 1931. *Reichardia decapetala* Roth, Nov. Pl. Sp. 212. 1821. *Caesalpinia sepiaria* Roxb. Fl. Ind. 2 : 360. 1832.

Prickly climbing shrubs. Leaves 10 - 35 cm long ; stipules subsagittate ; pinnae 5 - 10 pairs ; leaflets 8 - 12 pairs, oblong, 15 - 20 × 5 - 10 mm.

Flowers yellow, in 30-40 cm long racemes; petals suborbicular, 10-15 mm long. Pods woody, 6-13 × 2-3 cm, beaked.

Along cultivated fields; 320 m.

Fl. : October - November.

RAJNANDGAON : Singhari.

3. *C. pulcherrima* (L.) Swartz, Obs. 166. 1791. *Poinciana pulcherrima* L. Sp. Pl. 380. 1753.

Shrubs with rather slender sometimes prickly branches. Leaves bipinnate, 10-45 cm long; pinnae 4-12 pairs; leaflets oblong, 12-15 × 3-7 mm, apiculate. Flowers in erect 15-30 cm long racemes, orange-yellow or red; one of the petals with longer claw and crisped blade. Pods straight, 5-8 cm long, ca 17 mm broad.

Commonly planted as an ornamental; 300-450 m.

Fl. & *Fr.* : September - January.

RAIPUR : Raipur. RAJNANDGAON : Rajnandgaon.

3. CASSIA L.

- 1a. Trees. Leaflets 4-9 cm broad. Flowers before or along-with the young leaves. Pods terete, indehiscent, 20-40 cm long ... *C. fistula* 2
- 1b. Plants not as above.
- 2a. Leaflets all 0.5-5.0 mm broad.
 - 3a. Petiolar gland stipitate, peltate ... *C. pumila* 5
 - 3b. Petiolar gland sessile ... *C. mimosoides* 3
- 2b. Leaflets at least some more than 10 mm broad.
 - 4a. Leaflets 2 pairs. Pods 2-4 cm long ... *C. absus* 1
 - 4b. Leaflets 3-14 pairs. Pods 10-30 cm long.
 - 5a. Leaflets 3 pairs, obovate. Pods subterete or sub-tetragonal ... *C. tora* 7
 - 5b. Leaflets 3-14 pairs, ovate-lanceolate or elliptic-oblong. Pods compressed.
 - 6a. Leaflets mostly ovate-lanceolate with acute or acuminate apex, a few some-

- times elliptic - oblong, obtuse. Pods with
a brown median band and yellowish
green margins ... *C. occidentalis* 4
- 6b. Leaflets elliptic - oblong, rounded at the
apex with a small bristle from its sinus.
Pods brown, concolorous ... *C. siamea* 6

1. Cassia absus L. Sp. Pl. 376. 1753.

Viscous hairy herbs, 20 - 60 cm tall. Leaflets broadly elliptic or obovate, oblique, 2 - 3 × 1 - 2 cm, pubescent on both the surfaces. Racemes terminal or leaf - opposed, 4 - 12 cm long. Flowers pink red, ca 7 mm long ; disc bristly. Pods flat, 3 - 4 × 1 cm, hairy, 4 - 8 seeded.

In wastelands and among rock boulders ; 300 - 550 m.

Fl. & Fr. : August November.

DURG : Balod. RAIPUR : Taurenga. RAJNANDGAON : Deopura, Taregaon.

2. C. fistula L. Sp. Pl. 377. 1753. 'Dhan - buhar, Amaltas'

Medium sized deciduous trees ; bark of young branches smooth, grey, of old branches rough, brown. Leaves 20 - 40 cm long ; leaflets 3 - 8 pairs, ovate oblong, 5 - 15 × 4 - 9 cm. Flowers in 10 - 40 cm long drooping racemes, large, bright lemon yellow. Pods many seeded, ultimately black.

In mixed forests, commonly planted as an ornamental along roads and in gardens ; 300 - 500 m.

Fl. : March May ; *Fr.* : persisting throughout the year.

DURG : Budhum. RAIPUR : Dugli, Taurenga. RAJNANDGAON : Salewara.

Pulp of the fruits medicinally used.

3. C. mimosoides L. Sp. Pl. 379. 1753.

Slender herbs or undershrubs, 20 - 60 cm high. Leaves 5 - 10 cm long, rhachis clothed with somewhat curled hairs ; leaflets numerous,

linear, *ca* 4 mm long, sensitive to touch. Flowers solitary, rarely paired, 5–8 mm long, yellow. Pods 3–5 cm long, many seeded.

In roadside ditches ; 350–650 m.

Fl. & Fr. : April–October.

DURG : Talgaon. RAIPUR : Taurenga. RAJNANDGAON : Deopura.

4. *C. occidentalis* L. Sp. Pl. 377. 1753. '*Ban chironta*'

Stout suffruticose foetid smelling herbs or undershrubs, up to 2 m tall. Leaves 10–20 cm long ; leaflets 3–5 pairs, ovate lanceolate or oblong, 2–9 × 1–3 cm. Flowers in corymbose racemes, *ca* 12 mm across, yellow. Pods 7–12 cm long, *ca* 7 mm broad, septate, 20–30 seeded.

Along roadsides and forest margins ; 250–550 m.

Fl. & Fr. : August–January.

RAIPUR : Raipur, Rajim, Sitanadi. RAJNANDGAON : Baghnadi.

Various parts medicinally used ; seeds eaten roasted.

5. *C. pumila* Lamk. Encycl. 1 : 651. 1785.

Decumbent or erect annual herbs, 10–40 cm high, branches clothed with rather curled hairs. Leaves 3–6 cm long ; leaflets 6–25 pairs, obliquely linear-oblong, 5–13 × 1–3 mm. Flowers 1–3 together, *ca* 5 mm long, yellow. Pods 20–45 × 3–5 mm, pilose, 6–16 seeded.

In mixed forests ; 300–500 m.

Fl. & Fr. : August–November.

DURG : Balod, Bordih. RAIPUR : Gariaband. RAJNANDGAON : Baghnadi, Singhari.

6. *C. siamea* Lamk. Encycl. 684. 1785.

Evergreen trees. Leaves 10–25 cm long ; leaflets 4–16 pairs, oblong, 3–7 cm long, 10–25 mm broad, emarginate with a small bristle from the sinus. Flowers in up to 10 cm long, panicles of corymbbs, bright yellow ; petals 1–2 cm long. Pods compressed, 15–30 cm long, 10–15 mm broad.

Planted on roadsides ; 300–450 m.

Fl. : October November ; *Fr.* : May.

RAIPUR : Dhamtari. RAJNANDGAON : Baghnadi.

7. *C. tora* L. Sp. Pl. 376. 1753. 'Chekor'.

Annual erect herbs or undershrubs, 0.2–1.2 m high. Leaves 5–10 cm long; stipules 8–15 × 1 mm. Leaflets 0.5–5.0 × 0.5–2.5 cm, with glands between two lower pair of leaflets. Peduncles 1–2-flowered. Flowers yellow; pedicels 4–10 mm long; petals 8–10 mm long. Pods subtetragonal, 10–20 cm long, ca 5 mm broad, on 5–15 mm long pedicel; areoles on the seed 1.5–2.5 mm broad.

Common in wastelands and forest margins; 250–450 m.

Fl. & *Fr.* : August June.

DURG : Rajhara-dhalli. RAIPUR : Baghbahara, Dhamtari, Kasdol, Sitanadi. RAJNANDGAON : Baghnadi.

Leaves and seeds medicinal, sometimes sold in local markets.

4. *DEOLONIX* Raf.

- | | |
|---|-------------------|
| 1a. Pinnae 4–8 pairs; leaflets 10–20 pairs. Flowers white or pale yellow ... | <i>D. elata</i> 1 |
| 1b. Pinnae 11–18 pairs; leaflets 20–30 pairs. Flowers orange-vermilion or scarlet ... | <i>D. regia</i> 2 |

1. *Delonix elata* (L.) Gamble, Fl. Madras Pres. 1 : 396. 1919.
Poinciana elata L. Cent. Pl. 2 : 16. 1756.

Trees with greyish bark, 5–10 m tall. Leaves 5–20 cm long, pinnae ca 5 cm long; leaflets linear oblong, 7–15 × 2–3 mm. Racemes terminal. Flowers mildly scented; calyx silky; petals white turning yellow, ca 2.5 cm long. Pods 12–20 cm long, 5–25 mm broad, 4–8-seeded.

Sometimes planted as an ornamental; 300 m.

Fl. : January.

RAIPUR : Raipur.

2. *D. regia* (Bojer ex Hook.) Rafin. Fl. Tellur 2 : 92. 1836. *Pain-ciana regia* Bojer ex Hook. in Bot. Mag. 56. t. 2884. 1829. 'Gul-mohar'.

Deciduous trees. Leaves up to 60 cm long ; leaflets oblong, 7 - 10 \times 3 - 4 mm. Racemes terminal or axillary. Flowers ca 10 cm across ; standard yellow or white, streaked with red ; stamens much exserted. Pods compressed, 30 - 50 cm long, ca 5 cm broad ; seeds 20 - 40, mottled.

Commonly planted in the gardens and along roadsides ; 250 - 500 m.

Fl. : April - August.

RAIPUR : Dhamtari, Raipur. RAJNANDGAON : Baghnadi.

5. HARDWICKIA Roxb.

Hardwickia binata Roxb. Corom. Pl. 3 : 6. t. 209. 1819 'Anjan'.

Large trees with rather drooping branches. Leaves of only two palmately nerved glaucous leaflets ; leaflets coriaceous, obliquely ovate, 3 - 6 \times 1 - 3 cm. Flowers in slender panicles ; sepals petaloid, ca 5 mm long, yellowish green ; petals absent. Pods strap shaped, 5 - 10 cm long, with a solitary subapical seed.

In mixed forests ; 450 m.

Fl. & Fr. : February.

RAIPUR : Sitanadi.

6. PARKINSONIA L.

Parkinsonia aculeata L. Sp. Pl. 375. 1753.

Shrubs or small trees with rather drooping branches and thorn like leaf rhachises. Leaves bipinnate (apparently simply pinnate) ; rhachis of the pinnae flattened ; leaflets numerous, 3 - 5 mm long. Petals ca 15 mm long, yellow, the uppermost red brown mottled. Pods 8 - 10 cm long, constricted between the seeds.

Usually planted along roadsides ; 300 - 400 m.

Fl. & Fr. : April.

DURG : Durg. RAJNANDGAON : Khairagarh.

7. PELTOPHORUM (Vogel.) Benth.

Peltophorum pterocarpum (DC.) Backer ex K. Heyne in Nutt. Pl. Ned. Ind. ed 2, 2 : 755, 1927. *Inga pterocarpa* DC. Prodr. 2 : 441, 1825. *P. ferrugineum* Benth. Fl. Austral. 2 : 279, 1864.

Trees with smooth grey bark. Leaves bipinnate, rachis 15–30 cm long; leaflets numerous, obliquely oblong, notched, 8–25 × 3–10 mm. Racemes or panicles rusty tomentose. Calyx reddish; petals suborbicular, wrinkled, 18–25 mm long, yellow. Pods thin, 5–10 cm long, coppery red.

Commonly planted as an avenue tree; 250–350 m.

Fl. : April–September; *Fr.* : January.

DURG : Durg. RAIPUR : Dhamtari, Raipur, RAJNANDGAON : Rajnandgaon.

8. TAMARINDUS L.

Tamarindus indica L. Sp. Pl. 34, 1753. ‘*Imli*’

Large evergreen trees. Leaves 4–15 cm long; leaflets 10–20 pairs, oblong, 12–18 × 4–5 mm, obtuse. Racemes lax, several flowered. Calyx tube turbinate, lower two teeth connate, petals only 3 well developed, 10–15 mm long, yellow with red veins, the lower 2 reduced to filamentous scales. Pods linear, indehiscent, 5–12 cm long, with brown crustaceous epicarp and pulpy mesocarp.

Common along roadsides; 250–500 m.

Fl. : May–June; *Fr.* : January.

RAIPUR : Dhamtari, Sitanadi.

Fruit - juice obtained after soaking ripe fruits in water is commonly used in various dishes; also medicinal.

42. MIMOSACEAE

(D. M. Verma & M. I. Hanfi)

- 1a. Petioles modified into phyllodes ... *Acacia* 1
- 1b. Petioles not modified into phyllodes.
- 2a. Pinnae of the leaves two or four, digitately arranged.
- 3a. Leaflets upper 7 - 20 cm long. Pods ca 5 cm broad ... *Xyloia* 10
- 3b. Leaflets all 0.3 - 4.0 cm long. Pods 0.3 - 1.5 cm broad.
- 4a. Trees or shrubs. Pinnae with only two 2 - 4 cm long leaflets. Pods smooth, coiled ... *Pithecellobium* 7
- 4b. Herbs. Pinnae with several 0.3 - 0.5 cm long leaflets. Pods prickly, straight ... *Mimosa* 4
- 2b. Pinnae of the leaves mostly several, pinnately arranged.
- 5a. Aquatic herbs with radical fibres at the nodes and whorls of spongy floats on the internodes ... *Neptunia* 5
- 5b. Plants not as above.
- 6a. Flowers in elongated spikes.
- 7a. Stamens many. Pods flat ... *Acacia* 1
- 7b. Stamens 10. Pods turgid ... *Prosopis* 8
- 6b. Flowers in globose heads.
- 8a. Flower heads clavate with a constriction about one - third way up, 2 - 3 cm across, solitary, hanging on 10 - 15 cm long peduncles ... *Parkia* 6
- 8b. Flower heads not as above.
- 9a. Spiny or prickly trees, shrubs or scramblers.
- 10a. Stamens 4 or 8. Pods separating from the persistent wiry sutures and breaking up into 1 - seeded joints ... *Mimosa* 4
- 10b. Stamens many. Pods not breaking up as above ... *Acacia* 1
- 9b. Unarmed trees or shrubs.
- 11a. Leaflets 7 - 30 mm broad.

- 12a. Flowers white or creamy.
Pods thin, flat, dry ... *Albizia* 2
- 12b. Flowers pink - rose. Pods thick, sub - cylindric, fleshy ... *Samanea* 9
- 11b. Leaflets 1 - 3 mm broad.
- 13a. Stamens many, free. Pods 4 - 7 mm broad, tomentose ... *Acacia* 1
- 13b. Stamens 10, or if many then united. Pods 8 - 30 mm broad, thinly pubescent.
- 14a. Shrubs. Flowers white ; stamens 10, free ... *Leucaena* 3
- 14b. Trees. Flowers yellow ; stamens many, united ... *Albizia* 2

1. ACACIA Mill.

- 1a. Flowers in elongated spikes.
- 2a. Petioles modified into phyllodes ... *A. auriculiformis* 1
- 2b. Petioles not modified into phyllodes ... *A. catechu* 2
- 1b. Flowers in globose heads.
- 3a. Branches, and usually the petioles also, prickly ; stipular spines absent.
- 4a. Gland on the petiole conical ; leaflets 2.0 - 2.5 mm broad ... *A. torta* 8
- 4b. Gland on the petiole flattish ; leaflets 0.8 - 1.5 mm broad.
- 5a. Climbing shrubs. Petioles 3.0 - 4.5 cm long ; pinnae usually 6 - 12 pairs, sometimes up to 20 pairs ... *A. pennata* 7
- 5b. Trees, sometimes with rather slender branches. Petioles 1 - 2 cm long ; pinnae usually 16 - 20 pairs, sometimes 10 - 27 pairs ... *A. donaldii* 3

- 3b. Branches and petioles not prickly ; stipular spines present or absent.
- 6a. Heads in terminal panicles ... *A. leucophloea* 5
- 6b. Heads axillary, solitary or few fascicled.
- 7a. Lower pairs of pinnae mostly 5 - 7 mm apart. Pods cylindric ... *A. farnesiana* 4
- 7b. Lower pairs of pinnae mostly 10 - 15 mm apart. Pods moniliform ... *A. nilotica* ssp. *indica* 6

1. ***Acacia auriculiformis*** A. Cunn. ex Benth. in Hooker, London J. Bot. 1 : 377. 1842.

Small trees with smooth white bark. Phyllodes laterally compressed, falcate, 8 - 15 × 1 - 2 cm, with 4 - 6 principal nerves. Spikes axillary, 4 - 6 cm long. Flowers ca 5 mm long, white ; calyx toothed. Pods woody, compressed, twisted into a spiral.

Native of Australia, frequently planted as an ornamental ; 250 - 500 m.

Fl. : August - September ; *Fr.* : January - May.

DURG : Bhilai. RAIPUR : Raipur, Sitanadi. RAJNANDGAON : Baghnadi.

2. ***A. catechu* (L. f.) Willd.** Sp. Pl. 4 : 1079. 1806. *Mimosa catechu* L. f. Suppl. 439. 1781. 'Khair'.

Small trees with hooked stipular spines, irregularly splitting black bark and red blaze. Pinnae 7 - 24 pairs with 1 - 4 cm long pubescent rachilla ; leaflets 6 - 35 pairs, linear, 3 - 5 × 1 - 2 mm. Flowers small, greenish white, yellowish with age. Pods thin, irregularly constricted, 4 - 10 cm long, brown.

In open mixed forests ; 300 - 400 m.

Fl. : June ; *Fr.* : October - June.

RAIPUR : Baghbahara, Chhoora, Pithora. RAJNANDGAON : Singhari.

'Kattha' or 'Kaith' chewed with betel is obtained by boiling chips of its wood. The wood is also used as house posts.

3. *A. donaldi* Haines, Descr. List of trees, shrubs and economic herbs, Southern Circle, C. P. 100 - 101. 1916 et in Ind. For. 43 : 88 - 89. 1917.

Small trees, sometimes with rather slender branches. Leaf - rhachis usually 10 - 15 cm long, sometimes up to 25 cm long ; leaflets 25 - 40 pairs, linear, 6 - 12 × 1 mm. Heads ca 12 mm across, white or creamy. Pods attenuated at the base, 8 - 15 cm long, 20 - 25 mm broad, brownish white, ultimately grey.

In mixed forests ; 300 m.

Fl. : July August ; *Fr.* : November January.

RAIPUR : Dhamtari.

4. *A. farnesiana* (L.) Willd. Sp. Pl. 1083. 1806. *Mimosa farnesiana* L. Sp. Pl. 521. 1753.

Small trees or shrubs, with 3 - 20 mm long stipular spines. Leaves ca 5 cm long bearing 5 - 7 pairs of 1 - 3 cm long pinnae, the rhachis often ending in a spine. Heads ca 15 mm across, usually clustered. Flowers yellow, fragrant. Pods 5 - 7 cm long, turgid.

Along river banks ; 300 m.

Fl. : August ; *Fr.* : January.

RAIPUR : Raipur.

5. *A. leucophloea* (Roxb.) Willd. Sp. Pl. 4 : 1083. 1806. *Mimosa leucophloea* Roxb. Pl. Corom. 2 : 27. t. 150. 1800.

Small trees with smooth whitish branches, old trunks rough, blackish; stipular spines present or absent. Leaves 3 - 8 cm long, with 6 - 10 pairs of 2 - 3 cm long pinnae ; leaflets 15 - 30 pairs, linear, ca 5 × 1 mm. Heads ca 5 mm across, white, in large tomentose panicles. Pods thick, linear, 7 - 15 cm long, ca 8 mm broad.

Common along roadsides ; 300 - 450 m.

Fl. : August September ; *Fr.* : November.

DURG : Balod. RAIPUR : Dhamtari, Raipur. RAJNANDGAON : Rajnandgaon, Taregaon.

6. *A. nilotica* (L.) Willd. ex Delile ssp. *indica* (Benth.) Brenan in Kew Bull. 12 : 84. 1957. *A. arabica* auct. ; *non* (Lamk.) Willd. *A. arabica* var. *indica* Benth. London J. Bot. 1 : 500. 1842. *A. nilotica* var. *indica* (Benth.) Hill. in Bot. Mus. Leafl. Harvard Univ. 8 : 9. 1940. 'Babool'.

Trees, 3–7 m high with greyish black fissured bark and large stipular spines. Pinnae 2–7 pairs; leaflets 3–5 × 1 mm. Heads long peduncled, ca 1 cm across, bright yellow. Pods 5–12 cm long, velvety, constricted.

In open lands and along roadsides; 250–500 m.

Fl. : May August ; *Fr.* : October April.

DURG : Balod, Durg. RAIPUR : Raipur, Sitanadi. RAJNANDGAON : Khairagarh.

7. *A. pennata* (L.) Willd. Sp. Pl. 4 : 1090. 1806. *Mimosa pennata* L. Sp. Pl. 522. 1753.

Large shrubby climbers with 5 angled branches prickly on the angles. Leaves ca 10 cm long, bearing ca 6 cm long pinnae; leaflets 50–60 pairs, linear, ca 6 × 1 mm. Panicle 10–15 cm long; heads 1–2 cm across, white. Pods strap shaped, ca 15 × 2 cm, pale brown.

Along streams, on sandy soil; 480 m.

Fr. : June.

RAIPUR : Gariaband.

8. *A. torta* (Roxb.) Craib in Kew Bull. Misc. Inform. 1915 : 410. 1915. *Mimosa torta* Roxb. Fl. Ind. 2 : 566. 1832.

Climbing shrubs; branches greyish, with five rows of prickles, tomentose when young. Leaf - rhachis 15–30 cm long, bearing 10–20 pairs of 5–10 cm long pinnae; leaflets 25–45 pairs, linear - oblong, 5–8 × 3 mm. Heads panicled, ca 1 cm across, white. Pods flat, 8.0–13.0 × 1.5–2.5 cm, deciduously rusty tomentose.

Common in mixed and sal forests; 300–550 m.

Fl. : April August ; *Fr.* : throughout the year.

DURG : Rajolidhah. RAIPUR : Dhamtari, Sitanadi, Tautenga. RAJNANDGAON : Baghnadi, Taregaon.

2. *ALBIZIA* Durazz.

- 1a. Leaflets 4 - 7 mm long, 1.5 - 2.0 mm broad ... *A. amara* 1
- 1b. Leaflets 15 - 55 mm long, 5 - 30 mm broad.
- 2a. Flowers on 3 - 5 mm long pedicels. Pods stramineus when dry. ... *A. lebbeck* 2
- 2b. Flowers sessile or subsessile. Pods dark reddish brown or blackish brown when dry.
- 3a. Midrib of the leaflets closer to its upper margin... *A. odoratissima* 3
- 3b. Midrib of the leaflets closer to its lower margin... *A. procera* 4

1. *Albizia amara* (Roxb.) Boivin, Encycl. 19 Siecle 2 : 34. 1838.
Mimosa amara Roxb. Pl. Corom. t. 122. 1799.

Deciduous trees with smooth greenish bark ; young branches and leaf - rhachis yellow pubescent. Leaf - rhachis 5 - 12 cm long, bearing 6 - 15 pairs of 3 - 8 cm long pinnae ; leaflets 15 - 25 pairs, linear, midrib almost central. Flower heads 1 - 2 cm across, yellow, fragrant. Pods 10 - 15 × 2 - 3 cm, greyish brown.

Fl. : March May.

RAIPUR : Laon (*cf.* Haines, Descri. list of trees, shrubs & economic herbs, Southern Circle, C. P. 106. 1916.).

2. *A. lebbeck* (L.) Benth. in Hook. London J. Bot. 3 : 87. 1844.
Mimosa lebbeck L. Sp. Pl. 516. 1753. 'Siris'.

Deciduous trees ; old branches blackish, young greyish. Leaf - rhachis 7 - 20 cm long, bearing 2 - 4 pairs of 7 - 12 cm long pinnae ; leaflets 5 - 9 pairs, elliptic oblong, sometimes sinuate, 2 - 4 × 1 - 2 cm, midrib closer to the upper margin. Heads 1 - 3 together, white, fragrant. Pods 15 - 30 × 2 - 4 cm.

Commonly planted on the roadsides, sometimes wild ; 300 - 450 m.

Fl. : April June ; *Fr.* : October April.

RAIPUR : Gariaband, Pithora. RAJNANDGAON : Khairagarh.

3. *A. odoratissima* (L.f.) Benth. in Hook. London. J. Bot. 3 : 88. 1844. *Mimosa odoratissima* L.f. Suppl. 437. 1781. 'Chichwa, Jad - khair'

Medium sized trees with greyish bark. Leaves with 2 - 5 pairs of 8 - 15 cm long pinnae ; leaflets 6 - 24 pairs, elliptic oblong, 15 - 30 × 5 - 10 mm, pale beneath. Panicles downy ; heads ca 2 mm across, white. Pods 12 - 25 cm long, ca 2.5 cm broad.

In mixed forests ; 300 - 600 m.

Fl. : May ; *Fr.* : October - June.

DURG : Budbhumi. RAIPUR : Gariaband, Kasdol, Taurenga. RAJNANDGAON : Baghnadi.

4. *A. procera* (Roxb.) Benth. in Hook. London J. Bot. 3 : 89. 1844.
Mimosa procera Roxb. Corom. Pl. 2 : 12. t. 121. 1798. 'Safed Siris'.

Large deciduous trees with greenish white or brownish bark. Leaves with 3 - 6 pairs of pinnae ; leaflets 5 - 11 pairs, broadly oblong or even roundish, 25 - 55 × 15 - 30 mm, deciduously hairy. Panicles 10 - 30 cm long ; heads white. Pods 10 - 20 cm long, 10 - 25 mm broad.

Along roadsides ; 300 - 450 m.

Fl. : August - September ; *Fr.* : January - May.

DURG : Balod. RAIPUR : Raipur. RAJNANDGAON : Salewara.

Wood used for making carts and agricultural implements.

3. LEUCAENA Benth.

Leucaena leucocephala (Lamk.) de Wit in Taxon 10 : 53. 1961.
Mimosa leucocephala Lamk. Encycl. 1 : 12. 1783. *L. glauca* Benth. in Hooker, London J. Bot. 4 : 416. 1842.

Shrubs or small trees. Leaf - rhachis ending in a weak bristle ; pinnae 4 - 8 pairs ; leaflets 10 - 15 pairs, linear, 7 - 12 mm long, glaucous beneath. Heads ca 25 mm across, white or yellowish ; ovary stipitate. Pods flat, ca 15 cm long, many seeded.

Planted as ornamental ; 450 m.

Fl. & *Fr.* : August - September.

RAJNANDGAON : Rajnandgaon.

4. MIMOSA L.

- 1a. Shrubs. Pinnae 8 - 12 pairs, pinnately arranged. Pods 5 - 8 cm long ... *M. himalayana* 1
- 1b. Herbs. Pinnae 1 - 2 pairs, digitately arranged. Pods 2 - 3 cm long ... *M. pudica* 2

1. ***Mimosa himalayana*** Gamble in Kew Bull. 1920 : 4. 1920. *M. rubicaulis* Baker in Hook. f. Fl. Brit. Ind. 2 : 291. 1878, p. p.; non Lamk.

Shrubs or small trees with slender prickly branches. Leaf-rachis 6 - 25 cm long, prickly, bearing 6 - 10 pairs of 2 - 5 cm long pinnae; leaflets 7 - 10 pairs, linear, 3 - 10 mm long, 1.0 - 2.5 mm broad. Heads 1 - 2 together in leaf-axils, and in terminal panicles, 10 - 12 mm across, pink red. Pods 5 - 9 cm long, 9 - 12 mm broad, pale or dark brown, sutures usually smooth, rarely with 1 - 3 prickles (in the same twig).

In wastelands ; 450 m.

Fl. : August September ; *Fr.* : January June.

RAIPUR : Gariaband.

2. ***M. pudica*** L. Sp. Pl. 518. 1753. 'Lanjui.'

Small woody herbs or undershrubs with slender prickly branches. Leaves long petioled; pinnae 2.5 - 5.0 cm long; leaflets linear, 7 - 10 × 1 - 2 mm; stipules ciliate. Heads peduncled, axillary, ca 1 cm across, pink-purple. Pods 15 - 25 × 3 mm, closely prickly on the sutures.

On forest margins ; 600 m.

Fl. & *Fr.* : August.

RAIPUR : Borai.

5. NEPTUNIA Lour.

Neptunia oleracea Lour. Fl. Cochinch. 654. 1790.

Slender floating aquatic herbs. Pinnae 2 - 3 pairs, 5 - 8 cm long; leaflets 8-15 pairs, linear, 8 - 12 mm long. Heads axillary, long peduncled oblong, ca 12 mm across bearing polymorphous flowers, upper flowers bisexual, lower reduced to 5 - 7 mm long stramineous ligulate staminodes. Pods 1.5 - 2.5 cm long, beaked.

Along ponds ; 300 m.

Fl. & Fr. : September April.

RAIPUR : Raipur, n.v. (*cf.* Unni in *J. Bombay. nat. hist. Soc.* 64 : 98, 1967).

6. PARKIA R. Br.

Parkia biglandulosa Wt. & Arn. Prodr. 279. 1834.

Large trees. Leaves 30–50 cm long, feather like ; petiole with 2 glands ; pinnae 20–30 pairs, 7–10 cm long ; leaflets numerous, linear, *ca* 5×1 mm. Peduncles 10–20 cm long, rusty tomentose ; heads dark brown in buds, *ca* 2.5 cm across.

Planted in the Forest Rest House ; 450 m.

Fl. : January.

RAIPUR : Dugli, Nagri.

7. PITHECELLOBIUM Mart.

Pithecellobium dulce (Roxb.) Benth. in Hooker, London J. Bot. 3 : 199. 1844. *Mimosa dulcis* Roxb. Corom. Pl. 1 : 67. t. 99. 1798. *Inga dulcis* Willd. Sp. Pl. 4 : 1005. 1806. 'Jungle jalebee, Ganga Imli.'

Trees with persistent stipular spines ; branches greyish. Pinnae 2, leaflets 2 in each pinnae, obliquely elliptic, 2–4×1–2 cm. Heads panicled, *ca* 1 cm across, white. Pods spirally twisted. Seeds black with white fleshy aril.

Along roadsides ; frequently maintained as hedge in the gardens by periodical pruning ; 300–420 m.

Fl. : January ; *Fr.* : April May.

RAIPUR : Raipur. RAJNANDGAON : Khairagarh.

The aril is sometimes eaten.

8. PROSOPIS L.

Prosopis juliflora (Swartz) DC. Prodr. 2 : 447. 1825 ; Burkart in J. Arn. Arb. 57 : 499. 1976. *Mimosa juliflora* Swartz, Prodr. 85. 1788. *P. chilensis* Bhandari, Fl. Ind. Desert 151. 1978, *non* Stuntz.

Large evergreen shrubs or small trees with long slender branches ; stipular spines solitary or paired. Leaves 1–3 together ; rachis 1–6 cm

long ; pinnae 3-10 cm long ; leaflets 10-25 pairs, elliptic oblong, 5-10 × 2 mm. Spikes 6-10 cm long, greenish white turning light yellow. Pods straight or falcate, 10-15 × 1 cm, beaked.

In wastelands ; 300-420 m.

Fl. & Fr. : April - January.

RAIPUR : Raipur. RAJNANDGAON : Khairagarh.

A hardy fast growing species frequently used for afforestation. Pods relished by cattle.

9. SAMANEAE (DC.) Merr.

Samanea saman (Jacq.) Merr. in J. Wash. Acad. Sci. 6 : 47. 1916.
Mimosa saman Jacq. Frag. 15. t. 19. 1809. *Pithecellobium saman* Benth. in Hooker, Lond on J. Bot. 3 : 216. 1844. *Enterolobium saman* Prain ex King in J. As. Soc. Bengal 66 : 252. 1898.

Large evergreen trees with greyish bark. Leaves 20-30 cm long ; pinnae 3-7 pairs, 15-20 cm long ; leaflets 3-8 pairs, obliquely ovate oblong or rhomboid, 2-3 × 1-2 cm. Heads long peduncled, axillary. Flowers pedicelled ; filaments pink. Pods 10-25 cm long.

Planted on the roadsides ; 300 m.

Fl. : April.

DURG : On way to Bhilai Nagar.

10. XYLIA Benth.

Xylia xylocarpa (Roxb.) Taub. Bot. Centralbl. 47 : 397. 1891. *Mimosa cyclocarpa* Roxb. Pl. Corom. t. 100. 1798. *X. dolabriformis* Benth. in Hooker, Lond on J. Bot. 4 : 417. 1842. 'Suriya.'

Deciduous trees, with brown tomentose branchlets. Petiole together with the rachis 5-12 cm long ; rachilla of the pinnae 10-30 cm long ; leaflets (2-)5-6(-7) pairs, ovate oblong, 5-20 cm long. Heads (excluding the stamens) 1-3 cm across, yellowish white. Pods woody, flat, curved, c. 15 × 5 cm, brown pubescent.

In mixed forests ; 400 - 500 m.

Fl. : April ; *Fr.* : maturing the next year.

DURG : Budbhumi. RAJNANDGAON : Baghmadi.

43. VAHLIACEAE

(M.I. Hanfi)

VAHLIA Thunb.

Vahlia digyna (Retz.) Kuntze, Rev. Gen. Pl. 227. 1891. *Oldenlandia digyna* Retz. Obs. 4 : 23. 1786. *V. viscosa* Roxb. Fl. Ind. 2 : 89. 1832. *Bistella digyna* Bullock in Acta Bot. Neerl. 15 : 84 - 85. 1966.

Caespitose glandular pubescent herbs, 5 - 15 cm high. Leaves opposite, subsessile, ovate lanceolate or linear, 1 - 2 cm long. Flowers axillary, subsessile, usually paired, ca 7 mm across, white. Capsules subglobose, ca 3 mm across.

In sandy river beds ; 250 - 300 m.

Fl. & *Fr.* : May.

RAIPUR : Dhamtari, Kasdol.

44. DROSERACEAE

(P.C. Pant & M.I. Hanfi)

DROSCERA L.

- | | |
|--|-----------------------|
| 1a. Leaves in a basal rosette, obovate or suborbicular ... | <i>D. burmannii</i> 1 |
| 1b. Leaves caudate, linear ... | <i>D. indica</i> 2 |

1. *Drosera burmannii* Vahl, Symb. 3 : 50. 1794.

Stemless insectivorous purplish red herbs, 5 - 15 cm high. Leaves sessile, stipulate, obtuse, ca 1 x 1 cm, with sticky marginal glands. Flowers in 3 - 6 cm long terminal racemes, ca 5 mm across, white ; petals obovate.

Around ponds ; 300 m.

RAIPUR (*cf.* D.K. Tiwari in *Proc. 47th Ind. Sci. Congr.* 408. 1960).

2. *D. indica* L. Sp. Pl. 282. 1753.

Slender insectivorous pale green herbs, 5–25 cm high. Leaves petiolate, circinate, erect, spreading or deflexed, 3–10 × 1–2 mm, with red or yellow glands. Racemes lateral, 3–10 cm long. Flowers 7–10 mm across, reddish violet.

Around ditches : 450 m.

Fl. & Fr. : September.

RAJNANDGAON : Baghnadi.

45. HALORAGACEAE

(D.M. Verma)

MYRIOPHYLLUM L.

Myriophyllum oliganthum (Wt. & Arn.) F. v. Muell. Fragm. 10 : 54. 1876 ; Meijden in Blumea 17 : 308. 1969. *Haloragis oligantha* Wt. & Arn. Prodr. 338. 1834. *M. intermedium* auct., Clarke in Hook. f. Fl. Brit. Ind. 2 : 433. 1878, excl. syn. *M. variaefolium* Hook. f. ; non DC.

Slender aquatic herbs. Leaves usually simple, alternate or opposite, linear, 10–20 × 1 mm, sparsely denticulate, sometimes the lower pinnatifid, sometimes whorled. Flowers axillary, (1) 3–5 together, shortly pedicelled, ca 2 mm long ; anthers ca 1 mm long. Fruits rounded, ca 1 mm across, tuberculate, shallowly 4-sulcate.

In shallow waters of the stream ; 450 m.

Fl. & Fr. : May.

RAIPUR : Sitanadi.

46. COMBRETACEAE

(D.M. Verma & M. I Hanfi)

- | | | |
|--|-----|---------------------|
| 1a. Flowers in globose heads. Fruits 2-winged, ca 5 mm long | ... | <i>Anogeissus</i> 1 |
| 1b. Flowers in spikes or racemes. Fruits wingless, or 4-5 winged, 20–60 mm long. | | |

- | | |
|---|---------------------|
| 2a. Shrubby climbers or undershrubs. Petals present ... | <i>Combretum</i> 2 |
| 2b. Trees. Petals absent ... | <i>Terminalia</i> 3 |

1. ANOGEISSUS (DC.) Guill. Perr. & Rich.

Anogeissus latifolia (Roxb. ex DC.) Wall. ex Bedd. Fl. Sylv. t. 15. 1869. *Conocarpus latifolia* Roxb. ex DC. Prodr. 3 : 17. 1838.—‘*Safed dhanwada, Dheora.*’

Deciduous trees with smooth greyish bark peeling off in thin flakes and leaving roundish scars on the stem. Leaves shortly petioled, broadly elliptic or sometimes suborbicular, 5–7 cm long. Heads peduncled, ca 1 cm across, white, axillary, solitary or 2–3 together. Fruits beaked, pale brown.

Common in miscellaneous forests ; 300–500 m.

Fl. : May – September ; *Fr.* : September – January.

RAIPUR : Dhamtari, Sitanadi. RAJNANDGAON : Baghnadi, Salewara.

Timber used for agricultural implements and furniture.

2. COMBRETUM Loefl.

- | | |
|---|-------------------------|
| 1a. Inflorescence with large white foliaceous bracts ; flowers pentamerous. Fruits 5-winged ... | <i>C. roxburghii</i> 3 |
| 1b. Inflorescence without the above bracts ; flowers tetramerous. Fruits 4-winged. | |
| 2a. Herbs or undershrubs with 10–50 cm long branches from a woody rootstock ... | <i>C. nanum</i> 1 |
| 2b. Large shrubby climbers, usually several metres high | <i>C. ovalifolium</i> 2 |

1. *Combretum nanum* Buch. Ham. ex D. Don, Prodr. 219. 1825.

Leaves broadly lanceolate or obovate suborbicular, 5–10 cm long, red at the time of sprouting and before fall. Flowers white, in 10–20 cm long dense racemes. Fruits oblong, 25–35 mm long, pink red.

Along roadsides ; 530 m.

Fr. : June.

RAIPUR : Taurenga.

2. *C. ovalifolium* Roxb. Fl. Ind. 2 : 226. 1832. 'Piwar bet.'

Branches greyish. Leaves elliptic ovate, 5-10 cm long, tomentose beneath when young, apex rounded or shortly cuspidate. Spikes 1-3 cm long, racemose or panicle. Fruits 20-25 × 15-17 mm, wings shining, closely horizontally striate.

On roadside trees ; 350 m.

Fl. : May.

RAIPUR : Dhamtari.

3. *C. roxburghii* Spreng. Syst. 2 : 331. 1825. *Combretum decandrum* Roxb. Corom. Pl. 1 : 49. t. 59. 1795 ; non Jacq. 'Bellora, Medila.'

Extensive shrubby climbers. Leaves coriaceous, oblong, 7-12 × 3-5 cm, mucronate, sometimes hairy beneath. Spikes rusty tomentose, 15-30 mm long, in large axillary and terminal panicles ; flowers greenish. Fruits elliptic oblong, 25-35 mm long.

In miscellaneous forests ; 450-550 m.

Fl. : October January ; *Fr.* : April.

RAIPUR : Sitanadi, Taurenga. RAJNANDGAON : Takajee.

3. TERMINALIA L.

1a. Fruits 5-winged.

2a. Leaves glabrous ... *T. arjuna* 2

2b. Leaves tomentose beneath ... *T. alata* 1

1b. Fruits not winged.

3a. Fruits tomentose ... *T. bellirica* 3

3b. Fruits glabrous.

4a. Fruits compressed ... *T. catappa* 4

4b*. Fruits terete ... *T. chebula* 5

1. *Terminalia alata* Heyne ex Roth, Nov. Pl. Sp. 379. 1821. *Pentaptera tomentosa* Roxb. ex DC. Prodr. 3 : 14. 1828. *Terminalia tomentosa* Wt. & Arn. Prodr. 314. 1834 ; Bedd. Fl. Sylv. t. 17. 1869. 'Saja.'

Large deciduous trees with dark brown thick bark splitting into oblong chips. Leaves elliptic oblong, 10–20 cm long. Flowers in panicled tomentose spikes, ca 5 mm across, white. Fruits 4–6 cm long ; wings 15–30 mm broad, spreading, or rarely (*Verma* 17602) three wings diverging and two curving upwards, striations horizontal or ascending.

Common in sal and miscellaneous forests ; 300–600 m.

Fl. : April–May ; *Fr.* : January–June.

DURG : Rajolidih. RAIPUR : Dhamtari, Taurenga.

Timber commonly used.

2. *T. arjuna* (Roxb. ex DC.) Wt. & Arn. Prodr. 312. 1834. *Pentaptera arjuna* Roxb. ex DC. Prodr. 3 : 14. 1828. 'Kahu, Kohwa.'

Large evergreen trees with thin greenish or greyish white smooth bark and crimson-red blaze. Leaves oblong or oblong-lanceolate, 7–15 cm long, entire or crenate. Flowers in panicled spikes, ca 5 mm across, white. Fruits 25–35 mm long, wings 5–10 mm broad, premorse above, striations ascending.

Common along rivers and streams, also in miscellaneous forests ; sometimes planted along roadsides ; 250–450 m.

Fl. : April–June ; *Fr.* : August–June.

DURG : Durg. RAIPUR : Dhamtari, Khallari.

Bark medicinally used.

3. *T. bellirica* (Gaertn.) Roxb. Pl. Corom. 2 : 54. t. 198. 1805 ('*bellerica*'). *Myrobalanus bellirica* Gaertn. Fruct. 2 : 90. t. 97. 1790. 'Bahera'.

Large deciduous trees with dark grey bark and yellowish blaze. Leaves usually clustered at the tips of branchlets, elliptic-obovate, 7–20 cm long, obtuse or cuspidate. Spikes solitary, axillary or extra axillary,

7 - 15 cm long. Flowers ca 5 mm across, creamy white. Fruits pyriform, ca 3 cm long.

Common along roadsides and in miscellaneous forests ; 300 - 450 m.

Fl. : April. ; *Fr.* : October June.

DURG : Kamteli. RAIPUR : Dhamtari, Gariaband. RAJNANDGAON : Salewara.

Fruits medicinal.

4. *T. catappa* L. Mant. Pl. 519. 1771 '*Deshi Badam*'.

Large deciduous trees with thick brown bark cracking into oblong chips. Leaves clustered at the tips of branches, 15 - 25 cm long, shortly cordate at the base. Spikes solitary axillary. Flowers ca 5 mm across, white. Fruits ellipsoid, ca 4 cm long, with a thick fibrous endocarp.

Planted ; 300 m.

Fr. : April.

RAJNANDGAON : Rajnandgaon.

5. *T. chebula* Retz. Obs. Bot. 5 : 31. 1788. '*Harra*'.

Large deciduous trees with thick greyish flaking bark ; young parts rusty tomentose. Leaves elliptic ovate, 7 - 15 x 5 - 10 cm. Spikes in upper leaf - axils, forming a terminal panicle. Flowers ca 5 mm across, cream-coloured, scented. Fruits ovoid ellipsoid, 25 - 35 mm long, faintly 5 - ribbed when dry.

Along roadsides ; 300 - 750 m.

Fl. : May August ; *Fr.* : October April.

DURG : Bordih, Talgaon. RAIPUR : Gariaband, Mainpur, Pithora. RAJNANDGAON : Chilpi.

Fruits medicinal.

47. MYRTACEAE

(D. M. VERMA)

(*Psidium guajava* L. is cultivated for its edible fruits. Species and hybrids of *Eucalyptus* are commonly planted by the Forest Department).

SYZYGIUM Gaertn.

- 1a. Large trees along roadsides and streams. Leaves mostly over 10 cm long and over 3 cm broad; petioles 1.0 - 3.5 cm long ... *S. cumini* 1
- 1b. Shrubs or small bushy trees along streams. Leaves mostly under 10 cm long and under 3 cm broad; petioles 0.5 - 0.7 cm long ... *S. heyneanum* 2
1. *Syzygium cumini* (L.) Skeels in U.S.D.A. Bur. Pl. Industr. Bull. 248 : 2. 1912. *Myrtus cumini* L. Sp. Pl. 471. 1753. *Eugenia jambolana* Lamk. Encycl. 3 : 198. 1789. 'Jam'.

Evergreen trees with greyish brown branchlets. Leaves elliptic oblong, 7 - 15 × 4 - 9 cm, acute or acuminate, closely parallel nerved. Panicles 5 - 10 cm long. Calyx tube 4 - 6 mm long; petals white, soon caducous. Berries oblong - ellipsoid, 2 - 3 cm long, red-purple or blackish, juicy.

Common along roadsides, rivers and streams, also planted; 250 - 500 m.

Fl. & Fr. : April June.

DURG : Rajolidih. RAIPUR : Dhamtari, Khallari, RAJNAND-GAON : Baghnadi.

Berries eaten raw. Wood used for buildings, furniture and agricultural implements.

2. *S. heyneanum* (Duthie) Wall. ex Gamble, Fl. Madras Pres. 1 : 482. 1919. *Eugenia heyneana* Duthie in Hook. f. Fl. Brit. Ind. 2 : 500. 1879.

Shrubs or small bushy trees. Leaves oblong - lanceolate, 7 - 12 cm long, 1.0 - 2.5 cm broad, acuminate, rather irregularly closely nerved. Flowers in short panicled cymes, white; calyx ca 3 mm long. Berries oblong, ca 1 cm long, almost dry, purplish.

Along streams; 350 m.

Fl. & Fr. : May.

RAIPUR : Dhamtari.

48. LECYTHIDACEAE

(P. C. Pant)

CAREYA Roxb.

Careya arborea Roxb. Pl. Corom. t. 218. 1811. 'Kumbi'.

Deciduous trees with thick dark brown bark. Leaves clustered at the tips of branchlets, obovate, 10–30×5–15 cm, crenulate. Flowers in short spikes; petals 4–5 cm long, yellowish white. Berries globose, 4–8 cm across, crowned with calyx lobes, many seeded.

Common in mixed forests : 300–500 m.

Fl. : April ; *Fr.* : May June.

DURG : Budbhumi. RAIPUR : Dhamtari, Gariaband. RAJNANDGAON : Baghnadi.

49 MELASTOMATACEAE (D. M. Verma)

- | | |
|--|--------------------|
| 1a. Shrubs or small trees. Leaves 6–15 cm long. Ovary 1-celled | <i>Memecylon</i> 1 |
| 1b. Annual herbs. Leaves 1.0–3.5 cm long. Ovary 3-celled | <i>Sonerila</i> 2 |

1. MEMECYLON L.

Memecylon umbellatum Burm. *f.* *Fl.* Ind. 87. 1769 var. **contractum** (Haines) D. M. Verma, *comb. nov.* *Memecylon edule* Roxb. var. *contractum* Haines in Ind. For. 40 : 270. 1914.

Evergreen trees with trunk *ca* 30 cm across, or shrubs; blaze pink; branchlets 4 angled or subcylindrical. Leaves leathery, ovate lanceolate, shortly acuminate, 3–6 cm long, black dotted beneath; nerves very obscure, petioles 5–6 mm long. Flowers in blue subsessile heads; the heads along the branches, consisting of 2 or 3 very shortly pedunculate cymes. Berries *ca* 6 mm dia., black.

Fl. : April May.

RAIPUR : Singhpur range, along Marwapatra nala, *n.v.* (*cf.* Haines, *t. c.*).

2. SONERILA Roxb.

Sonerila tenera Royle, I.I. 215, t. 45, f. 2. 1834.

Annual delicate herbs, 5–20 cm high, with usually pinkish glandular hairy stem. Leaves elliptic-ovate or rhomboid, up to 2 cm broad,

usually sparsely hairy on both the surfaces. Flowers racemose, ca 8 mm long, pink - purple. Capsules trigonous, 6 - ribbed.

On moist slopes in mixed sal forests ; 300 - 500 m.

Fl. & Fr. : Sept. - October.

RAIPUR : Taurenga. RAJNANDGAON : Singhari.

50. LYTHRACEAE

(D. M. Verma)

1a. Herbs. Flowers and fruits 1.0 - 2.5 mm long.

2a. Flowers in dichasial cymes. Fruits circum sessile or bursting irregularly ... *Ammannia* 1

2b. Flowers solitary, spicate or racemose. Fruits septicidal ... *Rotala* 4

1b. Trees or shrubs. Flowers and fruits more than 5 mm long.

3a. Hypanthium tubular, more or less oblique at the mouth ; petals subulate. Fruits included within the hypanthium... *Woodfordia* 5

3b. Hypanthium cupular, straight at the mouth, petals obovate or spatulate. Fruits exserted from the hypanthium.

4a. Sepals and petals 4 each, stamens 8. Fruits bursting irregularly ... *Lawsonia* 3

4b. Sepals and petals 3 or 6 - 9 each ; stamens numerous. Fruits dehiscing by valves ... *Lagerstroemia* 2

1. AMMANNIA L.

1a. Leaves gradually narrowed towards the base. Cymes subsessile ... *A. baccifera* 1

1b. Leaves rounded or slightly cordate at the base. Cymes on 3 - 8 mm long peduncles ... *A. multiflora* 2

1. Ammannia baccifera L. Sp. Pl. 120. 1753.

Diffusely branched pinkish green herbs with 5 - 40 cm long quadrangular branches. Leaves elliptic - lanceolate, up to 6 × 1 cm, narrowed at

both ends. Flowers in 3-5 mm long cymes, *ca* 2 mm across, purple. Capsules depressed globose, red.

Common along streams, ponds and ditches ; 250-500 m.

Fl. & Fr. : throughout the year.

DURG : Talgaon. RAIPUR : Dhamtari, Kasdol, Raipur, Sitanadi. RAJNANDGAON : Taregaon.

2. *A. multiflora* Roxb. Fl. Ind. I : 447. 1820.

Diffusely branched pinkish green annuals, 10-40 cm high, with quadrangular branches. Leaves opposite, decussate, linear oblong, 15-35 mm long. Cymes usually longer than the leaves ; hypanthium campanulate, ribbed. Flowers *ca* 1.5 mm across, red. Fruits globose, *ca* 1 mm across, red.

Near streams and in moist depressions in sal forests ; 250-500 m.

Fl. & Fr. : October - January.

RAIPUR : Kasdol, Sitanadi, Taurenga.

2. *LAGERSTROEMIA* L.

- | | | |
|--|-----|------------------------|
| 1a. Flowers 5-7 cm across ; calyx ridges 12 or more, prominent | ... | <i>L. regiae</i> 3 |
| 1b. Flowers 1.0-3.5 cm across ; calyx ridges 4-6, obscure, or absent. | | |
| 2a. Leaves glaucous beneath. Flower buds 2-3 mm long.
Capsules 15-25 x 10-15 mm | ... | <i>L. parviflora</i> 2 |
| 2b. Leaves green beneath. Flower buds 5-6 mm long.
Capsules <i>ca</i> 10 x 8 mm | ... | <i>L. indica</i> 1 |

1. *Lagerstroemia indica* L. Syst. ed. 10, 1076. 1759.

Deciduous shrubs. Leaves subsessile, elliptic oblong, 3-10 x 2-4 cm. Panicles subpyramidal, 5-20 cm long. Calyx superficially ridged or smooth with age ; petals white, lilac or rose-coloured, suborbicular with crisped margins, blade *ca* 10 mm long, claw *ca* 7 mm long.

Commonly planted as ornamental ; 200-300 m.

Fl. & Fr. : May August.

RAIPUR : Raipur.

2. *L. parviflora* Roxb. Pl. Corom. 47. t. 66. 1795. 'Lendia, Senha.'

Shrubs or small trees with greyish branches. Leaves elliptic oblong or ovate lanceolate, 4-9 x 2-4 cm, young pubescent beneath. Panicles 5-20 cm long. Calyx not ribbed; petals white with ca 3 mm long rotundate crisped blade and ca 2 mm long claw. Capsules ellipsoid, 1.5-4.0 cm long.

Common in mixed forests and roadsides; 250-500 m.

Fl. & Fr. : June.

RAIPUR : Dugli, Gariaband, Kasdol, Pithora. RAJNANDGAON : Baghnadi, Khargaon, Rajnandgaon, Salewara, Taregaon.

Wood used for timber and agricultural implements.

3. *L. reginae* Roxb. Pl. Corom. 46. t. 65. 1795; Furtado & Srisuko in Gard. Bull. Singapore 24 : 261. 1969. *L. speciosa* auct p. p.; non (L) Pers. *L. flos-reginae* auct., p. p.; non Retz. *L. flos-reginae* var. *angusta* Clarke in Hook f. Fl. Brit. Ind. 2 : 577. 1879.

Evergreen trees. Leaves shortly petioled, elliptic oblong, 10-23 x 4-8 cm. Panicles subcylindrical, 10-40 cm long. Flower buds 8-14 x 7-10 mm, generally grey; calyx lobes thickened on the margins, spreading in fruits; petals mauve purple, blade suborbicular, undulate, ca 3 cm across, claw ca 3 mm long.

Planted in gardens and roadsides; 350-500 m.

Fl. : June.

RAIPUR : Dugli, Khallari.

3. *LAWSONIA* L.

Lawsonia inermis L. Sp. Pl. 349. 1753. *L. alba* Lamk. Ill. t. 296. f. 2. 1792. 'Menhdi.'

Shrubs, 1 - 3 m high with some of the branchlets spinous at the tip. Leaves opposite, shortly petioled, lanceolate or oblanceolate, 2 - 3 cm long. Flowers in terminal panicled cymes, ca 5 mm across, cream-coloured, fragrant ; sepals persistent. Fruits dry, depressed globose, ca 6 mm dia., red, tipped with persistent style.

Commonly planted as hedge ; 250 - 450 m.

Fl. & Fr. : April - August.

RAIPUR : Raipur. RAJNANDGAON : Baghnadi.

4. ROTALA L.

1a. Flowers in terminal peduncled spikes	...	<i>R. rotundifolia</i> 5
1b. Flowers solitary axillary or in sessile leafy axillary spikes.		
2a. Calyx, including the lobes, 2.5 - 3.5 mm long, tube pyramidal. Fruits 2-valved	...	<i>R. indica</i> 3
2b. Calyx, including the lobes, 1 - 2 mm long, tube campanulate. Fruits 3 - 5 valved.		
3a. Leaves broadly ovate - cordate	...	<i>R. fyonii</i> 2
3b. Leaves linear - oblong.		
4a. Leaves opposite, 10 - 30 mm long. Calyx between the lobes with linear subulate accessory lobes. Fruits ca 1.5 mm long	...	<i>R. densiflora</i> 1
4b. Leaves opposite or 3 - 4 - whorled, 3 - 13 mm long. Calyx between the lobes not with accessory lobes. Fruits ca 1 mm long.	...	<i>R. mexicana</i> 4

1. *Rotala densiflora* (Roth ex R. & S.) Koehne in Bot. Jahrb. 1 : 164. 1880. *Ammannia densiflora* Roth ex R. & S. Syst. 3 : 304. 1818. *A. pentandra* - Clarke in Hook. f. Fl. Brit. Ind. 2 : 568. 1879, p. p.

Annual erect or ascending herbs, 5 - 30 cm high with quadrangular branches pinkish at the base. Leaves oblong or oblong-lanceolate, with rather cordate decurrent bases, floral leaves much smaller than the cauline ones. Flowers pink, solitary or in dense up to 5 cm long leafy spikes ; petals equalling or exceeding the sepals ; style ca 0.5 mm long. Capsules 3 - valved.

In drains and ditches ; 300 - 500 m.

Fl. & Fr. : September - May.

RAIPUR : Dhamtari, Dugli, Gariaband. RAJNANDGAON : Baghnadi.

2. R. fysonii Blatt. & Hallb. in J. Bombay nat. hist. Soc. 25 : 709. 1918 ; Fyson, Fl. South Ind. Hill. Stations 1 : 683. t. 611. 1932.

Annual filiform herbs up to 10 cm high. Leaves sessile, decussate, sub-amplexicaul, 2.0 - 4.0 x 1.5 - 3.0 mm, acute. Flowers solitary axillary, tetramerous, purplish ; calyx ca 1 mm long with accessory subulate lobes. Capsules included within the calyx tube, 4 - 3 valved, red.

In ditches ; 500 m.

Fl. & Fr. : October.

RAIPUR : Taurenga.

3. R. indica (Willd.) Koehne in Bot. Jahrb. 1 : 172. 1880. *Peplis indica* Willd. Sp. Pl. 2 : 244. 1799. *Ammannia peploides* Spreng. Syst. 1 : 444. 1824.

Annual ascending or creeping herbs with quadrangular fleshy branches. Leaves opposite, oblong or spatulate, 4 - 15 x 2 - 8 mm. Flowers solitary or in up to 4 cm long leafy spikes, tetramerous ; calyx without accessory lobes ; petals white or reddish. Fruits ellipsoid, red.

In ditches ; 400 - 500 m.

Fl. & Fr. : November - January.

RAIPUR : Dugli. RAJNANDGAON : Deopura.

4. R. mexicana Cham. & Schlecht. in Linnaea 5 : 567. 1830. *Ammannia pygmaea* Kurz in Seem, J. Bot. 5 : 376. 1867.

Annual, filiform, green or purplish herbs, 3 - 12 cm high, generally forming matty growth. Leaves generally 3 - 4 whorled, sometimes opposite, linear, ca 1 mm broad. Flowers solitary axillary ; calyx ca 1 mm long ; petals absent. Fruits ca 1 mm long, 3 - valved.

In ditches ; 500 m.

Fl. & Fr. : October.

RAIPUR : Taurenga.

5. R. rotundifolia (Roxb.) Kochne in Bot. Jahrb. I : 175. 1880 ; Babu, Herb. Fl. Dehra Dun 186. 1977. *Ammannia rotundifolia* Roxb. Fl. Ind. I : 446. 1820.

Slender annual purplish green herbs with a creeping stem and numerous erect 5–15 cm high branches. Leaves sessile, broadly elliptic or suborbicular, 5–10 mm long. Spikes terminal, solitary or 2–3 together, 0.5–2.0 cm long, on 3–5 mm long peduncles. Flowers tetramerous; calyx tube campanulate; petals red. Capsules 4-valved.

Along ponds ; 580 m.

Fl. & Fr. : April.

RAJNANDGAON : Rengakhar.

5. WOODFORDIA Salisb.

Woodfordia fruticosa (L.) Kurz in J. Asiat. Soc. Beng. 40 : 56. 1871. *Lythrum fruticosum* L. Syst. ed. 10, 1045. 1759. *W. floribunda* Salisb. Parad. London t. 42. 1806. 'Dhanwai.'

Profusely branched shrubs, 1–2 m high, almost leafless in Feb., March. Leaves subsessile, linear lanceolate, 3–10 cm long, white pubescent beneath. Flowers in fascicled axillary racemes; calyx tube ca 1 cm long, red, lobes ca 3 mm long, accessory lobes ca 1 mm long; petals small, red. Fruits ellipsoid, ca 1 cm long.

In open sal and mixed forests ; 400–800 m.

Fl. & Fr. : January–May.

RAIPUR : Dugli, Mainpur. RAJNANDGAON : Chilpi.

Flowers yield a pink–yellow dye.

51. ONAGRACEAE

(D.M. Verma)

LUDWIGIA L.

- 1a. Prostrate or ascending herbs, floating branches with clusters of white spongy spindle-shaped aerophores at the nodes. Petals white or creamy with yellow bases ... *L. adscendens* 1
- 1b. More or less erect herbs without the above aerophores. Petals uniformly yellow.

- 2a. Usually villous - pubescent herbs, sometimes subglabrous. Sepals and petals 5 - 17 mm long; stamens 8 ... *L. octovalvis* 2
- 2b. Glabrous or puberulus herbs. Sepals and petals 1.0 - 3.5 mm long; stamens 4 - 5 (rarely more in some flowers of *L. perennis*).
 3a. Capsules terete; seeds pluriseriate in each cell ... *L. perennis* 3
 3b. Capsules slightly 4 - angled; seeds uniseriate in each cell ... *L. prostrata* 4

1. *Ludwigia adscendens* (L.) Hara in J. Jap. Bot. 28 : 290. 1953.
Jussiaea adscendens L. Mant. Pl. 1 : 69. 1771. *J. repens* L. Sp. Pl. 388. 1753, non *Ludwigia repens* Forst. 1771.

Aquatic or marsh - land herbs with a creeping stem rooting at the nodes and emitting erect branches. Leaves elliptic oblong, 1-7 cm long. Flowers solitary axillary, pentamerous ; sepals 5 10 mm long ; petals obovate, 10 18 mm long. Capsules terete, 10 ribbed, 12 27 mm long ; seeds uniseriate in each cell.

Along ponds & in shallow streams; 250 450 m.

Fl. & Fr. : January June.

DURG : Durg. RAIPUR: Gariaband, Raipur. RAJNANDGAON : Rajnandgaon.

2. *L. octovalvis* (Jacq.) Raven in Kew Bull. 15 : 476. 1962, *incl.*
ssp. brevisepala (Brenan) Raven *et* spp. *sessiliflora* (Mich.) Raven; Raven in Steenis, Fl. Males. I. 8 : 101. 1977. *Oenothera octovalvis* Jacq. En. Syst. Pl. 19. 1760. *Jussiaea suffruticosa* L. Sp. Pl. 388. 1753.

Herbs or undershrubs; 0.2 2.0 m high, usually profusely branched. Leaves lanceolate, 2.0 8.0 × 0.5 2.5 cm. Flowers solitary axillary ; sepals and petals 4 each. Capsules terete, thin walled, 8 ribbed, 15 - 30 mm long ; seeds pluriseriate in each cell.

In ditches and river beds; 300 800 m.

Fl. & Fr. : throughout the year.

DURG : Talgaon. RAIPUR : Dugli, Taurenga. RAJNANDGAON : Chilpi, Khargaon, Singhari.

3. *L. perennis* L. Sp. Pl. 119. 1753. *L. parviflora* Roxb. Fl. Ind. 440. 1820. *Jussiaea perennis* Brenen in Kew Bull. 8 : 163. 1953.

Annual herbs, 0.3 1.0 m high. Leaves elliptic - lanceolate 1.0 - 8.0 × 0.3 - 2.5 cm. Sepals 4, rarely 5, deltoid, 2.0 3.5 mm long ; petals elliptic, 1 3 mm long. Stamens 4 or 5, rarely more. Capsules 3 16 mm long; seeds 0.3 0.5 mm long.

Along ponds, ditches and in sandy river beds ; 250 - 550 m.

Fl. & Fr. : November - May.

RAIPUR : Dhamtari, Dugli, Raipur, Sitanadi, Taurenga. RAJNANDGAON : Baghnadi.

4. *L. prostrata* Roxb. Fl. Ind. 1 : 441. 1820.

Annual herbs, up to 60 cm high. Leaves elliptic, 1.0 - 10.0 × 0.3 - 1.8 cm. Sepals 4, deltoid, 1.3 - 2.5 × 0.7 - 1.0 mm; petals spatulate, equally long; stamens 4. Capsules 12 - 22 mm long; seeds ca 0.6 mm long, speckled.

Along roadside puddles ; 250 - 450 m.

Fl. & Fr. : November - April.

DURG : Budbhumi. RAIPUR : Dhamtari. RAJNANDGAON : Baghnadi.

52. TRAPACEAE

(D.M. Verma)

TRAPA L.

Trapa natans L. var. **bispinosa** (Roxb.) Makino in Linuma, Somoku Dzusetsu ed. 3, 1 : 137. 1907. *T. bispinosa* Roxb. Pl. Corom. t. 234. 1815. - 'Singhara.'

Aquatic floating herbs. Leaves dimorphic; submerged leaves opposite, pectinate; floating leaves clustered, ovate rhomboid, 3 - 5 cm broad, crenulate, red and villous beneath; petioles inflated. Flowers solitary axillary, tetramerous, ca 2 cm long, white with a yellowish blotch in the mouth. Fruit somewhat compressed, urn shaped, 2 - 3 cm broad, with two horns.

Cultivated in ponds; 400 m.

Fl. & Fr. : June - October.

RAIPUR : Gariaband.

The sweet white kernel is eaten raw and cooked.

53. CUCURBITACEAE
(D. M. Verma & P. C. Pant)

(*Citrullus lanatus* (Thunb.) Mansf., *Cucurbita maxima* Duch. ex Lamk. *Cucurbita pepo* DC. & *Lagenaria siceraria* (Makina) Standley are commonly cultivated for their edible fruits).

1a. Petals fimbriate	...	<i>Trichosanthes</i> 6
1b. Petals entire.		
2a. Tendrils 2 - 3 - branched at the tip	...	<i>Diplocyclos</i> 2
2b. Tendrils not branched.		
3a. Calyx tube closed near attachment of stamens by 2 - 3 incurved scales. Male peduncle with spathaceous bract	...	<i>Momordica</i> 4
3b. Calyx tube not closed. Bract not spathaceous.		
4a. Seeds compressed	...	<i>Cucumis</i> 1
4b. Seeds turgid.		
5a. Fruits 0.5 - 1.2 cm long	...	<i>Mukia</i> 5
5b. Fruits 4 - 5 cm long	...	<i>Melothria</i> 3

1. CUCUMIS L.

1a. Leaves deeply lobed. Ovaries and fruits not echinate	...	<i>C. callosus</i> 1
1b. Leaves angled or shallowly lobed. Ovaries and fruits echinate	...	<i>C. prophetarum</i> 2

1. *Cucumis callosus* (Rottl.) Cogn. in Engl. Das Pflanzenr. heft 88 : 129. 1924. *Bryonia callosa* Rottl. Ges. Naturf. Freunde Berlin Neue Schriften 4 : 210. 1803. *C. trigonus* Roxb. Fl. Ind. 3 : 722. 1832. 'Boda, Bundela, Petha.'

Slender, perennial, monoecious, creeping or climbing scabrid herbs. Leaves suborbicular, deeply 5 - 7 - lobed, 3 - 6 cm broad, cordate at the base, lobes dentate or lobulate. Flowers yellow, ca 6 mm long. Fruits ellipsoid globose, 3 - 4 cm long, pungent, greenish yellow with greyish stripes.

Common in wastelands and mixed forests; 300 - 550 m.

Fl. & Fr. : August - January.

RAIPUR : Dugli, Raipur, Taurenga.

2. *C. prophetarum* L. Cent. Pl. 32. 1755. 'Karu Budela'.

Slender, perennial, monoecious, creeping or climbing strigose herbs. Leaves suborbicular, 3-5 lobed or subentire, 2-4 cm long, subtruncate at the base, lobes dentate or lobulate. Flowers solitary or fasciculate, ca 4 mm long, yellow. Fruits subglobose, 3-4 cm across, dark green with greyish stripes.

In mixed forests; 500 m.

Fl. & Fr. : January.

RAIPUR : Sitanadi.

2. DIPLOCYCLOS (Endl.) von Post & Kuntze

Diplocyclos palmatus (L.) Jeffrey in Kew Bull. 15 : 352. 1962. *Bryonia palmata* L. Sp. Pl. 1012. 1753, excl. syn. *B. laciniosa*. *Bryonopsis laciniosa* auct. non (L), Naudin. - 'Shivlingi.'

Slender, perennial, monoecious, climbing, tuberous herbs. Leaves suborbicular, deeply 3-5 lobed, 3-10 cm long, dentate, cordate at the base, scabrid on the upper surface. Flowers fasciculate, male and female often together, 5-10 mm across, greenish yellow. Fruits globose, 2-3 cm across, red, pulpy; seeds compressed.

In wastelands ; 250-500 m.

Fl. & Fr. : September January.

RAIPUR : Khallari, Raipur. RAJNANDGAON : Deopura, Singhari.

Seeds mixed with jaggery is given to barren women for conception.

3. MELOTHRIA L.

Melothria heterophylla (Lour.) Cogn. in DC. Monogr. Phan. 3 : 618. 1881 ; Chakravarty in Fl. Ind. Fascl. 11 : 79. 1982. *Solena heterophylla* Lour. Fl. Cochinch. 1 : 514. 1790. *Zehneria umbellata* Thw. Enum. 125. 1853 ; Clarke in Hook. f. Fl. Brit. Ind. 2 : 625. 1879 p.p.

Perennial dioecious scandent herbs. Leaves coriaceous, extremely polymorphic, lanceolate, ovate, oblong or suborbicular, undivided or variously lobed, 5-20 cm long. Flowers small, yellow ; male flowers fascicled or umbellate ; female flower solitary. Fruits oblong, 4-5 × 2 cm.

In mixed forests; 450 m.

Fl. & Fr. : September.

RAJNANDGAON : Baghnadi.

4. MOMORDICA L.

- | | | |
|--|-----|-----------------------|
| 1a. Monoecious. Leaves deeply 5 - 7 lobed. Fruits
tubercl ^e d | ... | <i>M. charantia</i> 1 |
| 1b. Dioecious. Leaves subentire or shallowly lobed. Fruits
clothed with dense fleshy spines | ... | <i>M. dioica</i> 2 |

1. *Momordica charantia* L. Sp. Pl. 1009. 1753. 'Karela.'

Slender prostrate or climbing herbs, 1 - 2 m long. Leaves reniform or suborbicular, 5 - 12 cm broad, often pedately lobed, lobes dentate or lobulate. Flowers solitary, 15 - 20 mm long, yellow, male peduncle with a foliaceous bract about the middle. Fruits oblong, 8 - 20 cm long, bitter.

Usually cultivated ; 400 m.

Fl. & Fr. : May - June.

RAIPUR : Gariaband.

Fruits eaten cooked ; also considered medicinal.

2. *M. dioica* Roxb ex Willd. Sp. Pl. 4: 605. 1805. 'Ban Karela.'

Slender perennial climbers. Leaves ovate, 4 - 10 × 3 - 8 cm, entire or sinuately lobed. Flowers solitary, 20 - 35 mm long, yellow; male peduncle with a reniform bract at the tip. Fruits ovoid, 3 - 5 cm long, beaked, bitter.

In wastelands; 350 - 800 m.

Fl. & Fr. : August - September.

RAIPUR : Borai, Dhamtari. RAJNANDGAON : Chilpi.

Fruits eaten cooked.

5. MUKIA Arn.

Mukia maderaspatana (L.) Roem. Syn. Pepon. 47. 1846. *Cucumis maderaspatanus* L. Sp. Pl. 1012. 1753. *Bryonia scabrella* L. f. Suppl. 424.

1781. *Mukia scabrella* Arn. in Hooker, J. Bot. 3 : 276. 1841. *Melothria maderaspatana* Cogn. in DC. Monogr. Phan. 3 : 623. 1881.

Slender creeping or climbing annual herbs with hispid branches. Leaves ovate deltoid, angular or lobed, 4–15 × 3–13 cm, denticulate, scabrous (more on the upper surface). Flowers solitary or a few fascicled, small, yellow. Fruits globose, 5–12 mm across, smooth or sparsely echinate, greenish yellow or ultimately red.

In wastelands and mixed forests ; 250–600 m.

Fl. & Fr. : June - November.

DURG. : Balod. RAIPUR : Gariaband, Raipur, Taurenga. RAJNANDGAON : Deopura, Taregaon.

6. TRICHOSANTHES L.

Trichosanthes cucumerina L. Sp. Pl. 1008. 1753.

Slender annual climbers with 2–3 fid tendrils. Leaves broadly ovate or reniform, 5–7 lobed, 7–10 cm long, denticulate. Flowers white ; male flowers generally racemed ; female flowers solitary. Fruits ovoid, 5–6 × 3–4 cm ; seeds compressed.

On roadside bushes ; 300–500 m.

Fl. & Fr. : August – November.

DURG : Balod. RAIPUR : Raipur. RAJNANDGAON : Taregaon.

54. BEGONIACEAE

(M. I. Hanfi)

BEGONIA L.

Begonia picta Sm. Exot. Bot. 2 : 81. t. 101. 1805.

Small monoecious succulent herbs. Leaves few or solitary, ovate - suborbicular, cordate, 5–12 (~ 30) cm long, usually unequal - sided, bronze -

green above, crimson beneath, margins dentate. Flowers in terminal cymes, 10–20 mm long, pink. Ovaries and capsules 3-winged, the third wing sometimes obsolete.

In moist shady slopes ; 300–800 m.

Fl. & Fr. : September–November.

RAIPUR : Mainpur. RAJNANDGAON : Chilpi, Singhari.

55. CACTACEAE

(M. I. Hanfi)

OPUNTIA P. Mill.

Opuntia stricta (Haw.) Haw. var. *dillenii* (Ker. Gawl.) Benson, Cact. & Succ. J. Amer. 41 : 126. 1969. *Cactus dillenii* Ker. Gawl. in Edw. Bot. Reg. 3. t. 255. 1818. *O. dillenii* Haw. Suppl. Pl. Succ. 79. 1819.

Profusely branched succulent shrubs, 1–3 m high ; segments flat with many areoles, each bearing 2–7 flat yellow spines. Flowers solitary, 7–10 cm long, yellow. Berries globose, fleshy, glochidiate.

In villages ; 550 m.

Fl. : April.

RAJNANDGAON : Rengakhar.

56. AIZOACEAE

(D. M. Verma)

TRIANTHEMA L.

Trianthemum portulacastrum L. Sp. Pl. 223. 1753. *T. monogyna* L. Mant Pl. 1 : 69. 1771.

Succulent diffuse prostrate herbs with 10–40 cm long forked branches. Leaves sub opposite, obliquely elliptic obovate, 1–3 cm long, often wavy margined. Flowers solitary, sessile, in the forks of the branches, white or pinkish. Capsules scarious in the lower part, coriaceous above, circumsciss.

In wasteland ; 300 m.

Fl. & Fr. : August.

RAIPUR : Raipur.

Plants eaten cooked.

57. MOLLUGINACEAE

(D. M. Verma)

- | | | |
|---|-----|------------------|
| 1a. Flowers in axillary fascicles. Seeds with a filiform appendage curved round the seed | ... | <i>Glinus</i> 1 |
| 1b. Flowers in lax terminal or leaf - oppossed cymes or pseudo-racemes. Seeds without the above appendage | ... | <i>Mollugo</i> 2 |

1. GLINUS L.

- | | | |
|---|-----|----------------------------|
| 1a. Leaves tomentose beneath. Pedicels 1 - 2 mm long. Tepals densely hairy | ... | <i>G. lotoides</i> 1 |
| 1b. Leaves glabrous or sparsely hairy beneath. Pedicels 4 - 15 mm long. Tepals glabrous or thinly pubescent | ... | <i>G. oppositifolius</i> 2 |

1. *Glinus lotoides* L. Sp. Pl. 463. 1753. *Mollugo lotoides* (L.) Kuntze, Rev. Gen. Pl. 214. 1891. *M. hirta* Thunb. Fl. Cap. 1 : 24. 1794.

Slender, prostrate or ascending, annual herbs, greyish green or pinkish with age. Stems 10 - 80 cm long. Leaves in fugacious radical clusters and 2 - 3 nate on the stems, obovate rotundate, 10 - 30 x 5 - 15 mm. Flowers in axillary fascicles; tepals 6 - 10 mm long. Capsules 5 - valved.

In dry sandy river beds ; 500 m.

Fl. & Fr. : May June.

RAIPUR : Sitanadi.

2. *G. oppositifolius* (L.) A. DC. in Bull. Herb. Boiss. 2. 1 : 552. 1901. *Mollugo oppositifolia* L. Sp. Pl. 89. 1753. *M. sperrula* L. Syst. ed. 10, 881. 1759.

Erect or ascending annual herbs, 5 - 50 cm high, usually profusely branched from the base, sometimes prostrate. Leaves 3 - 5 - nate, oblong - spatulate, 5 - 30 x 3 - 12 mm. Flowers in axillary fascicles of 2 - 6 ; tepals 3 - 5 mm long, obtuse. Capsules 3 - 4 - valved, ca 3 mm long.

In dry sandy river beds and along dams; 300 - 500 m.

Fl. & Fr. : May June.

RAIPUR : Pithora, Sitanadi, Taurenga.

2. MOLLUGO L.

- | | | |
|---|-----|-------------------------|
| 1a. Leaves in a solitary basal whorl | ... | <i>M. nudicaulis</i> 2 |
| 1b. Leaves in two to several whorls at the nodes. | | |
| 2a. Leaves linear. Seeds smooth | ... | <i>M. cerviana</i> 1 |
| 2b. Leaves linear-lanceolate or obovate. Seeds tuberculate. | ... | <i>M. pentaphylla</i> 3 |

1. *Mollugo cerviana* (L.) Seringe in DC. Prodr. 1 : 392. 1824. *Pharnaceum cerviana* L. Sp. Pl. 272. 1753.

Slender annual erect herbs branching from the base. Leaves linear, clustered at the nodes, 5 - 12 mm long, ca 1 mm broad. Flowers in clusters, on filiform pedicels, ca 1 mm across ; tepals obovate ; stamens 5. Seeds smooth.

In moist places along tank ; 300 m.

Fl. & Fr. : May July.

RAIPUR : Raipur, *Sharma* (Herb. Sci. Coll. Raipur).

2. *M. nudicaulis* Desr. in Lamk. Encycl. 4 : 234. 1797.

Slender annual herbs, 7 - 20 cm high. Leaves in a radical cluster, elliptic, 2 - 5 cm long. Flowers ca 1.5 mm long, in profusely branched cymes ; tepals scarious margined. Capsules ellipsoid, ca 2 mm long ; seeds shining reddish black, tubercled.

On sandy river banks ; 300 - 400 m.

Fl. & Fr. : April June.

DURG : Talgaon. RAIPUR : Kasdol.

3. *M. pentaphylla* L. Sp. Pl. 89. 1753. *M. stricta* L. Sp. Pl. ed. 2, 131. 1762.

Slender annual herbs, 3-25 cm high, usually much branched. Leaves in pseudo whorls of 3-5(9), lower ones rosulate, spatulate, fugacious, upper linear-lanceolate, 1-3 cm long. Flowers 1-2 mm long, in terminal and leaf-opposed cymes. Capsules ellipsoid, ca 2 mm long; seeds brownish black, tubercled.

In dry or moist wastelands and crevices of rocks and walls; 300-500 m.

Fl. & Fr.: August - November.

DURG : Balod. RAIPUR : Dhamtari, Raipur, Sitanadi, Taurenga. RAJNANDGAON : Baghnadi, Deopura, Singhari.

58. APIACEAE
(UMBELLIFERAE)
(D. M. Verma & V. Chandra)

1a. Flowers in simple umbels.

- 2a. Leaves simple. Mericarps 7-9-ribbed ... *Centella* 1
2b. Leaves 3-5-lobed or partite. Mericarps 4-ribbed... *Hydrocotyle* 2

1b. Flowers in compound or decompound umbels.

- 3a. Fruits elliptic, 8-12 mm long, mature with about 2 mm broad wings ... *Peucedanum* 3
3b. Fruits roundish, 1-2 mm long, never winged.
4a. Fruits constricted at the commissure, laterally compressed.
5a. Involucral bracts conspicuous, 3-6 mm long *Trachyspermum* 6
5b. Involucral bracts minute or absent ... *Pimpinella* 4
4b. Fruits neither constricted at the commissure nor laterally compressed ... *Seseli* 5

1. CENTELLA L.

Centella asiatica (L.) Urb. in Mart. Fl. Bras. 11. 1 : 287, t. 78, f. 1, 1879. *Hydrocotyle asiatica* L. Sp. Pl. 234, 1753.

Creeping herbs with long stolons. Leaves rosulate, petioled, reniform, 1-5 cm broad, crenate dentate. Umbels solitary or 2-5 together, on 0.5-3.0 cm long peduncles. Flowers 3-5, ca 1.5 mm across, red. Mericarps ca 2.0×1.5 mm.

Along drains ; 500-750 m.

Fl. & Fr. : September-June.

RAIPUR : Taurenga. RAJNANDGAON : Chilpi, Deopura.

Plants medicinally used.

2. HYDROCOTYLE L.

Hydrocotyle sibthorpiioides Lamk. Encycl. 3 : 153. 1789. *H. rotundifolia* DC. Prodr. 4 : 64. 1830.

Trailing herbs. Leaves rounded or 3 to 5 palmatilobed or partite, 0.5-2.5 cm broad ; segments crenate serrate. Inflorescence leaf-opposed, on 0.5-3.0 cm long peduncles. Flowers 5-15 in each inflorescence, sessile or shortly pedicelled ; calyx teeth none ; petals red. Fruits 1.0-1.2×0.7 mm, glabrous or hairy, often red punctate.

Along streams ; 600 m.

Fl. & Fr. : January-April.

RAJNANDGAON : Chilpi.

3. PEUCEDANUM L.

Peucedanum nagpurensse (Clarke) Prain, Bengal Pl. 540. 1903. *P. glaucum* var. *nagpurensis* Clarke in Hook. f. Fl. Brit. Ind. 2 : 710. 1879. 'Tejraj'.

Perennial herbs, ca 1 m high. Leaves ternately compound, upper with narrow lobes. Rays 12-16 ; bracts absent ; bracteoles 4-7. Dried fruits blackish with stramineous wings.

In miscellaneous forests ; 450-500 m.

Fl. & Fr. : October-January.

RAIPUR : Mainpur, Sitanadi.

Medicinal.

4. PIMPINELLA L.

- 1a. Leaves all sub-similar ; leaflets all lanceolate or ovate-lanceolate ... *P. heyneana* 2
- 1b. Leaves dis-similar ; leaflets of radical and lower leaves ovate-lanceolate, of upper leaves deeply divided into linear lobes.
- 2a. Rays 6 - 12 ; fruit compressed, not didymous ... *P. diversifolia* 1
- 2b. Rays 8 - 13 ; fruit terete, didymous ... *P. wallichiana* 3

1. *Pimpinella diversifolia* DC. Prodr. 4 : 122. 1830.

Herbs up to 1.5 m high. Lower leaves rounded ovate; upper entire or 3-partite; segments ovate lanceolate, serrate to subpinnatifid. Flowers 8-16, white; rays 6-12. Fruits ovoid, narrowed towards the apex, hispidulous or glabrescent, greenish.

In sal forests ; 740 m.

Fl. & Fr. : September.

RAJNANDGAON : Chilpi.

2. *P. heyneana* (DC.) Wall. ex Kurz in J. Asiat. Soc. Bengal 46 : 115. 1877. *Helosciadium heyneanum* DC. Prodr. 4 : 106. 1830.

Perennial herbs, 30-70 cm high. Leaflets up to 5 cm long, serrate, puberulus. Flowers minute, in leaf-opposed umbels, white; rays 4-14; bracts absent. Fruits didymous, broader than long, smooth, ridges slender.

In miscellaneous forest undergrowth ; 450-550 m.

Fl. & Fr. : October.

RAIPUR : Sitanadi, Taurenga.

3. *P. wallichiana* (Miq.) Gandhi in Saldanha & Nicolson, Fl. Hassan dist. 417. 1976. *Helosciadium wallichianum* Miq. Bot. Zeit. 7 : 775. 1849. *P. monoica* Dalzell, Hook. J. Bot. Kew Gard. Misc. 3 : 212. 1851.

Perennial herbs up to 1 m high. Lower leaves 3-foliate; leaflets ovate with oblique bases, up to 7 x 4 cm, upper much lobed into linear lobes. Umbels 2.5-5.0 cm diam.; rays 8-13; flowers white; bracts absent. Fruits ovoid, compressed, minutely papillose.

In sal and miscellaneous forests ; 400 - 500 m.

Fl. & Fr. : January.

RAIPUR : Singhpur, Sitanadi.

5. SESELI L.

Seseli diffusum (Roxb. ex Sm.) Sant. & Wagh in Bull. Bot. Surv. India 5 : 108. 1963. *Ligusticum diffusum* Roxb. ex Sm. in Rees, Cyclop. 21 : 11. 1812. *Cnidium diffusum* DC. Prodr. 4 : 153. 1830. *Seseli indicum* Wt. & Arn. Prodr. 371. 1834.

Small pubescent herbs, 8 - 10 cm high. Leaves decomound, lobes obtuse, apiculate, pubescent. Flowers white or pinkish ; rays 11 - 13 ; bracts and bracteoles ciliate. Sepals absent ; petals 5. Fruits subglobose, hispid, gland-tipped, ridges thick, obtuse.

In wastelands ; 350 m.

Fl. & Fr. : April.

DURG: Kamteli.

6. TRACHYSPERMUM Link

Trachyspermum stictocarpum (Clarke) Wolff in Engl. Pflanzenr. heft 90 : 89. 1927. *Carum stictocarpum* Clarke in Hook. f. Fl. Brit. Ind. 2 : 681. 1879.

Annual herbs, 25 - 50 cm high. Leaves 1 - 2 pinnate with the pinnae and their segments usually 3 ; ultimate segments linear-lanceolate, glabrous. Umbel rays 3 - 6, slender, 1 - 4 cm long. Flowers ca 1.5 mm across, white (or pinkish). Fruits hispidulous.

In mixed forests ; 400 m.

Fl. & Fr. : November.

RAJNANDGAON : Taregaon.

59. ALANGIACEAE

(M.I. Hanfi)

ALANGIUM Lamk.

Alangium salviifolium (L.f.) Wang in Engl. Pflanzent. 4(220b) : 9. 1910. *Grewia salviifolia* L.f. Suppl. 409. 1781. *A. lamarkii* Thw. Enum. 133. 1859.

Small or medium sized spinescent deciduous trees with greyish branches. Leaves oblong or elliptic lanceolate, acute or acuminate, 7-15 cm long, glabrous above, pubescent beneath. Flowers white, fragrant, in axillary fascicles. Fruits baccate, ellipsoid, young green, mature turning pinkish, pulp inside white, soft, slimy.

In miscellaneous forests ; 350-500 m.

Fl. & Fr. : April June.

DURG : Budbhumi. RAIPUR : Dhamtari, Gariaband.

60. RUBIACEAE

(D.M. Verma & M.I. Hanfi)

1a. Herbs, up to 0.5 m high, sometimes (in *Knoxia*) about 1 m high. Flowers and fruits solitary, fascicled or in panicled cymes, up to 3 mm long.

2a. Flowers several, fascicled

Borreria 3

2b. Flowers solitary, or if more, then in open panicled cymes.

3a. Leaves oblong lanceolate, 4-12 x 1-3 cm.
Flowers subsessile, in cymes ...

Knoxia 9

3b. Leaves various. Flowers long-pedicelled, or if subsessile, then solitary.

4a. Leaves 2-8 mm long. Flowers subsessile; corolla lobes toothed ...

Dentella 5

4b. Leaves usually longer. Flowers long-pedicelled, corolla lobes entire.

5a. Leaves broadly ovate-oblong, 8-18 mm broad. Seeds pitted ...

Thecagonum 14

- 5b. Leaves linear or linear-lanceolate, 1 - 2 mm broad. Seeds not pitted.
- 6a. Cymes axillary. Corolla tube subequaling the sepals. Fruits about 2 mm across ... *Oldenlandia* 12
- 6b. Cymes terminal. Corolla tube far exceeding the sepals. Fruits about 3 mm across ... *Kohautia* 10
- 1b. Trees or shrubs, more than 1 m high. Flowers and fruits variously arranged, larger, or if smaller, then in globose heads.
- 7a. Flowers in globose heads.
- 8a. Leaves cordate at the base ... *Adina* 1
- 8b. Leaves acute or rounded at the base.
- 9a. Hypanthia free ; flowers bracteolate, creamy white ; corolla lobes valvate ; stigma mitriform ... *Mitragyna* 11
- 9b. Hypanthia connate ; flowers ebracteolate, orange ; corolla - lobes imbricate ; stigma fusi-form ... *Anthocephalus* 2
- 7b. Flowers solitary or in fascicled, panicled or corymbose cymes.
- 10a. Flowers solitary, or 2 - 4 in fascicles. Fruit a drupe or a berry, 1 - 5 cm long.
- 11a. Ovary 2 - celled, ovule solitary in each cell. Fruit a 1.0 - 1.5 cm long 2 - seeded drupe ... *Coffea* 4
- 11b. Ovary 1 or 2 - celled, ovules several in each cell. Fruit a 1.5 - 5.0 cm long many - seeded berry.
- 12a. Ovary 1 - celled ... *Gardenia* 6
- 12b. Ovary 2 - celled ... *Xeromphis* 16
- 10b. Flowers many, in panicled or corymbose cymes. Fruit a globose drupe or a capsule, 0.3 - 0.6 cm long, or a narrowly ellipsoid capsule, 1.5 - 2 cm long.
- 13a. Flowers in trichotomously branched corymbose cymes ; ovule solitary in each cell. Fruit a 2 - seeded drupe.
- 14a. Leaves and bracts coriaceous. Style bifid *Ixora* 8

- 14b. Leaves and bracts not coriaceous. Style entire ... *Pavetta* 13
- 13b. Flowers in panicled cymes or thyrsoid panicles ; ovules many in each cell. Fruit a many seeded capsule.
- 15a. Corolla lobes valvate in bud. Capsules ellipsoid ; seeds winged ... *Hymenodictyon* 7
- 15b. Corolla - lobes imbricate in bud. Capsules globose, seeds not winged ... *Wendlandia* 15

1. ADINA Salisb.

Adina cordifolia (Roxb.) Hook. f. ex Brandis, For. Fl. t. 33. 1874.
Nauclea cordifolia Roxb. Pl. Corom. t. 53. 1796. *Haldinia cordifolia* Ridsdale in Blumea 24 : 361. 1978. 'Haldu.'

Large trees, 2-10 m high with greyish black stems. Trunk 30-40 cm diam. Leaves broadly ovate, pubescent, 18×16 cm, petiole pinkish, up to 8 cm long. Flowers in globose heads, white. Heads 1-3 fascicled, axillary, 2-3 cm across ; peduncle 3-5 cm long, 2 bracteolate above the middle ; corolla brownish yellow. Capsules 4 mm long.

In sal and miscellaneous forests ; 300-550 m.

Fl. : August November ; *Fr.* : January June.

DURG : Budbhumi, Rajhara - dhalli. RAIPUR : Deori, Dhamtari, Pithora, Sitanadi. RAJNANDGAON : Taregaon.

2. ANTHOCEPHALUS A. Rich.

Anthocephalus cadamba Miq. Fl. Ind. Bat. 2 : 135. 1856. *A. indicus* A. Rich. in Mem. Soc. Hist. Nat. Paris 5 : 238. 1834. 'Kadam.'

Large trees, 5-7 m high with spreading subwhorled branches. Leaves elliptic - oblong or ovate, sometimes subcordate at the base, 12-25 cm long. Flowers small, orange ; sepals erect, narrowly lanceolate, ca 3 mm

long ; corolla *ca* 7 mm long ; stigmas far exserted, white. Pseudocarps large, fleshy, orange. 5–6 cm diam.

In sal and miscellaneous forests ; 500–600 m.

Fl. : May–July ; *Fr.* : persisting till next year.

RAIPUR : Borai, Sitanadi.

3. BORRERIA G. Meyer

- | | | |
|--|-----|------------------------|
| 1a. Leaves 2–3 times longer than broad | ... | <i>B. articulata</i> 1 |
| 1b. Leaves 7–9 times longer than broad | ... | <i>B. pusilla</i> 2 |

1. ***Borreria articulata* (L.f.) F.N. Will.** in Bull. Herb. Boiss. ser. 2, 5 : 956. 1905. *Spermacoce articulata* L.f. Suppl. 119. 1781. *S. hispida* L. Sp. Pl. 102. 1753. *B. hispida* (L.) K. Schum. in E. & P. Pflanzenfam. 4 (4) : 144. 1891 ; *non* Spruce ex K. Schum. 1880.

Deep rooted herbs with prostrate pinkish quadrangular branches, 5–20 cm long. Leaves lanceolate oblong or obovate, 0.5–3.0 × 0.4–1.5 cm. Flowers clustered at the ends of reduced axillary branches ; corolla *ca* 4 mm long, whitish or pale purple. Fruits ovoid, hispidly hairy, *ca* 4 × 2 mm.

In wastelands & miscellaneous forests : 300–800 m.

Fl. & *Fr.* : August–April.

DURG : Balod, Budbhumi. RAIPUR : Raipur, Taurenga. RAJ-NANDGAON : Chilpi, Baghnadi, Khargaon, Singhari..

2. ***B. pusilla* (Wall.) DC.** Prodr. 4 : 543. 1830. *Spermacoce pusilla* Wall. in Roxb. Fl. Ind 1 : 379. 1820. *S. stricta* L.f. Suppl. 120. 1781. *S. brachystema* R. Br. ex Benth. Fl. Austr. 3 : 439. 1867. *B. stricta* (L.f.) K. Schum. in E. & P. Pflanzenfam. 4(4) : 143. 1891 ; *non* G. Meyer, 1818. *B. brachystema* (R. Br. ex Benth.) Valet. in Lorentz, Nova Guinea 8 : 516. 1911.

Erect annual herbs, 10–20 cm high. Stems scabrid on angles. Leaves linear-lanceolate or oblong, 2.0–6.0 × 0.3–1.0 cm, glabrous or scabrid. Flowers in dense terminal clusters, rarely in axillary clusters ; bracts

filiform, *ca* 3 mm long. Corolla *ca* 3 mm long, white or pale purple; stamens 3-4, exserted. Fruits obovoid, hispidly hairy, *ca* 3 mm long.

In rock crevices; 400-800 m.

Fl. & Fr. : September-November.

DURG : Balod. RAIPUR : Tautenga. RAJNANDGAON : Baghnadi, Chilpi.

4. COFFEA L.

Coffea beghalensis Heyne ex Roem. & Schult. Syst. Veg. 5 : 200. 1819.

Pretty shrubs, 1.5-2 m high. Leaves broadly ovate oblong or rhomboid, abruptly acuminate at apex, glabrous, 5-8 × 3-4 cm; petiole 2-4 mm long. Flowers 1-3 together, salver-shaped, *ca* 3 cm across, white; corolla tube *ca* 17 mm long; stamens 4-5; stigmas lanceolate. Fruits ovoid, 10-12 mm long, black; seeds grooved.

In miscellaneous forests, on hill slopes; 450 m.

Fl. & Fr. : March-November.

RAIPUR : Gariaband.

5. DENTELLA J. & G. Forst.

Dentella repens (L.) J. & G. Forst. Char. Gen. 25. t. 13. 1776.
Oldenlandia repens L. Mant. 1 : 40. 1771.

Annual slender creeping herbs forming matty growth, rooting at the nodes, up to 10 cm high. Leaves linear oblanceolate, 3-10 × 1-4 mm, slightly hairy on the margins. Flowers axillary, pentamerous, campanulate, white or whitish mauve with a deep blotch of mauve on each lobe. Capsules globose, *ca* 3 mm diam.

In riverbeds, along streams, ditches and walls; 300-600 m.

Fl. & Fr. : January-June.

* DURG : Durg. RAIPUR : Dhamtari, Gariaband, Pithora, Sitanadi. RAJNANDGAON : Rengakhar.

6. GARDENIA J. Ellis

- 1a. Usually thorny, though the thorns sometimes absent from some of the branches. Leaves with 5 - 7 secondary nerves on each side of the midrib, irregularly ascending and spreading, not parallel. Corolla tube ca 1.5 cm long, lobes ca 1 cm long. Mature fruits globose, 4 - 7 cm diam. ... *G. turgida* 4
- 1b. Unarmed. Leaves usually with more secondary nerves on each side of the midrib, conspicuously parallel. Corolla tube 3.5 - 7.0 cm long, lobes 2.5 - 5.0 cm long. Mature fruits ovoid - ellipsoid or globose, 2 - 5 cm long.
- 2a. Flowers and fruits sessile. Calyx lobes like small teeth, scarcely 1 - 2 mm long ... *G. gummifera* 1
- 2b. Flowers and fruits peduncled. Calyx lobes linear, 7 - 15 mm long.
- 3a. Leaves elliptic - oblong, glabrous or deciduously hairy only along the nerves beneath. Mature fruits ovoid, 2.0 - 2.5 cm long ... *G. resinifera* 3
- 3b. Leaves broadly elliptic to almost suborbicular, or young sometimes obovate, deciduously tomentose beneath throughout. Mature fruits ovoid-globose, 3.5 - 5.0 cm long ... *G. latifolia* 2

1. *Gardenia gummifera* L. f. Suppl. 164. 1781. 'Chhote Kurra.'

Shrubs or small trees, up to 2.5 m high ; stem greyish. Leaves sessile, elliptic oblong or obovate oblong, 4.5 - 7.0 \times 2.0 - 2.5 cm ; main nerves 12 - 18 pairs. Flowers subsessile, 1 - 3 together ; calyx densely pubescent, teeth triangular ; corolla white yellow, tube pubescent outside, 3 - 4 cm long. Fruits 2.5 - 4.0 cm long, oblong with numerous ribs and a stout beak.

In mixed sal forests ; 400 - 550 m.

Fr. : October - June.

DURG : Budbhumi. RAIPUR : Khallari, Taurenga.

2. *G. latifolia* Ait. Hort. Kew 1 : 294. 1789. 'Safed panpra'.

Shrubs or trees, up to 10 m high with greyish white stems ; young parts coated with a resinous exudation. Leaves 10 - 20 \times 6 - 15 cm ; main nerves 10 - 20 pairs. Flowers solitary or 2 - nate, subsessile, villous outside, white changing to yellow ; calyx 20 - 25 mm long ; corolla - tube 5 - 6 cm long. Fruits oblong globose with persistent calyx.

In miscellaneous forests ; 350 - 800 m.

Fl. : April. ; *Fr.* : throughout the year.

DURG : Balod. RAIPUR : Dhamtari, Singhpur, Taurenga.
RAJNANDGAON : Baghnadi, Chilpi, Singhari.

3. **G. resinifera** Roth, Nov. Pl. Sp. 150. 1821. *G. lucida* Roxb. Fl. Ind. 2 : 553. 1824. 'Dikamali.'

Shrubs or trees, 1.5 - 3.0 m high ; stems smooth with whitish blotches ; resinous. Leaves 6 - 10 × 2.5 - 7.5 cm ; main nerves 20 - 25 pairs. Flowers fragrant, white ; calyx ca 17 mm long, pubescent ; corolla large, white changing to yellow, tube 3 - 5 cm long, lobes obovate, ca 3 × 2 cm, seeds numerous, small, flat, reddish.

In miscellaneous forests and along roadsides ; 350 - 450 m.

Fl. : May ; *Fr.* : October - May.

DURG : Budbhumi. RAIPUR : Dhamtari, Pithora. RAJNANDGAON : Baghnadi.

4. **G. turgida** Roxb. Fl. Ind. 2 : 557. 1824. *Ceriscoides turgida* Tirvengadum in Bull. Mus. Hist. Nat. Paris 35 : 15. 1978. 'Safed Phetra.'

Trees, 2.0 - 3.5 m high, usually with stout opposite spines. Leaves obovate, obtuse or shortly acuminate at the apex, long cuneate at the base, 5 - 8 × 3 - 6 cm, tomentose beneath. Flowers in axils of leaf scars, greenish white when young, turning yellow in age ; calyx campanulate, split on one side ; corolla tubular, twisted. Fruits foetid smelling ; seeds numerous, triangular, deep red.

In sal and mixed forests ; 350 - 550 m.

Fl. : June ; *Fr.* : ripening the next year ; almost leafless in June.

DURG : Budbhumi. RAIPUR : Kasdol, Taurenga.

Pulp of ripe fruits used as fish poison.

7. HYMENODICTYON Wall.

Hymenodictyon orixense (Roxb.) Mabb. in Taxon 31 : 66. 1982.
Cinchona orixensis Roxb. Bot. Descr. Swietenia : 21. 1793 *et in* Med. Facts
 Obs. 6 : 152. 1795. **H. excelsum** Wall. in Roxb. Fl. Ind. 2 : 149. 1824.
C. excelsa Roxb. Pl. Corom. 2. t. 106. 1798. - 'Bhenrmal'.

Trees *ca* 15 m high, bark usually smooth. Leaves ovate - elliptic, 10 - 13 × 7 - 10 cm ; petioles 2-7 cm long, pubescent ; stipules broadly oblong. Flowers numerous, greenish - white, pedicelled ; styles very long. Capsules in conspicuous bunches, ellipsoid, *ca* 2 cm long.

In miscellaneous forests ; 500 m.

Fl. : January.

RAIPUR : Sitanadi.

8. IXORA L.

Ixora pavetta Andrews in Bot. Rep. t. 78. 1799 : Matthew & Rani,
 Fl. Tamilnadu Carnatic 712. 1983. *I. arborea* Roxb. ex J. E. Smith in Rees,
 Cyclop. 19 : 5. 1811. *I. parviflora* Vahl Symb. 3 : 11. t. 52. 1794 ; *non*
 Lamk. 1791.

Shrubs or small trees, 2 - 5 m high, bark thick, reddish brown. Leaves coriaceous, oblong or elliptic, 7 - 12 × 4 - 6 cm. Flowers white, odorous, small and numerous, in subglobose clusters ; peduncles 3 - 5 cm long, reddish. Fruits 5 - 7 mm in diam., didymous, red.

In miscellaneous forests ; 350 - 500 m.

Fl. : January April. *Fr.* ; May June.

DURG : Bubdhum. RAIPUR : Dhamtari, Kasdol, Sitanadi.
 RAJNANDGAON : Bag'madi.

9. KNOXIA L.

Knoxia sumatrensis (Retz.) DC. Prodr. 4 : 569. 1830. *Spermacoce*
sumatrensis Retz. Observ. Bot. 4 : 23. 1786. *K. corymbosa* auct. pl., Hook.
f. Fl. Brit. Ind. 3 : 128. 1880 ; *non* Willd.

Erect annual herbs, up to 1 m high ; stems simple or branched at the top, 4 angular. Leaves oblong or elliptic lanceolate, 7-12 cm long ; petioles 2-15 mm long. Flowers greyish white or bluish, in axillary and terminal corymbose cymes. Fruits white or ultimately black ; seeds granulate, 2 × 1 mm.

In wastelands and forest clearings ; 400-800 m.

Fl. & Fr. : August-January.

DURG : Dondi, Rajhara-dhalli. RAIPUR : Borai, Dugli, Gariaband, Singhpur, Taurenga. RAJNANDGAON : Deopura, Chilpi.

10. KOHAUTIA Cham. et Schl.

Kohautia gracilis (Wall.) DC. Prodr. 4 : 430. 1830. *Hedyotis gracilis* Wall. in Roxb. Fl. Ind. 1 : 371. 1820. *Oldenlandia gracilis* (Wall.) Hook. f. Fl. Brit. Ind. 3 : 68. 1880.

Annual or perennial herbs, 20-30 cm high. Leaves linear or narrowly oblong, 15-30 × 1-2 mm, acute, glabrous ; stipule segments 2-4, 1-2 mm long. Flowers in terminal, cymose, corymbiform panicles. Fruits green, oblong, globose.

In wastelands and near drains ; 350-550 m.

Fl. & Fr. : May-June.

RAIPUR : Pithora, Taurenga.

11. MITRAGYNA Korth.

Mitragyna parvifolia (Roxb.) Korth. Obs. Nauci. Ind. 19. 1839. *Nauclea parvifolia* Roxb. Pl. Corom. 1 : 40. t. 52. 1795. *Stephegyne parvifolia* Korth. Verh. Nat. Ges. Bot. 161. 1840, p. p. 'Mundi'.

Large crookedly branched trees, up to 18 m high, trunk 30-50 cm thick with greyish brown rough bark. Leaves broadly ovate or suborbicular, 5-9 cm long, acute or obtuse. Flower heads globose, ca 4 cm across, creamy white, usually solitary. Fruiting heads globose, black, persistent.

Along roadsides and in miscellaneous forests ; 350-450 m.

Fl. : August ; *Fr.* : September January.

DURG : Rajhara - dhalli. RAIPUR : Dugli. RAJNANDGAON : Salewara.

12. OLDENLANDIA L.

- | | | |
|--|-----|-----------------------|
| 1a. All inflorescence 1 - 4 flowered | ... | <i>O. corymbosa</i> 2 |
| 1b. Upper inflorescence many - flowered and panicled. | | |
| 2a. Stems angled. Leaves linear, stiff | ... | <i>O. pusilla</i> 3 |
| 2b. Stems terete. Leaves linear lanceolate, thinly
herbaceous | ... | <i>O. affinis</i> 1 |

1. Oldenlandia affinis (R. & S.) DC. Prodr. 4 : 428. 1830. *Hedyotis affinis* R. & S. Syst. 3 : 194. 1818. *H. dichotoma* Heyne ex Roth, Nov. Pl. Sp. 93. 1821. *O. dichotoma* (Roth) Hook. f. Fl. Brit. Ind. 3 : 67. 1880.

Annual slender erect herbs, up to 30 cm high, copiously branched with filiform branches. Leaves up to 5.0 x 0.5 cm, nerveless ; cymes in upper axils panicled. Flowers minute, blue, on hair like pedicels up to 15 mm long ; calyx teeth subulate.

In wastelands ; 400 m.

Fl. & *Fr.* : September.

RAJNANDGAON : Baghnadi.

2. O. corymbosa L. Sp. Pl. 119. 1753. *Hedyotis corymbosa* Lamk. Encycl. 1 : 272. 1792.

Slender profusely branched annual herbs, up to 30 cm high. Leaves linear or narrowly elliptic lanceolate, up to 3 cm long and 2 mm broad. Peduncles solitary, 1 - 4 flowered ; flowers small, white. Capsules globose, greyish white.

In wastelands and along paddy - fields ; 300 - 450 m.

Fl. & *Fr.* : September - April.

RAIPUR : Dhamtari, Pithora. RAJNANDGAON : Baghnadi, Singhari.

3. *O. pusilla* Rottl. in Verh. Ges. Naturf. Fr. Neue. Schr. 4 : 216. 1803. *O. brachiata* Hook. f. Fl. Brit. Ind. 3 : 66. 1880.

Annual slender herbs with acutely 4 angled stems, 5-10 cm high. Leaves linear, ca 2 cm long and ca 1 mm broad. Peduncles in lower axils solitary, in upper and terminal many-flowered. Capsules globose.

In wastelands ; 300 m.

Fl. & Fr. : September.

DURG : Balod.

13. PAVETTA L.

Pavetta tomentosa Roxb. ex J. E. Smith in Rees, Cyclop. 26 : 2. 1819.
P. indica var. *tomentosa* Hook. f. Fl. Brit. Ind. 3 : 150. 1880.

Shrubs or trees, 1.0-2.5 m high. Leaves elliptic-lanceolate, up to 10 x 4 cm, greyish, glabrous or puberulous above, tomentose beneath. Panicles open, terminal. Flowers white, cymose; corolla tube ca 1 cm long. Fruits globse, ca 5 mm across, green.

Common in miscellaneous and sal forests ; 400-750 m.

Fl. : May ; *Fr.* : August January.

RAIPUR : Pithora, Singhpur, Sitanadi, Taurenga. RAJNANDGAON : Chilpi, Deopura.

14. THECAONUM Babu

Thecaonum ovatifolium (Cav.) Babu in Bull. Bot. Surv. Ind. 11 : 214. 1969. *Hedyotis ovatifolia* Cav. Descr. Pl. Ic. 6 : 52. 1802. *Gonotheca ovatifolia* (Cav.) Santap. & Wagh in Bull. Bot. Surv. Ind. 5 : 107. 1963. *Oldenlandia nudicaulis* Roth, Nov. Pl. Sp. 95. 1821.

Erect annual herbs ; stems 5-15 cm high, tetragonal. Leaves subsessile or on 3-10 mm long petioles, ovate-oblong, glabrous or pubescent beneath. Flowers in peduncled, loose, many-flowered corymbose panicle, white. Fruits hemispheric, crowned with subulate calyx-lobes. Seeds ovoid-globose.

In miscellaneous forests along drains ; 400 - 550 m.

Fl. & Fr. : August - October.

DURG : Balod. RAIPUR : Gariaband, Taurenga. RAJNANDGAON : Baghnadi.

15. WENDLANDIA Bartl. ex DC.

Wendlandia heynei (R. & S.) Sant. & Merch. in Bull. Bot. Surv. Ind. 3 : 110. 1961. *Rondeletia heynei* R. & S. Syst. 5 : 234. 1819. *R. exserta* Roxb. Fl. Ind. 2 : 135. 1824. *W. exserta* DC. Prodr. 4 : 411. 1830. 'Chat-pati'.

Trees up to 12 m high ; young parts pubescent. Leaves oblong or ovate lanceolate, acuminate, 8 - 20 x 2 - 6 cm ; stipules persistent, broadly oblong obovate, recurved. Flowers fragrant, white ; petals reflexed. Capsules hoary pubescent, crowned by the erect lanceolate hairy sepals.

In miscellaneous forests ; 500 - 800 m.

Fl. & Fr. : April - May.

RAJNANDGAON : Chilpi, Baghnadi.

16. XEROMPHIS Rafin.

- | | | |
|--|-----|-----------------------|
| 1a. Leaves 3 - 8 cm long. Corolla 1.5 - 3.5 cm dia. Fruits 2 - 3 cm long | ... | <i>X. spinosa</i> 1 |
| 1b. Leaves 10 - 25 cm long. Corolla 3 - 5 cm dia. Fruits 3.5 - 5.5 cm long | ... | <i>X. uliginosa</i> 2 |

1. Xeromphis spinosa (Thunb.) Keay in Bull. Jard. Bot. Elat 28 : 37. 1958. *Gardenia spinosa* Thunb. Diss. Gard. no. 7. 1780. *G. dumetorum* Retz. Obs. Bot. 2 : 14. 1781. *Randia dumetorum* Poir. in Lamk. Encycl. Suppl. 2 : 829. 1812. *R. spinosa* Poir. l. c. *R. brandisii* Gamble, Fl. Pres. Madras 616. 1921. 'Manhar, Safed-pheta, Manihar, Manjh.'

Small spinescent trees with 3 - 5 cm thick branches, branching near the top ; bark brown when young, grey when old. Leaves oblanceolate, subcoriaceous, glabrescent or pubescent. Flowers white, fragrant, soon falling. Fruits globose.

In miscellaneous forests ; 300 - 600 m.

Fl. : May June ; *Fr.* : October January.

RAIPUR : Dugli, Singhpur, Sitanadi, Taurenge. RAJNANDGAON : Singhari.

Fruits used as fish poison.

2. *X. uliginosa* (Retz.) Maheshwari in Bull. Bot. Surv. Ind. 3:92. 1961.
Gardenia uliginosa Retz. Obs. Bot. 2 : 14. 1781. *Randia uliginosa* DC. Prodr. 4 : 386. 1830. 'Kala - phetra, Thelka.'

Small trees, 1.5 - 2.0 m high ; bark brown blackish when young, older branches greyish ; spines 3 - 4 together on the base of young branches. Leaves on short branchlets, oblanceolate. Flowers white. Fruits oblong globose, 4 - 5 cm long, young ones green, mature yellow, red streaked inside, yielding red resin ; seeds blackish.

Common in sal and mixed forests ; 400 - 600 m.

Fl. & *Fr.* : April May.

DURG : Budbhumi. RAIPUR : Dugli, Khallari, Taurenge.

Fruits eaten cooked.

61. ASTERACEAE

(D. M. Verma)

- 1a. Leaves sinuately lobed, with the lobes ending in 5 - 25 mm long spines, cottony beneath ... *Echinops* 16
- 1b. Leaves not as above.
- 2a. Involucral bracts, some or all, spiny or prickly.
 - 3a. Leaves with petioles about as long as the blade and a broadly cordate base ... *Xanthium* 43
 - 3b. Leaves sessile or subsessile with a narrowed base.
 - 4a. Most of the leaves pinnately lobed. Flowers purple or violet ; spinous bracts tipped with a solitary spine, unarmed on the surface ... *Oligochaeta* 31
 - 4b. All the leaves unlobed. Flowers yellow ; spinous bracts tipped with a terminal spine and also with many spinules on the surface ... *Acanthospermum* 1

2b. Involucral bracts unarmed.

5a. Suberect herbs of marshy places. Leaves subsessile linear. Heads in the axils of dilated leaf - sheaths, sessile, globose, purple ...

Caesulia 9

5b. Plants not as above.

6a. Suberect herbs. Stems with deeply lobed and toothed wings. Heads ovoid - subglobose, compound, of numerous few flowered sessile glomerules on a common receptacle ...

Sphaeranthus 38

6b. Stems not winged, or if winged (*Laggera* sp.) then the plants erect with simple heads.

7a. Herbs, white woolly throughout. Heads more or less clustered, not distinct ...

Gnaphalium 24

7b. Herbs or shrubs, never white - woolly. Heads distinct, or in distinct compound heads.

8a. Fragrant herbs. Leaves bipinnately lobed. Florets all tubular, purple ...

Cyathocline 15

8b. Plants not as above.

9a. Leaves pinnately lobed. Heads radiate. Achenes tipped with bristle - like awns.

10a. Leaves once pinnate, lobed, serrate - dentate margined ...

Bidens 4

10b. Leaves usually twice or more pinnate, lobes entire - margined.

11a. Tall herbs, 50 - 130 cm high. Leaves scattered throughout the stem, all opposite, or the upper few alternate ...

Cosmos 13

11b. Low herbs, 5 - 25 cm high. Leaves almost all clustered at the base, few on the stem, alternate.

12a. Heads solitary axillary, yellow ...

Glossocardia 22

12b. Heads several on almost leafless cymosely branched stem, purplish white ...

Glossogyne 23

9b. Leaves entire or subentire, or if pinnately lobed then the heads not radiate and achenes awnless.

13a. Herbs with milky sap. Leaves sessile, all or most of the lower ones sinuately or pinnately lobed. Corolla yellow, all ligulate.

14a. Leaves in a basal rosette, none or few on the stem. Heads always tubular; fruiting receptacle ca 2 mm broad ...

Launaea 30

14b. Leaves scattered all along the stem, a few sometimes rather basal. Heads ovoid-globose when young, campanulate on maturity; fruiting receptacle 5 - 10 mm broad

Sonchus 37

13b. Plants not as above.

15a. Heads compound, of a cluster of few flowered glomerules; involucral bracts of the compound heads foliaceous.

16a. Dichotomously branched herbs with a rosette of radical leaves ...

Elephantopus 18

16b. Irregularly branched herbs or shrubs without radical leaves.

17a. Grey pubescent herbs. Leaves, at least the lower ones, long petioled

Lagascea 28

17b. Glabrous shrubs. Leaves subsessile.

Blepharispermum 6

15b. Heads simple; involucral bracts foliaceous or bracteiform.

18a. Leaves all opposite, rarely a few uppermost alternate.

- 19a. Outer involucral bracts 5, linear-lanceolate, glandular, spreading ... *Sigesbeckia* 36
- 19b. Outer involucral bracts not as above.
- 20a. Florets all tubular, white or purplish blue *Ageratum* 2
- 20b. Florets outer ligulate, inner tubular, yellow or white.
- 21a. Leaves irregularly toothed or lobed. Pappus of feathery bristles ... *Tridax* 40
- 21b. Leaves subentire or uniformly serrate-dentate (except sometimes undulate in *Enhydra*). Pappus absent, or of scales or barbellate bristles.
- 22a. Heads white; paleae of the receptacle filiform, not embracing the florets ... *Eclipta* 17
- 22b. Heads yellow or white; paleae of the receptacle broad, embracing the florets.
- 23a. Heads sessile; involucral bracts 4, decussate ... *Enhydra* 20
- 23b. Heads peduncled; involucral bracts not as above.
- 24a. Ligule of ray florets inconspicuous, up to 5 mm long.
- 25a. Receptacle conical; ligule filiform ... *Spilanthes* 39
- 25b. Receptacle flat; ligule obovate *Blainvillea* 5
- 24b. Ligule of ray florets conspicuous, more than 15 mm long.
- 26a. Leaves sessile. Heads panicled *Guizotia* 27
- 26b. Leaves petioled. Heads solitary or binate ... *Wedelia* 42
- 18b. Leaves all alternate.
- 27a. Outer florets ligulate, inner tubular.
- 28a. Heads 2-4 mm across, white; pappus of two minute awns ... *Parthenium* 32
- 28b. Heads and pappus not as above.
- 29a. Outer florets with purplish blue filiform ligules ... *Erigeron* 21
- 29b. Outer florets with yellow or orange strap-like ligules.

- 30a. Pappus of an outer row of scales and an inner row of hairs ... *Pulicaria* 34
- 30b. Pappus absent, or of a single row of hairs.
- 31a. Achenes mostly villous ... *Pentanema* 33
- 31b. Achenes all glabrous ... *Senecio* 35
- 27a. Florets all tubular,
- 32a. Pappus a minute cupule, or absent.
- 33a. Heads solitary or sub - solitary.
- 34a. Leaves pinnatifid ... *Grangea* 26
- 34b. Leaves simple, toothed ... *Centipeda* 10
- 33b. Heads mostly several together, racemed or paniced ... *Artemisia* 3
- 32b. Pappus of several hairs, bristles or scales.
- 35a. Pappus of several - seriate scales ... *Goniocaulon* 25
- 35b. Pappus of hairs or bristles, sometimes a few scales also added.
- 36a. Involucral bracts 1 - 2 seriate.
- 37a. Involucral bracts 1-seriate, connate at the base, free above ... *Emilia* 19
- 37b. Involucral bracts 2 - seriate, inner cohering into a tube, outer shorter, free ... *Crassocephalum* 14
- 36b. Involucral bracts several - seriate.
- 38a. Florets all bisexual and similar, never yellow.
- 39a. Outer involucral bracts membranaceous in the lower part, herbaceous in the upper part, mostly with obtuse or rounded tips ... *Centratherum* 11
- 39b. All involucral bracts uniformly membranaceous with a central band of green nerves, acute or spinulose at the tips ... *Vernonia* 41
- 38b. Florets marginal usually female, inner usually bisexual with its corolla different from that of the marginal, florets frequently yellow.

40a. Anther cells tailed with a filiform basal appendage ...	<i>Blumea</i> 7
40b. Anther cells not tailed.	
41a. Stems winged	<i>Laggera</i> 29
41b. Stems not winged.	
42a. Involucral bracts gla- ndular - hairy ...	<i>Conyzza</i> 12
42b. Involucral bracts glabrous ...	<i>Blumeopsis</i> 8

I. ACANTHOSPERMUM Schrank

Acanthospermum hispidum DC. Prodr. 5 : 522. 1836.

Annual, erect, profusely branched hispid herbs, 10 - 50 cm high. Leaves spathulate. Heads in the forks of the branches, yellowish green. Achenes 5 - 10, triangular, with numerous hooked spinules, and two large apical horns.

Common in wastelands and forest margins ; 300 - 500 m.

Fl. & Fr. : August - January.

DURG : Balod. RAIPUR : Dugli. RAJNANDGAON : Deopura.

2. AGERATUM L.

Ageratum conyzoides L. Sp. Pl. 839. 1753.

Erect hispid herbs, 30 - 80 cm high. Leaves long petioled, ovate, 3 - 8 cm long, coarsely crenate, scented. Heads in terminal corymbs, 3 - 5 mm broad, blue purple or white ; involucre campanulate. Achenes black ; pappus of 5 - awned scales.

In wastelands & rock - crevices ; 250 - 400 m.

Fl. & Fr. : throughout the year.

DURG : Rajhara - dhalli. RAIPUR : Dhamtari, Raipur.

3. ARTEMISIA L.

Artemisia nilagirica (Clarke) Pamp. in Nuov. Giorn. Bot. Ital. n. s. 33 : 452. 1926, *A. vulgaris* var. *nilagirica* Clarke, Comp. Ind. 162. 1876. *A. vulgaris* auct. pl.; Hook. f. Fl. Brit. Ind. 3 : 325. 1881; *non* L. 1753. *A. indica* Wt. Ic. t. 1112. 1846; *non* Willd. 1803.

Perennial, bushy, aromatic, pubescent or tomentose herbs. Leaves variously lobed or pinnatisid, up to 15 cm long, lobes serrate or lobulate. Heads ovoid-globose, 3-4 mm across, yellow, clustered, racemed or panicled; outer bracts herbaceous, inner scarious.

In miscellaneous forests; 450 m.

Fl. & Fr. : September.

RAJNANDGAON : Baghnadi.

4. BIDENS L.

Bidens biternata (Lour.) Merr. et Sherff. ex Sherff. in Bot. Gaz. 88 : 293. 1928. *Coreopsis biternata* Lour. Fl. Cochinch. 508. 1790. *B. wallichii* DC. Prodr. 5 : 598. 1836. *B. pilosa* var. *wallichii* (DC.) Clarke, Comp. Ind. 141. 1876.

Erect annual herbs, up to 1 m high. Leaves biternate or imparipinnate; leaflets oblong-lanceolate, subentire. Heads 10-30 flowered, yellow; outer involucral bracts linear, ciliate; marginal flowers 2-4, or absent, corolla 2-3 dentate. Achenes 5-20 mm long with 2-5 awns of 3-4 mm length.

In wastelands and miscellaneous forests; 300-450 m.

Fl. & Fr. : August-November.

DURG : Balod. RAIPUR : Gariaband. Pithora. RAJNANDGAON : Baghnadi, Singhari.

5. BLAINVILLEA Cass.

Blainvillea acmella (L.) Philipson in Blumea 6 : 350. 1950. *Verbesina acmella* L. Sp. Pl. 901. 1753. *Eclipta latifolia* L. f. Suppl. 378. 1781. *B. latifolia* (L. f.) DC. in Wt. Contr. Bot. Ind. 17. 1834. *B. rhomboidea* Cass. Dict. Sci. Nat. 29 : 493. 1823.

Erect annual, hairy herbs, 0.1 - 1.0 m high. Leaves lanceolate or ovate rhomboid, 5 - 15 × 3 - 7 cm. Heads large, long peduncled, white or blue tinged. Achenes obovoid, ca 4 mm long, angled or compressed ; pappus setae 5 - 10 mm long, plumose.

In wastelands and cultivated fields ; 300 - 450 m.

Fl. & Fr. : August - September.

DURG : Balod. RAJNANDGAON : Baghnadi, Khargaon.

6. BLEPHARISPERMUM DC.

Blepharispermum subsessile DC. in Wt. Contr. Bot. Ind. 12. 1834. - '*Rasna jadi*'.

Shrubs, 1.0 - 1.5 m high. Leaves sessile, coriaceous, ovate - elliptic 4 - 10 × 1 - 3 cm. Heads shortly peduncled, globose, 2 - 3 cm across, white, with leafy involucral bracts. Achenes compressed, black, villous.

In sal forests ; 600 m.

Fl. & Fr. : August.

RAIPUR : Sitanadi.

Roots medicinal.

7. BLUMEA DC.

1a. Plants densely woolly all over.

2a. Outer involucral bracts linear, tapering ... *B. lacera* 5

2b. Outer involucral bracts oblong - lanceolate, acute ... *B. hieracifolia* 4

1b. Plants glabrate or variously pubescent, never woolly all over.

- 3a. Corolla lobes of the bisexual florets with multicellular hairs in addition to callipers ... *B. obliqua* 9
- 3b. Corolla lobes of the bisexual florets glabrous or with unicellular hairs in addition to callipers.

 - 4a. Heads solitary, axillary and terminal ... *B. bifoliata* 1
 - 4b. Heads glomerulate or variously paniculate.
 - 5a. Heads glomerulate, the clusters interruptedly spicate ... *B. fistulosa* 3
 - 5b. Heads paniculate.
 - 6a. Leaves spinous - toothed. Corollas of both types of the florets hairy.
 - 7a. Plants erect. Corolla tubes hairy ... *B. eriantha* 2
 - 7b. Plants prostrate. Corolla tubes glabrous ... *B. oxyodonta* 10
 - 6b. Leaves not spinous - toothed. Corolla of at least the female florets glabrous.
 - 8a. Receptacles pilose ... *B. laciniata* 6
 - 8b. Receptacles glabrous.
 - 9a. Achenes ribbed ... *B. membranacea* 7
 - 9b. Achenes subangular or terete, not ribbed.
 - 10a. Leaves usually lyrate-lobed. Corolla yellow ... *B. lacera* 5
 - 10b. Leaves usually not lobed. Corolla purple or lilac ... *B. mollis* 8

1. *Blumea bifoliata* (L.) DC. in Wt. Contr. Bot. Ind. 14. 1834.
Conyza bifoliata L. Sp. Pl. 1207. 1753.

Annual, ascending, hairy herbs, 10-50 cm high. Leaves villous and glandular, distantly serrulate. Heads on 5-35 mm long peduncles, solitary, 6-8 mm across, yellow. Corolla 3.5-4.5 mm long. Achenes oblong, pubescent; pappus white, 3-4 mm long.

In wastelands ; 500 m.

Fl. & Fr. : May.

RAIPUR : Sitanadi.

2. **B. eriantha** DC. in Wt. Contr. Bot. Ind. 15. 1834.

Perennial dichotomously branched herbs, up to 1 m high. Leaves elliptic obovate, 2 - 19 cm long, pilose, spinulose serrate. Heads solitary or few clustered, ca 5 mm across. Flowers yellow. Achenes subterete, sparsely hairy; pappus white.

In wastelands; 300 m.

Fl. & Fr. : April.

DURG : Durg.

3. **B. fistulosa** (Roxb.) Kurz in J. As. Soc. Bengal 46 : 187. 1877. *Conyza fistulosa* Roxb. Fl. Ind. 3 : 429. 1832. *B. glomerata* DC. in Wt. Contr. Bot. Ind. 15. 1834 ; Hook. f. Fl. Brit. Ind. 3 : 262. 1881. *B. nodiflora* Hook. f. Fl. Brit. Ind. 3 : 262. 1881.

Erect, puberulus or tomentose herbs, up to 1.2 m high. Leaves sessile or subsessile, oblong or oblanceolate, 4 - 15 × 1 - 6 cm, serrate dentate. Heads in globose clusters, 4 - 5 mm across; outer involucral bracts purple or purple tipped. Achenes quadrangular, puberulus.

In miscellaneous forests; 450 m.

Fl. & Fr. : January.

RAIPUR : Singhpur.

4. **B. hieraciifolia** (D. Don) DC. in Wt. Contr. Bot. Ind. 15. 1834 ; Hook. f. Fl. Brit. Ind. 3 : 263. 1881. *Erigeron hieraciifolium* D. Don, Prodr. 272. 1825. *B. sericans* Hook. f. Fl. Brit. Ind. 3 : 262. 1881.

Perennial erect herbs, up to 1 m high; stems silky. Leaves spatulate, 2 - 20 cm long, woolly beneath, deciduously velutinous above, serrate dentate. Heads clustered, 6 - 10 mm across, clusters spicate; involucral bracts sometimes purple tipped. Flowers yellow.

In miscellaneous forests; 800 m.

Fl. & Fr. : April.

RAJNANDGAON : Chilpi.

5. **B. lacera** (Burm. f.) DC. Prodr. 5 : 436. 1836. *Conyza lacera* Burm. f. Fl. Ind. 180. t. 59, f. 1. 1768.

Erect herbs, up to 1 m high; stems silky. Leaves obovate - oblong, 3 - 15 cm long, entire or lobed, tomentose, base acute or cuneate. Heads

panicled, 5–6 mm across, involucral bracts reflexed on maturity. Flowers yellow. Achenes subterete, hairy.

In wastelands; 300 m.

RAIPUR : Raipur, n.v. (cf. Unni in *J. Bombay nat. hist. Soc.* 64 : 334. 1967).

6. *B. laciniata* (Roxb.) DC. Prodr. 5 : 436. 1836. *Conyza laciniata* Roxb. Fl. Ind. 3 : 428. 1832.

Erect or ascending herbs, up to 1.5 m high; stems hollow. Leaves radical and caudine, 5–30 cm long, lower lyrate lobed, upper less lobed, all dentate margined. Heads 6–8 mm across, in large panicles. Flowers yellow. Achenes ribbed, pubescent.

In wastelands; 500 m.

Fl. & Fr. : May.

RAIPUR : Sitanadi.

7. *B. membranacea* DC. Prodr. 5 : 440. 1836.

Erect hairy herbs, up to 1.5 m high. Leaves obovate-lanceolate, 4–18 cm long, pilose, serrate-dentate, lower petioled, lyrate lobed. Heads 5–6 mm across, panicled or at the ends of the branches. Flowers yellow. Achenes ribbed, pubescent.

Along miscellaneous forests; 400 m.

Fl. & Fr. : January.

RAIPUR : Singhpur.

8. *B. mollis* (D. Don) Merr. Phillip. J. Sci. (Bot.) 5 : 395. 1910. *Erigeron molle* D. Don, Prodr. 172. 1825. *B. wightiana* DC. in Wt. Contr. Bot. Ind. 14. 1834; Hook. f. Fl. Brit. Ind. 3 : 261. 1881. *B. neilgherrensis* Hook. f. Fl. Brit. Ind. 3 : 261. 1881.

Erect pilose herbs, up to 1 m high. Leaves ovate oblong, 1–10 cm long, closely serrate, lower petiolate. Heads 3–4 mm across, in dense terminal spiciform panicles; involucral bracts green or purplish. Flowers purplish.

Along ponds; 300–500 m.

Fl. & Fr. : January.

RAIPUR : Raipur, Sitanadi.

9. *B. obliqua* (L.) Druce in Rep. Bot. Exch. Club Brit. Isles 4 : 609. 1917. *Erigeron obliquum* L. Mant. 2 : 573. 1771. *B. amplexens* DC. in Wt. Contr. Bot. Ind. 13. 1834.

Erect dichotomously branched herbs, up to 0.5 m high. Leaves sessile, elliptic oblong, 1–6 cm long, serrate or subentire, usually cordate. Heads solitary, 6–10 mm across. Flowers yellow. Achenes pubescent, pappus yellowish.

In wastelands : 300 m.

Fl. & Fr. : April.

DURG : Kamteli.

10. *B. oxyodonta* DC. in Wt. Contr. Ind. 15. 1834.

Procumbent or ascending herbs with up to 40 cm long hairy stems. Leaves frequently crowded at the base, obovate-oblong, 3–7 × 1–3 cm, serrate, with spinulose teeth, upper narrower. Heads in corymbose panicles, 6–10 mm across. Flowers yellow.

In wastelands and along ponds ; 300–500 m.

Fl. & Fr. : January.

RAIPUR : Raipur, Sitanadi.

8. BLUMEOPSIS Gagnep.

Blumeopsis flava (DC.) Gagnep. Bull. Mus. Hist. Nat. Paris 26 : 76. 1920; Babu, Herb. Fl. Dehra Dun 248, 1977. *Blumea flava* DC. Prodr. 5 : 439. 1836. *Laggera flava* (DC.) Benth. ex Clarke, Comp. Ind. 90. 1876. *L. falcata* O. Kuntze, Rev. Gen. Pl. 1 : 350. 1891 ; *non Erigeron falcatum* D. Don, 1825. *Blumeopsis falcata* Merr. J. Arn. Arb. 19 : 70. 1938; *non Erigeron falcatum* D. Don, 1825.

Erect annual herbs, up to 1 m high. Leaves mostly in rosettes, obovate, dentate, upper few lanceolate. Heads ca 3 mm across, yellow, in corymbose panicles; anthers not tailed. Achenes minute, ribbed; pappus hairs white.

In wastelands; 400–450 m.

Fl. & Fr. : January–April.

RAIPUR : Dugli. RAJNANDGAON : Baghnadi.

9. CAESULIA Roxb.

Caesulia axillaris Roxb. Pl. Corom. I : 64. t. 93. 1798.

Succulent ascending herbs with up to 40 cm long branches. Leaves subsessile, linear, 5-12 cm long, with dilated bases embracing the floral clusters. Clusters white with purple dots, intermixed with fleshy involucral bracts.

In moist places along ponds & puddles; 250-350 m.

Fl. & Fr. : April January.

DURG : Durg. RAIPUR : Raipur.

10. CENTIPEDA Lour.

Centipeda minima (L.) A. Br. & Aschers. in Ind. Sem. Hort. Berol. App. 6. 1867. *Artemisia minima* L. Sp. Pl. 849. 1753. *C. orbicularis* Lour. Fl. Cochinch. 493. 1790.

Prostrate or ascending annual herbs. Leaves elliptic obovate, entire or pinnatifid, 5-15 x 1-4 mm. Heads solitary axillary, 2-3 mm across; marginal flowers white, disk flowers yellow. Achenes quadrangular, hairy.

In wastelands; 500 m.

Fl. & Fr. : September.

RAJNANDGAON : Deopura.

11. CENTRATHERUM Cass.

Centratherum anthelminticum (L.) O. Kuntze, Rev. Gen. Pl. 1 : 320. 1891. *Conyza anthelmintica* L. Sp. Pl. ed. 2. 1207. 1762. *Vernonia anthelmintica* (L.) Willd. Sp. Pl. 3 : 1634. 1803.

Erect herbs, 0.5-2.0 m high. Leaves subsessile, elliptic obovate, 5-20 cm long, dentate. Heads stoutly peduncled, subcorymbose, ca 15 mm long; involucre ca 10 mm long, outer linear oblong, constricted below the tip. Achenes black, ribbed; outer pappus of chaffy scales, inner of hairs.

Along roadsides ; 300 - 500 m.

Fl. & Fr. : October - November.

RAIPUR : Indagaon. RAJNANDGAON : Singhari.

12. CONYZA Less.

Conyzia leucantha (D. Don) Ludlow & Raven in Kew Bull. 17 : 71. 1963. *Erigeron leucanthum* D. Don, Prodr. 171. 1825. *E. falcatum* D. Don, Prodr. 172. 1825. *C. viscidula* Wall. ex DC. Prodr. 5 : 383. 1836.

Stout erect herbs, 1 - 2 m high, profusely branched. Leaves lanceolate, entire or shallowly crenate, lower up to 20 × 6 cm ; leaves and involucral bracts scarious - margined. Heads ca 6 mm long, pinkish, in lateral and terminal panicles. Achenes ca 0.5 mm long, bristles glandular,

In sal forests ; 500 m.

Fl. & Fr. : January.

RAIPUR : Sitanadi.

13. COSMOS Cav.

Cosmos caudatus Kunth in H.B.K. Nov. Gen. Sp. Pl. 4 : 240. 1820.

Erect herbs up to 1 m high. Leaves pinnatifid, the pinnae again lobed, ultimate lobes oblanceolate, acute. Ray florets pink, 3 notched, disc - florets yellow. Achenes slender, long - beaked ; beak hispid, 2 awned.

In wastelands ; 400 - 500 m.

Fl. & Fr. : November - January.

RAIPUR : Sitanadi. RAJNANDGAON : Deopura.

14. CRASSOCEPHALUM Moench

Crassocephalum crepidioides (Benth.) Moore in J. Bot. 50 : 211. 1912.

Gynura crepidioides Benth. in Hook. Niger Fl. 438. 1849 ; Mooney, Suppl. Bot. Bihar & Orissa 80. 1950.

Slender perennial herbs, *ca* 30 cm high. Leaves elliptic lanceolate, somewhat pinnately lobed, 10–15 × 3–4 cm, crenate. Heads in terminal corymbs, young nodding. Flowers red purple. Corolla tube widening above. Achenes ribbed; pappus hairs silky, white.

On river - banks ; 500 m.

Fl. & Fr. : January.

RAIPUR : Sitanadi.

15. CYATHOCLINE Cass.

Cyathocline purpurea (Buch. Ham. ex D. Don) Kuntze, Rev. Gen. Pl. 1 : 338. 1891. *Tanacetum purpureum* Buch. Ham. ex D. Don, Prodr. 181. 1825. *C. lyrata* Cass. in Ann. Soc. Sci. Nat. ser. 1. 17 : 420. 1829.

Profusely branched, erect or decumbent, sweetly scented hairy herbs, 20–60 cm high. Leaves pinnatifid; rachis denticulately winged; lower leaves up to 15 cm long with the lobes toothed or pinnatifid. Heads *ca* 5 mm across, purple.

Common in sandy river beds ; 350–520 m.

Fl. & Fr. : January June.

DURG : Rajolidih. RAIPUR : Dugli, Taurenga. RAJNAND-GAON : Baghnadi.

16. ECHINOPS L.

Echinops echinatus Roxb. Fl. Ind. 3 : 447. 1832.

Rigid, grey tomentose and spiny dichotomously branched annual herbs, 30–50 cm high. Leaves sinuately lobed. Balls of heads 3–5 cm across with a common involucre of spinous bracts, proper involucre of oblanceolate bracts sometimes ending in spines. Flowers white becoming brownish.

In wastelands & sandy places ; 300–450 m.

Fl. & Fr. : January - June.

DURG : Durg. RAIPUR : Gariaband, Raipur.

17. ECLIPTA L.

Eclipta alba (L.) Hassk. Pl. Jav. Rar. 528. 1848. *Verbesina alba* L. Sp. Pl. 902. 1753. *V. prostrata* L. Sp. Pl. 902. 1753. *E. prostrata* (L.) L. Mant. Pl. 2 : 286. 1771.

Prostrate or ascending appressed pubescent herbs. Leaves elliptic oblong or lanceolate, entire or serrate. Heads peduncled, 5–10 mm across, white; involucral bracts biserrate, 3–6 mm long. Achenes turbinate, ca 2 mm long, tubercled.

Common in moist depressions; 300–500 m.

Fl. & Fr. : August May.

DURG : Balod, Durg. RAIPUR : Dhamtari. RAJNANDGAON : Taregaon.

Plants medicinal.

18. ELEPHANTOPUS L.

Elephantopus scaber L. Sp. Pl. 814. 1753.

Erect herbs with a cluster of basal leaves and dichotomously branched hairy stem, 20–50 cm high. Leaves obovate or oblanceolate, basal 10–15 cm long, upper shorter. Clusters of partial floral heads interspersed with foliaceous cordate bracts. Achenes ca 3.5 mm long, pappus of 4–5 scabrid hairs.

Common in miscellaneous forests; 400–500 m.

Fl. & Fr. : September January.

RAIPUR : Dugli, Gariabad. RAJNANDGAON : Baghnadi.

19. EMILIA Cass.

Emilia sonchifolia (L.) DC. in Wt. Contr. Bot. Ind. 24. 1834. *Cacalia sonchifolia* L. Sp. Pl. 835. 1753.

Annual rather succulent herbs, 5-40 cm high. Lower leaves usually lyrate and pinnatifid, 7-10 cm long, upper oblong-lanceolate, smaller. Flowers pink-purple; involucre tubular, 8-10-toothed, splitting in fruits.

In forest clearings and sandy river beds; 300-800 m.

Fl. & Fr.: August-May.

DURG: Balod. RAIPUR: Dugli, Sitanadi. RAJNANDGAON: Rajhara dhalli, Taregaon.

20. ENHYDRA DC.

Enhydra fluctuans Lour. Fl. Cochinch. 511. 1790.

Prostrate herbs; stems succulent, rooting at the nodes, bearing short ascending flowering branches. Flowers in yellow heads; involucral bracts 4, decussate, greenish yellow.

Along ponds; 300 m.

RAIPUR (cf. Unni in *J. Bombay nat. hist. Soc.* 64 : 99. 1967.)

21. ERIGERON L.

Erigeron asteroides Roxb. Fl. Ind. 3 : 432. 1832.

Annual glandular hairy herbs, 15-45 cm high, branching from the base. Leaves oblong-obovate, toothed or lobulate, 1-5 cm long. Heads solitary, or few, corymbose, 5-10 mm across, with 1-2 rows of blue-purple ligulate florets and white or yellow disc florets.

In wastelands; 350 m.

Fl. & Fr.: August.

RAIPUR: Dhamtari.

22. GLOSSOCARDIA Cass.

Glossocardia bosvallea (L.f.) DC. in Wt. Contr. Bot. Ind. 19. 1834.
Verbesina bosvallea L. f. Suppl. 379. 1781. *G. linearifolia* Cass. in Dict. Sc. Nat. 19 : 62. 1821.

Annual procumbent herbs, 2 - 5 (15) cm high. Leaves pinnately cut into linear lobes. Heads oblong, somewhat shining, ca 7 mm long, yellow. Achenes few, large, oblong, hairy on the surfaces, 2 horned.

In wastelands ; 400 m.

Fl. & Fr. : September.

DURG : Balod.

23. GLOSSOGYNE Cass.

Glossogyne bidens (Retz.) Alst. Handb. Fl. Ceylon, Suppl. 6 : 168. 1931. *Zinnia bidens* Retz. Obs. 5 : 28. 1789. *G. pinnatifida* DC. in Wt. Contr. Bot. Ind. 19. 1834.

Slender annual herbs, 5 - 20 cm high. Leaves in a basal cluster, once or twice pinnatifid, 2 - 7 cm long, lobes linear, cuneate. Heads terminal on corymbosely branched stem, ca 5 mm across ; ligulate ; florets white, disc-florets purplish.

In gravelly wastelands ; 350 - 450 m.

Fl. & Fr. : April - June.

DURG : Budbhumi. RAIPUR : Pithora.

24. GNAPHALIUM L.

- | | | |
|---------------------------|-----|-------------------------|
| 1a. Heads in corymbs | ... | <i>G. luteo-album</i> 1 |
| 1b. Heads in leafy spikes | ... | <i>G. polycaulon</i> 2 |

1. *Gnaphalium luteo-album* L. Sp. Pl. 851. 1753.

Annual white - woolly herbs, 20 - 30 cm high. Leaves oblong - spathulate or linear - oblong, 2 - 6 cm long. Heads in dense terminal corymbs, glistening golden yellow or white ; involucral bracts oblong. Achenes tubercled or shortly bristly.

In wastelands ; 300 m.

Fl. & Fr. : February.

RAIPUR, n.v. (*cf.* Unni in *J. Bombay nat. hist. Soc.* 64 : 336. 1967).

2. *G. polycaulon* Pers. Syn. 2 : 421. 1807. *G. indicum* auct., non L.

Annual white-woolly herbs, 3-15 cm high. Leaves obovate or oblanceolate, mucronate. Heads in dense or lax terminal leafy spikes; involucral bracts several seriate. Flowers golden yellow. Achenes oblong, hairy.

In wastelands, along ditches & streams ; 250-500 m.

Fl. & Fr. : January-June.

DURG : Talgaon. RAIPUR : Dhamtari, Kasdol, Sitanadi.

25. GONIOCAULON Cass.

Goniocaulon indicum (Klein ex Willd.) Clarke, Comp. Ind. 236. 1876.
Serratula indica Klein ex Willd. Sp. Pl. 3 : 1642. 1803. *G. glabrum* Cass. in Bull. Soc. Philom. 34. 1817.

Coarse herbs with strongly ribbed stems, 30-80 cm high. Leaves sessile, linear oblanceolate, 5-10 cm long, serrate. Heads in terminal panicles, almost cylindrical, 12-17 mm long, including about 5 mauve-purple florets; involucral bracts with glistening silvery margins.

Along cultivated fields ; 250-350 m.

Fl. & Fr. : November-January.

RAIPUR : Simga. RAJNANDGAON : Singhari.

26. GRANGEA Adans.

Grangea maderaspatana (L.) Poir. in Lamk. Encycl. Suppl. 2 : 825. 1811. *Artemisia maderaspatana* L. Sp. Pl. 849. 1753.

Slender procumbent herbs with 5-10 cm long hirsute branches. Leaves oblong, pinnately lobed, 1-7 cm long. Heads button shaped, ca 1 cm across, yellow; involucral bracts 2-3 seriate, herbaceous; calyx tube with a ring of short hairs.

Common in ditches ; 300-350 m.

Fl. & Fr. : April May.

DURG : Durg. RAIPUR : Dhamtari.

27. *Guizotia* Cass.

Guizotia abyssinica (L.f.) Cass. Dict. Sci. Nat. 59 : 248. 1829.
Polymnia abyssinica L.f. Suppl. 383. 1781 'Sarkari - til'.

Erect annual herbs, 20-50 cm high. Leaves linear oblong or lanceolate, semi-amplexicaule, 7-12 cm long, serrate. Heads long peduncled, ca 2 cm across, golden yellow ; flowers sweetly scented.

Sometimes cultivated for its edible oil ; 300-350 m.

Fl. & Fr. : October November.

RAIPUR : Pithora. RAJNANDGAON : Singhari.

28. *LAGASCEA* Cav.

Lagascea mollis Cav. in Anal. Cienc. Nat. 6 : 333. t. 44. 1803.

Annual, slender, erect or ascending, grey, pubescent herbs. Leaves ovate, 2-3 cm long, acuminate, silky tomentose beneath. Heads compound, ca 2 cm across, white, on slender peduncles ; involucral bracts foliaceous, silky.

In moist wastelands & cultivated fields ; 300-800 m.

Fl. & Fr. : August January.

RAIPUR : Dugli, Raipur. RAJNANDGAON : Chilpi.

29. *LAGGERA* Sch. - Bip. ex Koch.

Laggera alata (D. Don) Sch. Bip. ex Oliver in Trans. Linn. Soc. Lond. 39 : 94. 1873. *Erigeron alatum* D. Don, Prodr. 171. 1825.

Stout perennial herbs, 0.5–1.2 m high; stem and branches with four rows of sinuately lobed wings. Leaves oblong-lanceolate, 3–10 cm long, scented, the bases decurrent. Heads ca 7 mm broad, purple; involucral bracts with recurved tips. Achenes ca 0.8 mm long, silky.

In sal forests; 500 m.

Fl. & Fr. : January.

RAIPUR : Sitanadi.

30. LAUNAEA Cass.

Launaea procumbens (Roxb.) Ramayya & Rajagopal in Kew Bull. 23 : 465. 1969. *Prenanthes procumbens* Roxb. Fl. Ind. 3 : 404. 1832. *L. nudicaulis* auct., Hook. f. Fl. Brit. Ind. 3 : 416. 1881, *p. max. p.*

Perennial succulent herbs with erect or trailing stems and yellow juice. Leaves in a basal rosette, spatulate, 5–20 cm long, lobed or pinnatifid, dentate. Heads subracemose, ca 15 mm long, yellow. Achenes ribbed, 3–4 mm long; pappus hairs white, deciduous.

In wastelands; 300 m.

RAIPUR, n.v. (*c.f.* Unni in *J. Bombay nat. hist. Soc.* 64 : 336. 1967).

31. OLIGOCHAETA (DC.) Koch.

Oligochaeta ramosa (Roxb.) Wagenitz in Veroff, Geobot. Inst. Rubel (Zurich) : 323. 1962. *Carduus ramosus* Roxb. Fl. Ind. 3 : 407. 1832. *Microlonchus divaricatus* DC. Prodr. 6 : 562. 1838. *Amberboa ramosa* (Roxb.) Jafri, The Scientist 3 : 29. 1959. *A. divaricata* (DC.) O. Kuntze, Rev. Gen. 1 : 305. 1891. *Volutrella divaricata* Benth. in B. & H. Gen. Pl. 2 : 476. 1873. *p.p.* *V. ramosa* (Roxb.) Santapau, Pl. Saurashtra 22. 1953.

Rigid caespitose herbs with thinly cottony stems. Leaves sessile, oblanceolate, 4–10 cm long, pinnatifid, the lobes tipped with short spinules. Heads bottle-shaped, ca 25 mm long, purplish; involucral bracts bearing erect or reflexed yellow spines, outer ovate, inner linear-lanceolate.

In cultivated fields ; 250 – 450 m.

Fl. & Fr. : October - June.

DURG : Durg. RAIPUR : Kasdol, Raipur. RAJNANDGAON : Baghnadi, Khairagarh.

32. PARTHENIUM L.

Parthenium hysterophorus L. Sp. Pl. 988. 1753.

Erect, profusely branched, very leafy herbs, 0.2 – 1.0 m high. Leaves 3 – 8 cm long, hairy, lower deeply pinnately lobed, upper less lobed, uppermost lanceolate, entire. Heads panicled, ca 3 mm across. Flowers yellow ; ray florets 5. Achenes compressed, ca 2 mm long ; pappus of 2 awns.

Along roadsides ; 300 m.

Fl. & Fr. : January.

RAIPUR : Raipur.

Pollen grains cause itching.

33. PENTANEMA Cass.

Pentanema indicum (L.) King in Acta Phytotax. Sinica 10 : 179. 1965. *Inula indica* L. Sp. Pl. ed 2. 1236. 1763. *Vicoa indica* (L.) DC. in Wt. Contr. Bot. Ind. 10. 1834. *V. auriculata* Cass. in Ann. Sc. Nat. ser. 1. 17 : 418. 1829. 'Bichhloo.'

Erect, glandular pubescent herbs, 0.5 – 1.0 m high. Leaves sessile, lanceolate, with a broadly auricled base, 5 – 10 cm long, hispidulous above, glandular beneath. Heads in terminal corymbose panicles, ca 25 mm across, yellow, with 5 – 7 mm long ligules.

In wastelands & miscellaneous forests ; 300 – 600 m.

Fl. & Fr. : October – April.

DURG : Durg. RAIPUR : Dugli, Raipur, Taurenga. RAJNANDGAON : Baghnadi.

34. PULICARIA Gaertn.

1a. Ligulate florets present.

- 2a. Leaves more or less crowded on the stem, usually over 12 mm broad. Peduncles thickened upwards ... *P. wightiana* 3
- 2b. Leaves distant on the stem, less than 12 mm broad. Peduncles not thickened upwards ... *P. angustifolia* 1
- 1b. Ligulate florets absent ... *P. foliolosa* 3

1. *Pulicaria angustifolia* DC. Prodr. 5 : 479. 1836.

Diffusely branched pubescent or tomentose herbs, 15-30 cm high. Leaves linear-oblanceolate, 1-3 cm long, entire or toothed. Heads small, bright yellow; involucral bracts slightly squarrose; ray florets 15-20; pappus hairs slightly thicker upwards.

In wastelands; 250-300 m.

Fl. & Fr.: August - January.

RAIPUR: Raipur.

2. *P. foliolosa* DC. Prodr. 5 : 480. 1836.

Profusely branched pubescent or tomentose herbs, 20-60 cm high. Leaves half-amplexicaul, lower spatulate, up to 10 cm long, upper narrower, smaller. Heads numerous, 6-8 mm across, orange red; involucral bracts glandular hairy.

In wastelands; 400 m.

Fl. & Fr.: April.

DURG: Rajolidih.

3. *P. wightiana* (DC.) Benth. ex Clarke, Comp. Ind. 128. 1876.
Poloa wightiana DC. Arch. Bot. (Paris) 2 : 514. 1833. *Callistephus wightianus* DC. Prodr. 5 : 275. 1836.

Profusely branched robust annual herbs, up to 60 cm high. Leaves crowded, sessile, linear-oblong, serrate, pubescent. Heads solitary, yellow, the peduncles thickened above; involucral bracts subequal. Achenes sparsely hairy.

In moist places; 300 m.

RAIPUR: Raipur. Sharma 078194H (Herb. Sci. Coll. Raipur).

35. SENECIO L.

Senecio nudicaulis Buch. Ham. ex D. Don, Prodr. Fl. Nepal. 1792. 1825.

Erect perennial herbs with fleshy roots. Leaves oblong, amplexicaul, lower shallowly lobed, upper mostly sinuate or dentate. Heads corymbose, *ca* 2 cm across, yellow; involucral bracts biserrate. Achenes ribbed and hispid; pappus dirty white.

In meadow; 300 m.

Fl. & Fr.: May.

RAIPUR : Raipur.

36. SIGESBECKIA L.

Sigesbeckia orientalis L. Sp. Pl. 900. 1753.

Annual erect herbs. Leaves 7-20 x 5-10 cm, hispid above, glandular pubescent beneath, lower ovate rhomboid, upper narrower. Heads *ca* 5 mm long, panicled, yellow. Achenes obpyramidal, *ca* 3 mm long, viscid.

In wastelands; 500 m.

Fl. & Fr.: November.

RAJNANDGAON : Deopura.

37. SONCHUS L.

- | | |
|---|------------------------|
| 1a. Annuals or biennials, with tap root. Achenes distinctly compressed, faces 3-ribbed | <i>S. oleraceus</i> 1 |
| 1b. Perennials, with slender creeping stolon. Achenes scarcely compressed, faces with variable number of ribs | <i>S. wightianus</i> 2 |

1. Sonchus oleraceus L. Sp. Pl. 794. 1753.

Herbs, 0.1-1.4 m high. Leaves mainly clustered at the base, deeply pinnately lobed, up to 30 x 15 cm, caudine less lobed or even entire, amplexicaul at the base. Heads panicled, 1-2 cm long, yellow; ligules of the ray florets as long as the tube, *ca* 6 mm long.

- In wastelands; 300 m.

RAIPUR, n. v. (cf. Unni in *J. Bombay nat. hist. Soc.* 64 : 337. 1967).

2. *S. wightianus* DC. Prodr. 7 : 187. 1838. *S. arvensis* auct., Hook. f. Fl. Brit. Ind. 3 : 414. 1881; non L. 1753.

Perennial herbs, up to 1 m high. Leaves mostly basal and deeply or shallowly pinnately lobed. Peduncles and involucral bracts white tomentose with purplish glands. Heads panicled, ca 15 mm long, yellow.

In wastelands ; 300 m.

RAIPUR n. v. (cf. Unni in *J. Bombay nat. hist. Soc.* 64 : 337. 1967).

38. SPHAERANTHUS L.

***Sphaeranthus indicus* L.** Sp. Pl. 927. 1753.

Viscous pubescent and strongly scented prostrate herbs with winged stems. Leaves obovate ob lanceolate, 2-5 cm long, toothed. Heads compound, terminal and leaf-opposed, 1-2 cm long, purple violet, surrounded by numerous linear bracts.

Common in roadside ditches ; 250-450 m.

Fl. & Fr. : January - June.

DURG : Durg. RAIPUR : Dhamtari, Raipur. RAJNANDGAON : Baghnadi.

39. SPILANTHES Jacq.

***Spilanthes iabidicensis* A. H. Moore** in Proc. Amer. Acad. Arts. 42 : 542. 1907; Grierson in Rev. Handb. Fl. Ceylon 1 : 221. 1980.

Profusely branched herbs, with up to 60 cm long ascending branches. Leaves sessile or petiolate, elliptic ovate, 2-5 cm long, subentire or sinuate. Heads long peduncled, ca 8 mm long, 3-5 mm across, yellow. Achene ca 1.5 mm long, black, weakly ciliate along one or both the margins particularly in the upper part; pappus bristles very weak, ca 0.2 mm long.

In roadside ditches ; 300 m.

Fl. & Fr. : February.

DURG : Bhilai.

40. TRIDAX L.

Tridax procumbens L. Sp. Pl. 900. 1753. '*Khal - muriya, Tal muriya*'.

Perennial hairy herbs with usually several procumbent stems up to 50 cm long. Leaves oblong, 2-5 cm long, variously toothed and lobed. Heads long peduncled, ca 1 cm across; ray florets pale yellow or whitish with 3-4 mm long ligule. Achenes black, silky.

Common in wastelands; 250-500 m.

Fl. & Fr. : throughout the year.

DURG : Rajhara dhalli. RAIPUR : Pithora, Raipur, Sitanadi.
RAJNANDGAON : Rajnandgaon.

Crushed leaves with salt are applied on boils.

41. VERNONIA Schreber

1a. Heads 5-6 mm long.

2a. Achenes hairy ... *V. cinerea* 1

2b. Achenes glabrous ... *V. divergens* 2

1b. Heads 10-15 mm long ... *V. pyramidale* 3

1. Vernonia cinerea (L.) Less. in Linnaea 4 : 291. 1829. *Conyza cinerea* L. Sp. Pl. 862. 1753.

Erect or decumbent hairy herbs, 20-80 cm high. Leaves extremely variable in shape, 2-5 cm long, entire or toothed. Heads in dense or very loose panicles, ca 6 mm long, pale purple; involucral bracts spinulous-tipped.

In wastelands, and sal & miscellaneous forests; 250-500 m.

Fl. & Fr. : August-May.

DURG : Bubhum. RAIPUR : Raipur, Sitanadi, Taurenga.
RAJNANDGAON : Baghnadi, Deopura, Singhari.

2. V. divergens (Roxb.) Edgew. in J Asiat. Soc. Bengal 21 : 172. 1853.
Eupatorium divergens Roxb. Fl. Ind. 3 : 415. 1832.

Perennial erect bushy herbs with pubescent stems. Leaves petioled, elliptic ovate, serrate. Heads short peduncled. ca 5 mm long, purple, in corymbose panicles; involucral bracts scarious. Achenes 10 - ribbed; pappus hairs reddish brown or dirty white.

In wastelands ; 400 - 500 m.

Fl. & Fr. : November April.

RAJNANDGAON : Baghnadi, Deopura.

3. *V. pyramidale* (D. Don) Mitra in Ind. For. 99 : 1973. *Eupatorium pyramidale* (D. Don) Prodr. 170. 1825. *V. roxburghii* Less. in Linnæa 6 : 674. 1831.

Usually stout erect herbs, 0.3 - 1.5 m high. Leaves oblanceolate or obovate, 7 - 17 x 2 - 7 cm. Heads purple red or bluish, in dense or lax panicles generally at the end of branchlets; involucral bracts shortly awned. Achenes ca 3 mm long, silky between the ribs.

In miscellaneous forest ; 400 - 550 m.

Fl. & Fr. : October May.

RAIPUR : Singhpur, Sitanadi, Taurenga.

42. WEDELIA Ja cq.

Wedelia urticifolia DC. in Wt. Contr. Bot. Ind. 18. 1834.

Annual erect hispid herbs, 30 - 50 cm high. Leaves ovate, 3 - 10 cm long, acuminate, serrate, 3 nerved. Heads 1 - 3, peduncled, 2 - 3 cm across, yellow; involucral bracts ovate lanceolate, acuminate, hispid. Achenes triquetrous, truncate.

In miscellaneous forests ; 600 - 800 m.

Fl. & Fr. : September October.

RAIPUR : Taurenga. RAJNANDGAON : Chpilpi.

43. XANTHIUM L.

Xanthium indicum Koenig in Roxb. Fl. Ind. 3 : 601. 1832 ; Grierson in Dassan. & Fosb. Rev. Handb. Fl. Ceylon 1 : 209. 1980. *X. strumarium* L. Sp. Pl. 987. 1753 p. p. quoad syn. Fl. Zeyl. 564. 1747 ; Hook. f. Fl. Brit. Ind. 3 : 303. 1881.

Stout erect hispid herbs, 0.3 - 1.0 m high. Leaves long petioled, broadly ovate triangular, 5 - 10 cm long, lobed and toothed, 3 costate. Female involucres with hooked spines; male heads in the upper part of the inflorescence, anthers long exserted.

In wastelands ; 250 - 600 m.

Fl. & Fr. : November June.

RAIPUR : Dhamtari, Sitanadi. RAJNANDGAON : Taregaon.

62. STYLEDIACEAE

(P. C. Pant)

STYLEDIUM Swartz ex Willd.

Stylium tenellum Swartz in Mag. Ges. Naturf. Fr. Berlin 1 : 51. 1807.

Annual slender herbs, up to 20 cm high. Leaves oblong obovate, ca 1 cm long. Flowers sessile, cymose, rose purple; corolla with 4 distinct lobes and a spur at the back. Capsules linear, 10 - 15 mm long, valves united at both ends.

In miscellaneous forests ; 400 - 500 m.

Fl. & Fr. : September November.

RAJNANDGAON : Baghnadi, Deopura.

63. CAMPANULACEAE

(D. M. Verma & V. Chandra)

- | | | |
|---|-----|-----------------------|
| 1a. Leaves ovate - rhomboid. Flowers solitary, axillary, or subracemose; corollabi-lipped | ... | <i>Lobelia</i> 1 |
| 1b. Leaves linear-oblong. Flowers panicled; corolla not bilipped | ... | <i>Wahlenbergia</i> 2 |

1. LOBELIA L.

- | | | |
|-----------------------|-----|------------------------|
| 1a. Seeds triquetrous | ... | <i>L. alsinoides</i> 1 |
| 1b. Seeds lenticular | ... | <i>L. heyneana</i> 2 |

1. *Lobelia alsinoides* Lamk. Dict. Bot. 3 : 588. 1791. *L. trigona* Roxb. Fl. Ind. 2 : 151. 1824.

Annual fleshy often pinkish green herbs, 20–30 cm high. Leaves subsessile, obtuse, serrulate, 1.0–1.5 × 1.0–1.5 cm. Flowers solitary axillary, blue, on up to 2 cm long pedicels, forming a lax, leafy, terminal raceme; calyx lobes triangular-subulate. Capsules hemispherical.

In sal and miscellaneous forests and river beds, in moist shady places; 440–480 m.

Fl. & Fr. : September – May.

RAJPUR : Dugli, Taurenga. RAJNANDGAON : Baghnadi, Ghor Talab.

2. *L. heyneana* R. & S. Syst. Veg. 5 : 50. 1819. *L. micrantha* Hook. Exot. Fl. 1 : t. 44. 1823. *L. trialata* Buch. Ham. ex D. Don, Prodr. 157. 1825.

Annual tufted herbs, ca 30 cm high. Leaves acute, dentate-serrate, 0.5–5.0 × 0.5–3.0 cm. Flowers pink, axillary, often forming a lax terminal raceme. Calyx lobes elliptic-lanceolate. Capsules obconical.

In moist places; 670 m.

Fl. & Fr. : January.

RAJPUR : Borai.

2. WAHLENBERGIA Schrad. ex Roth

Wahlenbergia marginata (Thunb.) DC. Monogr. Camp. 143. 1830. *Campanula marginata* Thunb. Fl. Jap. 89. 1784. *C. gracilis* Forst. Prodr. 15. 1786. *W. gracilis* (Forst.) DC. Monogr. Camp. 142. 1830.

Erect or ascending herbs. Lower leaves approximate; upper ones distant; all sessile, entire to serrate dentate. Flowers pale violet, terminal, solitary or in 1–3 flowered inflorescences. Calyx lobes narrowly triangular. Capsules obconical, 3-valved.

In open places along streams; 440 m.

Fl. & Fr. : March April.

RAJNANDGAON : Baghnadi.

64. PLUMBAGINACEAE

(P. C. Pant)

PLUMBAGO L.

Plumbago zeylanica L. Sp. Pl. 151. 1753.

Erect or straggling perennial undershrubs. Leaves ovate - lanceolate or oblong, 2 - 10 cm long, acute, undulate, white punctate beneath. Flowers white in terminal and axillary racemes; rhachis glandular; calyx with stalked red tipped glands. Fruit oblong, acute, longitudinally furrowed.

Roadsides ; 750 m.

Fl. : April.

RAJNANDGAON : Malaidah.

65. PRIMULACEAE

(D. M. Verma & M. I. Hanfi)

1a. Capsules opening by circumscissile dehiscence	...	<i>Anagallis</i> 1
1b. Capsules opening by valves	...	<i>Lysimachia</i> 2

1. ANAGALLIS L.

1a. Leaves 3-nerved. Petals blue, glandular hairy on the margins	...	<i>A. arvensis</i> 1
1b. Leaves 1-nerved. Petals white, eglandular	...	<i>A. pumila</i> 2

1. *Anagallis arvensis* L. Sp. Pl. 211. 1753.

Slender annual creeping herbs. Leaves opposite, ovate, 10 - 15 × 5 - 10 mm, cordate or amplexicaul at the base, palmately 3-nerved. Flowers axillary, on slender pedicels; petals broadly obovate, subequaling the calyx lobes, ca 4 mm long. Capsules circumscissile.

In moist places ; 300 m.

Fl. & Fr. : January.

RAIPUR : Raipur, Sharma 082031 H (Herb. Sci. Coll. Raipur).

2. A. pumila Sw. Prodr. 1 : 40. 1788 ; Taylor in Kew Bull. 1955 : 342. 1955. *Centunculus tenellus* Duby in DC. Prodr. 8 : 72. 1844. *C. pentandrus* R. Br. Prodr. 427. 1810.

Annual herbs up to 25 cm high. Stem scarcely winged. Leaves subsessile, ovate or obovate rounded, obtuse, apiculate, 0.5-1.0 cm long. Flowers axillary, short pedicelled; sepals lanceolate oblong, acute; corolla white, as long as the calyx. Capsules as long as the calyx.

In shady places ; 400-450 m.

Fl. & Fr. : September November.

RAJNANDGAON : Baghnadi, Deopura.

2. LYSIMACHIA L.

Lysimachia obovata Buch. Ham. ex Hook. f. Fl. Brit. Ind. 3 : 502. 1882.

Annual herbs, 20-50 cm high. Leaves petioled, oblanceolate, acute or obtuse, minutely gland-dotted. Flowers white, with long slender pedicel, in elongated terminal racemes; sepals linear, acuminate; corolla segments obovate. Capsules as long as the persistent calyx.

Scarce, in wastelands ; 600-800 m.

Fl. & Fr. : April September.

RAIPUR : Khaltari. RAJNANDGAON : Chilpi.

66. MYRSINACEAE

(D. M. Verma & V. Chandra)

1a. Flowers 15-20 mm across; pink-mauve, gamopetalous.
Fruits 8-12 mm diam.

Ardisia 1

1b. Flowers 3-4 mm across, greenish white or white, polypetalous. Fruits 2.5-3.5 mm diam.

Embelia 2

1. ARDISIA Sw.

Ardisia solanacea Roxb. Pl. Corom. 1 : 27. t. 27. 1795. *A. humilis* auct., Clarke in Hook. f. Fl. Brit. Ind. 3 : 529. 1882; *non* Vahl.

Shrubs *ca* 2 m high. Leaves coriaceous, clustered towards ends of the branchlets, oblanceolate. Flowers long pedicelled, deep mauve, pentamericous, in axillary often contracted or corymbose racemes; calyx and corolla glandular; stamens yellow. Berry depressed globose, black on ripening.

In sal forests; 450 m.

Fl. & *Fr.*; May June.

RAIPUR: Khallari.

2. EMBELIA Burm. f.

Embelia tsjeriam-cottam (R. & S.) A. DC. in Trans. Linn. Soc. Lond. 17 : 131. 1834. *Ardisia tsjeriam cottam* R. & S. Syst. 4 : 518. 1819. *E. robusta* Clarke in Hook. f. Fl. Brit. Ind. 3 : 515. 1882; *non* Roxb. 1820.

Shrubs, 1-2 m high. Leaves obovate, acuminate or obtuse, entire or serrate. Flowers in axillary racemes, white or greenish white, odorous; perianth lobes 5 (6). Fruits globose, red, or black on drying, with persistent style forming a filiform beak.

In sal and mixed sal forest; 400-750 m.

Fl.: August; *Fr.*: September January.

RAIPUR: Dugli, Sitanadi, Taurenga. RAJNANDGAON: Chilpi.

Fruits used as condiment and also considered medicinal.

67. SAPOTACEAE

(V. Chandra)

- | | | |
|---|-----|--------------------|
| 1a. Deciduous trees. Flowers when leafless; stamens 12 or more in two whorls; staminodes absent | ... | <i>Madhuca</i> 1 |
| 1b. Evergreen trees. Flowers along with leaves; fertile stamens 6, staminodes 6. | ... | <i>Manilkara</i> 2 |

1. MADHUCA Gmel.

Madhuca longifolia (Koen.) MacBr. var. *latifolia* (Roxb.) Chevalier in Rev. Bot. Appl. 23 : 140. 1945 ; Royen in Blumea 10 : 53. 1960. *Bassia latifolia* Roxb. Pl. Corom. 1 : 20. 1795. *M. latifolia* (Roxb.) MacBr. in Contr. Gray Herb. Harw. Univ. n. s. 53 : 17. 1918. - 'Mohwa'.

Trees *ca* 8 m high with spreading branches ; bark brown, nearly smooth. Leaves elliptic or oblong elliptic. Flowers fleshy, cream-coloured, on long rusty tomentose pedicels clustered at the ends of usually leafless branches. Fruits ovoid, brown tomentose. Seeds ellipsoid, almost terete, shining brown.

On road sides and in mixed forests. 400 - 440 m.

Fl. & Fr. : April June.

DURG : Budbhumi. RAIPUR : Dhamtari. RAJNANDGAON : Baghnadi.

Sun dried flowers and unripe fruits eaten. Spirit distilled from flowers.

2. MANILKARA Adans.

Manilkara hexandra (Roxb.) Dub. in Ann. Mus. Col. Marseille ser. 3. 3 : 9. 1915. *Mimusops hexandra* Roxb. Pl. Corom. 1 : 16. t. 15. 1795.

Small trees ; bark rough, grey. Leaves clustered towards the end of the branches, oblong, elliptic or elliptic obovate. Flowers white, in fascicles of 2 - 6 and from the axils of fallen leaves ; sepals 3 + 3. Fruits oblong ellipsoid.

RAIPUR : Singhpur, n. v. (cf. Haines, Descr. list of trees, shrubs & econ. herbs, Southern Circle, C.P. 136. 1916).

68. EBENACEAE
(D. M. Verma & M. I. Hanfi)
DIOSPYROS L.

1a. Leaves linear or narrowly linear - oblong, mostly one fifth to one - third as broad as long. Stamens 20 - 35, or more. Fruits covered with bright red deciduous scurf, mature 5 - 8 cm across ...

D. malabarica 1

- 1b. Leaves broadly elliptic - oblong, mostly one - half to two - third as broad as long. Stamens 12 - 16. Fruits glabrous or sparsely hairy with greenish white hairs, mature 2.0 - 3.5 cm across.
- 2a. Leaves mostly subopposite. Calyx of male flowers about one - half or more as long as the corolla ; anthers subacute : lobes of fruiting calyx with recurved margins ... *melanoxylon* 2
- 2b. Leaves alternate. Calyx of male flowers one - fourth to one - third as long as the corolla ; anthers awned ; lobes of fruiting calyx with flat margins ... *D. montana* 3

1. *D. malabarica* (Desr.) Kostel, All. Med. Pharm. Fl. 3 : 1099. 1834. *Garcinia malabarica* Desr. in Lamk. Encycl. 3 : 701. 1792. *D. embryopteris* Pers. Syn. 2 : 624. 1807. 'Kala tendu, Makar tendu.'

Trees, ca 4 m high ; bark black, smooth. Leaves coriaceous. 12.5 - 22.5 cm long. Flowers white, fragrant ; males in umbellate cymes : females solitary. Fruits globose.

In miscellaneous forests ; 550 m.

Fr. : October.

RAIPUR : Taurenga.

Fruits eaten raw.

2. *D. melanoxylon* Roxb. Pl. Corom. I : 36. t. 46. 1795. 'Tendu'.

Trees, 3 - 6 m high ; bark splitting into black chips. Leaves tomentose to glabrescent beneath. Male flowers 4 - 6 merous, in peduncled 3- 12-flowered cymes. Female flowers solitary, axillary or from leaf-scars. Fruit globose, green when young, red on maturity, becoming black when dry.

Common in miscellaneous forests and on roadsides ; 300 - 500 m.

Fr. : September June.

RAIPUR : Dugli, Khallari. RAJNANDGAON : Baghnadi, Singhari.

Leaves used for rolling 'bidis' ; mature fruits eaten raw.

3. *D. montana* Roxb. Pl. Corom. I : 37. t. 48. 1795. 'Bis - tendu.'

Shrubs ca 2 m high. Leaves glabrous or pubescent. Male flowers green in 3 - 7 or more flowered cymes ; buds conical. Female flowers green or yellow, on very short peduncles. Fruits globose to somewhat oblong, greenish - yellow.

In sal forests ; 450 m.

Fl. & Fr. : June - September.

RAIPUR : Gariaband. RAJNANDGAON : Baghnadi.

69. OLEACEAE

(D. M. Verma & V. Chandra)

- | | | |
|--|-----|---------------------|
| 1a. Leaves compound. Fruit a pyriform, 2 - valved, woody capsule | ... | <i>Schrebera</i> 4 |
| 1b. Leaves simple. Fruits not as above. | | |
| 2a. Leaves scabrid on the upper surface. Fruit a compressed 2 - valved capsule | ... | <i>Nyctanthes</i> 3 |
| 2b. Leaves not scabrid on the upper surface. Fruit a drupe, or baccate. | | |
| 3a. Trees. Flowers ca 3 mm long. Fruit drupaceous | ... | <i>Linociera</i> 2 |
| 3b. Usually climbing shrubs. Flowers more than 10 mm long. Fruit baccate | ... | <i>Jasminum</i> 1 |

1. JASMINUM L.

- | | | |
|--|-----|-------------------------|
| 1a. Leaves 7.5 - 11.0 cm long. Flowers in lax trichotomous cymes | ... | <i>J. arborescens</i> 1 |
| 1b. Leaves 3.5 - 7.0 cm long. Flowers in dense capitate cymes | | <i>J. pubescens</i> 2 |

1. *Jasminum arborescens* Roxb. Fl. Ind. 1 : 94. 1820.

Climbers, 5 - 20 m high. Leaves ovate acuminate, tomentose when young. Flowers white, fragrant, in lax trichotomous cymes ; bracts oblong, green, turning purplish black with age ; corolla lobes usually 9. Fruits oblong, with membranous pericarp, black when ripe.

On roadside trees and sal forests ; 380 - 800 m.

Fl. & Fr. : April - June.

DURG : Budhhum. RAIPUR : Gariaband. RAJNANDGAON : Chilpi.

2. *J. multiflorum* (Burm. f.) Andrews in Bot. Repos. 8, t. 496. 1807.
Nyctanthes multiflora Burm. f. Fl. Ind. 5, t. 3, f. 1. 1768. *Nyctanthes pubescens* Retz. Obs. 5 : 9. 1789. *J. pubescens* (Retz.) Willd. Sp. Pl. ed. 4, 1 : 37 : 1797.

Scandent shrubs. Leaves ovate, acuminate, upper surface pubescent, becoming glabrous, lower tomentose on the nerves. Flowers fragrant, white, in dense capitate cymes; corolla lobes 6-9. Fruits ellipsoid, simple or didymous, black when ripe, surrounded by long hairy calyx teeth.

Roadsides ; 680 m.

Fr. : April.

RAJNANDGAON : Rengakhar.

2. LINOCIERA Swartz ex Schr.

Linociera ramiflora (Roxb.) Wall. ex G. Don. Gen. Hist. 4 : 52. 1838. *Chionanthus ramiflora* Roxb. Fl. Ind. 1 : 106. 1820. *C. intermedius* Bedd. Fl. Sylv. t. 239. 1872. *L. intermedia* Wt. Ic. t. 1245. 1848.

Small or large trees. Leaves oblong or elliptic oblong, 7-20 cm long, shortly acuminate. Flowers white, in axillary pyramidal panicles. Drupes blue purple, oblong.

RAIPUR : Singhpur, n. v. (cf. Haines in Descr. list of trees, shrubs & econ. herbs, Southern Circle, C.P. 143. 1916).

3. NYCTANTHES L.

Nyctanthes arbor-tristis L. Sp. Pl. 6. 1753. 'Kharsi.'

Shrubs or small trees, 2-4 m high. Leaves ovate, 7-10 cm long, entire or toothed. Flowers white with orange red tube, fragrant, in terminal trichotomous cymes. Fruits compressed, suborbicular, ca 2 cm long.

In miscellaneous forests and planted in villages ; 300-500 m.

Fl. : September October ; *Fr.* : January.

RAIPUR : Chhoora, Sitanadi. RAJNANDGAON : Deopura, Singbari.

Flowers yield an orange yellow dye.

4. SCHREBERA Roxb.

Schrebera swietenioides Roxb. Pl. Corom. 2 : 1. t. 101. 1799.

Moderate sized trees. Leaves 7-9 foliolate; leaflets ovate or oblong, 7.5-15.0 cm long. Flowers white, in terminal panicles; sepals and petals 4-7. Capsules drooping, verrucose, seeds 2-4 angled.

In miscellaneous forests; 300 m.

Fr. : November.

RAJNANDGAON ; Singhari.

70. APOCYNACEAE

(D. M. Verma & J. Lal)

(*Nerium indicum* Mill., *Thevetia peruviana*. (Pers.) Schum. and *Tabernaemontana divaricata* (L.) R. Br. are planted as ornamentals.)

1a. Herbs or undershrubs, less than 1 m high.

2a. Leaves mostly ternately whorled, a few sometimes opposite. Flowers many together in long peduncled cymes. Fruits drupaceous ... *Rauvolfia* 6

2b. Leaves always opposite. Flowers solitary or paired. Fruits follicular ... *Catharanthus* 3

1b. Trees, shrubs or climbers, more than 1.5 m high.

3a. Plants armed with spines. Fruit a berry ... *Carissa* 2

3b. Plants not armed. Fruit a follicle.

4a. Climbers.

5a. Branches rusty tomentose. Flowers ca 6 mm across. Follicles slender, 2-3 mm broad ... *Ichnocarpus* 5

5b. Branches not rusty tomentose. Flowers ca 15 mm across. Follicles stout, 25-40 mm broad. ... *Vallaris* 7

4b. Trees or shrubs.

6a. Leaves mostly hairy. Pedicels, calyx and corolla tube densely pubescent; calyx divided almost to the base. Seeds comose ... *Holarrhena* 4

6b. Plants not as above.

- 7a. Leaves whorled, mostly ternate ; secondary nerves uniting with an intra - marginal nerve. Follicles with 1 - 2 cm long beak ... *Alstonia* 1
- 7b. Leaves opposite, intra marginal nerve absent. Follicles not beaked ... *Wrightia* 8

1. ALSTONIA R. Br.

Alstonia venenata R. Br. in Mem. Werner. Soc. 1 : 75. 1811.

Shrubs *ca* 2 m high. Leaves ternate, linear or oblong lanceolate, 11 - 16 × 3 - 4 cm, acuminate ; young leaves softly pubescent beneath, glabrescent with age ; secondary nerves many, strong, parallel, united in an intra marginal vein. Cymes dichotomous. Flowers pure white ; calyx ciliate. Follicles paired, terete, beaked, 9 - 12 cm long.

In miscellaneous forests ; 600 m.

Fl. : October.

RAIPUR : Taurenga.

2. CARISSA L.

Carissa opaca Stapf. ex Haines in Ind. For. 47. 378. 1921. *C. spinarum* auct., Hook. f. Fl. Brit. Ind. 3 : 631. 1882 ; *non L.*

Spiny shrubs, 1 - 2 m high. Spines straight, paired. Leaves opposite, ovate or elliptic, 3 - 4 × 2 - 3 cm, acute or mucronate. Cymes corymbose, few flowered. Corolla white, salver shaped. Berries sub globose or ellipsoid, 2 seeded.

In miscellaneous forests ; 550 m.

Fl. : April.

RAJNANDGAON : Rengakhar.

3. CATHARANTHUS G. Don

- 1a. Leaves lanceolate, apex acute to acuminate. Flowers *ca* 0.5 cm across ... *C. pusillus* 1
- 1b. Leaves obovate - oblong, apex rounded with retuse or mucronulate tips. Flowers 2 - 4 cm across ... *C. roseus* 2

1. ***Catharanthus pusillus*** (Murr.) G. Don, Gen. Syst. 4 : 95. 1837.
Vinca pusilla Murr. in Novi Comment. Soc. Reg. Sci. Goetting. 3 : 66.
 t. 2. f. 1. 1773. *Lochnera pusilla* K. Schumann in E. & P. Pflanzenfam.
 4 (2) : 145. 1895.

Small erect herbs, 10 - 40 cm high. Stem sharply 4 angled. Leaves lanceolate, 5 - 7 × 1 - 2 cm, glabrous. Flowers axillary, white. Follicles very slender, ca 5 cm long.

On roadsides ; 250 - 500 m.

Fl. & Fr. : August - November.

DURG : Balod. RAIPUR : Raipur. RAJNANDGAON : Deopura, Rajnandgaon.

2. ***C. roseus*** (L.) G. Don, Gen. Syst. 4 : 95. 1837. *Vinca rosea* L. Syst. ed, 10. 944. 1759. *Lochnera rosea* Reichenb. Conspl. Regni Veg. 134. 1828. 'Sada suhagi'.

Perennial diffusely branched herbs, 30 - 60 cm high. Leaves obovate oblong, 5 - 6 × 1 - 2 cm, pubescent, olive green. Flowers white or rose coloured. Follicles 2 - 3 cm long, pubescent.

Cultivated as ornamentals ; 400 - 550 m.

Fl. & Fr. : May - October.

RAIPUR : Chhoora, Gariaband, Sitanadi.

Highly medicinal.

4. HOLARRHENA R. Br.

Holarrhena antidysenterica (Roth) A. DC. in DC. Prodr. 8. : 413. 1844. *Echites antidysenterica* Roth, Nov. Pl. Sp. 138. 1821. *Chonemorpha antidysenterica* (Roth) G. Don, Gen. Syst. 4 : 76. 1837. 'Dudhi.'

Shrubs or small trees, 1.5 - 2.5 (- 5) m high with milky latex ; young branches and leaves pinkish. Leaves broadly ovate to elliptic oblong 17 - 20 × 6 - 9 cm, nerves 10 - 14 pairs. Cymes terminal, corymbose. Flowers white, sweet - scented. Follicles green, cylindrical, with lenticels ; seeds comose at the top.

Common in sal and miscellaneous forests ; 300 - 500 m.

Fl. : June ; *Fr.* : September - April.

DURG : Balod, Budbhumi. RAIPUR : Dhamtari, Dugli, Gariaband, Sitanadi. RAJNANDGAON : Baghnadi, Singhari.

Medicinal.

5. ICHNOCARPUS R. Br.

Ichnocarpus frutescens (L.) R. Br. in Ait. Hort. Kew. ed. 2, 2 : 69. 1811. *Apocynum frutescens* L. Sp. Pl. 213. 1753. 'Cherising, Khapribela.'

Large woody climbers. Leaves elliptic or broadly oblong, acute or shortly acuminate, $5 - 10 \times 3 - 4$ cm, glabrous. Panicles long, terminal or axillary. Flowers minute, white; corolla-tube swollen in the middle. Follicles linear, divaricate, $5 - 17$ cm long; seeds comose.

In miscellaneous forests; 350 - 500 m.

Fl. : September - November; *Fr.* : January - April.

DURG : Budbhumi. RAIPUR : Dugli. RAJNANDGAON : Baghnadi, Deopura.

6. RAUVOLFIA L.

Rauvolfia serpentina (L.) Benth. ex Kurz, For. Fl. Brit. Burma 2 : 171. 1877. *Ophioxylon serpentinum* L. Sp. Pl. 1043. 1753. — 'Bhuin kurwa, Bhuin - kurai'.

Erect perennial herbs or undershrubs. Leaves lanceolate or oblanceolate, acute or acuminate, $13 - 18 \times 6 - 8$ cm. Cymes corymbose, bracts minute. Flowers white or pinkish; pedicels and calyx red; corolla tube swollen above the middle; lobes elliptic oblong. Drupes purplish black.

Scarce, in miscellaneous forests; 500 m.

Fr. : October.

RAIPUR : Taurenga.

Roots highly medicinal.

7. VALLARIS Burm. f.

Vallaris solanacea (Roth) O. Kize, Rev. Gen. 417. 1891. *Peltanthera solanacea* Roth, Nov. Pl. Sp. 132. 1821. *V. heynei* Spreng. Syst. 1 : 635. 1825.

Climbing shrubs. Leaves elliptic oblong, acuminate, $4 - 10 \times 1.5 - 4.0$ cm. Cymes axillary, usually subcorymbose, $5 - 8$ cm across. Flowers on $5 - 10$ mm long pedicels; corolla white, with a short tube and broad lobes. Follicles $8 - 12$ cm long with a broad truncate base tapering above to a blunt apex.

In mixed forests ; 350 m.

Fl. : May ; *Fr.* : December.

RAJNANDGAON : Deori (*cf.* Haines, Descr. list of trees, shrubs & econ. herbs, Southern Circle, C.P. 148. 1916).

8. WRIGHTIA R. Br.

- | | | |
|---|-----|-----------------------|
| 1a. Corona - scales orange - red, entire or broadly toothed.
Follicles connate throughout its length | ... | <i>W. arborea</i> 1 |
| 1b. Corona - scales white, cut into linear segments. Follicles free or cohering only at the tip | ... | <i>W. tinctoria</i> 2 |

1. **Wrightia arborea** (Dennst.) Mabb. in Taxon 26 : 533. 1977. *Periploca arborea* Dennst. in Schluessel Hort. Malab. 13, 23 & 25. 1818 and in Fortsetz. Allg. Teutsch. Gart. Mag. 3 :32, 41 & 83. 1818. *W. tomentosa* R. & S. Syst. Veg. 4 : 414. 1819.

Small trees with slender pubescent branches. Leaves shortly caudate-acuminate, tomentose, 5-15×4-6 cm. Flowers greenish orange or cream-coloured. Follicles slender, 15-30 cm long, connate, greenish with white tubercles.

In miscellaneous forests ; 400 m.

RAIPUR : Sihawa, n. v. (*cf.* Haines, Descr. list of trees, shrubs & econ. herbs, Southern Circle, C. P. 147. 1916).

2. **W. tinctoria** (Roxb.) R. Br. in Mem. Werner. Soc. 1 : 74. 1811. *Nerium tinctorium* Roxb. Orient. Repert. 1 : 39. 1791.

Trees *ca* 3 m high, with milky sap. Leaves subsessile, elliptic, oblong, obovate or oblanceolate, 8-12×3-5 cm. Flowers white. Follicles slender, 40-55 cm long, curved and cohering at the tip or sometimes free.

In miscellaneous forests ; 400-500 m.

Fl. & *Fr.* : April.

DURG : Budbhumi. RAJNANDGAON : Baghnadi, Deopura.

71. ASCLEPIADACEAE

(D. M. Verma & J. Lal)

1a. Plants erect.

- | | | |
|---|-----|---------------------|
| 2a. Shrubs or small trees, 0.7-2.5 m high with milky sap.
Leaves 5-25 cm long. Corolla 1-2 cm long | ... | <i>Calotropis</i> 1 |
|---|-----|---------------------|

- 2b. Herbs, 0.3 - 0.5 m high with watery sap. Leaves 1 - 4 cm long. Corolla *ca* 0.3 cm long ... *Tylophora* 12
- 1b. Plants climbing or straggling.
- 3a. Corolla - tube *ca* 2 cm long, conspicuously curved forward, widened at the base and the top, lobes cohering at the tips by means of hard cusps at their tips ; corona cupular, behind each anther with a ligulate appendage ... *Ceropegia* 2
- 3b. Corolla and corona not as above.
- 4a. Corolla - lobes 5 - 10 mm broad, pinkish - white with purple - red blotches or veins.
- 5a. Leaves linear or linear - lanceolate, acute at the base. Corolla - lobe margins villosus ... *Oxystelma* 10
- 5b. Leaves broadly ovate - oblong, at least the lower ones deeply cordate at the base. Corolla - lobe margins glabrous ... *Holostemma* 7
- 4b. Corolla - lobes otherwise, usually white or yellow, or (in *Hemidesmus*) uniformly dark brown purple. ...
- 6a. Cymes subsessile ; flowers brown - purple ; filaments free ... *Hemidesmus* 6
- 6b. Cymes mostly distinctly peduncled ; flowers greenish white or yellow ; filaments connate, or (in *Cryptolepis*) free.
- 7a. Leaves glabrous. Corolla - lobes glabrous ; filaments free ; pollinia granular ... *Cryptolepis* 3
- 7b. Leaves usually hispid to tomentose, or glabrate with age. Corolla - lobes hairy to ciliate within or on margins, or glabrous ; filaments connate into a tube ; pollinia waxy.
- 8a. Corolla - lobes valvate ; anthers without a membranous tip ... *Leptadenia* 8
- 8b. Corolla - lobes imbricate ; anthers with a membranous tip.
- 9a. Pollinia pendulous. Follicles clothed with soft spines ... *Pergularia* 11
- 9b. Pollinia erect or horizontal. Follicles smooth.
- 10a. Corolline corona of small fleshy callosities projecting above the sinuses of the corolla ; staminal corona absent. Follicles 5 - 8 mm thick ... *Gymnema* 5

- 10b. Corolline corona absent ; staminal corona present, various. Follicles 25 - 40 mm thick.
- 11a. Prostrate herbs. Corona - lobes tubercle - like, quite adnate to the staminal column ... *Tylophora* 12
- 11b. Stout climbers. Corona - lobes otherwise, adnate to the staminal column at the base, free above.
- 12a. Corolla sub - campanulate, pubescent outside ; corona - lobes hard, linear - oblong, appressed to the column and with membranous bifid tips ... *Marsdenia* 9
- 12b. Corolla rotate, glabrous ; corona - lobes fleshy, roundish with a small apiculus *Dregia* 4

1. **CALOTROPI** R. Br.

- 1a. Corolla - lobes spreading to revolute, uniformly reddish purple or lilac in the upper half ; corona - scales shorter than the staminal column, hairy at the back, its apex entire, with two obtuse auricles below it, spur involute ... *C. gigantea* 1
- 1b. Corolla - lobes erect or suberect, with a distinct reddish purple blotch in the upper half ; corona - scales equalling to exceeding the staminal column, glabrous, its apex bifid, without auricles ; spur not involute ... *C. procera* 2

1. *Calotropis gigantea* (L.) R. Br. in Ait. Hort. Kew ed. 2, 2 : 78.
1811. *Asclepias gigantea* L. Sp. Pl. 214. 1753.

Shrubs, 1 - 2.5 m high. Leaves sessile or sub sessile, thick, elliptic oblong, cordate, acute, white pubescent beneath, 7 - 13 × 3 - 6 cm. Flowers in umbellate cymes. Follicles paired, recurved, 7 - 10 × 3 - 4 cm ; seeds flat, with 2 - 3 cm long coma.

In wastelands ; 300 - 500 m.

Fl. & Fr. : throughout the year.

DURG : Bordih. RAIPUR : Chhoora, Dhamtari, Sitanadi.

2. *C. procera* (Ait.) R. Br. in Ait. Hort. Kew ed. 2, 2 : 78. 1811.
Asclepias procera Ait. Hort. Kew ed. 1, 1 : 305. 1789.

Shrubs, 0.7 - 1.5 m high. Leaves ovate - oblong, cordate, acute or sub mucronate, glabrescent with age, 12 - 17 × 7 - 11 cm. Follicles recurved, somewhat sausage shaped, 8 - 10 × 4 - 5 cm; seeds obovate, ca 6 mm long, comose.

In wastelands ; 300 - 500 m.

Fl. & Fr. : throughout the year.

DURG : Durg. RAIPUR : Dhamtari, Raipur, Sitanadi.

2. CEROPEGIA L.

- | | | |
|--|-----|-------------------------|
| 1a. Stems and peduncles glabrous ; inner corona lobes not hooked | ... | <i>C. candelabrum</i> 1 |
| 1b. Stems and peduncles pubescent ; inner corona lobes hooked | ... | <i>C. hirsuta</i> 2 |

1. *Ceropegia candelabrum* L. Sp. Pl. 211. 1753 ; Matthew & Rani in Matthew, Fl. Tamilnadu Carnatic 935. 1983. *C. tuberosa* Roxb. Pl. Corom. t. 9. 1795.

Slender tuberous twiners. Leaves ovate - lanceolate, acuminate or mucronate, 3 - 7 cm long. Flowers in umbellate cymes ; corolla inflated at the base, usually with brown stripes within and long reflexed hairs in the neck ; corolla lobes with cohering appendages. Follicles very slender, 10 - 13 cm long.

In miscellaneous forests ; 500 m.

Fl. & Fr. : October.

RAJNANDGAON : Taregaon.

2. *C. hirsuta* Wt. & Arn. in Wt. Contr. Bot. Ind. 30. 1834.

Slender hirsute twiners. Tubers ca 2 cm diam. Leaves ovate elliptic, acute, 10 - 13 × 3 - 5 cm. Flowers axillary ; sepals linear subulate, green ; corolla tube beautifully purple green dotted and striped, lobes green, joined at the tips. Follicles erecto patent, ca 8 cm long.

Along miscellaneous forests ; 550 m.

Fl. : October.

RAIPUR : Taurenga.

3. CRYPTOLEPIS R. Br.

- | | | |
|--|-----|------------------------|
| 1a. Main secondary nerves of the leaves many pairs, more or less horizontal, and parallel, meeting in an intra-marginal loop. Follicles lanceolate, 5 - 10 cm long, 12-18 mm thick | ... | <i>C. buchananii</i> 1 |
|--|-----|------------------------|

- 1b. Main secondary nerves of the leaves about seven pairs, not as above, mostly curving upwards. Follicles linear, 12 - 20 cm long, 5 - 8 mm thick ... *C. elegans* 2

1. *Cryptolepis buchananii* R. & S. Syst. Veg. 4 : 409. 1819.
'Nag - bel.'

Climbers with milky latex. Leaves coriaceous, elliptic oblong, apiculate, 7 - 15 × 5 - 10 cm. Flowers pale yellow or greenish yellow; sepals ovate, acute. Follicles divaricate, splitting by two diverging valves, ca 8 cm long; seeds brown with silky, white coma.

Common on roadsides and in miscellaneous forests : 300 - 600 m.

Fl. : August - October ; *Fr.* : January - June.

DURG : Balod, Budbhumi. RAIPUR : Baloda Bazar, Borai, Gari-band, Raipur. RAJNANDGAON : Singhari.

2. *C. elegans* Wall. ex G. Don, Gen. Syst. 4 : 82. 1838.

Climbers, ca 2 m high. Leaves linear lanceolate, sometimes ovate, 4 - 6 cm long. Flowers 3 - 4 cm across, yellow. Follicles paired, long cylindric, each splitting by two valves, ca 15 cm long. Seeds black, each tipped with a tuft of white silky hairs.

In miscellaneous forests ; 400 m.

Fr. : June.

RAIPUR : Pithora.

4. DREGEA E. Meyer

Dregea volubilis (L. f.) Benth. in B. & H. Gen. Pl. *Asclepias volubilis* L. f. Suppl. 170. 1781. *Marsdenia volubilis* (L. f.) Cooke, Fl. Pres. Bombay 2 : 106. 1904. *Wattakaka volubilis* Stapf in Curtis, Bot. Mag. sub. t. 8976. 1922.

Perennial woody twiners with watery sap. Leaves broadly ovate, 7 - 10 × 5 - 7 cm. Flowers green, in drooping umbels. Follicles paired, divaricate, slightly bottle shaped with rounded apex, ca 10 cm long, velvety, reddish brown, wrinkled when ripe.

On roadsides ; 300 - 400 m.

Fl. : April ; *Fr.* : January.

DURG : Dondi. RAIPUR : Raipur.

5. **GYNNEA R. Br.**

Gymnema sylvestre (Retz.) R. Br. ex Schult. in R. & S. Syst. Veg. ed. 15, 6 : 57. 1820. *Periploca sylvestris* Retz. Obs. Bot. 2 : 15. 1781.

Climbers with densely yellow pubescent or hirsute branchlets. Leaves ovate or oblong, acuminate, densely pubescent, $3\ 5 \times 2\ 3$ cm. Flowers pale yellow, in corymbose cymes. Follicles usually solitary, $6\ 7$ cm long, gradually tapering from the base.

In miscellaneous forests ; 450 m.

Fl. : September ; *Fr.* : December.

RAIPUR : Sihawa, n.v. (*cf.* Haines, Descr. list of trees, shrubs & econ. herbs. Southern Circle, C.P. 153 : 1916).

6. **HEMIDESMUS R. Br.**

Hemidesmus indicus (L.) R. Br. in Ait. Hort. Kew. ed. 2, 2 : 75. 1811. *Periploca indica* L. Sp. Pl. 211. 1753. - 'Amendm.'

Slender twining shrubs. Leaves in distant pairs, linear, linear-lanceolate, elliptic oblong or ovate oblong, apiculate, $5\ 10 \times 1\ 5$ cm. Flowers few in axillary fascicles. Follicles slender, striate, $17\ 22$ cm long.

On roadsides and in miscellaneous forests ; 250 600 m.

Fl. : August November ; *Fr.* : January April.

DURG : Balod. RAIPUR : Chhoora, Mahasamund, Sitanadi, Taurenga. RAJNANDGAON : Baghnadi, Malaiddah, Rajnandgaon.

7. **HOLOSTEMMA R. Br.**

Holostemma ada-kodien Schult. in R. & S. Syst. Veg. 6 : 95. 1820. *H. annulare* K. Schum. in E. & P. Pflanzenfam. IV (2) : 250. 1895. *H. rheedii* Wall. Pl. Asiat. Rar. 2 : 51. 1831. *Asclepias annularis* Roxb. Fl. Ind. 2 : 37. 1832.

Climbers, without latex. Stems glaucous green. Leaves broadly ovate, cordate with a broad sinus, $9\ 11 \times 6\ 7$ cm, apex shortly acuminate. Flowers in axillary panicles ; petals fleshy, white with deep red blotch inside ; corona white. Follicles boat-shaped, $9\ 12 \times 3\ 6$ cm.

In sal forests ; 600 m.

Fl. : August.

RAIPUR : Borai.

8. LEPTADENIA R. Br.

Leptadenia reticulata (Retz.) Wt. & Arn. in Wt. Contr. Bot. Ind. 47. 1834. *Cynanchum reticulatum* Retz. Obs. Bot. 2 : 15. 1781.

Slender climbers with watery sap. Leaves ovate or lanceolate, 4–7 × 2–3 cm, acute or acuminate. Flowers long pedicelled, in axillary peduncled clusters, green ; petals 5, stellately spreading. Follicles ovate lanceolate, ca 15 cm long.

On roadsides ; 300–350 m.

Fl. : August–October.

RAIPUR : Dhamtari, Raipur.

9. MARSDENIA R. Br.

Marsdenia tenacissima (Roxb.) Moon, Cat. Pl. Ceylon 21. 1824. *Asclepias tenacissima* Roxb. Pl. Corom. 3 : 35. t. 240. 1815.

Climbers up to 3 m high, pubescent or tomentose throughout. Leaves broadly ovate, deeply cordate, acuminate or cuspidate, villous on both the surfaces, 10–18 × 8–13 cm. Flowers deep yellow, in umbellate cymes arranged in a panicle. Follicle solitary, 13–15 cm long.

In miscellaneous forests ; 450 m.

Fl. : August.

RAIPUR : Dhamtari.

10. OXYSTELMA R. Br.

Oxystelma secamone (L.) Karst. Deut. Fl. 1031. 1880 83. *Periploca secamone* L. Mant. 2 : 216. 1771. *Oxystelma esculentum* Schult. in R. & S. Syst. Veg. 6 : 89. 1820.

Slender climbers with milky latex. Leaves opposite, linear or narrowly lanceolate, acuminate, 7–10 cm long, 4–7 mm broad, purplish-green when young. Flowers on long axillary peduncles ; sepals 5, linear, ca 3 mm long ; corolla lobes stellately spreading, white, red veined on the inside.

On roadsides ; 350 - 450 m.

Fl. : August - September.

RAIPUR : Dhamtari. RAJNANDGAON : Baghnadi.

11. PERGULARIA L.

Pergularia daemia (Forsk.) Chiov. in Result. Sci. Miss. Sefan. Paoli Somal. Ital. I : 115. 1916. *Asclepias daemia* Forsk. Fl. Aegpt. Arab. 51. 1775. *Cynanchum extensum* Jacq. Misc. 2 : 353. 1782. *Daemia extensa* (Jacq.) R. Br. in Ait. Hort. Kew ed. 2, 2 : 76. 1811. *Pergularia extensa* (Jacq.) N.E. Br. in Thistleton Dyer, Fl. Cap. 4 : 758. 1908.

Hirsute climbers. Leaves ovate or suborbicular, deeply cordate with rounded basal lobes, 8 - 12 × 6 - 10 cm. Flowers greenish white, ridges on the corona acute at the base. Follicles paired, green turning purplish, hairy, echinate, ca 6 cm long.

On roadsides ; 300 m.

Fl. & Fr. : August - January.

RAIPUR : Raipur. RAJNANDGAON : Singhari.

12. TYLOPHORA R. Br.

- | | | |
|---|-----|--------------------------|
| 1a. Erect herbs or undershrubs. Leaves ovate | ... | <i>T. macrantha</i> 1 |
| 1b. Herbs with prostrate branches, leaves rotundate | ... | <i>T. rotundifolia</i> 2 |

1. ***Tylophora macrantha*** Hook. f. Fl. Brit. Ind. 4 : 40. 1883.

Perennial herbs. Stems simple or branched, pubescent. Leaves petiolate, ovate, acute, 2 - 3 × 1 - 2 cm, glabrous. Sepals lanceolate; corolla lobes ovate lanceolate, ca 2 mm long.

In wastelands ; 550 m.

Fl. : August.

RAIPUR : Dhamtari Keskal.

2. ***T. rotundifolia*** Buch. Ham. ex Wt. Contr. Ind. Bot. 50. 1834.

Perennial herbs with 50 - 70 cm long branches. Stem pubescent. Leaves rotundate, 4 - 5 × 5 - 6 cm, pilose on margins, rounded to slightly cordate, apex rounded to obtuse sometimes mucronate. Cymes umbellate to paniculate. Sepals lanceolate, pilose; corolla lobes ovate, pale greenish purple.

In sal forests ; 500 m.

Fl. : June.

RAIPUR : Sitanadi.

72. LOGANIACEAE
(D. M. Verma & V. Chandra)

1a. Trees or shrubs.

- | | | |
|---|-----|--------------------|
| 2a. Leaves tomentose beneath. Flowers 4 - merous. Fruit a 2 - valved capsule | ... | <i>Buddleja</i> 1 |
| 2b. Leaves not tomentose beneath. Flowers 5 - merous. Fruit indehiscent, bacate | ... | <i>Strychnos</i> 4 |

1b. Annual herbs.

- | | | |
|---|-----|---------------------|
| 3a. Flowers 5 - merous, in 2 - 3 - cymose cymes | ... | <i>Cynoctonum</i> 2 |
| 3b. Flowers 4 - merous, solitary or clustered | ... | <i>Mitrasacme</i> 3 |

1. BUDDLEJA L.

Buddleja asiatica Lour. Fl. Cochinch. 72. 1790.

Shrubs *ca* 1.5 m high : branches densely hairy when young. Leaves narrowly oblong or ovate lanceolate, serrate, dentate or subentire. Inflorescence terminal or axillary, densely tomentose ; flowers in cymes. Calyx densely tomentose ; corolla white or pale violet, stellate hairy outside. Capsules ovate or oblong, brown, reflexed ; seeds ellipsoid.

Frequent ; 500 m.

Fl. & Fr. : May June.

RAIPUR : Sitanadi.

2. CYNOCTONUM Gmel.

Cynoctonum mitreola (L.) Britt. in Mem. Torr. Bot. Cl. 5 : 258. 1894.
Ophiorrhiza mitreola L. Sp. Pl. 150. 1753. *Mitreola oldenlandioides* G. Don, Gard. Dict. 4 : 172. 1837; DC. Prodr. 9 : 9. 1845.

Annual herbs, *ca* 5 cm high. Leaves ovate or ovate oblong. Inflorescence terminal, branched ; bracts narrowly deltoid ; flowers shortly pedice-

lled or subsessile ; sepals broadly membranous margined, corolla 1 - 2 mm long ; stigmas 2, horn like. Capsules compressed ; seeds ellipsoid, smooth.

Along drains in moist shady places ; 500 - 550 m.

Fl. & Fr. : September - October.

RAIPUR : Taurenga. RAJNANDGAON : Deopura.

3. MITRASACME Labill.

Mitrasacme indica Wt. Ic. 4 : 15. t. 1601. 1850. *M. alsinoides* Clarke in Hook. f. Fl. Brit. Ind. 4 : 80. 1883, *non* R. Br. 1810.

Annuals, up to 15 cm high. Stems narrowly winged. Leaves lanceolate or ovate, 1 nerved. Flowers white, solitary in the upper leaf - axils, white ; calyx - lobes lanceolate ; corolla bearded in the mouth. Capsules subglobose, ca 2 mm across ; seeds angular ovoid, coarsely reticulate.

In miscellaneous forests ; 450 m.

Fl. & Fr. : September.

RAJNANDGAON : Baghnadi.

4. STRYCHNOS L.

- | | | |
|---|-----|------------------------|
| 1a. Petioles 7 - 12 mm long. Fruits 2.5 - 5.0 cm across | ... | <i>S. nux-vomica</i> 1 |
| 1b. Petioles 2 - 5 mm long. Fruits 1.0 - 1.7 cm across | ... | <i>S. potatorum</i> 2 |

1. *Strychnos nux-vomica* L. Sp. pl. 189. 1753.

Trees up to 20 m high ; branches sometimes with axillary thorns. Leaves broadly ovate or elliptic, acuminate. Inflorescence on short axillary branchlets, many - flowered, thinly tomentose. Sepals ovate, tomentose. Fruits globular ; seeds lenticular, orbicular or elliptic.

Fl. : March - April ; *Fr.* : December - January.

RAIPUR : Laon range, n. v. (cf. Haines, Descr. list of trees, shrubs and econ. herbs, Southern Circle, C.P. 157. 1916).

2. *S. potatorum* L. f. Suppl. 148. 1781 'Kaya'.

Small trees or shrubs, ca 3 m high. Stem covered with black thick square to rectangular pieces of bark. Leaves elliptic or ovate, acute at both

ends. Flowers fragrant, white, in dense glabrous cymes. Fruits globose. Seeds lenticular.

In miscellaneous forests ; 300 m.

Fl. : May.

RAIPUR : Dhamtari.

73. GENTIANACEAE
(D. M. Verma & R. Saran)

1a. Aquatic herbs. Leaves broadly ovate or orbicular, deeply cordate at the base	...	<i>Nymphoides</i> 6
1b. Terrestrial or marsh herbs. Leaves linear, elliptic - oblong or ovate, acute or roundish at the base.		
2a. Leaves ca 5 mm long. Flowers subsessile, irregular, 2 - 3 mm long ; style almost absent	...	<i>Hoppea</i> 5
2b. Plants not as above.		
3a. Corolla lobes glandular inside at the base	...	<i>Swertia</i> 7
3b. Corolla lobes eglandular,		
4a. Ovary 2 - celled. Capsules subglobose	...	<i>Exacum</i> 4
4b. Ovary 1 - celled. Capsules linear - oblong or ellipsoid.		
5a. Corolla regular.		
6a. Flowers in sessile axillary clusters	...	<i>Ericostema</i> 3
6b. Flowers in open dichotomous cymes		<i>Centaurium</i> 2
5b. Corolla irregular		<i>Canscora</i> 1

1. *CANSORA* Lamk.

1a. Stems winged	<i>C. decussata</i> 1
1b. Stems not winged	<i>C. diffusa</i> 2

1. *Canscora decussata* (Roxb.) R. & S. Mant. 1 : 229. 1822. *Pladera decussata* Roxb. Fl. Ind. 1 : 418. 1820. 'Sankhabati'

Erect herbs up to 25 cm high. Leaves sessile, ovate lanceolate, 2 - 3 cm long, subcordate at base, minutely ciliate. Flowers in cymes ; pedicels 4 winged, up to 2 cm long ; corolla tubes 8 - 10 mm long. Capsules oblong.

Roadsides ; 450 m.

Fl. & Fr. : September.

RAJNANDGAON : Baghnadi, Salewara.

2. *C. diffusa* (Vahl) R. Br. Prodr. 451. 1810. *Gentiana diffusa* Vahl Symb. Bot. 3 : 47. 1794. 'Bhuin neem'.

Erect much branched herbs. Leaves ovate elliptic, 15-40 x 5-12 mm. Flowers in paniculate cymes ; pedicels subterete or quadrangular, 15-20 mm long ; corolla tube as long as the calyx ; one stamen longer than the other three. Capsule 10-12 mm long.

In shade along drains and streams ; 300 - 450 m.

Fl. & Fr. : October May.

RAIPUR : Gariaband, Raipur.

2. CENTAURIUM Hill

Centaurium centaurioides (Roxb.) Rolla Rao & Hemadri in J. Bombay nat. hist. Soc. 67 : 357. 1970. *Chironia centaurioides* Roxb. Fl. Ind. 1 : 585. 1832. *Erythraea roxburghii* G. Don. Syst. Gard. 4 : 206. 1837 : 38.

Small erect herbs. Basal leaves rosulate, lanceolate oblong, obtuse, upper ones linear-lanceolate, acute or subobtuse. Flowers in cymose panicles ; calyx lobes linear, 5-6 mm long ; corolla pink or purple, ca 1 cm long. Capsules up to 6 mm long.

In marshy places ; 300 m.

Fl. : August.

RAIPUR : Raipur.

3. ENICOSTEMA Blume

Enicostema axillare (Lamk.) Raynal in Adansonia 9 : 75. 1969. *Gentiana axillaris* Lamk. Tabl. Encycl. 1 : 487. 1793. *Exacum hyssopifolium* Willd. Sp. Pl. 1 : 640. 1798. *Enicostema hyssopifolium* Verdoon in Bothalia 7 : 462. 1961. *Enicostema littorale* Hook. f. Fl. Brit. Ind. 4 : 101. 1883, non Blume, 1826.

Profusely branched perennial herbs with erect or ascending branches. Leaves linear or linear oblong, up to 6.0 x 1.2 cm, 3 nerved. Flowers white ; corolla with a long tube, funnel shaped above ; filaments with scales at the base. Capsules ellipsoid.

Along tanks ; 300 m.

Fl. & Fr. : October.

RAIPUR : Raipur.

4. EXACUM L.

1a. Flowers 5 - 8 mm across.

2a. Leaves ovate, shortly petioled, one - half to two - third as broad as long. Calyx wings ovate ... *E. carinatum* 1

2b. Leaves elliptic - oblong, narrowed to a sessile or subsessile base, one - eighth to one - third as broad as long. Calyx wings lanceolate ... *E. pedunculatum* 2

1b. Flowers 15 - 25 mm across ... *E. tetragonum* 3

1. Exacum carinatum Roxb. *Fl. Ind.* 1 : 415. 1820. *E. petiolare* Griseb. in DC. *Prodr.* 9 : 46. 1845.

Slender erect herbs, 5 - 15 cm high. Leaves ovate - elliptic, 3 - 9 cm long. Flowers in axillary and terminal cymes, blue or whitish ; corolla lobes lanceolate. Capsules subglobose.

Along drains ; 300 - 450 m.

Fl. & Fr. : September - October.

RAIPUR : Taurenga. RAJNANDGAON : Salewara, Singhari.

2. E. pedunculatum L. Sp. Pl. 112. 1753. *E. pedunculare* Arn. in Ann. Sc. Nat. 2. 9 : 176. 1839.

Erect herbs, 5 - 30 cm high. Stem quadrangular. Leaves sessile or subsessile, elliptic lanceolate, 12 - 30 mm long. Flowers in terminal cymes, blue ; calyx lobes ovate ; corolla lobes elliptic, exserted. Capsules subglobose.

River banks ; 300 - 400 m.

Fl. & Fr. : January - April.

DURG. : Rajhara dhalli. RAIPUR : Raipur.

3. E. tetragonum Roxb. *Fl. Ind.* 1 : 413. 1820.

Erect herbs, 30 - 60 cm high. Stem quadrangular. Leaves subsessile, elliptic - lanceolate, 8 - 12 cm long. Flowers in terminal panicled cymes, blue ; calyx lobes ovate, winged on the back ; corolla lobes ovate lanceolate. Capsules globose or subglobose.

Roadsides ; 500 - 800 m.

Fl. & Fr. : September November.

RAJNANDGAON : Chilpi, Deopura.

5. HOPPEA Willd.

Hoppea dichotoma Heyne ex Willd. in Ges. Naturf. Fl. Neue Shrift. 3 : 435. 1801.

Tiny herbs up to 7 cm high. Stems 4 winged. Leaves opposite, sessile, ovate-lanceolate, 4-5 mm long. Flowers white or green, irregular, in dichasial cymes. Capsules subglobose.

In moist depressions ; 350-500 m.

Fl. & Fr. : November April.

DURG : Talgaon. RAIPUR : Dhamtari. RAJNANDGAON : Deopura.

6. NYMPHOIDES J. Hill.

1a. Corolla white throughout, longitudinally folded in the middle forming a subcrispy keel, margin entire *N. hydrophylla* 1

1b. Corolla white with a yellow centre, lobes not folded, margin fimbriate ... *N. indica* 2

1. ***Nymphoides hydrophylla*** (Lour.) Kuntze, Rev. Gen. Pl. 429. 1891 ; Cramer in Dassan. & Fosb. Rev. Handb. Fl. Ceylon 3 : 208. 1981. *Menyanthes hydrophylla* Lour. Fl. Cochinch. 1 : 129. 1790. *N. cristata* Kuntze, Rev. Gen. Pl. 2 : 429. 1891. *M. cristata* Roxb. Pl. Corom. t. 105. 1799. *Limnanthemum cristatum* Griseb. Gen. Sp. Gent. 342. 1839.

Aquatic herbs with slender stolons. Leaves ovate orbicular, 5-10 x 6-12 cm, herbaceous, floating. Flowers white, clustered ; pedicel up to 4 cm long ; corolla ca 2 cm across. Capsules broadly ovoid or subglobose ; seeds tubercled.

Common in ponds ; 300-450 m.

Fl. & Fr. : throughout the year.

RAIPUR : Raipur, Taurenga. RAJNANDGAON : Rajnandgaon, Singhari.

2. N. indica (L.) Kuntze, Rev. Gen. Pl. 429. 1891. *Menyanthes indica* L. Sp. Pl. 145. 1753. *Limnanthemum indicum* Thw. Enum. 205. 1860. 'Barachuli.'

Aquatic stoloniferous herbs. Leaves leathery, orbicular, deeply cordate, 10–20 cm across. Flowers clustered; pedicel up to 10 cm long; corolla white with a yellow centre, 20–30 mm across, lobes fimbriate. Capsules ellipsoid; seeds smooth.

In ponds; 300–550 m.

Fl. & Fr.: November–June.

RAIPUR : Gariaband. RAJNANDGAON : Rengakhar, Singhari.

7. SWERTIA L.

Swertia corymbosa (Griseb.) Wt. ex Clarke in Hook. *J. Fl. Brit. Ind.* 4: 126. 1883. *Ophelia corymbosa* Griseb. Gen. 317. 1839.

Erect much branched herbs. Stem quadrangular. Leaves, upper ovate, obtuse mucronate, lower spatulate obovate, obtuse. Flowers tetramerous, in terminal corymbose or panicled lax cymes; corolla lobes white with blue nerves or pale blue with a gland at the base of each lobe.

In miscellaneous forests; 450 m.

Fl. & Fr.: January.

RAIPUR : Singhpur.

74. HYDROPHYLACEAE

(V. Chandra)

HYDROLEA L.

Hydrolea zeylanica (L.) Vahl, Symb. Bot. 2: 46. 1791. *Nama zeylanica* L. Sp. Pl. 226. 1753.

Prostrate or procumbent herbs. Leaves narrowly lanceolate, 1.5–6.0 cm long. Flowers blue, ca 1 cm across, in short, terminal, hairy racemes; calyx glandular pubescent. Capsules ovoid oblong or ellipsoid, 4–6 mm long, enclosed within persistent calyx; seeds numerous, minute, oblong.

In marshy places; 300 m.

Fl. & Fr.: November–January.

RAIPUR : n. v. (*cf.* Unni in *J. Bombay nat. hist. Soc.* 64: 99. 1967).

75. BORAGINACEAE

(D. M. Verma & J. Lal)

- 1a. Trees, more than 3 m high.
- 2a. Style twice 2 - partite. Fruits 15 - 20 mm across ... *Cordia* 2
- 2b. Style once 2 - partite. Fruits ca 5 mm across ... *Ehretia* 4
- 1b. Herbs, undershrubs or shrubs (*Rotula*), less than 1.5 m high.
- 3a. Prostrate herbs. Leaves plicate, serrate - lobulate, densely appressed hairy. Flowers solitary axillary though sometimes very close along short leafy side - shoots... *Coldenia* 1
- 3b. Plants not as above.
- 4a. Flowers 1 - 2 cm across on long slender pedicels, pedicels usually 1 - 3 cm long ; calyx 10 - 15 mm long ... *Trichodesma* 7
- 4b. Flowers usually smaller, sessile or on up to 0.5 cm long pedicels ; calyx 1 - 5 mm long.
- 5a. Fruits with many spreading glochidia ... *Cynoglossum* 3
- 5b. Fruits without glochidia.
- 6a. Shrubs. Flowers 1 - 3 together on short lateral branches, 5 - 10 mm across ; style linear ... *Rotula* 6
- 6b. Herbs. Flowers in scorpioid cymes, less than 3 mm across ; style conoid or disciform at the apex ... *Heliotropium* 5

1. COLDENIA L.

Coldenia procumbens L. Sp. Pl. 125. 1753.

White hairy herbs with prostrate branches forming patches. Leaves thick, with deeply set veins forming attractive pattern, elliptic - obovate, ca 15 x 8 mm. Flowers solitary axillary, sessile ; calyx lobes persistent. Fruits ovoid.

In open moist places ; 250 - 550 m.

Fl. & Fr. : April - June.

DURG : Durg. RAIPUR : Dhamtari, Pithora, Taurenga.

2. CORDIA L.

Cordia obliqua Willd. Phytogr. 1 (4) : t. 4. f. 1. 1794. *C. myxa* auct. ; *non* L. 1753. 'Lasora'.

Small tree, branches hairy when young. Leaves orbicular, elliptic oblong or obovate, 6-11 x 5-9 cm. Flowers corymbose, white, fragrant; calyx persistent. Fruits globose, ripe yellowish or pinkish, glossy, with very sticky juice.

In miscellaneous forests and roadsides ; 500 m.

Fl. & Fr. : May June.

RAIPUR : Sitanadi.

3. CYNOGLOSSUM L.

Cynoglossum lanceolatum Forsk. Fl. Aegypt. Arab. 41. 1775.

Perennial hairy herbs or undershrubs with rather slender up to 2 m long branches spreading among bushes. Leaves linear lanceolate, 3-12 x 1-4 cm, white dotted above. Flowers white, in long slender branches. Nutlets glochidiate.

In miscellaneous forests ; 400-550 m.

Fl. & Fr. : October January.

RAIPUR : Mainpur, Sitanadi. RAJNANDGAON : Deopura.

4. EHRETIA P. Br.

Ehretia laevis Roxb. Pl. Corom. 1 : 42. t. 55. 1796.

Small trees. Leaves variable, ovate, elliptic or obovate, 7-12 x 3-8 cm, glabrous or pubescent beneath, secondary nerves forked and reticulate below the margins. Flowers ca 7 mm across, in 5-10 cm broad scorpioid cymes. Drupes ca 5 mm diam., black.

In open areas ; 300 m.

Fl. : February.

RAIPUR : Raipur, Sharma 095022H (Herb. Sci. Coll. Raipur).

5. HELIOTROPIUM L.

- 1a. Leaves usually more than 15 mm broad. Flowers blue or violet. Fruits glabrous, strongly ribbed ... *H. indicum* 1
- 1b. Leaves less than 12 mm broad. Flowers white or yellowish. Fruits, at least in some parts, hairy, not ribbed.
- 2a. Inflorescence bracteate. Calyx - lobes subequal, stigma on ca 0.5 mm long style ... *H. strigosum* 3
- 2b. Inflorescence ebracteate. Calyx - lobes very unequal ; stigma sessile or subsessile ... *H. ovalifolium* 2

1. *Heliotropium indicum* L. Sp. Pl. 130. 1753.

Herbs, slightly strigose to woolly, 15–30 cm high. Leaves alternate or sometimes subopposite, ovate or ovate oblong, 3–9 x 2–6 cm, rugose above, pilose beneath. Cymes coiling at the tip, 5–15 cm long. Flowers blue mauve.

In wastelands and along drains ; 300 - 400 m.

Fl. & Fr. : throughout the year.

DURG : Talgaon. RAIPUR : Raipur. RAJNANDGAON : Khargaon.

2. *H. ovalifolium* Forssk. Fl. Aegypt. Arab. 38. 1775.

Annual hairy deep rooted herbs, 3–15 cm high. Leaves rather thick, elliptic obovate, 1.0–1.3 x 0.5–0.8 cm. Cymes long, curved. Corolla hairy in the mouth. Fruits pubescent.

In wastelands, river beds and along ponds ; 250–400 m.

Fl. & Fr. : August – June.

DURG : Durg. RAIPUR : Dhamtari, Gariaband.

3. *H. strigosum* Willd. Sp. Pl. 1 : 743. 1798.

Profusely branched white hairy herbs with prostrate branches. Leaves linear or linear lanceolate, 10–12 x 2–3 mm. Cymes 2–5 cm long. Flowers white, bracteate ; corolla strigose ; connective produced into a long acumens.

In wastelands, and along ponds ; 300–350 m.

Fl. & Fr. : August – June.

RAIPUR : Dhamtari, Pithora, Raipur.

6. ROTULA Lour.

Rotula aquatica Lour. Fl. Cochinch. 121. 1790. *Rhabdia lycioides* Mart. Nov. Gen. & Sp. ii : 137. t. 195. 1827 ; Clarke in Hook. f. Fl. Brit. Ind. 4 : 145. 1883.

Closely branched woody undershrubs, 0.3–1.0 m high. Leaves linear or oblong-ob lanceolate, apiculate, narrowed at the base, purplish when young, 1.2–1.5 x 0.4–0.6 cm. Flowers campanulate, ca 1 cm long, blue. Drupes subglobose, ca 2 mm diam., brown with stellately spreading persistent sepals.

In river beds, among rocks and pebbles ; 300–450 m.

Fl. & Fr. : September June.

RAIPUR : Pithora, Raipur. RAJNANDGAON : Baghnadi.

7. TRICHODE SMA R. Br.

1a. Fruiting calyx - lobes cordate or hastate at the base.

- | | |
|--|---------------------------|
| 2a. Anthers exserted ; connectives with short, crisped, yellowish-white hairs on the back, tips spirally contorted | <i>T. indicum</i> 1 |
| 2b. Anthers included ; connectives with long, straight, glistening white hairs on the back, equaling or exceeding the tips of the connective, tips not contorted ... | <i>T. sedgwickianum</i> 2 |

1b. Fruiting calyx - lobes rounded at the base ... *T. zeylanicum* 3

1. Trichodesma indicum (L.) R. Br. Prodr. 149. 1810. *Borago indica* L. Sp. Pl. 137. 1753.

Annual hirsute herbs, ca 20 cm high. Leaves crowded, lanceolate, 3–8 x 0.7–1.5 cm, strigose on both the surfaces with white bulbous based hairs, base narrow or broad and subcordate. Flowers white, pale blue or violet.

In wastelands ; 300–500 m.

Fl. & Fr. : August April.

DURG : Talgaon. RAIPUR : Dugli, Raipur. RAJNANDGAON : Deopura.

2. T. sedgwickianum Banerjee in Bull. Bot. Soc. Beng. 16 : 10. 1964. *T. amplexicaule* DC. Prodr. 10 : 172. 1846 ; Clarke in Hook. f. Fl. Brit. Ind. 4 : 153. 1883 p. p. ; non Roth, 1821.

Annual hirsute herbs, *ca* 30 cm high. Leaves ovate oblong, cordate, subamplexicaul, 5-8 x 1.5-3.5 cm, densely scabrid with white bulbous based hairs. Flowers white (or pinkish lilac) with brown bands at corolla mouth.

Along drains ; 300 m.

Fl. & Fr. : August.

RAIPUR : Raipur.

3. *T. zeylanicum* (Burm. *f.*) R. Br. Prodr. 496. 1810. *Borago zeylanica* Burm. *f.* Fl. Ind. 41. 1768.

Annual hairy herbs, *ca* 40 cm high. Leaves sessile or shortly petioled, oblong or oblong lanceolate, 3.7-7.5 x 1.5-2.0 cm, densely clothed above with white bulbous based hairs. Flowers pale blue.

In wastelands ; 400-500 m.

Fl. & Fr. : September-April.

DURG : Rajbara dhalli. RAJNANDGAON : Deopura.

76. CONVOLVULACEAE

(D. M. Verma & R. C. Srivastava)

- 1a. Plants parasitic. Stems yellow. Leaves reduced to scales ... *Cuscuta* 2
- 1b. Plants autotrophic. Stems never yellow. Leaves well developed.
 - 2a. Leaves rotundate, silky whitish pubescent beneath ... *Rivea* 8
 - 2b. Leaves not as above.
 - 3a. Leaves coriaceous. Corolla lobes bifid ; styles absent *Erycibe* 3
 - 3b. Leaves herbaceous. Corolla lobes entire or subentire ; styles present.
 - 4a. Styles two, stigmas four ... *Evolvulus* 4
 - 4b. Style one, stigmas one or two.
 - 5a. Fruits dehiscent, dry.
 - 6a. Corolla campanulate, yellow. Pollen smooth.
 - 7a. Flowers 3.5-5.0 cm long. Capsule opening by circumscissile dehiscence... *Operculina* 7

7b. Flowers 0.5 - 2.0 cm long. Capsule opening by 4 valves or irregularly dehiscent ...	<i>Merremia</i> 6
6b. Corolla infundibuliform or salverform, pink - purple (white in <i>I. pestigridis</i>). Pollen spinulous ...	<i>Ipomoea</i> 5
5b. Fruits indehiscent, fleshy, woody or leathery	<i>Argyreia</i> 1

1. ARGYREIA Lour.

1a. Well developed leaves about half as broad as long, acute. Bracts and sepals narrow, linear - oblong.	
2a. Sepals 9 - 10 mm long	<i>A. daltonii</i> 1
2b. Sepals 14 - 15 mm long	<i>A. involucrata</i> 2
1b. Well developed leaves about as broad as long. Bracts and sepals broadly obovate - oblong to suborbicular.	
3a. Flowers in heads ...	<i>A. sericea</i> 3
3b. Flowers in corymbose cymes ...	<i>A. strigosa</i> 4

1. *Argyreia daltonii* Clarke in Hook f. Fl. Brit. Ind. 4 : 190. 1883.

Climbers. Leaves elliptic or oblong, 4 - 15 x 2 - 9 cm, acute, fulvous strigose beneath. Peduncles 2 - 7 cm long, rigid, fulvous silky. Sepals fulvous strigose in fruit, coriaceous ; corolla 7 - 8 cm long, purple, densely hairy outside. Capsules 4 - 5 cm across.

In miscellaneous forests ; 480 m.

Fl. & Fr. : October.

RAIPUR : Gariaband.

2. *A. involucrata* Clarke in Hook f. Fl. Brit. Ind. 4 : 187. 1883.

Climbers. Leaves ovate, 5 - 18 x 5 - 11 cm, acuminate, sparingly hairy or glabrescent. Peduncles 3 - 12 cm long, shorter than the leaves. Flowers sub capitate ; bracts ca 3 cm long, stellately spreading, persistent ; sepals subequal or unequal, ovate - lanceolate ; corolla funnel-shaped. Capsules oblong, 4 - 6 cm across.

In miscellaneous forests ; 450 - 550 m.

Fl. & Fr. : October - January.

RAIPUR : Singhpur, Taurenga.

3. A. sericea Dalz. & Gibbs. *Bombay Fl.* 169. 1861.

Climbers. Leaves ovate - cordate, 4 - 9 x 6 - 10 cm, acute, hispid or trigose above, silky beneath. Peduncles equal to or longer than the petioles, 2 - 15 cm long. Flowers capitate ; bracts persistent, oblong or elliptic, silky ; sepals elliptic lanceolate, unequal ; corolla ca 5.5 cm long, hairy outside in bands.

In miscellaneous forests ; 800 m.

Fl. : September.

RAJNANDGAON : Chilpi.

4. A. strigosa (Roth) Roberty in *Candollea* 14 : 44. 1952. *Ipomoea strigosa* Roth, *Nov. Pl. Sp.* 113. 1821. *Letsomia setosa* Roxb. *Fl. Ind.*, 2 : 80. 1824. 'Bagh Chaura.'

Climbers. Leaves ovate cordate, 5 - 13 x 3 - 12 cm, acute or sub obtuse, sparsely hirsute on both the surfaces. Peduncles 4 - 16 cm long ; bracts ovate, 5 - 8 cm long, obtuse, persistent ; bracts and sepals strigose. Sepals ovate elliptic ; corolla mauve, densely setose. Capsules 5 - 7 cm across.

In miscellaneous forests ; 500 m.

Fl. & Fr. : October.

RAIPUR : Taurenga.

Roots medicinal.

2. CUSCUTA L.

1a. Flowers ca 2 mm long ; styles 2 ... *C. campestris* 1

1b. Flowers 6 - 10 mm long ; style 1.

2a. Infrastaminal scales fimbriate at the margins as well as at the bridges ... *C. santapauli* 3

2b. Infrastaminal scales fimbriate at the margins only... *C. reflexa* 2

1. Cuscuta campestris Yuncker in *Mem. Torr. Bot. Club* 18 : 138. 1932.

Leafless filiform twining parasites. Flowers in globose clusters ; calyx campanulate, ca 1.5 mm long ; corolla campanulate, ca 2 mm long, white, lobes broadly triangular ; stamens ca 1 mm long, infrastaminal scales ovate, fimbriate, bridged at the base.

Common on linseed plants ; 300 m.

Fl. & Fr. : September February.

RAIPUR : Raipur, *Sharma* 097163H (Herb. Sci. Coll. Raipur).

2. C. reflexa Roxb. Pl. Corom. 2 : 3. t. 104. 1798. 'Amarbel'.

Leafless twining parasites. Flowers white or cream coloured ; calyx cupular, 2–4 mm long ; corolla campanulate, 6–10 mm long, lobes erect, spreading or reflexed ; anthers basifixied ; style very short, stigmas 2, thick. Capsules globose, circumscissile near the base ; seeds ca 3 mm long, black.

On roadside trees and shrubs ; 400–500 m.

Fl. & Fr. : September.

RAIPUR : Gariaband. RAJNANDGAON : Baghnadi.

3. C. santapaui Banerji & Das in J. Arn. Arb. 46 : 87. 1965.

Leafless yellow parasitic twiners. Flowers 6–8 mm long, in few flowered fascicles ; calyx somewhat urceolate, ca 1.5 mm broad ; corolla white with brown spots in the throat, tube 3–4 mm long, lobes broadly lanceolate, ca 2 mm long ; anthers attached to filaments slightly above its base ; style short, stigmas thick.

On roadside hedges ; 300 m.

Fl. & Fr. : February.

RAIPUR : Raipur.

3. ERYCIBE Roxb.

Erycibe paniculata Roxb. Pl. Corom. 2 : 31. t. 159. 1798.

Large woody climbers. Leaves oblong obovate, 5–10 cm long. Flowers in many flowered terminal panicles ; sepals ovate or rounded, 1–2 mm long, tomentose, corolla campanulate rotate, 5–6 mm long, white. Fruits sub baccate, leathery, ovoid to ellipsoid, 10–14 mm long, glabrous ; seeds solitary, glabrous.

In miscellaneous forests ; 400 m.

Fl. & Fr. : August.

RAIPUR : Dhamtari.

4. EVOLVULUS L.

- 1a. Leaves elliptic or linear oblong, pilose. Capsules 2
locular ... *E. alsinoides* 1
- 1b. Leaves broadly ovate or orbicular, glabrous. Capsules 1 -
locular ... *E. nummularius* 2

1. *Evolvulus alsinoides* (L.) L. Sp. Pl. ed. 2, 392. 1762. *Convolvulus alsinoides* L. Sp. Pl. ed. 1, 157. 1753.

Prostrate herbs, mostly covered with silky indumentum. Leaves sub sessile, 8 - 26 mm long, acute or rounded at both ends. Sepals ovate lanceolate, 4-5 mm long; corolla campanulate, white. Capsules globose, 3 - 4 mm long; seeds ovoid.

Common in wastelands & river beds, sometimes in miscellaneous forests; 300 - 550 m.

Fl. & Fr. : August June.

DURG : Balod, Budbhumi. RAIPUR : Gariaband, Kasdol, Pithora, Raipur, Taurenga. RAJNANDGAON : Deopura, Baghnadi, Rajnandgaon.

2. *E. nummularius* (L.) L. Sp. Pl. ed. 2, 381. 1762. *Convolvulus nummularius* L. Sp. Pl. ed. 1, 157. 1753. *Volvulopsis nummularius* (L.) Roberty in Candollea 14 : 28. 1952.

Prostrate herbs, rooting at nodes, pilose to glabrate. Leaves shortly petiolate, 4 - 15 mm long, glabrous, apex rounded or emarginate. Flowers axillary, solitary or paired; sepals elliptic ovate; corolla campanulate, 5 - 7 mm long. Capsules globose; seeds sub globose.

Common in wastelands and cultivated fields, sometimes in miscellaneous forests; 250 - 500 m.

Fl. & Fr. : August June.

DURG : Durg, Rajhara dhalli. RAIPUR : Dugli, Kasdol, Pithora, Gariaband, Raipur, Sitanadi. RAJNANDGAON : Deopura, Rajnandgaon.

5. IPOMOEA L.

- 1a. Stout shrubs; stem ca 1 - 2 cm thick below, erect or scandent (or sometimes twining); latex milky. Leaves entire, ovate - oblong, young leaves softly pubescent on both the surfaces. Flowers 5 - 8 cm long ... *I. carnea* 4

- 1b. Slender climbers, twiners or creepers ; other characters not united.
- 2a. Leaves pinnately lobed with filiform segments. ... *I. quamoclit* 10
- 2b. Leaves entire or palmately lobed with broad segments
- 3a. Leaves palmately lobed.
- 4a. Leaves deeply divided, lobes cut almost to the base.
- 5a. Plants glabrous. Leaves 5 - lobed ... *I. cairica* 3
- 5b. Plants pubescent. Leaves 7 - 9 lobed ... *I. pes-tigridis* 9
- 4b. Leaves shallowly divided, lobes cut less than half way down.
- 6a. Sepals 4 - 5 mm long, corolla yellowish red... *I. hederifolia* 6
- 6b. Sepals 12 - 25 mm long ; corolla purple or blue ... *I. nil* 7
- 3b. Leaves entire.
- 7a. Leaves linear - lanceolate to narrowly oblong-lanceolate with hastate or cordate bases.
- 8a. Flowers in open peduncled cymes, or solitary ; peduncles more than 10 mm long ... *I. aquatica* 1
- 8b. Flowers in dense sessile or subsessile cymes or heads ; peduncles less than 3 mm long... *I. eriocarpa* 5
- 7b. Leaves ovate or broadly oblong lanceolate, with cordate bases.
- 9a Lower surface of the leaves with white cottony indumentum ... *I. arachnosperma* 2
- 9b. Lower surface of the leaves not as above.
- 10a. Stems warty. Peduncles muricate ... *I. turbinata* 12
- 10b. Stems not warty. Peduncles smooth.
- 11a. Leaves rotundate. Sepals 3 - 4 mm long ; corolla 15 - 25 mm long ... *I. obscura* 8
- 11b. Leaves ovate. Sepals 6 - 9 mm long ; corolla 30 - 60 mm long ... *I. sepiaria* 11

1. Ipomoea aquatica Forsk. Fl. Aegypt. Arab. 44. 1775. *I. reptans* Poir. in Lamk. Encycl. Suppl. 3 : 460. 1814.

Procumbent or floating herbs rooting at the lower nodes. Stems hollow. Leaves mostly hastate, 3 - 10 cm long, 0.5 - 6.5 cm broad. Sepals

ovate oblong, 6–7 mm long, glabrous; corolla 2–6 cm long, purple. Capsules ovoid, 7–8 mm long; seeds glabrous.

In ponds; 300 m. RAIPUR : Raipur.

2. *I. arachnosperma* Welw. Apont. Phyto Geogr. 588. 1859. *Convolvulus pilosus* Roxb. Fl. Ind. 2 : 55. 1824. *I. pilosa* Sweet, Hort. Brit. ed. 2, 372. 1830, *non* Houtt. 1777.

Annual prostrate or twining herbs with rigid trichomes. Leaves ovate, 5–10 cm long and equally broad. Flowers in lax or dense bracteate cymes; sepals densely hairy, ciliate marginated; corolla tubular, 20–25 mm long, pink or mauve. Capsules ovoid, pubescent.

In wastelands; 300 m.

Fl. : September November.

RAIPUR : Raipur, Sharma 096117H (Herb. Sci. Coll. Raipur).

3. *I. cairica* (L.) Sweet, Hort. Brit. ed. 1, 287. 1827. *Convolvulus cairicus* L. Syst. ed. 10, 922. 1759. *I. palmata* Forsk. Fl. Aegypt. Arab. 43. 1775.

Climbers. Leaves ovate orbicular, palmately divided to the base into 5–7 lobes, 3–10 cm long, lobes lanceolate, ovate or elliptic, 3–5 cm long. Inflorescence one many-flowered. Sepals ovate, 4–6 mm long, unequal, glabrous; corolla 3–5 cm long, purple or blue purple. Capsules subglobose, ca 1 cm across; seeds subglobose or ovoid, 4–6 mm long, tomentose blackish.

Planted in houses as an ornamental; 300 m.

Fl. : January.

RAIPUR : Raipur.

4. *I. carneae* Jacq. Enum. Pl. Carib. 13. 1760. *I. fistulosa* Mart. ex Choisy in DC. Prodr. 9 : 349. 1845. *I. carneae* ssp. *fistulosa* Austin in Taxon 26 : 237. 1977. *I. crassicaulis* (Benth.) Robinson in Proc. Amer. Arts 51 : 530. 1916. ‘Behya’, ‘Besharam’

Shrubs, 1–6 m tall. Stems woody. Leaves ovate cordate to lanceolate, 4–21 x 3–10 cm. Flowers in cymose paniculate clusters; corolla deep pink to purple, rarely white (Verma 24968), 5–9 cm long; stigma biglobular. Capsules ovoid sub globose, ca 15 mm across; seeds covered with long comose brown trichomes.

Common on roadsides, and along cultivated fields for protection and demarcation; 300–500 m.

Fl. & Fr. : April January.

DURG : Durg. RAIPUR : Raipur, Sitanadi. RAJNANDGAON : Rajnandgaon.

5. *I. eriocarpa* R. Br. Prodr. 484. 1810. *Convolvulus hispidus* Vahl, Symb. Bot. 3 : 29. 1795. *I. hispida* R. & S. Syst. 4 : 238. 1819 ; non Zucc. 1809. *I. sessiliflora* Roth, Nov. Pl. Sp. 116. 1821.

Twining or prostrate pilose herbs. Leaves ovate, oblong, lanceolate or linear lanceolate, 2 - 9 x 1 - 4 cm, glabrate. Flowers axillary, in sessile or short peduncled cymes, or almost in heads ; sepals linear, 5 - 7 mm long ; corolla tubular, 7 - 9 mm long, pink or purple. Capsules broadly ovoid or globular, 5 - 6 mm across, pubescent ; seeds glabrous.

In wastelands & paddy fields ; 300 - 600 m.

Fl. & Fr. : September October.

RAIPUR : Pithora, Sitanadi, Tauranga. RAJNANDGAON : Baghnadi, Deopura, Singhari.

6. *I. hederifolia* L. Syst. ed. 10, 925. 1759. *I. coccinea* auct. ; Clarke in Hook. f. Fl. Brit. Ind. 4 : 199. 1883 ; non L. 1753. *I. angulata* Lamk. Ill 1 : 464. 1793.

Twiners. Stems glabrous or sparsely pubescent. Leaves ovate suborbicular, 2 - 8 x 1 - 8 cm, entire or trilobed, acute or acuminate. Flowers solitary or in few to several flowered cymes ; sepals elliptic oblong, 4 - 5 mm long, outer with 1.5 - 2.0 mm long subapical fleshy aristas ; corolla salver-shaped, red - yellow, 3 - 4 cm long. Capsules subglobose, 6 - 8 mm long ; seed ca 5 mm across.

On roadside bushes and trees ; 350 m.

Fl. & Fr. : October.

RAIPUR : Pithora.

7. *I. nil* (L.) Roth, Cat. Bot. 1 : 36. 1797. *Convolvulus nil* L. Sp. Pl. ed. 2, 219. 1762. *I. hederacea* auct., Clarke in Hook. f. Fl. Brit. Ind. 4 : 199. 1883 ; non Jacq. 1786.

Climbers. Stems pubescent. Leaves ovate suborbicular, 2 - 14 cm long, entire or 3 lobed, cordate. Flowers in 1 flowered cymes ; sepals lanceolate, 12 - 25 mm long with linear-lanceolate apices ; corolla purple or blue, 3 - 5 cm long. Capsules globose, 8 - 10 mm long ; seeds pyriform, glabrous.

In miscellaneous forests ; 450 m.

Fl. & Fr. : October.

RAIPUR : Gariaband.

8. I. obscura (L.) Ker. *Gawl. Bot. Reg.* 3 : t. 239. 1817. *Convolvulus obscurus* L. *Sp. Pl. ed.* 2, 220. 1762.

Twiners. Leaves ovate - cordate to rotundate, 2-7 x 1-6 cm, acute, acuminate or apiculate, glabrous. Flowers axillary ; sepals ovate to ovate lanceolate, 3-4 mm long ; corolla pale yellow, ca 2 cm long, campanulate. Capsules globose, 5-10 mm across ; seeds ovoid, softly pubescent, 4 mm long.

In wastelands ; 300 m.

Fl. & Fr. : November January.

RAIPUR : Raipur. RAJNANDGAON : Singhari.

9. I. pes-tigridis L. *Sp. Pl.* 162. 1753.

Twining, prostrate or sprawling pubescent annual herbs. Leaves orbicular, palmately divided nearly to the base, 5-9 lobed. Inflorescence involucrate cymose. Sepals lanceolate, 13-17 mm long ; corolla funnel shaped, 2-4 cm long. Capsules ovoid, ca 7-8 mm across ; seeds sparsely pubescent, 3-4 mm long.

In wastelands and along cultivated fields ; 300-450 m.

Fl. & Fr. : August November.

DURG : Balod. RAIPUR : Rajim. RAJNANDGAON : Baghnadi, Singhari.

10. I. quamoclit L. *Sp. Pl.* 159. 1753. *Quamoclit vulgaris* Choisy in *Mem. Soc. Phys. Geneve* 6 : 464. 1833. *Q. pinnata* Boj. *Hort. Maurit.* 224. 1837.

Slender climbers. Leaves 1-5 cm long, ovate to elliptic in outline, deeply pinnatisect with 6-19 pairs of linear lobes. Flowers solitary or in 2-5 flowered cymes ; sepals oblong, 4-7 mm long ; corolla salver shaped, red, 2-3 cm long. Capsules ovoid, 6-8 mm across.

Cultivated in gardens as an ornamental, sometimes found as escape ; 400-800 m.

Fl. & Fr. : September October.

RAIPUR : Indagaon. RAJNANDGAON : Chilpi.

11. *I. sepiaria* Roxb. Fl. Ind. 2 : 90. 1824. *Convolvulus maximus* auct. ; *non* L. f. 1781.

Slender pilose twiners. Leaves ovate cordate, 3 - 7 x 3 - 6 cm, with rounded lobes at the base, acute to acuminate at apex, glabrous. Inflorescence few to many flowered cyme. Sepals elliptic oblong to ovate, obtuse to acute, glabrous ; corolla funnel shaped, 3 - 6 cm long. Capsules globose, 8 - 10 mm across, glabrous ; seeds densely tomentose.

Along drains ; 450 m.

Fl. & Fr. : January.

RAIPUR : Dugli.

12. *I. turbinata* Lag. Gen. Pl. 10. 1816 ; Gunn in Brittonia 24 : 163. 1972. *Convolvulus muricatus* L. Mant. 44. 1771. *I. muricata* Jacq. Hort. Schoenb. 3 (2) : 40. t. 323. 1803 ; *non* Cav. 1799.

Climbers. Stems warty at some places. Leaves broadly ovate to orbicular, 3 - 12 cm long. Peduncles usually muricate, 1 - 6 cm long. Sepals ovate to oblong, outer 6 - 7 cm long ; corolla lavender to purplish, 5 - 6 cm long, limbs funnel or salver shaped. Capsules ovoid, 1 - 2 cm long ; seeds ovoid, glabrous.

In wastelands ; 500 m.

Fl. & Fr. : November.

RAJNANDGAON : Deopura.

6. MERREMPIA Donnst. ex Endl.

- | | | |
|---|-----|------------------------|
| 1a. Prostrate herbs. Peduncles very short or absent | ... | <i>M. emarginata</i> 1 |
| 1b. Twiners. Peduncles long, equal to or longer than the flowers. | | |
| 2a. Leaves ovate to broadly ovate, rarely narrow. Inner sepals obtuse | ... | <i>M. hederacea</i> 2 |
| 2b. Leaves linear - oblong to oblanceolate, spatulate or subquadrate. Inner sepals attenuate or acuminate | ... | <i>M. tridentata</i> 3 |

1. *Merremia emarginata* (Burm. f.) Hall. f. Bot. Jahrb. Syst. 16 : 552. 1893. *Evolvulus emarginatus* Burm. f. Fl. Ind. 77. t. 30. 1768. *Ipomoea reniformis* Choisy, Mem. Soc. Phys. Geneve 6 : 446. 1834 ; Clarke in Hook. f. Fl. Brit. Ind. 4 : 206. 1883.

Prostrate herbs. Stems glabrescent, rooting at nodes. Leaves reniform to broadly ovate, 0.5 - 3.0 cm long, emarginate, cordate. Inflorescence axill-

ary, solitary or in 2-3 flowered cymose groups. Sepals obovate to orbicular, unequal, deeply emarginate; corolla campanulate, 5-9 mm long, white. Capsules sub-globose, glabrous, 5-6 mm across; seeds greyish brown, glabrous, dotted, 2.5 mm long.

In wastelands; 300-500 m.

Fl. & Fr.: November - April.

DURG : Durg. RAIPUR : Raipur, Sitanadi. RAJNANDGAON : Singhari.

2. *M. hederacea* (Burm. f.) Hall. f. in Bot. Jahrb. Syst. 18 : 118. 1894. *Evolvulus hederaceus* Burm. f. Fl. Ind. 77. t. 30. f. 2. 1768. *Ipomoea cryseoides* Ker Gawl. Bot. Reg. t. 270. 1818; Clarke in Hook. f. Fl. Brit. Ind. 4 : 206. 1883.

Twiners. Stems smooth, glabrous. Leaves ovate, 1-5 cm long, broadly cordate, apex obtuse, 3 lobed. Sepals broadly obovate, notched at apex; corolla 7-11 mm long, yellow. Capsules broadly conical to depressed-globose, 4 angled; seeds blackish, glabrescent, 2.5 mm long.

In wastelands; 400-500 m.

Fl. & Fr.: November - April.

DURG : Talgaon. RAJNANDGAON : Deopura.

3. *M. tridentata* (L.) Hall. f. in Bot. Jahrb. 16 : 552. 1893. *Convolvulus tridentatus* L. Sp. Pl. 157. 1753. *C. hastatus* Desr. in Lamk. Encycl. 3 : 542. 1791, non Forsk. 1775. *M. hastata* Hall. f., l.c. *Ipomoea tridentata* Roth in Roem. Arch. Bot. 1 (2) : 38. 1798; Clarke in Hook. f. Fl. Brit. Ind. 4 : 205. 1883. *I. angustifolia* Jacq. Ic. Pl. Rar. 2 : 10. t. 317. 1786 93; Clarke, l.c. *M. tridentata* ssp. *hastata* Ooststr. in Blumea 3 : 317. 1939. *Xenostegia tridentata* Austin & Staples in Brittonia 32 : 533. 1981.

Twiners. Stems glabrous or pubescent. Leaves linear or oblong-lanceolate, 2-10 cm long. Sepals ovate oblong or lanceolate, 4-10 mm long; corolla pale yellow, 10-20 mm long. Capsules globose, 4-9 mm long; seeds black, glabrous, 2-3 mm long.

In wastelands and river beds; 300-450 m.

Fl. & Fr.: August-June.

DURG : Balod. RAIPUR : Gariaband, Pithora, Raipur. RAJNANDGAON : Baghnadi.

7. OPERCULINA Manso

Operculina petaloidea (Choisy) Ooststr. in Blumea 3 : 366. 1939. *Ipomoea petaloidea* Choisy in Mem. Soc. Phys. Geneve 6 : 451. 1834.

Usually shrubby climbers with narrowly winged stems. Leaves broadly ovate or oblong lanceolate, $4 - 15 \times 2 - 10$ cm, with reddish midribs. Flowers in one several flowered cymes ; sepals 15 - 20 mm long ; corolla 4 - 5 cm long, sulphur yellow, densely hirsute outside with long hairs. Capsules ovoid, ca 12 mm long.

In mixed forests ; 600 m.

Fl. & Fr. : April.

RAJNANDGAON : Chilpi.

8. RIVEA Choisy

Rivea hypocarteriformis (Desr.) Choisy in Mem. Soc. Phys. Geneve 6 : 408. 1834. *Convolvulus hypocarteriformis* Desr. in Lamk. Encycl. 3 : 561. 1792.

Creepers or climbers. Stems woody, pubescent. Leaves rotundate, obtuse, silvery white pubescent beneath. Flowers usually solitary, sometimes subspicate ; sepals unequal, ovate, obtuse ; corolla salverform, 6 - 9 cm long. Fruits indehiscent ; seeds brown, glabrous.

Roadsides ; 400 m.

Fr. : August.

DURG : Rajhara dhalli.

77. SOLANACEAE (D. M. Verma & V. Chandra)

(*Capsicum annuum* L., *Cestrum nocturnum* L., *Lycopersicon lycopersicum* (L.) Karst. ex Farwell, *Solanum melongena* L., *S. tuberosum* L. are some of the commonly cultivated plants).

- | | |
|---|-------------------|
| 1a. Flowers more than 6 cm long. Fruits prickly ... | <i>Datura</i> 1 |
| 1b. Flowers less than 2 cm long. Fruits smooth. | |
| 2a. Flowers solitary in the forks of branches ; fruiting calyx inflated like a bladder and enclosing the berry ... | <i>Physalis</i> 2 |
| 2b. Flowers in extra - axillary or terminal raceme - like cymes ; fruiting calyx not inflated, shorter than the berry ... | <i>Solanum</i> 3 |

1. DATURA L.

- 1a. Plants throughout densely grey pubescent. Corolla 10-toothed. Prickles on the fruits sharp, mostly 7-10 mm long ... *D. inoxia* 1
- 1b. Plants glabrous, or pubescent on some, particularly the younger parts. Corolla 5-toothed. Prickles on the fruits blunt, 2-5 mm long ... *D. metel* 2

1. *Datura inoxia* Mill. Gard. Dict. ed. 8, n. 5. 1768. *D. metel* auct.; Clarke in Hook. f. Fl. Brit. Ind. 4 : 243. 1883; non L. 1753. 'Datura.'

Undershrubs, up to 70 cm high. Leaves elliptic ovate, often unequal at the base, entire or toothed. Flowers white, ca 8 cm long. Fruits globose, green, clothed with sharply pointed spines, irregularly dehiscing.

In wastelands, along drains ; 300 m.

Fl. & Fr. : August - January.

RAIPUR : Raipur.

2. *D. metel* L. Sp. Pl. 179. 1753; non Clarke in Hook. f. Fl. Brit. Ind. 4 : 243. 1883. *D. fastuosa* L. Syst. ed. 10, 932. 1759; Clarke, l.c. *D. alba* Nees in Trans. Linn. Soc. 17 : 73. 1837. *D. fastuosa* var. *alba* Clarke, l.c. 'Datura'.

Undershrubs up to 1.7 m high, young branches purplish. Leaves elliptic or ovate, 7-15 cm long, with sinuate margins. Flowers white with purplish tinge outside; calyx reflexed in fruits. Fruits nodding, irregularly dehiscing.

In wastelands ; 300-450 m.

Fl. & Fr. : August - January.

RAIPUR : Dhamtari, Raipur. RAJNANDGAON : Rajnandgaon.

Leaves soaked in hot oil are tied over sprained parts.

2. PHYSALIS L.

Physalis minima L. Sp. Pl. 183. 1753.

Herbs, 20-30 cm high. Leaves ovate, 2-3 cm long, toothed, sinuate or lobulate. Flowers pale yellow; corolla often with small spots at the base within. Fruits globose, ca 5 mm diam., enclosed within ca 2 cm long inflated calyx.

In wastelands ; 300 - 450 m.

Fl. & Fr. : August January.

DURG : Balod, Durg. RAIPUR : Rajim, Raipur. RAJNANDGAON : Baghnadi, Rajnandgaon.

3. SOLANUM L.

1a. Plants unarmed	...	<i>S. nigrum</i> 3
1b. Plants prickly.		
2a. Erect herbs or undershrubs ; prickles on the stem conspicuously broad - based and compressed, almost triangular with recurved tips.		
3a. Flowers bisexual, in cymose corymbs. Fruits ca 8 mm in diam.	...	<i>S. anguivi</i> 1
3b. Flowers unisexual, male flowers racemose, female flowers solitary. Fruits 18 - 25 mm in diam.	...	<i>S. incanum</i> 2
2b. Diffuse herbs ; prickles on the stem not much broad at the base, subterete, linear, with straight tips	...	<i>S. surattense</i> 4

1. *Solanum anguivi* Lamk. Tabl. Encycl. 2 : 23. 1794 ; Hepper in Bot. J. Linn. Soc. 76 : 290. 1978. *S. indicum* auct., Hook. f. Fl. Brit. Ind. 4 : 234. 1883, non L. 1753.

Slender to rather stout undershrubs up to 1.5 m high, clothed with purplish brown prickles. Leaves ovate oblong, 6 - 15 × 5 - 10 cm, sinuate pinnatifid. Flowers violet ; calyx and corolla stellate pubescent. Fruits globose, green and pale green blotched ; seeds smooth.

Mostly in sal or mixed forests, sometimes on roadsides ; 480 - 600 m.

Fl. & Fr. : throughout the year.

RAIPUR : Borai, Sitanadi.

2. *S. incanum* L. Sp. Pl. 188. 1753.

Shrubs. Leaves ovate elliptic, 7 - 11 cm long, sinuate or lobed, stellate tomentose above, woolly beneath. Flowers blue ; peduncles lateral, usually paired ; calyx and corolla stellate hairy. Fruits ovoid or sub-globose, yellow ; seeds minutely pitted.

In miscellaneous forests ; 450 m.

Fr. : September.

RAJNANDGAON : Salewara.

3. *S. nigrum* L. Sp. Pl. 186. 1753.

Herbs up to 40 cm. high. Leaves ovate, ovate oblong or oblong lanceolate, 6–10 × 3–5 cm, entire, sinuate or dentate. Flowers white, in umbelliform extra axillary inflorescences ; anthers yellow, ca 2 mm long. Fruits globose.

In wastelands : 300–500 m.

Fl. & Fr. : November–January.

RAIPUR : Raipur. RAJNANDGAON : Deopura.

4. *S. surattense* Burm. f. Fl. Ind. 57. 1768. *S. xanthocarpum* Schrad. & Wendl. Sert. Hannov. 1: 8. t. 2. 1795.

Perennial diffuse very prickly herbs. Leaves ovate elliptic or oblong, pinnatifid, stellate hairy when young, segments ovate, irregularly dentate. Flowers violet, in 2–6 flowered cymes ; calyx and corolla stellate hairy. Fruits globose, green, white mottled.

In wastelands : 300–530 m.

Fl. & Fr. : throughout the year.

DURG : Durg, Rajhara dhalli. RAIPUR : Raipur, Sitanadi. RAJNANDGAON : Baghnadi.

78. SCROPHULARIACEAE

(D. M. Verma & R. Prasad)

- 1a. Plants hairy throughout. Leaves all alternate ... *Verbascum* 15
- 1b. Plants glabrous or hairy. Leaves all, or at least some, opposite or whorled.

 - 2a. Bracteoles 2.

 - 3a. Anthers 1-celled.

 - 4a. Corolla tube strongly incurved ; upper lip emarginate ... *Striga* 12
 - 4b. Corolla tube almost straight ; upper lip 2-lobed ... *Buchnera* 2

 - 3b. Anthers 2-celled.

- 5a. Anther cells stipitate.
- 6a. Bracteoles at the base of pedicel ; calyx lobes dissimilar ... *Mecordonia* 8
- 6b. Bracteoles at the base of calyx ; calyx lobes similar.
- 7a. Plants densely viscid hairy. Seeds not angular ... *Stemodia* 11
- 7b. Plants glabrous or almost so. Seeds angular ... *Limnophila* 6
- 5b. Anther cells sessile.
- 8a. Anther cells equal ... *Bacopa* 1
- 8b. Anther cells unequal.
- 9a. Calyx spathaceous, split on one side ... *Centranthera* 3
- 9b. Calyx tubular, not split ... *Sopubia* 10
- 2b. Bracteoles absent.
- 10a. Calyx 4 - lobed.
- 11a. Tiny filiform herbs, 1- 3 cm high. Corolla glabrous ... *Glossostigma* 5
- 11b. Stout herbs, 10 - 15 cm high. Corolla bearded in mouth ... *Scaparia* 9
- 10b. Calyx 5 - lobed.
- 12a. Calyx winged or strongly ribbed, flowering calyx 5 mm or more broad ; anther cells divergent. Fruits included ... *Torenia* 14
- 12b. Plants not as above.
- 13a. Viscid hairy herbs. Lower leaves pinnatifid. Stamens 4, didynamous ; anthers 1 - celled ... *Sutera* 13
- 13b. Plants not as above.
- 14a. Fertile stamens 4. Fruits 4 - valved ... *Limnophila* 6
- 14b. Fertile stamens 2 or 4. Fruits 2 - 3 - valved.

- 15a. Leaves with several faint parallel nerves. Anther cells parallel ... *Dopatrium* 4
- 15b. Leaves 1 - 3 - nerved from the base, or pinnately nerved. Anther cells divergent ... *Lindernia* 7

1. BACOPA Aubl.

1. *Bacopa monnieri* (L.) Pennell in Proc. Acad. Nat. Sci. Philadelphia 98 : 94, 1946, *Lysimachia monnieri* L. Cent. Pl. 2 : 9, 1756. *Herpestis monniera* Benth. Scroph. Ind. 30, 1835. 'Brahmi'.

Creeping, suberect or prostrate herbs, rooting at the nodes. Leaves simple, opposite, nerves indistinct. Flowers axillary, solitary, ca 1 cm long. Capsules ovoid, acute, glabrous.

In moist places ; 250 m.

Fl. & Fr. : April.

DURG : Durg.

2. BUCHNERA L.

Buchnera hispida Buch. Ham. ex D. Don, Prodr. 91, 1825.

Erect annual hispid herbs, branches ascending. Leaves obovate or oblanceolate. Flowers 10-13 mm long, white or pale purple ; bracteoles 2, subulate ; calyx tubular, almost 10 ribbed ; stamens 4 ; anthers 1 celled. Capsules oblong ovoid.

In wastelands ; 450 m.

Fl. & Fr. : November.

RAJNANDGAON : Taregaon.

3. CENTRANTHERA R. Br.

- 1a. Leaves elliptic or linear oblong. Corolla purple or white ... *C. nepalensis* 1
- 1b. Leaves linear. Corolla yellow ... *C. tranquebarica* 2

1. *Centranthera nepalensis* D. Don, Prodr. 88. 1825. *C. hispida* auct., Hook. f. Fl. Brit. Ind. 4 : 301. 1884 ; non R. Br.

Erect, somewhat hispid or hoary herbs. Leaves clothed with white tubercles. Flowers subsessile, *ca* 15 mm long ; bracts usually longer than calyx ; calyx spathaceous, hairy ; corolla 13–15 mm long ; stamens 4. Capsules broadly ovoid oblong, grooved, 5–6 mm long ; seeds reticulate.

In wastelands ; 400 m.

Fl. & Fr. : November.

RAJNANDGAON : Deopura.

2. *C. tranquebarica* (Spreng.) Merr. in 150th Anniv. Vol. R. Bot. Gard. Calcutta 55. 1941. *Razumovia tranquebarica* Spreng., Mant. Fl. Hal. 45. 1807. *Centranthera humifusa* Wall. ex Benth., Scroph. Ind. 50. 1835.

Erect herbs, often diffusely branched. Leaves opposite below, alternate above, linear. Flowers axillary ; bracts oblong ; corolla *ca* 1 cm long, purplish yellow. Capsules globose, slightly shorter than the calyx ; seeds oblong-cuneate, reticulate.

In wastelands ; 350 m.

Fl. : October.

RAIPUR : Saraipalli.

4. DOPATRIUM Buch. Ham. ex Benth.

Dopatrium junceum (Roxb.) Buch. Ham. ex Benth. Scroph. Ind. 31. 1835. *Gratiola juncea* Roxb. Pl. Corom. 2 : 16. t. 129. 1798.

Annual slender herbs, 15–30 cm high. Leaves opposite, lower oblong, obtuse, entire. Flowers in slender racemes of distant opposite pairs, 5–7 mm long, rose coloured. Stamens 2. Capsules globose or broadly ellipsoid, 2.5–3.5 mm long. Seeds tubercled.

Along ponds & in paddy fields ; 350–450 m.

Fl. & Fr. : September–October.

RAIPUR : Dhamtari, Saraipalli. RAJNANDGAON : Baghnadi.

5. GLOSSOSTIGMA Wt. et Arn. ex Arn.

Glossostigma diandrum (L.) Kuntze, Rev. Gen. Pl. 461. 1891.
Limosella diandra L. Mant. 252. 1771. *Glossostigma spathulatum* Arn. ex Benth. in Comp. Bot. Mag. 2 : 59. 1836. *Microcarpaea spathulata* W. Hooker in Bot. Misc. 2 : 101. Suppl. t. 4. 1831.

Filiform herbs, 1-3 cm high. Pedicels slender, shorter than the leaves; calyx campanulate, 3-lobed, ca 1 mm long; corolla bluish, 5-lobed; stamens 2; anthers unilocular. Capsules globose, equalling the calyx; seeds small, ovoid.

Along ponds; 350 m.

Fl. & Fr.: October.

RAIPUR: Saraiapalli.

6. LIMNOPHILA R. Br.

1a. Leaves all entire, pinninerved.

2a. Flowers pedicellate ... *L. aromatica* 1

2b. Flowers sessile ... *L. rugosa* 3

1b. Leaves upper entire, 3-ribbed from the base, lower pinnatifid or multifid.

3a. Flowers pedicellate, the pedicel longer than the calyx *L. indica* 2

3b. Flowers sessile or subsessile ... *L. sessiliflora* 4

1. **Limnophila aromatica** (Lamk.) Merr., Interpret. Herb. Amb. 466. 1917. *Ambulia aromatica* Lamk. Encycl. 1 : 128. 1783. *Limnophila gratusima* Blume, Bijdr. 749. 1826. 'Kuttra'.

Erect herbs. Leaves opposite and 3-nately whorled, linear oblong, subacute, serrate. Racemes up to 25 cm long and paniculately branched with whorled flowers, or few flowered, or the flowers solitary, axillary; pedicels glandular. Capsules oblong.

In drains; 450 m.

Fl. & Fr.: January.

RAIPUR: Singhpur.

2. *L. indica* (L.) Druce in Rep. Bot. Exch. Club. Brit. Isl. 3 : 420. 1914. *Hottonia indica* L. Syst. ed. 10, 919. 1759. *L. gratiolooides* R. Br. Prodr. 442. 1810. *L. racemosa* Benth., Scroph. Ind. 26. 1835. 'Kuttra'.

Aquatic, slender, or stout and much branched herbs. Leaves whorled, upper sometimes opposite. Flowers solitary axillary, or in terminal racemes; corolla 9–13 mm long, white, purple or bluish; stamens 4. Capsules broadly ellipsoid or globose, ca 5 mm long.

Common in roadside drains & ditches; 250–500 m.

Fl. & Fr. : throughout the year.

DURG : Talgaon. RAIPUR : Dhamtari, Pithora, Sitanadi. RAJNANDGAON : Baghnadi.

3. *L. rugosa* (Roth) Merr., Interpret. Herb. Amb. 466. 1917. *Herpestis rugosa* Roth, Nov. Pl. Sp. 290. 1821. *L. roxburghii* auct., Hook. f. Fl. Brit. Ind. 4 : 265. 1884; *non* G. Don, 1838.

Erect herbs, up to 30 cm high. Leaves opposite, elliptic to ovate, acute or obtuse, crenate, glabrous or pubescent. Flowers sessile, blue-purple with yellow mouth; corolla ca 9 mm long; stamen 4. Capsules compressed, ca 6 mm long, oblong, grooved.

In wastelands; 450 m.

Fl. & Fr. : September.

RAJNANDGAON : Salewara.

4. *L. sessiliflora* (Vahl) Blume, Bijdr. 749. 1826. *Hottonia sessiliflora* Vahl, Symb. Bot. 2 : 36. 1791.

Annual sparingly branched herbs, floating or partly submerged. Leaves subsessile, verticillate, 7–13 mm long, lobulate and pinnatisect or the upper up to 18 mm long, less divided. Flowers solitary, axillary, subsessile, light purple or pink; stamens 4. Capsules orbicular.

In marshy places; 500 m.

Fl. & Fr. : October.

RAJNANDGAON : Taregaon.

7. LINDERNIA All.

- 1a. Flowering calyx lobed to about half-way down, or less. Capsules ellipsoid or ovoid globose, about as long as the calyx ... *L. crustacea* 4
- 1b. Flowering calyx lobed to about two-third way down, or more. Capsules (except in *L. procumbens*) subcylindric, 2 - 3 - times as long as the calyx.
- 2a. Leaves 2 - 3 - ribbed from the base. Capsules ovoid-ellipsoid, about as long as the calyx. ... *L. procumbens* 5
- 2b. Leaves penninerved. Capsules subcylindric, 2 - 3 times as long as the calyx.
- 3a. Leaf-margins closely denticulate with apices of the teeth developed into fine aristae almost as long as the teeth ... *L. ciliata* 3
- 3b. Leaf-margins entire, or if serrate - dentate then the teeth subacute.
- 4a. Perfect stamens 4 ... *L. anagallis* 1
- 4b. Perfect stamens 2 ... *L. antipoda* 2

1. *Lindernia anagallis* (Burm. f.) Pennell in Arn. Arb. 24 : 252. 1943. *Ruellia anagallis* Burm. f. Fl. Ind. 135. 1768. *Gratiola cordifolia* Colsm. Prodr. Descr. Grat. 15. 1793. *Vandellia pedunculata* Benth. Scroph. Ind. 37. 1835. *L. cordifolia* (Colsm.) Merr. Enum. Philip. Fl. Pl. 3 : 437. 1923.

Decumbent or creeping annual or perennial herbs. Leaves oblong, elliptic or obovate lanceolate up to 4.0×1.3 cm. Flowers 11 - 13 mm long, blue, pinkish or violet, linear subulate, 12 - 17 mm long, septicidal.

In river beds ; 450 - 500 m.

Fl. & Fr. : June.

RAIPUR : Taurenga.

2. *L. antipoda* (L.) Alston in Trim. Handb. Fl. Ceylon 6 : 214. 1931. *Ruellia antipoda* L. Sp. Pl. 635. 1753. *Gratiola veronicifolia* Retz. Obs. 4 : 8. 1786. *Ilysanthes veronicifolia* (Retz.) Urb. Ber. Deutsch. Bot. Ges. 2 : 436. 1884 ('veronicaefolia').

Erect or more or less prostrate annual herbs with ascending branches up to 20 cm long. Leaves linear - oblong or oblanceolate, subentire or serrulate. Flowers about 8 mm long ; corolla blue violet or purple. Capsules linear, striate, 10 - 13 mm long.

Common in moist places, sometimes partly submerged ; 300 - 600 m.

Fl. & Fr. : May - October.

DURG : Balod. RAIPUR : Dhamtari, Kasdol, Pithora, Sitanadi, Taurenga.

3. *L. ciliata* (Colsm.) Pennell in Brittonia 2 : 182. 1936. *Gratiola ciliata* Colsm. Prodr. Descrip. Grat. 14. 1793. *Bonnaya brachiata* Link & Otto, Icon. Pl. Select. 25. t. 11. 1820.

Small annual herbs, stem quadrangular. Leaves sessile, broadly oblong, 12 - 40 mm long, obtuse or subacute. Flowers ca 8 mm long, white, pink or red ; fertile stamens 2, staminodes 2. Capsules linear-oblong, acute ; seeds truncate at both ends.

In moist places ; 300 - 450 m.

Fl. & Fr. : August - October.

DURG : Balod. RAIPUR : Dhamtari. RAJNANDGAON : Baghnadi, Khairagarh, Rajnandgaon.

4. *L. crustacea* (L.) F. v. Muell. Cens. Austr. Pl. 1 : 97. 1882. *Capraria crustacea* L. Mant. 87. 1771. *Vandellia crustacea* (L.) Benth. Scroph. Ind. 35 : 1835.

Erect or decumbent annual herbs. Leaves small, ovate, entire or serrate. Flowers axillary and terminal, purple or blue violet ; corolla ca 8 mm long ; stamens 4. Capsules oblong ovoid ; seeds ovoid with minute tail at one end, pale yellow, granulate.

Along roadside drains and forest clearings ; 300 - 800 m.

DURG : Balod. RAIPUR : Borai, Dhamtari, Kasdol. RAJNANDGAON : Baghnadi, Chilpi, Khairagarh.

5. *L. procumbens* (Krock.) Philcox in Taxon 14 : 30. 1965. *Anagalloides procumbens* Krock. Fl. Siles. 2 : 398. t. 26. 1790. *Vandellia erecta* Benth. Scroph. Ind. 36. 1835, p. max. p.

Erect annual herbs, 10 - 20 cm high. Leaves sessile, opposite, elliptic oblong, entire or crenulate, 3 - 5 nerved. Flowers solitary, axillary, 5 - 8 mm long, white ; stamens 4. Capsule broadly ellipsoid, as long as calyx ; seeds rugose.

Along streams, sometimes partly submerged ; 300 - 350 m.

Fl. & Fr. : May - June.

RAIPUR : Dhamtari, Kasdol.

8. MECARDONIA Ruiz & Pavon

Mecardonia procumbens (Mill.) Small, Fl. Southeast U.S. 1065, 1338. 1903. *Erinus procumbens* Mill. Gard. Dict. ed. 8. no. 6. 1768. *Lindernia dianthera* Swartz, Prodr. 92. 1788. *Bacopa procumbens* (Mill.) Greenm. Publ. Field Columbian Mus. Bot. ser. 2 : 261. 1907. *M. dianthera* Pennell in Proc. Acad. Nat. Sci. Philad. 98 : 87. 1946.

Annual glabrous herbs. Leaves subsessile, ovate-lanceolate, up to 15×7 mm, glandular beneath. Flowers solitary axillary, yellow ; corolla bilabiate, slightly exserted. Capsules ca 6 mm long,

Along forests ; 400 - 750 m.

Fl. & Fr. : September - November.

RAJNANDGAON : Chilpi, Taregaon.

9. SCOPARIA L.

Scoparia dulcis L. Sp. Pl. 116. 1753.

Annual or perennial, much branched herbs. Leaves opposite or verticillate, entire or dentate, punctate. Flowers axillary, usually paired, sometimes solitary, white, yellow or pale blue ; sepals 4-5 ; corolla 4-fid ; stamens 4. Capsules ovoid-globose.

Common in wastelands and forest clearings ; 300 - 600 m.

Fl. & Fr. : January - September.

DURG : Balod. RAIPUR : Dhamtari, Raipur, Sitanadi, Taurenga. RAJNANDGAON : Deopura.

10. SQPUBIA Buch. Ham. ex D. Don

Sopubia delphinifolia (L.) G. Don, Gen. Syst. 4 : 560. 1837 ('*delphinifolia*'). *Gerardia delphinifolia* L. Cent. Pl. 21. 1756.

Annual herbs, 40 - 80 cm high ; stem quadrangular, glabrous or hispidulous, often speckled with purple. Leaves pinnatisect. Flowers purple or rose coloured ; corolla 5-lobed, up to 38 mm long. ; stamens 4. Capsule oblong ; seeds oblong, striate.

In roadside ditches : 300 - 500 m.

Fl. & Fr. : August - October.

DURG : Balod. RAIPUR : Taurenga. RAJNANDGAON : Baghnadi, Deopura.

11. STEMODIA L.

Stemodia viscosa Roxb. Pl. Corom. 2 : 33. t. 163. 1802.

Annual or perennial viscid herbs, up to 30 cm high. Leaves sessile, oblong, 10 - 25 mm long, base amplexicaul, cordate. Flowers axillary, solitary or rarely in terminal few flowered racemes, violet ; stamens 4. Capsules ovoid oblong ; seeds ellipsoid.

In river beds ; 300 - 450 m.

DURG : Durg, Talgaon. RAIPUR : Dhamtari. RAJNANDGAON : Baghnadi.

12. STRIGA Lour.

1a. Three calyx - ribs terminating at the tip of each lobe ... *S. angustifolia* 1

1b. One calyx - rib terminating at the tip of each lobe ... *S. asiatica* 2

1. *Striga angustifolia* (D. Don) Saldanha in Bull. Bot. Surv. Ind. 5 : 70. 1963. *Buchnera angustifolia* D. Don, Prodr. 91. 1825. *B. euphrasioides* auct., Roxb. Fl. Ind. 3 : 32. 1832, non Vahl, 1794. *S. euphrasioides* auct., Hook. f. Fl. Brit. Ind. 4 : 299. 1884, non Benth. 1836.

Erect annual herbs, glabrous, or more or less scabrid. Leaves mostly alternate, linear or linear lanceolate, entire or 1-2-toothed. Flowers solitary axillary, 10 - 18 mm long, white ; corolla pilose ; calyx ribs 15 or more. Capsules ovoid, ca 7 mm long.

In wastelands and paddy fields ; 300 - 450 m.

Fl. & Fr. : September - January.

DURG : Balod. RAIPUR : Dhamtari, Rajim. RAJNANDGAON : Baghnadi.

2. *S. asiatica* (L.) Kuntze, Rev. Gen. Pl. 2 : 466. 1891. *Buchnera asiatica* L. Sp. Pl. 630. 1753. *Striga lutea* Lour. Fl. Cochinch. 22. 1790.

Erect parasitic herbs. Leaves linear, up to 3 cm long, rough. Spikes elongate ; bracts long, usually longer than the calyx ; bracteoles minute. Flowers white or yellow, tube twice as long as the calyx ; calyx 10–15 ribbed, one rib reaching the tip of each lobe, others ending in sinus.

Along ditches ; 450 m.

Fl. & Fr. : November.

RAJNANDGAON : Taregaon.

13. SUTERA Roth

Sutera dissecta (Del.) Walp. Rep. 3 : 271. 1844. *Capraria dissecta* Del., Fl. Agypte 95. t. 32. f. 2. 1812. *Sutera glandulosa* Roth, Nov. Pl. Sp. 291. 1821.

Erect or spreading herbs. Leaves 2–3 cm long. Flowers sessile or subsessile, solitary axillary or the uppermost racemed ; corolla 5 lobed, purplish yellow or white ; stamens 4. Capsules ellipsoid oblong, ca 4 mm long ; seeds pitted.

In wastelands ; 300 m.

Fl. & Fr. : April.

DURG : Durg.

14. TORENIA L.

Torenia indica Saldanha in Bull. Bot. Surv. Ind. 8 (2) : 126. 1966. *T. cordifolia* sensu Hook. f. Fl. Brit. Ind. 4 : 276. 1884, non Roxb. 1802.

Annual herbs up to 30 cm high ; stem quadrangular, simple or trichotomously branched. Leaves opposite, ovate lanceolate. Flowers axillary and usually whorled, or sub umbellate at the tip of the branches, pale blue ; stamens 4. Capsules oblong.

In miscellaneous forests ; 450–550 m.

Fl. & Fr. : September–October.

RAIPUR : Taurenga. RAJNANDGAON : Deopura.

15. VERBASCUM L.

Verbascum chinense (L.) Santapau, Fl. Purandhar 90, 1958. *Scrophularia chinense* L. Mant. 2 : 250, 1771. *Celsia coromandeliana* Vahl, Symb. Bot. 3 : 79, 1794. *V. celosoides* Benth. in DC. Prodr. 10 : 229, 1846. *V. coromandelianum* (Vahl) Kuntze, Rev. Gen. Pl. 1 : 468, 1891 'Kokhima, Gadar tambaku'.

Erect hairy herbs, up to 60 cm high. Leaves serrate dentate, basal lyrate, pinnatifid, 5-7 × 3 cm, upper ovate oblong, shorter. Racemes simple or branched. Flowers yellow; corolla 5 lobed; stamens 4, filaments pilose. Capsules subglobose, glandular.

In wastelands & river beds; 300-500 m.

Fl. & Fr.: May June.

RAIPUR: Dhamtari, Gariaband, Sitanadi.

79. OROBANCHACEAE

(M. I. Hanfi)

AEGINETIA L.

Aeginetia indica L. Sp. Pl. 632, 1753.

Perennial leafless root parasitic herbs, 15-30 cm high, with a short rootstock. Flowers racemose, on curved peduncles, mauve to purple; calyx spathaceous, swollen at the base; corolla lobes subequal. Fruits ovoid globose, 1.5-2.0 cm long.

In sal and miscellaneous forests; 450-550 m.

Fl. & Fr.: September - October.

RAIPUR: Gariaband, Taurenga. RAINANDGAON: Salewara.

80. LENTIBULARIACEAE

(D. M. Verma)

UTRICULARIA L.

1a. Leaves divided into capillary segments.

2a. Primary leaf segments two. Peduncle with a scale in the middle

U. exalata 5

2b. Primary leaf segments three or more. Peduncle naked	...	<i>U. aurea</i> 1
1b. Leaves not divided, sometimes evanescent.		
3a. Flowers yellow.		
4a. Peduncle twining	...	<i>U. scandens</i> 8
4b. Peduncle not twining	...	<i>U. bifida</i> 3.
3b. Flowers blue, purple, mauve or white.		
5a. Bracts medifixed	...	<i>U. caerulea</i> 4
5b. Bracts basifixed.		
6a. Peduncle twining.		
7a. Lower lip of the corolla 3 - 5 mm broad	...	<i>U. baouleensis</i> 2
7b. Lower lip of the corolla 12 - 25 mm broad	...	<i>U. reticulata</i> 2
6b. Peduncle not twining	...	<i>U. polygaloides</i> 6

1. *Utricularia aurea* Lour. Fl. Cochinch. 26. 1790. *U. flexuosa* Vahl, Enum. 1 : 198. 1804.

Aquatic herbs, 5 - 25 cm high. Ultimate leaf segments capillary, setulose. Traps usually numerous on the leaves, ovoid, 1 - 4 mm long. Peduncle bearing 5 - 10 rather congested flowers. Corolla 10 - 15 mm long, yellow. Seeds 5 angled, narrowly winged.

In shallow water along ponds ; 300 m.

Fl. & Fr. : August January.

DURG : Balod. RAIPUR : Dhamtari. RAJNANDGAON : Baghnadi.

2. *U. baouleensis* A. Chev. in Bull. Soc. Bot. Fr. Mem. 8 : 186. 1912. *U. scandens* Oliver in J. Linn. Soc. (Bot.) 3 : 181. 1859 ; Clarke in Hook. f. Fl. Brit. Ind. 4 : 332. 1884 ; non Benj. 1847.

Terrestrial herbs, up to 20 cm high. Leaves linear, up to 3 cm long and 1 mm broad. Traps few, globose, ca 1 mm dia. Peduncles capillary, bearing 2 - 5 distant flowers ; pedicels reflexed in fruits. Capsules compressed, ovoid ; seeds with loose corky testa.

Along ponds and in paddy fields ; 250–350 m.

Fl. & Fr. : October.

RAIPUR : Rajim, Sarai-palli.

3. *U. bifida* L. Sp. Pl. 18. 1753.

Terrestrial herbs, up to 20 cm high. Rhizoids capillary with thickened bases. Leaves linear, 1–2 cm long, ca 1 mm broad. Traps on the vegetative organs globose, 0.5–1.0 mm long. Peduncles capillary, bearing 1–10 distant flowers. Corolla 5–10 mm long, lower lip suborbicular, ca 4 mm broad.

In marshy places ; 400 m.

Fl. & Fr. : April.

DURG : Talgaon.

4. *U. caerulea* L. Sp. Pl. 18. 1753 ; Gamble, Fl. Madras Pres. 2 : 983. 1924. *U. racemosa* Wall. ex Walp. in Meyen, Observ. Bot. Nov. Acta 19 : 401. 1843 ; Clarke in Hook. f. Fl. Brit. Ind. 4 : 333. 1884, *incl. var. filicaulis* Clarke. *U. roseo-purpurea* Stapf. ex Gamble, l.c.

Terrestrial herbs, up to 30 cm high. Leaves narrowly spatulate, up to 7.0 × 1.5 mm. Traps dimorphic, larger ca 1.5 mm long, smaller ca 0.7 mm long. Peduncles rather stout, bearing 1–20 distant or very congested flowers ; bracts ca 2 mm long. Corolla 4–10 mm long, pink, mauve or blue purple, sometimes white. Capsules globose, ca 2 mm across.

In mud and shallow water ; 400 m.

Fl. & Fr. : September.

RAJNANDGAON : Baghnadi.

5. *U. exoleta* R. Br. Prodr. 430. 1810. *U. gibba* L. ssp. *exoleta* P. Taylor in Mitt. Bot. Staatss. Munchen 4 : 101. 1961.

Free floating aquatic herbs, up to 15 cm high. Leaves dichotomously divided into capillary, sometimes setulose, segments. Traps on foliar segments ca 1 mm long. Peduncles solitary or fasciculate. Corolla 4–8 mm long, yellow. Capsules 2–3 mm across ; seeds with an irregular corky wing.

Forming matty growth in shallow still water ; 350–450 m.

Fl. & Fr. : June–September.

RAIPUR : Gariaband. RAJNANDGAON : Baghnadi.

6. *U. polygaloides* Edgew. in Proc. Linn. Soc. 1 : 351. 1849 ; Bhattacharya in Bull. Bot. Soc. Bengal 30 : 77. 1976. *U. stricticaulis* Stapf ex Gamble, Fl. Madras Pres. 982. 1924. *U. reticulata* var. *uliginosa* Clarke in Hook. f. Fl. Brit. Ind. 4 : 331. 1884.

Peduncles rather stout, 3–10 flowered ; pedicels recurved in fruits. Sepals ovate, decurrent ; corolla blue ; lower lip suborbicular, ca 6 mm dia., spur conical. Seeds obovoid, longitudinally reticulate.

In marshy places ; 400 m.

Fl. & Fr. : April.

DURG : Talgaon.

7. *U. reticulata* Sm. Exot. Bot. t. 119. 1805.

Terrestrial herbs, up to 60 cm high. Leaves narrowly spatulate. Peduncles twining and interlacing, bearing several flowers. Corolla blue-violet, reticulated with pale blue and white, upper lip obovate, lower suborbicular. Seeds rhomboid, reticulate.

RAIPUR, n.v. (cf. D. K. Tiwari in Proc. 47th Ind. Sci. Congr. 407. 1960).

8. *U. scandens* Benj. in Linnaea 20 : 309. 1847. *U. wallichiana* Wt. Sc. t. 1572. 1850 ; Clarke in Hook. f. Fl. Brit. Ind. 4 : 332. 1884 ; non Benj. 1845.

Terrestrial herbs, up to 35 cm high. Leaves linear, up to 10 × 1 mm. Traps globose, 0.5–1.0 mm long. Peduncles capillary, bearing 1–8 distant flowers. Corolla 5–10 mm long, upper lip oblong, lower suborbicular, 5–7 mm long. Seeds reticulate.

RAIPUR, n. v. (cf. D. K. Tiwari in Proc. 47th Ind. Sci. Congr. 407. 1960).

SI. GESNERACEAE

(R. Saran)

DIDYMOCARPUS Wall.

Didymocarpus pygmaea Clarke in Hook. f. Fl. Brit. Ind. 4 : 345. 1884.

Pubescent annual herbs up to 10 cm high. Stem curved having one leaf at its tip. Leaf sessile, elliptic, cordate, 1.5–10.0 × 1.8–6.0 cm. ;

calyx 5 partite, *ca* 5 mm long ; corolla tubular, white. Capsules up to 18 mm long.

In miscellaneous forests ; 500 m.

Fl. & Fr. : September.

RAJNANDGAON : Mukhiarighat.

82. BIGNONIACEAE

(D. M. Verma)

(*Jacaranda mimosifolia* D. Don, *Kigelia africana* (Lamk.) Benth. (*K. pinnata* DC.), *Millingtonia hortensis* L. f., *Spathodea campanulata* P Beauv. and *Tecoma stans* (L.) H.B.K. are commonly planted along roadsides and in gardens).

1a. Leaves twice or thrice pinnate. Flowers 7 - 10 cm long.

Capsules sword - like ... *Oroxylum* 1

1b. Leaves once pinnate. Flowers 2 - 3 cm long. Capsules

cylindrical ... *Stereospermum* 2

I. OROXYLUM Vent.

Oroxylum indicum (L.) Vent. Dec. Gen. Nov. 8. 1808. *Bignonia indica* L. Sp. Pl. 625. 1753.

Sparingly branched deciduous trees with greyish stem. Petioles 0.5 - 1.5 m long ; leaflets ovate oblong, 4 - 11 × 3 - 9 cm, acuminate, viscid hairy. Racemes up to 1 m long. Calyx 2 - 4 cm long, purplish brown, almost woody ; corolla red purple, crisped. Capsules pendulous, rather woody, *ca* 60 × 7 cm, ultimately black ; seeds winged.

In mixed forests ; 400 m.

RAIPUR : Sihawa, n.v. (cf. Haines, Descr. list of *trees, shrubs and eco. herbs*, Southern Circle C. P. 167. 1916).

2. STEREOSPERMUM Cham.

1a. Leaves and inflorescence viscid hairy by capitale - glandular hairs. Corolla dull purple, yellow streaked within ; filaments glabrous. [Capsules terete or faintly 3 - angled, 10 - 20 mm across ...

S. chelonoides 1

- 1b. Leaves and inflorescence glabrous or puberulus. Corolla yellowish, red streaked within ; filaments hairy at the base. Capsules somewhat 4 - angled, 5 - 7 mm across ... *S. colais* 2

1. *Stereospermum chelonoides* (L. f.) DC. in Bibl. Univ. Geneve II. 125. 1838, *pro comb.*, *excl. ref.* Rheede t. 26 *et* Prodr. 9 : 210. 1845, *pro basion.* ; Santisuk in Kew Bull. 28 : 176. 1973 ; *non auct.* *Bignonia chelonoides* L. f. Suppl. 282. 1781, *pro typ.*, *excl. ref.* Rheede. *B. suaveolens* Roxb. Fl. Ind. 3 : 104. 1832. *S. suaveolens* DC. Prodr. 211. 1845. 'Padar'.

Large deciduous trees. Leaves 30 - 50 cm long ; leaflets 3 - 4 pairs, obovate oblong, 5 - 23 × 3 - 10 cm, viscid hairy, glabrescent, entire or denticulate. Inflorescence up to 25 cm across. Flowers 2 - 3 cm long, fragrant. Capsules 15 - 25 (-45) cm long ; seeds winged, *ca* 35 mm long.

Common in mixed and sal forests ; 350 - 500 m.

Fl. : April ; *Fr.* : June - January.

DURG : Rajhara dhalli. RAIPUR : Khallari, Pithora, Sitanadi. RAJNANDGAON : Baghnadi.

2. *S. colais* (Dillw.) Mabberley in Taxon 27 : 553. 1978. *Bignonia colais* Dillw. Rev. Ref. Hort. Mal. 28. 1839. *Dipterosperma personatum* Hassk. Fl. 25 (2) Beibl. 1 : 28. 1842. *Stereospermum chelonoides* DC. Bibl. Univ. Geneve II. 17 : 125. 1838, *quoad ref.* Rheede t. 26 *et* Prodr. 9 : 210. 1845, p.p. ; Clarke in Hook. f. Fl. Brit. Ind. 4 : 382. 1884. *S. personatum* Chatterjee in Bull. bot. Soc. Bengal 2 : 70. 1948. *S. tetragonum* DC. Prodr. 9 : 210. 1845. 'Chhota padar.'

Medium sized deciduous trees with greyish black bark. Leaves 20 - 40 cm long ; leaflets 3 - 6 pairs, elliptic oblong, 5 - 15 × 2 - 6 cm, caudate acuminate, pinkish green when young. Inflorescence up to 40 cm long. Flowers *ca* 3 cm long ; calyx purple. Capsules 8 - 45 cm long ; seeds winged, *ca* 2 cm long.

On hill slopes in mixed forests ; 300 - 400 m.

Fl. : June ; *Fr.* : August.

RAIPUR : Dhamtari, Gariaband.

83. PEDALIACEAE (M. I. Hanfi)

- | | | |
|---|-----|-------------------|
| 1a. Flowers in terminal racemes. Fruits with two apical hooks | ... | <i>Martynia</i> 1 |
| 1b. Flowers solitary axillary. Fruits apiculate | ... | <i>Sesamum</i> 2 |

1. MARTYNIA L.

Martynia annua L. Sp. Pl. 618. 1753. *M. diandra* Gloxin. Obs. 14. t. I. 1785. 'Ulat - Kanta.'

Perennial viscous hairy herbs 0.5 - 2.0 m high. Leaves ovate orbicular, 20 - 45 cm across, dentate ; petiole fistular. Flowers mauve with deep purple blotches on the inside of the corolla lobes ; calyx and corolla glandular pubescent. Fruit ovoid, green, drying black.

In wastelands ; 300 - 350 m.

Fl. & Fr. : August - November.

DURG : Balod. RAIPUR : Dhamtari. RAJNANDGAON : Singhari.

2. SESAMUM L.

Sesamum orientale L. Sp. Pl. 634. 1753 ; Graham, Cat. Pl. Bombay 126. 1839. *S. indicum* L. Sp. Pl. 634. 1753.

Annual glandular pubescent herbs, 50 - 70 cm high. Lower leaves opposite, 3 foliolate or palmatisect ; higher ones ovate lanceolate or oblong. Flowers white, pedicels with a pair of yellow glands at the base. Fruits 1.5 - 3.0 cm long, apiculate ; seeds white, brown or black, smooth or rugose.

Cultivated for its oil yielding seeds, sometimes found as escape ; 300 - 500 m.

Fl. & Fr. : September - October.

RAIPUR : Dhamtari. RAJNANDGAON : Baghnadi, Deopura.

84. ACANTHACEAE
(D. M. Verma & R. Prasad)

- 1a. Climbers. Leaves palmately nerved. Calyx many toothed ... *Thunbergia* 23
- 1b. Herbs or shrubs. Leaves pinnately nerved. Calyx 4 - 5 - lobed.
- 2a. Calyx 4 - lobed.
 - 3a. Stamens 2, staminodes 1 - 2, or absent.
 - 4a. Flowers more than 2 cm long ... *Barleria* 3
 - 4b. Flowers less than 1 cm long.

- 5a. Capsules four - seeded ; seeds borne on retinacula ... *Justicia* 13
- 5b. Capsules several - seeded ; seeds not borne on retinacula ... *Nelsonia* 15
- 3b. Stamens 4, staminodes absent.
- 6a. Corolla with a spreading 3 - lobed lower lip, upper lip obsolete ; anther 1 - celled ... *Blepharis* 4
- 6b. Corolla 2 - lipped, or lobes 5, subequal ; anther 2 - celled.
- 7a. Corolla distinctly 2 - lipped, lobes in bud contorted ... *Hygrophila* 12
- 7b. Corolla not distinctly 2 - lipped, lobes in bud imbricate ... *Barleria* 3
- 2b. Calyx 5 - lobed.
- 8a. Stamens 2, staminodes 1 - 2, or absent.
- 9a. Corolla - lobes in bud contorted ... *Eranthemum* 8
- 9b. Corolla - lobes in bud imbricate.
- 10a. Anther cells inserted at the same level. Capsule cells three - many - seeded ... *Andrographis* 2
- 10b. Anther cells inserted at different levels. Capsule cells 1 - or 2 - seeded.
- 11a. One or both the anther cells spurred at the base.
- 12a. Shrubs. Inflorescences all axillary. Flowers ca 25 mm long ... *Adhatoda* 1
- 12b. Herbs or shrubs. Inflorescences, at least most of them, terminal. Flowers 5 - 15 mm long.
- 13a. Shrubs or under shrubs. Bracts all linear. Calyx - lobes subequal ... *Gendarussa* 10
- 13b. Plants not as above.
- 14a. Calyx lobes subequal. Bracts, at least [the flowering, broadly ovate - obovate or suborbicular, conspicuously white scarious margined *Rungia* 22

- 14b. Posterior calyx - lobe usually little developed,
Bracts all linear - lanceolate, (or if obovate - sub-
orbicular then not scarious - margined) ... *Justicia* 13
- 11b. Anther cells not spurred at the base.
- 15a. Flowers white, 2.5 - 3.5 cm long ... *Rhinacanthus* 20
- 15b. Flowers rose or blue - purple, 1.0 - 1.8 cm
long.
- 16a. Cymules in dense clusters ... *Dicliptera* 5
- 16b. Cymules in lax panicles ... *Peristrophe* 17
- 8b. Stamens 4, staminodes absent.
- 17a. Corolla - lobes in bud imbricate ... *Lepidagathis* 14
- 17b. Corolla - lobes in bud contorted.
- 18a. Capsule cells one - two - seeded.
- 19a. Flowers ca 5 mm across, white ; corolla
tuba very slender, scarcely widening
above ... *Phaulopsis* 19
- 19b. Flowers 10 - 20 mm across, blue -
purple or white ; corolla tubular
ventricose.
- 20a. Flowers in 3 - 10 cm long spikes ;
anther cells muticous at the base... *Perilepta* 16
- 20b. Flowers in clusters or contracted
cymes or spikes ; anther cells spur-
red at the base.
- 21a. Flowers 1.5 - 2.0 cm long,
blue purple ; bracteoles
subulate ... *Dyschoriste* 7
- 21b. Flowers 3.0 - 4.0 cm long,
white ; bracteoles large, ovate
... *Petalidium* 18
- 18b. Capsule cells three - or more - seeded.
- 22a. Corolla 2 - lipped, upper lip erect, lower
lip erecto - patent or reflexed ... *Hygrophila* 12
- 22b. Corolla not 2 - lipped, lobes all erecto -
patent.
- 23a. Flowers 2 - 4 cm long.
- 24a. Bracteoles foliaceous. Cap-
sules clavate, with a solid
base, bearing seeds only in
the upper part ... *Dipteracanthus* 6

- 24b. Bracteoles narrow. Capsules linear, without a solid base, bearing seeds throughout ... *Ruellia* 21
- 23b. Flowers *ca* 1 cm long.
- 25a. Plants almost bristly with stiff hairs. Leaves entire or crenulate. Heads with 4 large reticulate outer bracts and oblong spathulate inner bracts ; bracteoles linear or absent. Capsules *ca* 1 cm long ... *Gantebua* 9
- 25b. Plants not as above ... *Hemigraphis* 11

1. ADHATODA Mill.

Adhatoda vasica Nees in Wall. Pl. As. Rar. 3 : 103. 1832. *Justicia adhatoda* L. Sp. Pl. 15. 1753. 'Adusa'.

Dense evergreen shrubs. Leaves elliptic lanceolate, acuminate, glabrous when mature. Flowers in short, bracteate, pedunculate spikes, clustered towards the ends of the branches ; bracts foliaceous ; corolla white with some rose purple lines and dots in the throat. Capsules clavate, 2-3 cm long.

In wastelands ; 400 m.

Fl. : January.

RAIPUR : Sitanadi.

Leaves medicinal.

2. ANDROGRAPHIS Wall. ex Nees

- 1a. Hirsute herbs. Flowers all sessile ... *A. echiooides* 1
- 1b. Glabrous or puberulous herbs. Flowers all or mostly pedicelled ... *A. paniculata* 2

1. *Andrographis echiooides* (L.) Nees in Wall. Pl. As. Rar. 3 : 117. 1832. *Justicia echiooides* L. Sp. Pl. 16. 1753. *Indoneesiella echiooides* Sreemadh. in Phytologia 15 : 271. 1967.

Annual white hairy herbs. Leaves sessile, oblong-elliptic, 2-8 cm long. Flowers white, streaked with purple ; calyx ciliate ; corolla glan-

dular hairy outside ; anthers dark purple. Capsules elliptic lanceolate, hairy ; seeds rugose.

In wastelands ; 300 - 400 m.

Fl. & Fr. : August - January.

DURG : Bordih. RAIPUR : Dugli, Rajim.

2. *A. paniculata* (Burm. f.) Wall. ex Nees in Wall. Pl. As. Rar. 3 : 116. 1832. *Justicia paniculata* Burm. f. Fl. Ind. 9. 1768. 'Kiryat'.

Erect annual herbs, 30 - 90 cm high. Stems quadrangular. Leaves linear lanceolate. Flowers in axillary and terminal racemose panicles, or rarely solitary, axillary ; corolla 2 lipped, glandular pubescent outside, white with deep pink or purplish violet markings inside at the base of the lower lip. Capsules linear oblong ; seeds rugose.

In wastelands ; 400 - 500 m.

Fl. & Fr. : April - June.

RAIPUR : Sitanadi. RAJNANDGAON : Baghnadi.

Roots and leaves medicinal.

3. BARLERIA L.

1a. Plants armed with 1 - 2 cm long spines. Flowers yellow ... *B. prionitis* 2

1b. Plants unarmed. Flowers blue - mauve (or white).

2a. Spikes secund. Bracteoles ovate - lanceolate. Outer sepals ciliate on the margins ... *B. strigosa* 3

2b. Spikes not secund. Bracteoles linear. Outer sepals spinulose - dentate ... *B. cristata* 1

1. *Barleria cristata* L. Sp. Pl. 636. 1753.

Undershrubs 0.3 - 1.0 m high. Leaves elliptic or oblong lanceolate. Flowers in axillary and terminal, short head like spikes. Bracts absent ; bracteoles 10 - 15 mm long. Calyx 4 partite nearly to the base, the two outer sepals lanceolate ; corolla deep purple or pinkish purple. Capsules ellipsoid, 4 seeded.

Roadsides & forest clearings ; 400 - 550 m.

Fl. & Fr. : September - June.

DURG : Budbhumi. RAIPUR : Singhpur, Sitanadi, Taurenga.
RAJNANDGAON : Baghnadi.

Roots and leaves medicinal.

2. *B. prionitis* L. Sp. Pl. 636. 1753.

A much branched prickly shrub or undershrub ; young shoots pubescent. Leaves elliptic, bristle tipped, short petioled. Flowers terminally spicate or sometimes 1-2 in lower axils. Bracts 1-2 cm long. Corolla yellow. Capsules ovoid, pointed ; seeds 2, ca 6 mm diam.

In wastelands ; 300 m.

Fl. : January.

RAIPUR : Raipur.

Leaves medicinal.

3. *B. strigosa* Willd. Sp. Pl. 3 : 379. 1800.

Undershrubs, young branches fulvous strigose. Leaves ovate, acuminate. Calyx densely strigose, margins denticulate and ciliate ; corolla 3.5-5.0 cm long, blue. Capsules ca 1.8 cm long ; 4-seeded ; seeds silky hairy.

In sal and miscellaneous forests ; sometimes roadsides ; 450-550 m.

RAIPUR : Sitanadi, Taurenga.

4. **BLEPHARIS** Juss.

- | | | |
|---|-----|-----------------------------|
| 1a. Leaves petiolate, acute. Flowers in clusters of 2-3 | ... | <i>B. maderaspatensis</i> 1 |
| 1b. Leaves sub-sessile, obtuse. Flowers solitary | ... | <i>B. repens</i> 2 |

1. *Blepharis maderaspatensis* (L.) Heyne ex Roth, Nov. Pl. Sp. 320. 1821. *Acanthus maderaspatensis* L. Sp. Pl. 892. 1753. *B. boerhaviaefolia* Pers. Syn. Pl. 2 : 180. 1806.

Prostrate perennial herbs. Stems wiry, divaricately branched. Leaves whorled, elliptic, 2 larger and 2 smaller at each node. Corolla pale blue with a yellow spot on the anterior lip. Capsules broadly ellipsoid, ca 7 mm long ; seeds 2, densely papillose.

In wastelands ; 500 m.

Fl. & Fr. : November.

RAJNANDGAON : Deopura.

2. *B. repens* (Vahl) Roth, Nov. Pl. Sp. 321. 1821. *Acanthus repens* Vahl, Symb. 2 : 76. 1791. *B. molluginifolia* Pers. Syn. Pl. 2 : 180. 1806.

Prostrate herbs. Stem wiry, with patent hairs. Leaves whorled, 4 at each node, oblong obovate, slightly succulent, mucronate. Flowers sessile, solitary, axillary. Corolla blue or violet. Capsules compressed, elliptic, enclosed by accrescent calyx.

In wastelands ; 300 - 450 m.

Fl. & Fr. : September - January.

RAIPUR : Raipur. RAJNANDGAON : Baghnadi.

5. DICLIPTERA Juss.

- | | |
|--|--------------------------|
| 1a. Flowers 12 - 15 mm long. Cymule bracts mostly ovate, glandular - pubescent ... | <i>D. roxburghiana</i> 1 |
| 1b. Flowers ca 6 mm long. Cymule bracts oblanceolate, densely white - ciliate ... | <i>D. verticillata</i> 2 |

1. *Dicliptera roxburghiana* Nees in Wall. Pl. As. Rar. 3 : 111. 1832.

Herbs, up to 1 m high. Leaves elliptic, up to 6 cm long, puberulus ; petiole ca 12 mm long. Flowers numerous, in small sessile axillary clusters ; bracts unequal, ca 12 mm long. ; corolla rose purple, ca 18 mm long. Capsules ca 18 mm long ; seeds verrucose.

In wastelands and rock crevices ; 500 m.

Fl. & Fr. : May - June.

RAIPUR : Sitanadi.

2. *D. verticillata* (Forsk.) C. Christensen in Dansk. Bot. Arkiv. V. 4. 3 : 11. 1922. *Dianthera verticillata* Forsk. Fl. Aegypt. Arab. 9. 1775. *D. micranthes* Nees in Wall. Pl. As. Rar. 3 : 112. 1832.

Extensively branched ascending annual herbs, 15 - 45 cm high. Leaves ovate or elliptic, acuminate, lineolate, glabrous or slightly hairy ; petiole 10 - 35 mm long. Flowers in small, sessile, axillary clusters ; corolla hairy outside. Capsules compressed, elliptic, hairy at the tip ; seeds echinulate.

In wastelands ; 400 m.

Fr. : April.

DURG : Budbhumi.

6. DIPTERACANTHUS Nees

- 1a. Flowers 2 - 3 cm long. Corolla (outside) and capsules pubescent ... *D. prostratus* 1
- 1b. Flowers 4 - 5 cm long ; corolla (outside) and capsules glabrous ... *D. suffruticosus* 2

1. *Dipteracanthus prostratus* (Poir.) Nees in Wall. Pl. As. Rar. 3 : 81. 1832. *Ruellia prostrata* Poir. in Lamk. Encycl. 6 : 349. 1804 ; Clarke in Hook. f. Fl. Brit. Ind. 4 : 412. 1884 ; incl. var. *dejecta* Clarke.

Prostrate or decumbent. Stem 15 - 50 cm long, rooting at lower nodes. Leaves elliptic ovate, acute. Flowers almost sessile, usually solitary, pale mauve violet ; bracteoles 2, broadly elliptic or elliptic oblong, 1 - 2 cm long. Capsules clavate, 15 - 20 mm long ; seeds 16 - 20, ca 3 mm diam.

In wastelands and sandy river beds ; 400 - 550 m.

Fl. & Fr. : April June.

DURG : Budbhumi. RAIPUR : Sitanadi.

2. *D. suffruticosus* (Roxb.) Voigt, Hort. Suburb. Calc. 483. 1845. *Ruellia suffruticosa* Roxb. Fl. Ind. 3 : 53. 1832.

Erect pubescent perennial herbs, 25 - 60 cm high. Roots stout, often with fusiform swellings. Leaves oblong or broadly elliptic, rounded or obtuse at the tip. Flowers solitary, terminal, subsessile, white ; calyx lobes ca 6 mm long. Capsules oblong, ca 35 mm long ; seeds 12 - 14.

In wastelands and forest floors ; 350 - 550 m.

Fl. & Fr. : August June.

RAIPUR : Dhamtari, Gariaband, Taurenga.

7. DYSCHORISTE Nees

- 1a. Calyx 6 - 8 mm long. Corolla 8 - 10 mm long ... *D. erecta* 1
- 1b. Calyx 12 - 15 mm long. Corolla 18 - 20 mm long ... *D. vagans* 2

1. *Dyschoriste erecta* (Burm. f.) O. Ktze. Rev. Gen. Pl. 485. 1891. *Ruellia erecta* Burm. f. Fl. Ind. 135. t. 41. f. 3. 1768. *Calophanes nagchana* Nees in DC. Prodr. 11. 109. 1847.

Perennial herbs, branches usually prostrate and rooting at the nodes, Leaves broadly elliptic or obovate. Flowers subsessile, in axillary clusters, pink violet ; bracts absent, bracteoles long, linear. Calyx 6-8 mm long, divided more than half way down. Capsules ca 1 cm long.

In wastelands ; 300 m.

Fl. & Fr. : April.

DURG : Durg.

2. *D. vagans* (Wt.) O. Ktze. Rev. Gen. Pl. 486. 1891. *Calophanes vagans* Wt. Ic. t. 1526. 1850.

Undershrubs, up to 1 m high ; branches strigulose. Leaves lanceolate or ovate, pale beneath, hispidulous above. Clusters or cymes glandular-pubescent, often few-flowered ; bracts and bracteoles linear. Calyx with sub equal filiform tipped teeth & stalked glands ; corolla 18-20 mm long.

In forest floors and along drains ; 350-450 m.

Fl. & Fr. : September January.

RAIPUR : Dugli, Singhpur. RAJNANDGAON : Salewara.

8. ERANTHEMUM L.

Eranthemum purpurascens Nees in Wall. Pl. As. Rar. 3 : 106. 1832. *Daedalacanthus purpurascens* (Nees) T. Anders. in J. Linn. Soc. (Bot.) 9 : 488. 1867.

Stout herbs, ca 1 m high. Leaves ovate, acuminate. Spikes solitary, oblong, very dense, 3-8 cm long ; bracts glandular pubescent, ca 2.5 cm long ; bracteoles smaller, linear lanceolate. Calyx 6-9 mm long ; corolla ca 3 cm long, bluish purple or lilac. Capsules 12-16 mm long.

In miscellaneous forests ; 300-500 m.

Fl. & Fr. : October April.

DURG : Dondi. RAIPUR : Singhpur, Tairenga. RAJNANDGAON : Singhari.

9. GANTELBUA Bremek.

Gantelbua urens (Heyne ex Roth) Bremek. in Mat. Mon. Strob. 148. 1944. *Ruellia urens* Heyne ex Roth, Nov. Pl. Sp. 302. 1821. *Hemigraphis dura* T. Anders. in J. Linn. Soc. (Bot.) 9 : 461. 1867.

Procumbent or diffuse hairy herbs, 25–60 cm high. Leaves short petioled, spatulate oblong, subentire, hispid. Heads many flowered, densely clothed with white and yellowish brown hairs; bracts oblong or spatulate, 18–25 mm long. Calyx ca 12 mm long; corolla ca 16 mm long, blue, tube slender. Capsules ca 12 mm long, 6–8 seeded.

In wastelands; 300 m.

Fl. & Fr.: February.

RAIPUR : Nagpur Road.

10. GENDARUSSA Nees

Gendarussa vulgaris Nees in Wall. Pl. As. Rar. 3 : 104. 1832; Bremek. in Dansk. Bot. Arkiv 20(1) : 81. 1961. *Justicia gendarussa* Burm. f. Fl. Ind. 10. 1768. ‘*Nili - nargandi*’.

Shrubs, 0.6–1.3 m high. Leaves linear lanceolate, subacute. Flowers in interrupted 4–8 cm long terminal or axillary spikes; corolla 12–15 mm long, rose, white purple or pinkish with deep reddish violet spots within the throat, tube narrow. Capsules clavate, ca 12 mm long.

Commonly planted as hedge; 300–500 m.

Fl.: January.

RAIPUR : Raipur, Sitanadi.

11 HEMIGRAPHIS Nees

- | | |
|--|-----------------------|
| 1a. Leaves 1.0–2.5 cm long. Corolla tubular - ventricose ... | <i>H. hirta</i> 1 |
| 1b. Leaves 3.5–10.0 cm long. Corolla tubular - funnel - shaped | <i>H. latebrosa</i> 2 |

1. *Hemigraphis hirta* (Vahl) T. Anders. in J. Linn. Soc. (Bot.) 9 : 462. 1867. *Ruellia hirta* Vahl, Symb. Bot. 3 : 84. t. 67. 1794.

Prostrate, softly hairy or villous much branched herbs. Leaves ovate or elliptic, acute or obtuse. Heads 2–6 flowered; bracts 10–15 mm long. Calyx ca 8 mm long; Corolla 10–15 mm long, ashy grey or greyish violet with deep violet throat. Capsules linear cylindric, ca 1 cm long, ca 12 seeded.

In wastelands; 550 m.

Fl.: April.

RAJNANDGAON : Rengakhar.

2. *H. latebrosa* (Heyne ex Roth) Nees in DC. Prodr. 11 : 723. 1847.
Ruellia latebrosa Heyne ex Roth, Nov. Pl. Sp. 307. 1821.

Annual hairy herbs, up to 60 cm high. Leaves ovate oblong, acuminate, 2-11 cm long. Heads usually terminating small axillary branches; bracts ovate or elliptic, petioled. Corolla tube sometimes yellow, lobes rounded, blue; longer filaments bearded with papillose hairs, shorter glabrous. Capsules pubescent, 6 seeded.

In miscellaneous forests; 350-550 m.

Fl. & Fr.: October-January.

RAIPUR: Dugli, Singhpur, Taurenga.

12. HYGROPHILA R. Br.

1a. Flowers in whorls.

2a. Plants armed with axillary whorls of spines	...	<i>H. auriculata</i> 1
2b. Plants unarmed	...	<i>H. salicifolia</i> 4

1b. Flowers in spikes.

3a. Flowers purplish blue. Retinacula conical	...	<i>H. heinei</i> 2
3b. Flowers white. Retinacula hooked	...	<i>H. polysperma</i> 3

1. *Hygrophila auriculata* (Schum.) Heine in Kew Bull. 16 : 172. 1962.
Barleria auriculata Schum. in Schum. & Thonn. Beskr. Guin. Pl. 285. 1827. *B. longifolia* L. Amoen. Acad. 4 : 320. 1759. *Asteracantha longifolia* (L.) Nees in Wall. Pl. As. Rar. 3 : 1832. *H. spinosa* T. Anders. in Thw. Enum. Pl. Zeyl. 225. 1860. *H. longifolia* (L.) Kurz in J. As. Soc. Beng. 78 : 390. 1870; non Nees, 1847.

Stout herbs, up to 70 cm high, with axillary whorls of 15-30 mm long spines. Leaves subsessile, linear-lanceolate, 4-8 cm long. Flowers about 8 in each whorl; corolla 30-35 mm long, blue-purple. Capsules linear-oblong, ca 8 mm long, pointed, 4-8 seeded.

Along ponds & ditches; 300-750 m.

Fl. & Fr.: September-June.

DURG. Durg. RAIPUR: Gariaband, Raipur. RAJNANDGAON: Chilpi.

2. *H. heinei* Sreem. in Bull. Bot. Surv. Ind. 10 : 223. 1969. *Ruellia uliginosa* L. f. Suppl. 290. 1791. *Adenosma uliginosa* (L. f.) Nees in Wall. Pl. As. Rar. 3 : 79. 1832. *Cardanthera uliginosa* (L. f.) Benth. ex Clarke in

Hook. f. Fl. Brit. Ind. 4 : 403. 1884 ; *non Hygrophila uliginosa* Moore, 1880.

Erect or decumbent succulent herbs, 30–45 cm high. Leaves oblong-obovate, 2–4 cm long, entire or crenate. Bracts elliptic ovate, cordate, ca 6 mm long. Flowers purplish blue; sepals linear, pubescent; corolla ca 8 mm long. Capsules ca 5 mm long.

In cultivated fields; 300 m.

Fl. & Fr. : January.

RAIPUR : Dhamtari.

3. *H. polysperma* (Roxb.) T. Anders. in J. Linn. Soc. (Bot.) 9 : 456. 1867. *Justicia polysperma* Roxb. Fl. Ind. 1 : 119. 1832. *Hemiadelphus polyspermus* Nees in Wall. Pl. As. Rar. 3 : 80. 1832.

Erect or procumbent herbs, rooting at the lower nodes. Leaves ovate or elliptic oblong. Flowers in dense terminal spikes; bracts foliaceous, bracteoles ciliate margined. Calyx ca 4 mm long; corolla ca 7 mm long, white, pink or blue. Capsules ca 7 mm long, ca 20 seeded.

Along drains; 300–550 m.

Fl. & Fr. : October. April.

DURG : Rajhara dhalli. RAIPUR : Raipur. RAJNANDGAON : Rengakhar.

4. *H. salicifolia* (Vahl) Nees in Wall. Pl. As. Rar. 3 : 81. 1832. *Ruellia salicifolia* Vahl, Symb. 3 : 84. 1794.

Erect or ascending rather stiff herbs, 30–90 cm high. Leaves narrowed at both the ends. Bracts ovate or elliptic, 6–8 mm long. Calyx 8–12 mm long; corolla 12–16 mm long, pale purple; stamens 4. Capsules 12–16 mm long. 20–28 seeded.

Near ponds; 300 m.

Fl. : September.

RAIPUR : Raipur, n.v. (cf. D.K. Tiwari in Proc. 47th Sess. Ind. Sci. Congr. 407. 1960).

13. JUSTICIA L.

1a. Calyx lobes 5, subequal.

2a. Suffruticose. Bracts ovate, white with green nerves ... *J. betonica* 1

2b. Herbs. Bracts obovate, uniformly green *J. glauca* 3

- 1b. Calyx lobes 4, sometimes with an additional tooth.
- 3a. Bracts distinctly longer than the sepals. Capsules constricted between seeds.
- 4a. Hairs on the bracts and bracteoles jointed. Capsules obtuse, mucronulate ... *J. simplex* 7
- 4b. Hairs on the bracts and bracteoles not jointed. Capsules sharply pointed ... *J. procumbens* 4
- 3b. Bracts shorter or as long as the sepals. Capsules not constricted.
- 5a. Bracts as long as the sepals, obtuse ... *J. quinqueangularis* 6
- 5b. Bracts shorter than the sepals, acute.
- 6a. Bracts glabrous except for a tuft of hairs at the apex. Capsules glabrous ... *J. diffusa* 2
- 6b. Bracts hairy throughout. Capsules puberulus ... *J. prostrata* 5

1. *Justicia betonica* L. Sp. Pl. 15. 1753.

Undershrubs with several *ca* 1 m high pubescent branches, swollen above the nodes. Leaves ovate lanceolate, 4–10 × 2–4 cm. Spikes terminal, solitary or several panicled; bracts and bracteoles imbricating, up to 15 mm long, white with green nerves. Flowers small, white with red purple dots.

In wastelands ; 300 m.

Fl. & Fr. : October.

RAIPUR : Raipur.

2. *J. diffusa* Willd. Sp. Pl. 1 : 87. 1789.

Diffuse or erect profusely branched herbs. Stems 4 angled. Leaves opposite, ovate or elliptic lanceolate, 2–5 cm long, acute or acuminate. Flowers pink or pale purple, in erect axillary and terminal spikes. Bracts linear lanceolate, shorter than the calyx. Capsules oblong, glabrous.

In wastelands and miscellaneous forests ; 300–450 m.

Fl. & Fr. : August June.

DURG : Bordih. RAIPUR : Pithora, Raipur. RAJNANDGAON : Baghnadi.

3. *J. glauca* Rottl. in Ges. Naturf. Neue Schr. 4 : 219. 1802. *Gendarussa tranquebarensis* Wt. Ic. t. 462. 1840 ; non Nees, 1843.

Erect or somewhat diffuse herbs, 30–60 cm high. Branches purple, pubescent with bulbous based hairs. Leaves ovate elliptic, 2–8 cm long. Spikes terminal, lax, solitary flowers often scattered in the distant lower axils. Sepals linear, pubescent or glabrous; corolla *ca* 8 mm long. Capsules obovate, 4 seeded.

In forest clearings and rock crevices ; 350–500 m.

Fl. & Fr. : August–October.

RAIPUR : Dhamtari, Taurenga.

4. *J. procumbens* L. Sp. Pl. 15. 1753. *Rostellaria procumbens* (L.) Nees in Wall. Pl. As. Rar. 3 : 101. 1832.

Slender annual herbs, often rooting at the lower nodes with zigzag branches. Leaves petioled, elliptic or lanceolate, 15–30 mm long, hairy or glabrate. Spikes cylindric, dense, hirsute, 2–6 cm long ; bracts linear lanceolate, acute. Sepals linear lanceolate, hirsute ; corolla pink or blue.

Roadsides ; 750 m.

Fl. & Fr. : September.

RAJNANDGAON : Chilpi.

5. *J. prostrata* (Clarke) Gamble in Fl. Pres. Madras 1081. 1924. *J. diffusa* var. *prostrata* Clarke in Hook. f. Fl. Brit. Ind. 4 : 538. 1885.

Slender herbs with long spreading branches from a rootstock. Leaves elliptic – ovate or orbicular, up to 18 mm long. Flowers in axillary and terminal, up to 6 cm long spikes ; bracts scabrous. Corolla *ca* 7 mm long, pink or white, with purple spots. Capsules puberulus ; seeds tuberculate, black.

In wastelands ; 300 m.

Fl. & Fr. : April.

DURG : Durg.

6. *J. quinqueangularis* Koen. ex Roxb. Fl. Ind. I : 133. 1832. *Rostellaria quinqueangularis* Nees in Wall. Pl. As. Rar. 3 : 101. 1832.

Erect or ascending herbs. Stem 4–5 angled. Leaves in distant pairs, linear or linear lanceolate, 2–8 cm long. Spikes terminal, rather lax ; bracts linear, glabrous. Corolla white with purplish blotch. Capsules oblong, pointed.

In wastelands ; 300–800 m.

Fl. & Fr. : August April.

DURG : Budbhumi. RAIPUR : Raipur. RAJNANDGAON : Chilpi, Singhari.

7. *J. simplex* D. Don, Prodr. Fl. Nep. 118. 1825. *Rostellaria mollissima* Nees in Wall. Pl. As. Rar. 3 : 101. 1832.

Ascending or prostrate herbs. Branches quadrangular, grooved, hairy, swollen above the nodes. Leaves variable, 2-5 cm long. Flowers in dense cylindric terminal or axillary spikes ; bracts and bracteoles membranous, margined, longer than the calyx. Calyx lobes unequal, ciliate ; corolla pale purple or whitish. Capsules elliptic, pubescent at the tip.

In wastelands ; 400 m.

Fl. & Fr. : August. September.

DURG : Balod.

14. LEPIDAGATHIS Willd.

Ia. Flower heads aggregated at the base of the stem.

Capsules 2-seeded.

2a. Bracts and calyx-lobes with dense soft silky hairs, no stiff ones ...

L. cristata 1

2b. Bracts and calyx-lobes glabrescent but ciliate with long stiff white hairs ...

L. hamiltoniana 2

1b. Flower heads terminal and axillary. Capsules 4-seeded ...

L. incurva 3

1. *Lepidagathis cristata* Willd. Sp. Pl. 3 : 400. 1801.

Perennial herbs, 15-45 cm high, with a woody rootstock. Leaves linear oblong, lineolate, up to 3 × 0.5 cm. Bracts and calyx-lobes spinous tipped. Flowers white with purple brown spots, ca 8 mm long ; lower calyx-lobes joined to about half way up. Capsules grooved.

In wastelands ; 300 m.

Fl. & Fr. : October.

RAJNANDGAON : Singhari.

2. *L. hamiltoniana* Nees in Wall. Pl. As. Rar. 3 : 96. 1832.

Erect or diffuse herbs. Leaves linear or narrowly oblong, nearly glabrous. Spikes aggregated at the base of the stem in globose heads. Bracts

long, tapering upwards with white hairs on their margins. Calyx lobes membranous upwards, reddish when young ; corolla with adpressed straight white hairs, blue mauve or white, with brown spots.

In wastelands and miscellaneous forests ; 300 - 500 m.

Fl. & Fr. : October, June.

RAIPUR : Pithora, Raipur, Taurenga.

3. *L. incurva* Buch. Ham. ex D. Don Prodr. Fl. Nep. 119. 1825.
L. hyalina Nees in Wall. Pl. As. Rar. 3 : 95. 1832.

Stems 30 - 60 cm high, 2 - 4 ribbed. Leaves petioled, variable in shape, lower ovate, upper narrower. Bracts lanceolate, acuminate mucronate, ca 12 mm long. Calyx linear lanceolate, outer lobes longest ; corolla ca 6 mm long, white with brown spots on the palate. Capsules 4 seeded.

In forest clearings ; 500 - 700 m.

Fl. & Fr. : January June.

RAIPUR : Khallari, Sitanadi. RAJNANDGAON : Mataidah, Ren-gakhar.

15. NELSONIA R. Br.

Nelsonia canescens (Lamk.) Spreng. Syst. 1 : 42. 1825. *Justicia canescens* Lamk. Encycl. 1 : 1141. 1783. *N. campestris* R. Br. Prodr. 481. 1810. 'Khara bhaji.'

Herbs with trailing branches, young parts more or less densely clothed with white hairs. Leaves elliptic oblong, lower 10 - 20 cm long, with long petioles. Spike 1 - 5 cm long, grey woolly ; bracts 4 - 6 mm long ; bracteoles represented by two opposite tufts of hairs. Calyx strongly nerved ; corolla purplish, ca 6 mm long. Capsules ovoid conic, 8 - 12 seeded.

In wastelands and river beds ; 300 - 550 m.

Fl. & Fr. : April June.

RAIPUR : Kasdol, Khallari. RAJNANDGAON : Baghnadi.

16. PERILEPTA Bremek.

Perilepta edgeworthiana (Nees) Bremek. in Verh. Nederl. Akad. Wet. 41 : 194. 1944. *Strobilanthes edgeworthiana* Nees in DC. Prodr. II : 190. 1847. *S. auriculatus* Nees var. *edgeworthiana* (Nees) Clarke in Hook. f. Fl. Brit. Ind. 4 : 453. 1884.

Small shrubs. Branches divaricate, quadrangular. Leaves often very unequal, sessile, auriculate, oblong lanceolate, serrulate. Flowers in compact, strobiliform, axillary and terminal spikes; bracts obovate, broader than long, imbricate, pubescent, margins ciliate. Corolla blue, 20–25 mm long.

In miscellaneous forests; 400 m.

Fl. & Fr. : January.

RAIPUR : Singhpur.

17. PERISTROPHE Nees

Peristrophe bicalyculata (Retz.) Nees in Wall. Pl. As. Rar. 3 : 113. 1832. *Dianthera bicalyculata* Retz. in Act. Holm. 297. t. 9. 1775. 'Atrilal' Annual erect or suberect hispid herbs, with quadrangular branches. Leaves petioled, ovate, lanceolate. Flowers in lax panicles; bracts 2, unequal, linear. Calyx lobes 5, linear lanceolate with ciliate margins; corolla 2-lipped, ca 12 mm long, pink. Capsules oblong, ca 1 cm long.

In wastelands, under shade ; 300 m.

Fl. & Fr. : January.

RAIPUR : Raipur.

Plants medicinal.

18. PETALIDIUM Nees

Petalidium barlerioides (Roth.) Nees in Wall. Pl. As. Rar. 3 : 82. 1832. *Ruellia barlerioides* Roth. Nov. Pl. Sp. 310. 1821.

Straggling shrubs. 0.6–1.5 m high with straw coloured twigs. Leaves on the main stem petioled, broadly ovate, 5–10 cm long, crenate

serrate. Bracts absent ; bracteoles ovate elliptic. Calyx glandular-hairy ; corolla narrowly campanulate, up to 35 mm long, yellowish white, pale blue or white. Capsules ca 12 mm long.

In miscellaneous forests : 450 - 600 m.

Fl. & Fr. : January - May.

RAIPUR : Borai, Sitanadi. RAJNANDGAON : Baghnadi.

19. PHAULOPSIS Willd.

Phaulopsis imbricata (Forssk.) Sw. Hort. Brit. 327. 1827. *Ruellia imbricata* Forssk. Fl. Aegypt. Arab. 113. 1775. *R. dorsiflora* Retz. Obs. 6 : 31. 1791. *P. parviflora* Willd. Sp. Pl. 3 : 342. 1801. *P. dorsiflora* Santapau in Kew Bull. 3 : 276. 1948.

Prostrate or decumbent hairy herbs. Stem 20 - 80 cm long. Leaves ovate or elliptic, 2 - 8 cm long, narrowed at both ends ; petioles 0.5 - 2.5 cm long. Flowers in terminal spikes, or sometimes clustered in lower axils also. Calyx ciliate and glandular hairy. Corolla 7 - 9 mm long, white. Capsules 5 - 6 mm long, 4 seeded.

In miscellaneous forests ; 500 m.

Fl. : January.

RAIPUR : Sitanadi.

20. RHINACANTHUS Nees

Rhinacanthus nasutus (L.) Kurz in J. As. Soc. Beng. 39 : 79. 1870. *Justicia nasuta* L. Sp. Pl. 16. 1753. *R. communis* Nees in Wall. Pl. As. Rar. 3 : 109. 1832.

Undershrubs, 0.8 - 1.5 m high, young shoots pubescent. Leaves elliptic or elliptic lanceolate, 5 - 10 cm long, margins undulate ; petioles 7 - 15 mm long. Flowers sessile or subsessile, in terminal pubescent panicles. Calyx ca 3 mm long ; corolla 2.0 - 2.5 cm long, white or bluish tinged. Capsules ca 2 cm long, pubescent.

In miscellaneous forests ; 500 m.

Fl. : January.

RAJPUR - Sitanadi.

21. RUELLIA L.

Ruellia tuberosa L. Sp. Pl. 635. 1753.

Annual or perennial herbs, 10-40 cm high, much branched from a rootstock of numerous fleshy tubers. Leaves elliptic or elliptic obovate, apex obtuse or rounded. Flowers in axillary and terminal cymes ; calyx 15-20 mm long, glandular ; corolla 30-35 mm long, blue. Capsules cylindric, pointed, ca 2 cm long.

In wastelands ; 300 m.

Fl. & Fr. : August.

DURG : Durg.

22. RUNGIA Nees

1a. Bracts dimorphic. Flowers 3-5 mm long	...	<i>R. pectinata</i> 1
1b. Bracts all similar. Flowers 8-10 mm long	...	<i>R. repens</i> 2

1. **Rungia pectinata** (L.) Nees in DC. Prodr. 11 : 470. 1847. *Justicia pectinata* L. Amoen. Acad. 4 : 299. 1759. *Rungia parviflora* var. *pectinata* (L.) Clarke in Hook. f. Fl. Brit. Ind. 4 : 550. 1885.

Annual procumbent herbs. Leaves sessile or petioled, lanceolate or elliptic. Spikes dense ; flowering bracts obovate orbicular, ca 4 mm long, broadly scarious-margined, barren bracts oblong lanceolate, narrowly scarious margined. Calyx lobes ciliate margined ; corolla light blue with two rows of darker patches in the lower lip.

In wastelands and miscellaneous forests ; 300 - 450 m.

Fl. & Fr. : January - April.

DURG : Durg. RAIPUR : Dugli, Raipur. RAJNANDGAON : Baghandi.

2. *R. repens* (L.) Nees in Wall. Pl. As. Rar. 3 : 110. 1832. *Justicia repens* L. Sp. Pl. 15. 1753.

Diffuse or procumbent annual herbs ; branches tetragonal. Leaves subsessile, elliptic lanceolate or oblong. Spikes erect, pubescent, 1 - 3 cm long ; bracts all ovate orbicular, broadly scarious margined. Calyx ca 4 mm long, pubescent ; corolla pink or rose with deep red or purple spots in the throat of the lower lip. Capsules ovoid oblong, compressed, 4 - 5 mm long.

In roadside ditches ; 300 - 500 m.

Fl. & Fr. : November - January.

RAIPUR : Raipur. RAJNANDGAON : Deopura.

23. THUNBERGIA Retz.

Thunbergia fragrans Roxb. Pl. Corom. 1 : 47. t. 67. 1796. *T. volubilis* Pers. Syn. Pl. 2 : 179. 1806.

Slender climbers. Leaves oblong or deltoid ovate, 5 - 8 cm long, rounded, cordate or hastate at the base, entire or with a few basal angular apiculate lobes. Flowers solitary or paired in the leaf axils ; calyx pubescent ; corolla ca 4 cm long, pure white. Capsules 18 - 25 mm long ; seeds rugose.

In sal forests ; 450 - 500 m.

Fl. : November - January.

RAIPUR : Sitanadi. RAJNANDGAON : Deopura.

85. VERBENACEAE
(D.M. Verma & A. Kumar)

- 1a. Leaves digitately 3 - 5-foliate ... *Vitex* 11
- 1b. Leaves simple.
 - 2a. Flowers in capitate cymes, subtended by a clusture of foliaceous bracts ; corolla several - lobed. ... *Symploca* 9
 - 2b. Flowers variously arranged without any clusture of foliaceous bracts ; corolla 4 - 5 - lobed or - toothed.
 - 3a. Flowers in spikes or racemes.
 - 4a. Flowers somewhat immersed into the rhachis ... *Stachytarpheta* 8
 - 4b. Flowers not immersed into the rhachis.
 - 5a. Flowers in lax terminal and axillary racemes ... *Duranta* 3
 - 5b. Flowers in dense capitate or cylindric spikes.
 - 6a. Rambling or climbing shrubs. Leaves ovate ... *Lantana* 5
 - 6b. Creeping herbs. Leaves obovate or spatulate ... *Phyla* 6
 - 3b. Flowers in cymes, the cymes frequently disposed in panicles.
 - 7a. Fruits enclosed in persistent bladder like calyx ... *Tectona* 10
 - 7b. Fruits not enclosed in bladder like calyx.
 - 8a. Flowers less than 5 mm long.
 - 9a. Flowers distinctly zygomorphic ; stamens didynamous ... *Premna* 7
 - 9b. Flowers almost regular ; stamens not didynamous ... *Callicarpa* 1

8b. Flowers more than 10 mm long.

- 10a. Stamens longer than the corolla and much exserted, the exserted part more than 1 cm long ... *Clerodendrum* 2
- 10b. Stamens shorter than to as long as the corolla, scarcely exserted ... *Gmelina* 4

1. CALICARPA L.

Callicarpa arborea Roxb. Fl. Ind. 1 : 390. 1832.

Trees up to 10 m high; branchlets tomentose. Leaves opposite, elliptic or ovate oblong, 16–30 × 7–15 cm, sub acuminate, glabrous above, tomentose beneath, margin entire. Flowers lilac purple, in dichotomous cymes. Drupes globose, 2–3 mm across, purple; seeds more or less oblong, pale yellow.

In miscellaneous forests; 450 m.

Fr. : September.

RAJNANDGAON : Salewara.

2. CLERODENDRUM L.

1a. Corolla tube over 5 cm long ... *C. indicum* 1

1b. Corolla tube less than 3 cm long.

2a. Leaves ovate - rhomboid. Flowers ca 2 cm across; calyx lobes triangular, caudate - acuminate ... *C. phlomidoides* 2

2b. Leaves narrowly elliptic - oblong. Flowers ca 3 cm across; calyx lobes very shallow, obtuse - acute ... *C. serratum* 3

1. **Clerodendrum indicum** (L.) Kuntze, Rev. Gen. Pl. 586. 1891.
Siphonanthus indica L. Sp. Pl. 109. 1753. *C. siphonanthus* R. Br. in Ait. f. Hort. Kew. ed. 2, 4 : 65. 1812. ‘Bharangi’.

Shrubs, 1 - 2 m high. Stems fistular, quadrangular. Leaves subsessile, in whorls of 3 - 5, elliptic lanceolate, 10 - 20 × 1 - 5 cm. Flowers in 20 - 40 cm long terminal panicles, white. Drupes globose, blue, subtended by red enlarged calyx ; seeds oblong.

River banks, on sandy soil ; 550 m.

Fl. : June ; *Fr.* : October.

RAIPUR : Taurenga.

2. *C. phlomoides* L. f. Suppl. 292. 1781.

Shrubs or small trees with pubescent branches. Leaves ovate rhomboid, 3 - 6 × 3 - 4 cm, subentire or crenate dentate. Flowers in dense axillary dichotomous cymes forming a subglobose bunch, white or pinkish.

In wastelands and as hedges ; 300 m.

Fl. & *Fr.* : October February.

RAIPUR : Raipur.

3. *C. serratum* (L.) Moon, Cat. 46. no. 382. 1824. *Volkameria serrata* L. Mant. 90. 1771. 'Bharangi, Duma'.

Shrubs, 1 - 3 m high. Stem quadrangular. Leaves subsessile, opposite or ternate, elliptic or ovate, 10 - 25 × 5 - 10 cm. Flowers in 10 - 35 cm long terminal pyramidal panicles, blue. Drupes obovoid, up to 7 mm across ; seeds oblong.

On forest margins ; 350 - 800 m.

Fl. : August - September ; *Fr.* : October.

DURG : Rajhara dhalli. RAIPUR : Chhoora, Sitanadi.
RAJNANDGAON : Chilpi.

3. DURANTA L.

Duranta repens L. Sp. Pl. 637. 1753. *D. plumieri* Jacq. Select. Stirp. Amer. Hist. 186. t. 176.. f. 76. 1763.

Armed shrubs, 1-2 m high. Leaves opposite or verticillate, obovate elliptic, 1.5-2 cm, obtuse, entire or serrate. Flowers in 4-10 cm long drooping racemes, blue or violet; calyx pubescent. Drupes globose, 4-5 mm across, completely enclosed in accrescent, beaked calyx, orange; seeds oblong.

Usually planted as hedge, sometimes found as escape; 300-400 m.

Fl. & Fr. : August.

RAIPUR : Dhamtari, Raipur.

4. GMELINA L.

Gmelina arborea Roxb. Pl. Corom. 3 : 42. t. 246. 1819. 'Kamhar, Sewan.'

Trees, up to 15 m high; bark smooth; young branches yellowish tomentose. Leaves opposite, ovate, 5-20 x 5-18 cm, acuminate, fulvous-tomentose beneath. Flowers in 10-25 cm long fulvous paniculate cymes, yellow. Drupes obovoid, 1-2 cm long, orange-yellow.

In sal forests; 350-500 m.

Fl. & Fr. : April-June.

RAIPUR : Kasdol Deori. RAJNANDGAON : Baghnadi.

5. LANTANA L.

Lantana camara L. Sp. Pl. 627. 1753; Jafri & Ghafoor in Nasir & Ali, Fl. W. Pak. no. 77 : 9. 1974. *L. camara* L. var. *aculeata* (L.) Moldenke in Torreya 34 : 9. 1974. *L. aculeata* L. Sp. Pl. 627. 1753. - 'Rai-munia'.

Prickly rambling or climbing shrubs up to 2.5 m high. Leaves opposite, ovate, 2-9 x 1-6 cm, base cuneate, rounded or cordate. Flowers in pedunculate capitate spikes; all pink or orange, or central

ones yellow or orange and peripheral ones pink. Drupes globose, 2-3 mm across, black.

On roadsides and forest margins, becoming a serious pest; 250-550 m.

Fl. & Fr. : April June.

DURG : Rajhara dhailli. RAIPUR : Raipur, Sitanadi.

6. PHYLA Lour.

Phyla nodiflora (L.) Greene in Pittonia 4 : 46. 1899. *Verbena nodiflora* L. Sp. Pl. 20. 1753. *Lippia nodiflora* Rich. in Michx. Fl. Bor. Amer. 2 : 15. 1803.

Perennial creeping herbs, rooting at the nodes. Leaves subsessile, opposite, obovate or spatulate, 0.5-2.8 x 0.2-1.2 cm, serrate in upper part. Flowers in pedunculate, 5-15 mm long cylindric spikes, white or pink. Drupes globose; seeds plano convex, yellow.

In moist wastelands; 250-450 m.

Fl. & Fr. : April June.

DURG : Durg. RAIPUR : Dhamtari, Raipur. RAJNANDGAON : Baghnadi, Rajnandgaon.

7. PREMNA L.

1a. Trees	...	<i>P. flavescens</i>
	var. <i>gmelinoides</i>	1

1b. Herbs with leaves appressed to the ground	<i>P. herbacea</i> 2
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1. **Premna flavescens** Buch. Ham. var. *gmelinoides* (Haines) Haines, Bot. Bihar & Orissa 4 : 715. 1924. *P. gmelinoides* Haines in Ind. For. 40 : 398. 1914.

Trees. Leaves usually ovate, cordate, $17 - 30 \times 10 - 20$ cm, coarsely toothed, minutely pubescent on the nerves beneath. Fruits globose, *ca* 4 mm across with 3 - 4 cells, seated on the enlarged calyx.

RAJNANDGAON : Khairagarh (*cf.* Haines, Descr. list of trees, shrubs & econ. herbs, Southern Circle, C.P. 182. 1916).

2. *P. herbacea* Roxb. Fl. Ind. 3 : 80. 1832. *Pygmaeopremna herbacea* Moldenke in Phytologia 2 : 54. 1941.

Perennial herbs up to 10 cm high ; rootstock woody. Leaves appressed to the ground, sessile, in 2 - 3 close pairs, elliptic - obovate or sub orbicular, $3 - 16 \times 1 - 15$ cm, serrate crenate in the upper part. Flowers in terminal corymbs, white. Drupes globose, 4 - 5 mm across, black ; seeds tuberculate, yellow.

In sal forests ; 500 - 650 m.

Fl. & Fr. : June - August.

RAIPUR : Borai, Sitanadi.

8. STACHYTARPHETA Vahl

Stachytarpheta jamaicensis (L.) Vahl, Enum. Pl. 1 : 206. 1804. *Verbena jamaicensis* L. Sp. Pl. 19. 1753. *Stachytarpheta indica* sensu Clarke in Hook. f. Fl. Brit. India 4 : 564. 1885 p.p. ; non Vahl, 1804.

Herbs or undershrubs, up to 1 m high ; young branches pubescent. Leaves elliptic ovate, $1.0 - 6.0 \times 0.8 - 3.0$ cm, serrate, cuneate at the base. Flowers in terminal, 10 - 25 cm long spikes, violet, becoming white on drying. Bracts acuminate. Fruits linear oblong, ribbed.

In miscellaneous forests : 500 - 600 m.

Fl. & Fr. : November - April.

RAJNANDGAON : Chilpi, Deopura.

9. SYMPHOREMA Roxb.

Symporema polyandrum Wight, Ic. t. 363. 1840.

Climbing shrubs, up to 2 m high ; young branches fulvous - tomentose. Leaves sessile, ovate, $4 - 13 \times 3 - 8$ cm, dentate, stellately hairy on either sides. Flowers when leafless, white, in capitate cymes, with an involucre of 6 foliaceous tomentose bracts ; calyx tomentose ; coroll a many - lobed.

In miscellaneous forests ; 400 - 450 m.

Fl. & Fr. : April June.

DURG : Budbhumi. RAIPUR : Gariaband. RAJNANDGAON : Baghnadi.

10. TECTONA L. f.

Tectona grandis L. f. Suppl. 151. 1781 ‘*Sagon.*’

Deciduous trees, up to 15 m high, young parts tomentose. Leaves opposite, ovate elliptic, $10 - 50 \times 5 - 40$ cm, stellate - tomentose beneath. Flowers white, in dichotomously branched, 20 - 40 cm long, terminal tomentose panicles. Drupes enclosed in tetragonal inflated calyx.

Commonly planted for its timber, natural regeneration seen at some places ; 300 - 500 m.

Fl. : August ; *Fr.* : September January.

DURG : Balod. RAIPUR : Raipur, Sitanadi. RAJNANDGAON : Baghnadi.

11. VITEX L.

- | | | |
|------------------------------------|-----|---------------------|
| 1a. Leaves greyish - white beneath | ... | <i>V. negundo</i> 2 |
| 1b. Leaves green beneath. | | |

- 2a. Leaves gland - dotted beneath ... *V. peduncularis* 3
 2b. Leaves eglandular beneath ... *V. leucoxylon* 1
 1. **Vitex leucoxylon** L. f. Suppl. 293. 1781.

Trees, up to 3 m high ; bark grey, smooth. Leaves 3 - 5 foliolate ; leaflets petiolulate, elliptic or lanceolate, 3 - 10 × 1 - 3 cm, obtuse or acute. Flowers white, in axillary, corymbose cymes, ca 15 mm long, purple, supported on enlarged calyx at the base. Seeds obovate.

In river beds ; 400 - 600 m.

Fl. & Fr. : May June.

RAIPUR : Pithora, Taurenga.

2. **V. negundo** L. Sp. Pl. 638. 1753. '*Shivari, Negur*'.

Shrubs, 1.5 - 3 m high, young branches tomentose ; bark grey. Leaves 3 - 5 foliolate ; leaflets petiolulate, elliptic or lanceolate, 2 - 10 × 1 - 3 cm, acute or acuminate, tomentose, beneath. Flowers blue - purple, in 4 - 20 cm long tomentose panicled cymes. Drupes globose, black.

Along roadsides ; 300 - 400 m.

Fl. & Fr. : August November.

RAIPUR : Kasdol, Raipur. RAJNANDGAON : Taregaon.

Leaves medicinally used.

3. **V. peduncularis** Wall. ex Schauer in DC. Prodr. 11 : 687. 1847.

Trees, up to 10 m high ; young shoots pubescent, Leaves 3 - foliolate, petiole often winged in young plants ; leaflets petiolulate, lanceolate or elliptic, 8 - 15 × 3 - 5 cm, yellow gland dotted beneath. Flowers white with a yellow palate, in 12 - 25 cm long panicled cymes. Drupes obovoid.

In miscellaneous forests ; 400 m.

RAIPUR : Sitanadi.

86. LAMIACEAE
(D. M. Verma & V. Chandra)

- 1a. Calyx - lobes 6 - 10.

 - 2a. Flowers orange - red ; bracts and calyx - lobes spinulous ... *Leonotis* 8
 - 2b. Flowers white or creamy ; bracts and calyx lobes not spinulous ... *Leucas* 9

- 1b. Calyx lobes 5, or less.

 - 3a. Calyx bilipped, upper lip entire, lower usually toothed.

 - 4a. Verticillasters congested forming capitate or cylindric spikes.

 - 5a. Spikes solitary, 0.5 - 1.5 cm long. Corolla about as long as the calyx ... *Acrocephalus* 1
 - 5b. Spikes several, panicled, 1 - 5 cm long. Corolla about twice as long as the calyx ... *Anisochilus* 2

 - 4b. Verticillasters, at least the lower, distantly placed, forming interrupted spikes or racemes.

 - 6a. Fertile stamens 2 ... *Salvia* 15
 - 6b. Fertile stamens 4.

 - 7a. Stamens declinate.

 - 8a. Lower lip of the corolla navicular, about twice as long as the upper lip ... *Plectranthus* 13
 - 8b. Lower lip of the corolla flat, about as long as the upper lip.

 - 9a. Stigma two - lobed ... *Ocimum* 11
 - 9b. Stigma entire ... *Orthosiphon* 12

 - 7b. Stamens not declinate ... *Nepeta* 10

 - 3b. Calyx not bilipped, lobes all similar and subequal.

10a. Corolla sub - 2 - lipped or 4 - lobed.		
11a. Calyx 5 - fid, lobes ultimately plumose	...	<i>Colebrookea</i> 4
11b. Calyx 5 - toothed, lobes never plumose.		
12a. Inflorescence of panicled subcapitiate cymes. Corolla sub - 2 - lipped	...	<i>Pogostemon</i> 14
12b. Inflorescence spicate. Corolla 4 - lobed	...	<i>Eustheralis</i> 5
10b. Corolla distinctly 2 - lipped.		
13a. Lower lip of corolla entire	...	<i>Hypnis</i> 6
13b. Lower lip of corolla 3 - fid.		
14a. Stamens included	...	<i>Lavandula</i> 7
14b. Stamens exserted	...	<i>Anisomeles</i> 3

1. ACROCEPHALUS Benth.

Acrocephalus indicum (Burm. f.) Kuntze, Rev. Gen. Pl. 2 : 511. 1891. *Prunella indica* Burm. f. Fl. Ind. 130. 1768. *Ocimum capitatum* Roth, Nov. Pl. Sp. 276. 1821. *A. capitatus* (Roth) Benth. Bot. Reg. 1300. t. 1282. 1829.

Annual herbs, 20 - 30 cm high. Leaves ovate-lanceolate, 2 - 4 cm long, coarsely serrate. Flowers in capitate-cylindric spikes; calyx pubescent outside; upper lip entire; lower lip with 4 lanceolate teeth; corolla pale purple, lower and upper lips subequal. Nutlets minute, oblong-ellipsoid, compressed.

In mixed forest; 400 - 450 m.

Fl. & Fr. : September - October.

RAIPUR : Gariaband. RAJNANDGAON : Baghnadi.

2. *ANISOCHILUS* Wall. ex Benth.

Anisochilus carnosus (L. f.) Wall. Pl. As. Rar. 2 : 18. 1830 31.
Lavandula carnosa L. f. Suppl. 273. 1781.

Undershrubs, 30 - 80 cm high. Leaves broadly ovate, 2 - 6 cm long, crenate - serrate. Flowers in dense cylindric spikes ; calyx tubular, upper lip ovate, lower lip truncate; corolla mauve coloured, lower lip much longer than the upper lip. Nutlets ovoid suborbicular, ca 1 mm long, glistening brownish black.

In rock crevices; 450 - 550 m.

Fl. : October ; *Fr.* : January - June.

RAIPUR : Sitanadi, Taurenga.

3. *ANISOMELES* R. Br.

Anisomeles indica (L.) Kuntze, Rev. Gen. Pl. 2 : 512. 1891. *Nepeta Indica* L. Sp. Pl. 571. 1753. *A. ovata* R. Br. in Ait. f. Hort. Kew. ed. 2, 2 : 364. 1811.

Undershrubs, up to 1.5 m high. Stems tetraquetrous. Leaves ovate, 3 - 8 cm long, serrate, hirsute on both the surfaces. Flowers mauve, in axillary dense - flowered whorls and terminal spikes; calyx ca 6 mm long, ciliate. Nutlets ca 2.5 mm long, smooth, shining black.

In sal and miscellaneous forests ; 400 - 500 m.

Fl. & Fr. : September - January.

RAIPUR : Chhoora, Gariaband, Singhpur, Sitanadi. RAJNAND-GAON : Baghnadi.

4. *COLEBROOKEA* J. E. Smith

Colebrookea oppositifolia J. E. Smith, Exot. Bot. 2 : t. 115. 1805.

Shrubs, 2-3 m high with whitish branchlets. Leaves opposite or 3-nate elliptic oblong, 10-20 cm long, crenate, white tomentose, strongly nerved. Flowers small, white, in 5-10 cm long panicled spikes; calyx villous, with 5 capillary lobes in fruits.

In wastelands; 300 m.

Fl. & Fr. : February.

RAIPUR : Raipur, Sharma 106121H (Herb. Sci. Coll. Raipur).

5. EUSTERALIS Raf.

Eusteralis stellata (Lour.) Panigrahi in Phytologia 32 : 474. 1976 ; Majumdar in J. Bombay nat. hist. Soc. 74 : 385. 1977. *Mentha stellata* Lour. Fl. Cochinch. 2 : 361. 1790. *M. verticillata* Roxb. Fl. Ind. 3 : 5. 1832. *Dysophylla verticillata* Benth. in Wall. Pl. As. Rar. 1 : 30. 1830.

Annual succulent herbs, up to 85 cm high. Leaves verticillate, sessile, 4-10 in a whorl, linear, 2-16 cm long, serrate. Flowers in dense terminal spikes; calyx ca 1 mm long, hispidulous; corolla pinkish, lobes long-ciliolate. Nutlets globose, ca 0.7 mm long.

In wastelands ; 300 m.

Fl. & Fr. : October.

RAJNANDGAON : Singhari.

6. HYPTIS Jacq.

Hyptis suaveolens (L.) Poit. in Ann. Mus. Natl. Hist. Paris 7 : 472. t. 29. f. 2. 1806. *Ballota suaveolens* L. Syst. ed. 10, 1100. 1759.

Undershrubs, 0.5-1.5 m high. Stems quadrangular, white hairy. Leaves ovate, crenate-denticulate, 3.0-9.5 cm long, sweetly scented, purplish-green when young. Flowers axillary, in cymose racemes, or in fascicles; calyx somewhat deflexed, mouth ciliate; corolla red-purple or blue. Nutlets 1-3 mm long, compressed, ribbed.

In wastelands ; 300 - 550 m

Fl. & Fr. : throughout the year.

DURG : Talgaon. RAIPUR : Dugli, Sitanadi, Taurenga.

7. LAVANDULA L.

Lavandula bipinnata (Roth) Kuntze, Rev. Gen. Pl. 521. 1891. *Bis eropogon bipinnata* Roth, Nov. Sp. 255. 1820. *L. burmanii* Benth. Lab. Gen. et Sp. 151. 1833. *L. bipinnata* var. *burmanii* Kuntze, I.c. 521.

Perennial herbs, 60 - 100 cm high. Leaves subsessile, pinnatisect, 5 - 12 cm long ; segments linear, entire or cut. Spikes solitary, capitate or sometimes panicled; bracts glandular, 1 flowered ; calyx tubular, 4 - 6 mm long ; corolla blue or white, throat hairy. Nutlets oblong, smooth, black.

In wastelands ; 400 - 700 m.

Fl. & Fr. : October - April.

RAJNANDGAON : Malaidah, Taregaon.

8. LEONOTIS (Pers.) R. Br.

Leonotis nepetifolia (L.) R. Br. Prodr. 504. 1810. *Phlomis nepetaefolia* L. Sp. Pl. 586. 1753.

Annual herbs, up to 1.5 m high. Stem tetraquetrous, brown puberulent. Leaves ovate, 4 - 20 cm long, crenate. Flowers bright orange - red, velvety, in dense axillary whorls ; bracts many, spinescent ; calyx with several unequal spinescent teeth, pubescent ; corolla-tube exserted. Nutlets oblong - ovoid, black.

In wastelands ; 300 - 450 m.

Fl. & Fr. : October - January

RAIPUR : Gariaband, Raipur. RAJNANDGAON : Singhari.

9. LEUCAS R. Br.

- 1a. Bracts lanceolate, imbricating and forming a conspicuous involucre almost concealing the floral head ... *L. cephalotes* 2
- 1b. Bracts linear - subulate, neither imbricating nor forming an involucre.
- 2a. Calyx-mouth oblique ... *L. lavandulifolia* 4
- 2b. Leaf-mouth straight.
- 3a. Leaf-margins entire ... *L. clarkei* 3
- 3b. Leaf-margins crenate - serrate.
- 4a. Calyx hispidulous on the ribs only,
or entirely glabrous ... *L. biflora* 1
- 4b. Calyx with long spreading hairs on the ribs,
pubescent or glabrous in between ... *L. mollissima* 5

1. ***Leucas biflora*** (Vahl) R. Br. Prodr. 504. 1810; Hook. f. Fl. Brit. Ind. 4 : 683. 1885. (excl. syn. *L. procumbens* Thw.) *Phlomis biflora* Vahl, Symb. Bot. 3 : 77. 1794. *Nepeta indica* Burm. f. Fl. Ind. 126. 1768; non L. 1753.

Procumbent or trailing herbs. Stem 4-angular, retrorsely pubescent. Leaves broadly ovate or elliptic, 1.5 - 5.0 cm long, obtuse, serrate or crenate; petiole 6 - 10 mm long. Flowers axillary, 2 - 4 in a whorl (rarely 6); bracts setaceous; calyx 8 - 9 mm long, ribbed. Nutlets ovoid, ca 1.5 mm long.

In wastelands; 400 - 500 m.

Fl. & Fr.: November.

RAJNANDGAON: Deopura.

2. ***L. cephalotes*** (Roth) Spreng. Syst. 2 : 743. 1825. *Phlomis cephalotes* Roth, Nov. Pl. Sp. 262. 1821.

Annual pubescent herbs, 7 - 30 cm high. Leaves elliptic - lanceolate, 3 - 10 cm long, crenate - serrate, glandular - punctate beneath. Flowers in large globose verticillasters; calyx ca 2 cm long, hairy above, bearded at mouth; corolla white, woolly, lower lip slightly longer than the upper lip; anthers red. Nutlets ca 3 mm long.

In wastelands ; 300 - 800 m.

Fl. & Fr. : August January.

DURG : Balod. RAIPUR : Balodabazar, Pithora, Raipur.
RAJNANDGAON : Chilpi, Baghnadi.

3. *L. clarkii* Hook. f. *Fl. Brit. Ind.* 4 : 688. 1885.

Annual herbs, 15 - 30 cm high, scabrous with deflexed hairs. Leaves subsessile, linear-lanceolate, 3 - 6 cm long, hispid above. Flowers in terminal subglobose verticillasters ; bracts ciliate ; calyx ca 5 mm long, pubescent, upper teeth acicular ; corolla white, upper lip short, narrowly oblong, lower wider. Nutlets ca 2 mm long.

Along cultivated fields and in rock-crevices ; 300 - 550 m.

Fl. & Fr. : September November.

DURG : Balod. RAIPUR : Taurenga. RAJNANDGAON : Singhari.

4. *L. lavandulifolia* Rees, Cyclop. 20. n. 2. 1812. *Phlomis linifolia* Roth, Nov. Sp. 260. 1821. *L. linifolia* (Roth) Spreng. Syst. 2 : 743. 1825.

Perennial herbs, 15 - 30 cm high. Stem softly pubescent. Leaves linear-lanceolate, 5 - 10 cm long. Flowers subsessile or shortly pedicelled, white, in axillary and terminal clusters ; calyx up to 9 mm long. Nutlets oblong, triquetrous, ca 2 mm long.

In sandy river beds ; 350 m.

Fl. & Fr. : May.

RAIPUR : Dhamtari.

5. *L. mollissima* Wall. ex Benth. in Wall. Pl. As. Rar. 1 : 62. 1830.
L. montana var. *mollissima* Haines, Bot. Bihar & Orissa 748. 1922.

Slender diffusely branched herbs, up to 1 m high. Leaves ovate or ovate lanceolate, serrate, 3 - 8 cm long ; petiole up to 2.5 cm long. Flowers in axillary clusters ; bracts minute, villous ; calyx 6 - 8 mm long, tubular ; teeth triangular subulate, subequal ; corolla white. Nutlets ca 2 mm long, black.

In miscellaneous forests ; 400 - 500 m.

Fl. & Fr. : August - January.

DURG : Bordih. RAIPUR : Mainpur, Sitanadi.

10. NEPETA L.

Nepeta hindostana (Roth) Haines, Bot. Bihar & Orissa 744. 1922.
Glechoma hindostana Roth, Nov. Sp. 259. 1821. *N. ruderalis* Buch. - Ham.
 ex Benth. in Wall. Pl. As. Rar. 1 : 64. 1860.

Annual herbs, 15 - 40 cm high. Leaves ovate, 1.5 - 6.0 cm high, crenate serrate ; petiole 1 - 2 cm long. Flowers in axillary dense cymes aggregated at the top of the stem into dense spikes ; calyx ca 4 mm long, villous ; corolla blue - purple, ca 6 mm long.

In wastelands ; 650 m.

Fl. & Fr. : April.

RAJNANDGAON : Rengakhar.

11. OCIMUM L.

- 1a. Shrubs or undershrubs. Leaves shortly acuminate, 5 - 10 cm long. Lower calyx teeth shorter than the upper lip ... *O. gratissimum* 3
- 1b. Herbs, sometimes woody below. Leaves acute or obtuse, mostly 1.5 - 3.5 cm long, sometimes a few up to 5 cm long. Lower calyx teeth longer than the upper lip.

 - 2a. Leaves obtuse. Calyx inside, above the glabrous base, very thinly covered with minute hairs, or glabrous ... *O. sanctum* 4
 - 2b. Leaves acute. Calyx inside, above the glabrous base, with a dense whorl of long hairs.

3a. Fruiting calyx 4.0 - 5.5 mm long ; corolla
5 - 7 mm long ... *O. canum* 2

3b. Fruiting calyx 6 - 8 mm long ; corolla 7 - 10
mm long ... *O. basilicum* 1

1. *Ocimum basilicum* L. Sp. Pl. 597. 1753 ; Benth. in DC. Prodr. 12 : 32. 1848 (incl. var. *glabratum*) ; Cramer in Dassan. & Fosb. Rev. Handb. Fl. Ceylon 3 : 115. 1981. *O. americanum* L. Cent. Pl. 1 : 15. 1755. 'Marmari'.

Annual or perennial herbs, 0.5 - 1.3 m high. Leaves ovate - lanceolate, acute, 2 - 4 cm long, entire or serrate ; petiole 1 - 2 cm long, hairy. Verticillasters racemed ; lower calyx teeth longer than the upper lip ; corolla white. Nutlets ellipsoid, 2 - 3 mm long.

In wastelands ; 250 - 350 m.

Fl. & Fr. : November - April.

DURG : Durg. RAIPUR : Raipur. RAJNANDGAON : Singhari.

2. *O. canum* Sims, Bot. Mag. 51 : t. 2452. 1824. *O. americanum* auct. pl., non L. 1755. 'Ban tulsa'.

Annual herbs, 30 - 50 cm high. Leaves elliptic lanceolate, 1.5 - 3.5 cm long, entire or faintly toothed, scented ; petiole 1.0 - 2.5 cm long, pilose. Verticillasters in 6 - 15 cm long racemes ; bracts awned, ciliate ; calyx villous inside ; corolla white. Nutlets elliptic oblong, puncticulate, ca 1 mm long, blackish.

In wastelands ; 300 - 500 m.

Fl. & Fr. : August - May.

RAIPUR : Chhoora, Dhamtari, Sitanadi. RAJNANDGAON : Rajnandgaon.

3. *O. gratissimum* L. Sp. Pl. 1197. 1753.

Shrubby, ca 1 m high. Leaves scented, long petioled, ovate, lower 7 - 12 cm long. Flowers white, whorled, whorls in 10 - 15 cm long racemes, the pedicel about half as long as the calyx ; upper lip of the calyx much longer than the lower one.

In wastelands ; 300 m.

Fl. & Fr. : October.

RAIPUR : Raipur, *Sharma* 106011 H (Herb. Sci. Coll. Raipur).

4. *O. sanctum* L. Mant. I : 85. 1767. *O. inodorum* Burm. f. Fl. Ind. 130. 1768. 'Tulsa'.

Perennial herbs, ca 50 cm high, purplish green with age. Leaves ovate or ovate oblong, 1.5 - 3.0 cm long, crenate - serrate, pubescent, scented ; petiole 1.0 - 2.5 cm long. Verticillasters racemed ; bracts broadly cordate, finally reflexed ; calyx ca 3 mm long ; corolla purplish, upper lip pubescent on the back. Nutlets reddish yellow with black markings.

Considered sacred by Hindus and frequently grown in houses and temples ; 300 - 500 m.

Fl. & Fr. : August - May.

RAIPUR : Raipur, Sitanadi.

Decoction of leaves is quite effective in common cold and cough.

12. ORTHOSIPHON Benth.

Ia. Roots swollen into 3 - 10 cm long fusiform tubers.
Leaves sessile or short-petioled. Corolla tube longer
than the calyx ...

O. rubicundus 2

Ib. Roots not swollen into tubers. Leaves at least some with
the petiole about half as long as to equalling the lamina.
Corolla tube as long as the calyx ...

O. pallidus 1

1. *Orthosiphon pallidus* Royle ex Benth. in Hook. Bot. Misc. 3 : 370. 1833.

Diffusely branched herbs, 15 - 35 cm high. Leaves elliptic - ovate,
1 - 4 cm long, acute, serrate dentate ; petiole ca 1 cm long. Verticillasters
racemed ; calyx glabrous within, many - nerved, hispidulous outside ;
corolla white. Nutlets subglobose, smooth, yellowish brown.

In wastelands ; 300 m.

Fl. & Fr. : August.

RAIPUR : Raipur.

2. *O. rubicundus* (D. Don) Benth. in Wall. Pl. As. Rar. 2 : 14. 1830. *Plectranthus rubicundus* D. Don, Prodr. 116. 1825.

Perennial herbs, 20–40 cm high. Leaves usually confined to basal clusters, elliptic oblong, 5–10 cm long, serrate crenate. Verticillasters racemed ; calyx 4–6 mm long, minutely pubescent, upper lobe subpetaloid ; corolla pinkish. Nutlets suborbicular, compressed, puncticulate

In sal forests ; 500–550 m.

Fl. & Fr. : August May.

RAIPUR : Khallari, Sitanadi.

13. PLECTRANTHUS L' Herit

Plectranthus mollis (Ait.) Spreng. Syst. 2 : 690. 1825. *Ocimum molle* Ait. Hort. Kew 2 : 322. 1789. *P. incanus* Link, Enum. Hort. Berol. 2 : 120. 1822.

Undershrubs ca 40 cm high. Leaves ovate cordate, 5–10 cm long, crenate ; petiole 3–8 cm long. Flowers in terminal racemes or panicles ; calyx 2-lipped, upper lip broadly ovate, lower lip with 4 long subulate teeth ; corolla white or pale bluish white. Nutlets subglobose.

In wastelands ; 400–800 m.

Fl. & Fr. : September January.

RAIPUR : Chhoora, Sitanadi. RAJNANDGAON : Chilpi, Deopura.

14. POGOSTEMON Desf.

Pogostemon benghalense (Burm. f.) Kuntze, Rev. Gen. Pl. 2 : 529. 1891. *Origanum benghalense* Burm. f. Fl. Ind. 128. t. 38. f. 3. 1768. *P. plectranthoides* Desf. in Ann. Mus. Paris 2 : 155. 1803.

Shrubs, *ca* 1.5 m high. Leaves ovate, serrate, 5-12 cm long. Flowers in bracteate spikes; bracts softly pubescent, overtopping the flower-buds; calyx *ca* 5 mm long, ciliate; corolla pink or white; filaments bearded. Nutlets minute, shining, brownish black.

Along miscellaneous forests; 500-700 m.

Fl. & Fr. : April.

RAIPUR : Sitanadi. RAJNANDGAON : Malaidah.

15. SALVIA L.

Salvia plebeia R. Br. Prodr. 501. 1810.

Annual herbs, *ca* 20 cm high. Leaves oblong-lanceolate, ovate, 2.5-7.5 cm long, crenate, sparsely hairy or glabrous. Flowers minute, in terminal often spicate racemes; bracts small, narrow; upper lip of the calyx entire, reflexed, lower lip obtusely 2-toothed; corolla white or lilac, tube exserted. Nutlets ovoid, brown.

In sandy river beds; 300-350 m.

Fl. & Fr. : April-May.

DURG : Durg. RAIPUR : Dhamtari.

87. NYCTAGINACEAE (M.I. Hanfi)

- | | | |
|--|-----|--------------------|
| 1a. More or less creeping or diffuse herbs. Flowers 2-4 mm long. | ... | <i>Boerhavia</i> 1 |
| 1b. Erect herbs or undershrubs. Flowers 5-7 cm long | ... | <i>Mirabilis</i> 2 |

1. BOERHAVIA L.

Boerhavia diffusa L. Sp. Pl. 3. 1753. *B. repens* L. Sp. Pl. 3. 1753; Hook. f. Fl. Brit. Ind. 4 : 709. 1885. (incl. var. *procumbens* Hook. f. & var. *diffusa* Hook. f.) *B. procumbens* Roxb. Fl. Ind. 1 : 146. 1820.

Diffuse herbs with up to 1 m long almost prostrate branches. Stems often purple tinged. Leaves in unequal pairs, ovate rounded or lanceolate, 2-6 cm long, acute or obtuse, subentire undulate. Flowers 1- several in glandular viscid pubescent cymose panicles. Perianth bright purple.

In wastelands ; 300-500 m.

Fl. & Fr. : throughout the year.

DURG : Rajhara dhalli. RAIPUR : Sitanadi. RAJNANDGAON : Rajnandgaon.

Plants medicinal.

2. MIRABILIS L.

Mirabilis jalapa L. Sp. Pl. 177. 1753.

Shrubs with slender spreading branches. Leaves in unequal pairs, ovate lanceolate, acute or acuminate, subentire or sinuate. Flowers white or red, crowded in lax leafy corymbs ; stamens subequal, filaments coiling on maturity. Anthocarp globose, ribbed, black.

Cultivated in gardens as ornamental, sometimes found as escape ; 300 m.

Fl. : August.

RAIPUR : Raipur.

88. AMARANTHACEAE (D.M. Verma & M.I. Hanfi)

1a. Leaves opposite.

2a. Flowers mixed with several hooked bristles (the imperfect flowers) ...

Pupalia 9

- 2b. Flowers without the above bristles, sometimes the outer tepals spine - like (*Achyranthes* sp.).
- 3a. Flowers in spikes, deflexed after anthesis ; one or more of the outer tepals spine - like ... *Achyranthes* 1
- 3b. Flowers in globose cylindric heads or in spikes, always erect or spreading ; tepals none spine - like.
- 4a. Leaves filiform - setaceous ... *Trichurus* 10
- 4b. Leaves elliptic lanceolate, obovate or orbicular.
- 5a. Anthers 2 - celled ... *Aerva* 2
- 5b. Anthers 1 - celled.
- 6a. Filaments connate only towards the base, forming a short cup ; stigma solitary, capitate ... *Alternanthera* 4
- 6b. Filaments connate throughout, forming a tube ; stigmas two, linear - filiform ... *Gomphrena* 8
- 1b. Leaves alternate or fascicled.
- 7a. Fruits several - seeded ... *Celosia* 6
- 7b. Fruits one - seeded.
- 8a. Tepals all or the inner only woolly ; stamens with interposed linear staminodes.
- 9a. Leaves filiform - setaceous Tepals 4 ... *Trichurus* 10
- 9b. Leaves ovate elliptic or lanceolate. Tepals 5 ... *Aerva* 2
- 8b. Tepals all glabrous or pubescent ; stamens without the above staminodes.
- 10a. Flowers bisexual, distinctly spicate or capitate.
- 11a. Flowers spicate ... *Dilgera* 7
- 11b. Flowers capitate ... *Allmania* 3
- 10b. Flowers unisexual, variously clustered and spicate ... *Amaranthus* 5

1. ACHYRANTHES L.

Achyranthes aspera L. Sp. Pl. 204. 1753. 'Chichdi.'

Erect perennial herbs, up to 1 m high with slightly mealy tomentose branches. Leaves ovate, obovate or oblong, $2\ 10 \times 1\ 5$ cm. Spikes 10 - 40 cm long; bracts acuminate. Flowers 4 - 6 mm long, glistening whitish green or purplish, lower reflexed.

In wastelands ; 250 - 500 m.

Fl. & Fr. : June - September.

RAIPUR : Sitanadi. RAJNANDGAON : Baghnadi.

Plants medicinal.

2. AERVA Forssk.

1a. Tepals 1.2 - 1.5 mm long ; stigmas 2, linear ... *A. lanata* 1

1b. Tepals 2.0 - 2.5 mm long ; stigma 1, globular or obscurely bilobed ... *A. sanguinolenta* 2

1. *Aerva lanata* (L.) Juss. in Ann. Mus. Nat. Hist. Paris 11 : 131. 1808. *Achyranthes lanata* L. Sp. Pl. 205. 1753.

Slender perennial herbs, 20 - 70 cm high. Leaves alternate, ovate - elliptic or obovate, $0.5\ 5.0 \times 0.3\ 3.0$ cm. Spikes mostly 2 - 4 together, axillary, cylindric, white, for the greater part 5 - 25 mm long, the highest collected into more or less leafless inflorescence ; bracts, bracteoles and tepals woolly.

In wastelands ; 300 - 500 m.

Fl. & Fr. : August - April.

DURG : Balod, Rajhara - dhalli. RAIPUR : Sitanadi.

2. *A. sanguinolenta* (L.) Bl. Bijdr. 547. 1826. *Achyranthes sanguinolenta* L. Sp. Pl. ed. 2, 294. 1762. *Aerva scandens* Wall. ex Moq. in DC. Prodr. 13 : 302. 1849.

Perennial herbs with slender somewhat climbing branches. Leaves opposite or alternate, ovate elliptic or lanceolate, $2.0 - 7.0 \times 0.5 - 4.0$ cm, green or purplish. Spikes in the axils of leaves and bracts, frequently forming a panicle, $0.7 - 5.0$ cm long, white or purplish.

In wastelands and forest floors ; 400 - 550 m.

Fl. & Fr. : October January.

RAIPUR : Dugli, Sitanadi, Taurenga. RAJNANDGAON : Deopura.

3. ALLMANIA R. Br. ex Wt.

Allmania nodiflora (L.) R. Br. ex Wt. in Hook. J. Bot. I : 226. 1834 ; Hook. f. Fl. Brit. Ind. 4 : 716. 1885. *Celosia nodiflora* L. Sp. Pl. 205. 1753.

Erect or ascending annual slender herbs, 10 - 60 cm high. Leaves linear spathulate or obovate, $1.5 - 7.0 \times 0.5 - 2.0$ cm, glabrous or pubescent beneath. Heads terminal or leaf-opposed, first globose, later elongating, 1 - 2 cm long, greenish or purplish white. Seeds ca 2.5 mm diam., black ; aril pink brown.

In wastelands and miscellaneous forests ; 300 - 600 m.

Fl. & Fr. : August.

DURG : Balod. RAIPUR : Dhamtari.

4. ALTERNANTHERA Forssk.

1a. Heads, except sometimes the terminal one, borne on long
bractless peduncle ; filaments connate at the base into an
elongated tube ...

A. philoxeroides 2

- 1b. Heads all sessile, sometimes appearing peduncled after the fall of the lower flowers but this spurious peduncle can be recognised by the presence of bracts ; filaments connate at the base into a short cup.
- 2a. All tepals 1 - nerved, or obscurely 3 - nerved only at the very base ; anthers 3 ... *A. sessilis* 3
- 2b. Three outer tepals distinctly 3 - nerved in their basal half to one - third part ; anthers 5 ... *A. paronychioides* 1

I. ***Alternanthera paronychioides*** St. Hil. Voy. Bres. 2 : 439. 1833 ; Mears & Gillis in J. Arn. Arb. 58 : 62. 1977.

Prostrate, hairy annuals. Leaves lanceolate or narrowly spatulate, up to 7×2 cm. Spikes sessile, on short axillary branches, globose cylindric, up to 2×1 cm ; bracts and bracteoles white, scarious. Tepals sparsely strigose ; anthers reniform ellipsoid, ca 0.3 mm long.

Forming large patches in open moist places along ponds, roadsides and in sandy river - beds ; 300 - 550 m.

Fl. & Fr. : January June.

DURG : Durg. RAIPUR : Raipur, Taurenga. RAJNANDGAON : Rajhara dhalli.

2. ***A. philoxeroides*** (Mart.) Griseb. in Abh. Ges. Wiss. Goett. 24 : 36. 1879. *Bucholzia philoxeroides* Mart. in Nov. Acta Leop. Carol. 13 : 315. 1826.

Aquatic herbs with long creeping fistular stems rooting at the nodes and erect emerged branches. Leaves obovate oblong, $3.0 - 8.0 \times 1.0 - 2.5$ cm, attenuated at the base. Heads terminal and axillary, ovoid ellipsoid or globular, 8 - 15 mm long. Flowers ca 6 mm long, white ; anthers yellow.

In ponds ; 280 m.

Fl. & Fr. : January.

RAIPUR : Raipur.

3. ***A. sessilis*** (L.) R. Br. ex DC. Cat. Hort. Monspel. 4 : 77. 1813. *Gomphrena sessilis* L. Sp. Pl. 225. 1753. *A. triandra* Lamk. Encycl. 1 : 95. 1783. 'Guroo'.

Erect, ascending or prostrate herbs rooting at the lower nodes. Leaves sessile or shortly petioled, linear lanceolate or obovate, 1.0 - 10.0 × 0.5 - 2.0 cm, green or purplish. Heads solitary or few, axillary, ovoid globose or cylindric, white. Utricles equalling the tepals, brown.

In moist wastelands ; 250 - 400 m.

Fl. & Fr. : throughout the year.

DURG : Balod, Durg. RAIPUR : Simga. RAJNANDGAON : Baghnadi, Rajnandgaon, Taregaon.

Sometimes eaten as vegetable.

5. AMARANTHUS L.

1a. Herbs armed with axillary spines	...	<i>A. spinosus</i> 2
1b. Herbs not armed.		
2a. Tepals 3. Utricle indehiscent or irregularly bursting ...		<i>A. viridis</i> 4
2b. Tepals 5 or 3. Utricle circumscissile.		
3a. Tepals 3, long awned	...	<i>A. tricolor</i> 3
3b. Tepals 5, mucronate - acuminate	...	<i>A. hybridus</i> 1

1. *Amaranthus hybridus* L. ssp. *incurvatus* (Gren. & Godr.) Brenan var. *paniculatus* (L.) Mansf. in Die Kulturpfl. Beih. 2 : 54. 1959. *A. paniculatus* L. Sp. Pl. 1406. 1763. *A. hybridus* L. ssp. *cruentus* Thell. var *paniculatus* (L.) Thell. in Aschers. & Graebn. Syn. 5 : 247. 1914. 'Chaulai'.

Annual erect herbs, 0.5 - 2.0 m high. Stem purplish green. Leaves long petioled, ovate - oblong, 5 - 10 × 2 - 3 cm. Spikes or panicles terminal and in upper leaf axils, erect or drooping, green ; bracts and bracteoles longer than the tepals, acuminate. Seeds white or black.

Cultivated ; 280 m.

Fl. & Fr. : January.

RAIPUR : Raipur.

2. *A. spinosus* L. Sp. Pl. 991. 1753.

Erect annual herbs, 10 - 50 cm high. Stem yellowish or reddish green. Leaves ovate - oblong or lanceolate, the larger ones $3 - 10 \times 1 - 4$ cm. Flower clusters dense, lower axillary, higher collected into axillary and terminal spikes. Tepals 5. Utricles circumscissile.

Usually in wastelands, sometimes in forests ; 220 - 650 m.

Fl. & Fr. : August - January.

DURG : Rajhara dhalli. RAIPUR : Borai, Dhamtari, Raipur.
RAJNANDGAON : Deopura.

3. *A. tricolor* L. Sp. Pl. 989. 1753. *A. mangostanus* L. Cent. Pl. 1 : 32. 1755. *A. polygamus* L. Cent. Pl. 1. t. 32. 1755. *A. gangeticus* L. Syst. ed. 10, 2 : 1268. 1759.

Annual herbs, 20 - 50 cm high. Leaves petioled, ovate rhomboid or elliptic, $5 - 15 \times 1 - 10$ cm, suffused or blotched with red purple. Flower clusters dense, green, lower ones axillary, upper ones often collected in spikes ; bracts, bracteoles and tepals all long awned from a broad base.

In wastelands and river - beds, sometimes cultivated ; 250 - 550 m.

Fl. & Fr. : November - May.

RAIPUR : Gariaband, Sitanadi. RAJNANDGAON : Taregaon.

Sometimes eaten as vegetable ; the variegated leaved forms often grown as ornamentals.

4. *A. viridis* L. Sp. Pl. ed. 2, 1405. 1763. *A. gracilis* Desf. Tabl. Encycl. 43. 1804. 'Chaulai.'

Annual erect herbs, 10 - 50 cm high. Leaves ovate rhomboid or oblong, glabrous or sparingly hairy, the larger ones $3 - 7 \times 2 - 5$ cm. Flowers clustered, green or purplish, ca 1.5 mm long ; lower clusters axillary, upper in terminal, continuous or interrupted spikes. Utricles subequaling the tepals and falling off with it, beaked.

In wastelands ; 300 - 400 m.

Fl. & Fr. : May - August.

RAIPUR : Dhamtari, Dokal.

6. CELOSIA L.

Celosia argentea L. Sp. Pl. 205. 1753.

Annual erect herbs, 30 - 80 cm high with green or reddish stem. Leaves linear, ca 3.5×0.3 cm. Spikes terminal, ovoid or subcylindrical, 2 - 10 cm long, glistening white with pink tips. Flowers white with pink tips, bracts and bracteoles persistent. Utricles obovoid, ca 3 mm long.

In rock-crevices and wastelands ; 250 - 550 m.

Fl. & Fr. : August June.

DURG : Balod, Talgaon. RAIPUR : Raipur, Sitanadi. RAJNANDGAON : Baghnadi, Deopura.

7. DIGERA Forssk.

Digera muricata (L.) Mart. in Beitr. Amar. 77. n. 2. 1825. *Achyranthes muricata* L. Sp. Pl. ed. 2, 295. 1762. *D. arvensis* Forssk. Fl. Aegypt. Arab. 65. 1775.

Annual, erect, diffusely branched herbs, 20 - 60 cm high, sometimes shortly creeping. Leaves long petioled, ovate oblong, 2 - 6 \times 1 - 4 cm. Racemes axillary, rather flexuous, 1 - 20 cm long. Flowers 3 - 5 mm long, pink or white, mostly accompanied by a pair of sterile lateral flowers.

In wastelands and along cultivated fields; 250 - 350 m.

Fl. & Fr. : August January.

DURG : Balod. RAIPUR : Simga. RAJNANDGAON : Singhari.

8. GOMPHRENA L.

Gomphrena celosioides Mart. in Beitr. Amar. 93. 1825. *G. decumbens* auct. ; Gamble, Fl. Pres. Madras 1179. 1925 ; *non* Jacq.

Profusely branched ascending white hairy herbs. Leaves short petioled, oblong spathulate, 2 - 5 cm long. Spikes terminal, globose-cylindric ; bracts and bracteoles scarious, bracteoles shortly winged at the top. Flowers white ; tepals hairy on the back.

Common in lawns and wastelands ; 250 - 550 m.

DURG : Balod. RAIPUR : Raipur, Sitanadi.

9. PUPALIA Juss.

Pupalia lappacea (L.) Juss. Ann. Mus. Paris 2 : 132. 1803. *Achyranthes lappacea* L. Sp. Pl. 204. 1753.

Perennial sarmentose herbs, up to 2 m high. Leaves ovate oblong, 3 - 10 × 2 - 6 cm, glabrous or hairy. Racemes terminal and in upper leaf axils, rather flexuous, up to 30 cm long. Flowers in clusters of 2 - 3 bisexual flowers and several rudimentary flowers consisting of fascicled hooked bristles.

In mixed forests ; 550 m.

Fl. & Fr. : October.

RAIPUR : Taurenga.

10. TRICHURUS Townsend

Trichurus monsoniae (L. f.) Townsend in Kew Bull. 29 : 466. 1974.
Illocebrum monsoniae L. f. Suppl. 161. 1781. *Aerva monsoniae* Mart. Nov. Act. Acad. Caes. Leop. Carol. Nat. Curios 13 : 291. 1826.

Annual slender herbs, 10 - 20 cm high. Leaves opposite or fascicled, 1 - 3 cm long. Spikes terminal, cylindric, ca 1 cm long, glistening white or purplish red ; bracts and bracteoles scarious. Tepals 4, subulate ; stigmas 2, spreading. Seeds ovoid with an aereole like depression on the opposite side to the hilum.

Among rock boulders and in sandy river beds ; 400 - 500 m.

Fl. & Fr. : October - June.

RAIPUR : Chhoora, Gariaband, Taurenga.

89. CHENOPodiACEAE
(P.C. Pant)

CHENOPodium L.

Chenopodium murale L. Sp. Pl. 219. 1753.

Herbs, *ca* 30 cm high. Leaves rhomboid deltoid, acute or obtuse, undulate. Flowers green, in cymose clusters combined into spikes forming panicles ; tepals slightly keeled. Seeds orbicular, sharply margined.

Near drains ; 300 m.

Fl. & Fr. : January.

RAIPUR : Raipur.

90. BASELLACEAE
(P.C. Pant)

BASELLA L.

Basella alba L. Sp. Pl. 272. 1753 ; Roxb. Fl. Ind. 2 : 104. 1832 ; Matthew & Rani in Matthew, Fl. Tamilnadu Carnatic 1327. 1983. *B. rubra* L. Sp. Pl. 272. 1753. 'Poye'.

Climbers with purplish or greenish stems. Leaves fleshy, ovate, acute or acuminate. Flowers sessile, red, in cymose clusters combined into spikes ; bracts much shorter than the perianth. Fruits depressed globose, slightly lobed, shining black, with violet juice.

Cultivated ; 350 m.

Fl. & Fr. : October.

RAIPUR : Sankra.

Leaves eaten cooked.

91. POLYGONACEAE
(D.M. Verma & V. Chandra)

- 1a. Climbers, with tendrils ... *Antigonon* 1
- 1b. Erect, prostrate or ascending herbs, without tendrils.

 - 2a. Perianth lobes 6, biseriate, inner whorl much enlarged in fruits. Nutlets triquetrous ... *Rumex* 3
 - 2b. Perianth lobes 3 - 5, acyclic, not much enlarging in fruits. Nutlets compressed or trigonous ... *Polygonum* 2

1. ANTIGONON Endl.

Antigonon leptopus Hook. & Arn. Bot. Beech. Voy. 308. t. 69. 1841.

Slender extensive climbers. Leaves ovate triangular, 5-10 cm long, undulate, pubescent on the nerves beneath. Flowers pink red, fascicled, fascicles combined into axillary racemes; rachis of the racemes frequently terminated by a branched tendril. Fruits ovoid conical; seeds deeply grooved.

On roadside bushes & hedges; 300 m.

Fl. & Fr. : August.

RAIPUR : Raipur.

2. POLYGONUM L.

- 1a. Flowers axillary, solitary or in clusters. ... *P. plebejum* 6
- 1b. Flowers in terminal pseudo-spikes, spurious heads or panicles.

 - 2a. Stems with recurved prickles on the nodes. Flowers in cymosely disposed spurious heads ... *P. dichotomum* 2

- 2b. Stems not prickly at the nodes. Flowers in pseudo - spikes or panicles.
- 3a. Ochrae with a spreading or reflexed limb at the mouth ... *P. limbatum* 5
- 3b. Ochrae without the above limb.
- 4a. Ochrae eciliate. Styles 2 ; nuts lenticular (rarely a few flowers with 3 styles and trigonous nuts) ... *P. glabrum* 3
- 4b. Ochrae ciliate at the mouth (rarely a few almost eciliate). Styles 3 ; nuts trigonous (rarely a few flowers with 2 styles and lenticular nuts).
- 5a. Pseudo - spikes lax, bracts remote ... *P. hydropiper*
var. *triquetrum* 4
- 5b. Pseudo spikes dense, bracts closely imbricate ... *P. barbatum* 1

1. *Polygonum barbatum* L. Sp. Pl. 362. 1753 ; Hook. f., Fl. Brit. Ind. 5 : 37. 1886. *P. stagninum* Meisn. in Wall. Pl. As. Rar. 3 : 56. 1832 ; Hook. f., l.c. *Persicaria barbata* Hara, Fl. East. Himal. 1 : 70. 1966.

Perennial aquatic herbs, 15 - 30 cm high. Leaves linear lanceolate, 5 - 20 cm long, narrowed at both ends, usually shortly appressed hairy on both the surfaces but sometimes almost glabrescent with the hairs confined only to the midrib beneath. Pseudo spikes in panicles ; peduncles glabrous or hairy. Perianth white or pinkish. Nuts ca 2 mm long.

Along streams and paddy fields ; 300 - 800 m.

Fl. & Fr. : September - April.

RAIPUR : Dhamtari, Sitanadi, Taurenga. RAJNANDGAON : Chilpi.

2. *P. dichotomum* Bl., Bijdr. 11 : 529 et 535. 1825 ; Danser in Bull. Jard. Bot. Buit. ser. III. 8 : 222. 1926. *P. pedunculare* Meisn. in Wall. Pl. Asiat. Rar. 3 : 58. 1832 ; Hook. f. Fl. Brit. Ind. 5 : 48. 1886.

Trailing herbs. Leaves elliptic oblong or linear - oblong, 2.5 - 5.0 cm long, acuminate at both ends, softly ciliate, prickly on the margins. Peduncles glandular ; bracts pubescent. Perianth white, sometimes tinged with pink.

Along streams ; 750 m.

Fl. & Fr. : September.

RAJNANDGAON : Chilpi.

3. *P. glabrum* Willd. Sp. Pl. 2 : 447. 1799. *Persicaria glabra* Gomez in Ann. Inst. Segunda Enset. Habana 2 : 278. 1896.

Perennial herbs, creeping at the base, 1.0 - 2.5 m high. Ochrae tubular. Leaves elliptic - ovate or lanceolate, up to 16 cm long, acuminate, gland dotted. Racemes in terminal panicles. Perianth pink red or whitish. Nuts glistening dark brown.

Common along ponds and streams ; 300 - 550 m.

Fl. & Fr. : September - May.

DURG : Rajhara - dhalli. RAIPUR : Dhamtari, Gariaband, Pithora, Taurenga.

RAJNANDGAON : Baghnadi, Deopura.

4. *P. hydropiper* L. ssp. *microcarpum* Danser var. *triquetrum* Danser in Bull. Jard. Bot. Buit. Ser. III. 8 : 189. 1927 ; Babu, Herbaceous Fl. Dehra Dun 443. 1977. *P. flaccidum* Meissn. in DC. Prodr. 14 : 106. 1856. Hook. f. Fl. Brit. Ind. 5 : 39. 1886 ; non Roxb. 1832.

Undershrubs with glandular punctate branches. Leaves ovate - lanceolate or oblong, 5 - 12 cm long, acute or acuminate. Pseudo - spikes glandular - punctate ; bracts glandular, ciliate on the upper margin. Nuts brown, 2 - 3 mm long.

Along streams ; 400 m.

Fl. & Fr. . September.

RAJNANDGAON : Salewara.

5. *P. limbatum* Meissn. in DC. Prodr. 5 : 14. 1856.

Perennial herbs. Leaves lanceolate, 10 - 20 cm long, acuminate, scaberulous on both the surfaces. Flowers white, in short erect paniculate racemes ; peduncles strigose. Nuts orbicular.

In puddles ; 300 m.

Fl. & Fr. : October.

RAJNANDGAON : Singhari.

6. *P. plebejum* R. Br. Prodr. 420. 1810.

Small, tufted, deep rooted, purplish green, white hairy herbs. Leaves whorled, linear - oblong, 1 - 3 cm long, obtuse or rounded. Perianth white or pink. Nuts glistening, ca 1 mm long.

In wastelands & sandy river beds ; 250 - 500 m.

Fl. & Fr. : January - April.

DURG : Durg. RAIPUR : Dhamtari, Gariaband, Sitanadi, Taurenga.

3. RUMEX L.

Rumex dentatus L. Mant. Pl. 2 : 226. 1771.

Annual herbs. Leaves variable, basal much larger than the cauline ones, oblong, obtuse ; petioles equaling or shorter than the lamina. Flowers greenish, arranged in leafy or leafless whorls. Nutlets trigonous, brown.

RAIPUR, n.v. (*cf.* Unni in *J. Bombay nat. hist. Soc.* 64 : 99. 1967).

92. PODOSTEMACEAE

(D.M. Verma & J. Lal)

POLYPLEURUM (Tay. ex Tuf.) Warming

Polypleurum stylosum (Wt.) J. B. Hall in Kew Bull. 26 : 131. 1971 ; D. M. Verma & J. Lal in J. Econ. Tax. Bot. 3 : 645 - 647. 1982. *Dicraea stylosa* Wt. Ic. t. 1917. f. 2. 1852. *Podostemon stylosus* Benth. in Hook. f. Fl. Brit. Ind. 5 : 64. 1886.

Thalloid perennial submerged herbs. Thallus dichotomously branched with distinct midrib, reddish brown, up to 16 cm long. Flowers on both

margins of the branches, bisexual; bracts 2 pairs. Style branches 2. Capsules stipitate, 2 valved.

On rock boulders in slow flowing streams; 500 m.

Fl. & Fr. : October.

RAIPUR : Taurenga.

93. ARISTOLOCHIACEAE
(D. M. Verma)

ARISTOLOCHIA L.

Aristolochia indica L. Sp. Pl. 960. 1753.

Slender climbers. Leaves elliptic obovate, often slightly constricted above the base, 5 - 10 × 2.5 cm, mucronate. Flowers somewhat clustered, 2-3 cm long with a subglobose base, a short tube and a purple brown strap like lip. Capsules broadly oblong subglobose, 3-4 cm long on a pedicel which is ultimately split into 6 strands.

In miscellaneous forests; 400 m.

Fl. : September ; *Fr.* : February.

RAIPUR : Barnawapara.

94. PIPERACEAE
(P. C. Pant)

PEPEROMIA Ruiz. & Pav.

Peperomia pellucida (L.) H. B. K. Nov. Gen. Sp. 1 : 64. 1815. *Piper pellucidum* L. Sp. Pl. 30. 1753.

Annual herbs. Stem purple streaked. Leaves ovate cordate, 0.7-4.0 cm long, obtuse or acuminate, punctate. Spikes one or two together; bracts ovate - rounded. Fruits globose; seeds warty.

Along cultivated fields ; 450 m.

Fr. : September.

RAJNANDGAON : Rajnandgaon.

95. LAURACEAE
(D. M. Verma & V. Chandra)

LITSEA Lamk.

- | | | |
|---------------------------------------|-----|------------------------|
| 1a. Perianth absent ; stamens 15 - 21 | ... | <i>L. glutinosa</i> 1 |
| 1b. Perianth present ; stamens 12 | ... | <i>L. monopetala</i> 2 |

1. *Litsea glutinosa* (Lour.) Robinson in Philip. J. Sci. Bot. 6 : 321. 1911. *Sebifera glutinosa* Lour. Fl. Cochinch. 2 : 783. 1790. *L. sebifera* Pers. Syn. 2 : 4. 1804.

Small or medium sized trees with light grey bark. Leaves narrowly to broadly elliptic, 7 - 22 cm long, glabrescent except sometimes on the nerves, slightly aromatic. Flowers in small corymbose umbels. Fruits globose, black, shining, on slightly enlarged perianth tube.

Fl. & *Fr.* : June November.

RAIPUR, n.v. (*cf.* Haines, Descr. list of trees, shrubs and eco. herbs, Southern Circle, C.P. 192. 1916).

2. *L. monopetala* (Roxb.) Pers. Syn. 2 : 4. 1804. *Tetranthera monopetala* Roxb. Pl. Corom. 2 : 26. t. 148. 1798. *L. polyantha* Juss. in Ann. Mus. Hist. Nat. Paris 6 : 211. 1805.

Small trees with smooth bark. Leaves elliptic or oblanceolate - oblong 10 - 20 cm long, pubescent and glaucous beneath. Flowers in stout peduncled umbels which are axillary and clustered along the branchlets. Fruits ellipsoid or ovoid, seated on the shallow saucer shaped perianth.

In miscellaneous forests ; 550 m.

Fl. : June.

RAIPUR : Taurenga.

96. LORANTHACEAE
(D. M. Verma & V. Chandra)

- | | |
|--|-----------------------|
| 1a. Leaves absent or if present then without a midrib.
Flowers unisexual .. | <i>Viscum</i> 3 |
| 1b. Leaves present, with a midrib. Flowers bisexual. | |
| 2a. Flowers regular ; corolla tube not split on one side .. | <i>Dendrophthoe</i> 1 |
| 2b. Flowers irregular ; corolla tube split on one side .. | <i>Scurrula</i> 2 |

I. DENDROPHTHOE Mart.

Dendrophthoe falcata (L.f.) Etting in Denkschr. Akad. Wissensch. Math. Nat. 32 : 52. 1872. *Loranthus falcatus* L.f. Suppl 211. 1781. *L. longiflorus* Desr. in Lamk. Encycl. 3 : 598. 1789. 'Banda.'

Epiphytic bushy herbs. Leaves elliptic oblong, obovate or ovate-lanceolate, 6-15 cm long, obtuse or rounded. Flowers in secund racemes which are often clustered in the axils of fallen leaves ; perianth bright red. Fruits ovoid oblong, bright red, crowned with a persistent calyxulus.

Epiphytic ; 400 - 800 m.

Fl. & Fr. : January May.

DURG : Budbhumi, Dondi. RAIPUR : Dugli, Khallari.
RAJNANDGAON : Baghnadi, Chilpi.

2. SCURRULA L.

Scurrula parasitica L. Sp. Pl. 110. 1753 ; Danser in Bull. Jard. Bot. Buit. ser. III. 16 : 34. 1938. *Loranthus scurrula* L. Sp. Pl. ed. 2, 472. 1762.

Tufted shrubby parasitic epiphytes, young parts brown or white tomentose. Leaves ovate oblong or elliptic, 5 - 10 cm long, mature sometimes glabrous. Flowers in few flowered contracted racemes ; corolla & style 8 - 15 mm long. Fruits clavate.

RAIPUR, n. v. (c. f. Haines in *Ind. For.* 40 : 432. 1914).

3. VISCUM L.

1a. Branches flattened, leafless	...	<i>V. nepalense</i> 1
1b. Branches terete or angular, leafy	...	<i>V. orientale</i> 2

1. *Viscum nepalense* Spreng. *Syst. Cur. Post.* 47. 1827. *V. articulatum* auct., Hook. f. *Fl. Brit. Ind.* 5 : 226. 1886 ; *non* Burm. f. 1768. 'Madang.'

Leafless pendulous dichotomously branched shrubs ; branches jointed, linear, flattened, readily disarticulating, pale green. Flowers 1 - 6 together in fascicles at the nodes, each with a large cup shaped bract at the base. Fruit globose, smooth, yellowish green.

Epiphytic ; 400 - 500 m.

Fl. & Fr. : April - June.

DURG : Budbhumi. RAIPUR : Dugli, Pithora, Taurenga.

2. *V. orientale* Willd. *Sp. Pl.* 4 : 737. 1805.

Stems much branched ; branches terete or angular, grooved, thickened at the nodes. Leaves elliptic or elliptic lanceolate, 3 - 8 cm long, obtuse. Flowers in axillary sessile or shortly pedunculate clusters of 3 - 5. Fruits ovoid or subglobose.

Epiphytic ; 500 - 600 m.

Fr. : May.

RAIPUR : Borai, Sitanadi.

97. SANTALACEAE
(V. Chandra)

SANTALUM L.

Santalum album L. Sp. Pl. 497. 1753. 'Chandan.'

Trees *ca* 3 m high with blackish bark. Leaves ovate lanceolate or elliptic, 4-7 cm long. Flowers in panicles; calyx 4-lobed, lobes stellately spreading, deep purple inside; corolla lobes obovate, *ca* half the size of the calyx. Fruits globose, black.

Planted in gardens; 350 m.

Fl. : August.

RAIPUR : Dhamtari.

Wood scented.

98. EUPHORBIACEAE
(D.M. Verma & M.I. Hanfi)

1a. Plants with milky juice. Flowers arranged in a head resembling a single flower. Heads consisting of 4-5-lobed calyx-like involucre enclosing several male flowers consisting of solitary pedicelled stamens surrounding a single central stalked female flower consisting of a 3-carpelled pistil ...

Euphorbia 10

1b. Plants not as above.

2a. Perianth differentiated into distinct calyx and corolla.

3a. Stamens 5, on a gynandrophore; ovary cells 2-ovuled.

4a. Styles 3. Fruit a schizocarp, 2.0-2.5 cm across ...

Cleistanthus 7

4b. Styles 2. Fruit a drupe, *ca* 0.7 cm across ...

Bredella 5

3b. Stamens frequently more, not on a gynandrophore; ovary cells 1-ovuled.

- 5a. Flowers in corymbs, the main branches of which are terminated by a female flower, the other flowers male ... *Jatropha* 13
- 5b. Flowers in racemes bearing female flowers at base and male flowers above.
- 6a. Inflorescence terminal, or in bifurcations of the stems. Stamens incurved in bud ... *Croton* 8
- 6b. Inflorescence axillary. Stamens erect in bud ... *Chrozophora* 6
- 2b. Perianth monochlamydous, either calycine or corolline.
- 7a. Leaves peltate, palmi - lobed, serrate - crenate ; petioles glandular. Stamens numerous, in several branched fascicles. Schizocarp subglobose, 1.5 - 2.5 cm across ... *Ricinus* 17
- 7b. Plants not as above.
- 8a. Herbs. Leaves linear. Male flowers in 5 - 12 mm long extra - axillary spikes with a single female flower at the base ; ovary 3 - lobed, each lobe with two vertical rows of 4 - 5 fleshy red warts ... *Sebastiania* 19
- 8b. Plants not as above.
- 9a. Shrubs or undershrubs with hairy twigs. Leaves mostly lobulate or sinuate - dentate, biglandular at the base. Male flowers with 4 - 6 disk - glands ; stamens many. Female flowers with annular disk ; ovary cells 1 - ovuled ... *Baliospermum* 3
- 9b. Plants not as above.
- 10a. Flowers in elongated, simple or branched spikes or racemes.
- 11a. Leaves linear - lanceolate, with small orbicular scales on the lower surface. Stamens numerous, in several branched fascicles. Ovary cells 1 - ovuled, stigmas on the inside feather like ... *Homonia* 12
- 11b. Plants not as above.

- 12a. Monoecious. Female flowers in the lower part of the raceme in the axils of foliaceous bracts, and male flowers in the upper part, ebracteate ... *Acalypha* 1
- 12b. Dioecious. Flowers, both male and female, in the axils of scale-like bracts.
- 13a. Leaf-margins entire. Flowers with lobed or annular disk. Ovary 1-celled, cells 2-ovuled ... *Antidesma* 2
- 13b. Leaf-margins more or less toothed. Flowers without disk. Ovary 2-3-celled, cells 1-ovuled ... *Mallotus* 15
- 10b. Flowers, at least the male, solitary, or in fascicles, clusters or very short cymes.
- 14a. Trees. Leaves pinnately arranged on short lateral branchlets, linear, 10-20 × 2-3 mm. Fruits globose, succulent, 2-3 cm diam. ... *Emblea* 9
- 14b. Plants not as above.
- 15a. Flowers with distinct disk or disk-glands.
- 16a. Herbs or shrubs (*P. lawit*) Stamens 3. Fruits dry ... *Phyllanthus* 16
- 16b. Shrubs. Stamens 5. Fruits fleshy.
- 17a. Monoecious. Flowers usually one male and one female in each leaf axil, sometimes racemed. Stamens 3, united, 2 free; pistillode absent. Fruit green, turning black ... *Kirganelia* 14

17b. Dioecious. Flowers both male and female, mostly several clustered in each leaf axil. Stamens all free; pistillode present. Fruits pure white ...

Securinega 20

15b. Flowers without disk.

18a. Ovary 3 - celled; style or stigmas 3, free, divaricate, each divided into two recurved branches ...

Sauvagesia 18

18b. Ovary 3 - 15 - celled, styles or stigmas different.

19a. Ovary 3 - 15 - celled; styles connate into a column bearing at the apex nearly free, often bidentate, erect stigmas ...

Glochidion 11

19b. Ovary 3 celled; stigmas 3, free, incurved, sessile, subulate - dentiform ...

Breynia 4

1. ACALYPHA L.

1a. Bract - teeth with gland - tipped hairs ... *A. malabarica* 3

1b. Bract - teeth without gland - tipped hairs.

2a. Bracts dentate or crenate ... *A. indica* 2

2b. Bracts almost pectinate with subulate hispid teeth ... *A. ciliata* 1

1. *Acalypha ciliata* Forsk. Fl. Aegypt. Arab. 162. 1775.

Erect, sparingly branched annual herbs, 0.2 - 2 m high. Stems shortly pubescent with recurved hairs. Leaves ovate rhomboid, 5 - 10 × 2 - 6 cm, crenate - serrate. Inflorescence axillary, elongating to

2 cm. Perianth segments 3, ovate, acute. Fruits enclosed by the accrescent bracts ; seeds smooth.

In wastelands and on hill slopes ; 400 - 600 m.

Fl. & Fr. : August - November.

RAJNANDGAON : Baghnadi, Deopura, Taregaon.

2. *A. indica* L. Sp. Pl. 1003. 1753.

Erect annual herbs, 30 - 40 cm high. Stems with numerous, angular, pubescent branches. Leaves ovate or rhomboid ovate, 2.5 - 7.5 × 2 - 4 cm, acute or subobtuse, crenate, serrate, glabrous ; petiole longer than the blade ; stipules minute. Inflorescence axillary, up to 8 cm long. Capsules hispid ; seeds ovoid, smooth.

In wastelands and along cultivated fields ; 300 - 400 m.

Fl. & Fr. : August - September.

RAIPUR : Arang. RAJNANDGAON : Rajnandgoan.

3. *A. malabarica* Muell. Arg. in Linnaea 34 : 42. 1865.

Leafy branched annual herbs, up to 20 cm high. Stems pubescent. Leaves rigid, elliptic or elliptic lanceolate, 2.5 - 3.7 × 1.2 - 2 cm ; petiole shorter than the blade. Flowers in ca 15 mm long axillary androgynous spikes, the males few, terminal, minute, the females numerous. Capsules nearly glabrous ; seeds globose ovoid, smooth.

In wastelands ; 400 m.

Fl. & Fr. : September.

DURG : Balod.

2. ANTIDESMA L.

1a. Stamens 2	..	<i>A. acidum</i> 1
1b. Stamens 3 - 7.		

- 2a. Stamens inserted in hollows of the disk ... *A. menas* 3
 2b. Stamens inserted within the disk ... *A. ghaesembilla* 2

1. *Antidesma acidum* Retz. Obs. Bot. 5 : 30. 1788. *A. diandrum* Roth,
 Nova Pl. Sp. 369. 1821. *Stilago diandra* Roxb. Corom. Pl. t. 166. 1798.
 'Amoori.'

Erect, dioecious undershrubs or shrubs with slender branches, up to 2 m high. Leaves obovate elliptic to oblong with a rounded cuneate or acute base, entire, hairy, $3\frac{1}{2} \times 2\frac{1}{2}$ cm; petioles grooved above. Female flowers in glabrous racemes; bracts ovate, acute; stamens 2, in the cavities of unlobed glabrous disk. Fruits red, compressed.

In miscellaneous and sal forests; 300 - 600 m.

Fl. & *Fr.* : August - October.

RAIPUR : Khallari, Raipur. RAJNANDGOAN : Baghnadi, Singhari.

2. *A. ghaesembilla* Gaertn. Fruct. 1 : 189. t. 39. 1788. 'Amthi.'

Shrubs with slender branches and greyish stems, ca 2 m high. Leaves broadly elliptic or orbicular oblong, obtuse, $5\frac{1}{2} \times 2\frac{1}{2}$ cm; fulvous tomentose beneath, stipules lanceolate, acute. Flowers sessile, in slender paniculate spikes; petals white becoming brownish. Fruits subglobose, reddish purple.

In sal and miscellaneous forests, along streams; 300 - 600 m.

Fl. : June ; *Fr.* : August - September.

DURG : Rajhara dhalli. RAIPUR : Borai, Dhamtari, Khallari, Pithora.

3. *A. menas* Miq. ex Tul. in Ann. Sc. Nat. ser. III. 15 : 215. 1851.

Small or middle sized trees; branchlets, stipules, petioles and inflorescence pubescent. Leaves elliptic - oblong, acuminate or mucronate, $9\frac{1}{2} \times 3\frac{1}{2}$ cm, shining on both sides; stipules linear, acute. Flowers in axillary and terminal, solitary or paniculate racemes; ovary glabrous; stigmas 3 - 5. Fruits ovoid, 5 - 8 mm long, sour.

In miscellaneous forests, along streams ; 450 m.

Fr. : September.

RAJNANDGAON : Salewara.

3. BALIOSPERMUM Bl.

Baliospermum montanum (Willd.) Muell. Arg. in DC. Prodr. 15 : 1125. 1866. *Jatropha montana* Willd. Sp. Pl. 4 : 563. 1805. *B. axillare* Bl. Bijdr. 604. 1825.

Perennial herbs or undershrubs, 0.3 - 1 m high, usually branching from the base. Leaves mostly towards the tips of the branches, 5 - 20 × 2 - 15 cm, lobulate sinuate, denticulate, strigose on both surfaces ; petioles 2 - 15 cm long with a pair of stipular glands at the base. Inflorescence axillary and terminal. Flowers pinkish. Fruits shortly pedicelled.

In moist shady places and hill slopes ; 300 - 500 m.

Fl. : October - November ; *Fr.* : January - May.

RAIPUR : Raipur. RAJNANDGAON : Singhari.

4. BREYNIA J. & G. Forst.

Breynia vitisidaea (Burm. f.) Fischer in Bull. Misc. Inform. 1932 : 65. 1932. *Rhamnus vitisidaea* Burm. f. Fl. Ind. 61. 1768. *B. rhamnoides* Muell. Arg. in DC., Prodr. 15 : 440. 1866. *Phyllanthus rhamnoides* Retz. Obs. 5 : 30. 1788. *Melanthesa rhamnoides* Bl. Bijdr. 591. 1826.

Large glabrous shrubs, 1 - 3 m high. Leaves thin distichous, 0.7 - 1.0 cm long. Flowers minute, monoecious or rarely dioecious, green, yellow or pinkish, solitary, male and female often on separate twigs. Berries numerous, globose ovoid, ca 5 mm across, red.

In sal and miscellaneous forests ; 300 - 600 m.

Fl. & Fr. : June - October.

DURG : Balod. RAIPUR : Borai, Gariaband, Sitanadi.
RAJNANDGAON : Singhari.

5. BRIEDELIA Willd.

- 1a. Leaves elliptic - oblong, sometimes a few obovate - rounded ; secondary nerves 15 - 20 pairs, markedly straight and parallel, unbranched or only a few forked below the margin ... *B. squamosa* 2
- 1b. Leaves rhombic - obovate or oblanceolate; secondary nerves 6 - 10 pairs, not markedly straight or parallel, mostly forked, looped or reticulate before reaching the margins ... *B. hamiltoniana* 1

1. *Briedelia hamiltoniana* Wall. ex Muell. Arg. in Linnaea 34 : 77. 1865-66. *B. montana* var. *hamiltoniana* Haines, Bot. Bihar & Orissa pt. 2 : 120. 1921.

Straggling shrubs. Leaves elongate - elliptic or obovate elliptic, 4 - 8 × 2 - 3 cm, obtuse, entire, glabrous, cuneate at the base. Flowers in small axillary and spicate sessile clusters. Drupes globose, ca 5 mm in dia., black.

Fl. & Fr. : August - December.

RAIPUR : Laon range, n.v. (*cf.* Haines, Descr. list of trees, shrubs & econ. herbs, Southern Circle, C. P. 199. 1916).

2. *B. squamosa* (Lamk.) Gehrm. in Engler, Bot. Jahrb. 41, Beibl. 95 : 30. 1908. *Cluytia squamosa* Lamk. Encycl. 5 : 54. 1790. *B. retusa* var. *squamosa* Muell.-Arg. in DC. Prodr. 15 : 493. 1866. 'Kasai.'

Small trees with greyish flaking bark. Leaves elliptic oblong, 10 - 20 cm long, glaucous beneath, strongly nerved. Flowers small, green, in axillary clusters, or clusters spicate, male and female intermixed. Fruits globose, 6 - 8 mm across, yellowish.

Common in sal and miscellaneous forests; 300–500 m.

Fl. & Fr. : August–January.

DURG : Balod. RAIPUR : Dhamtari, Gariabad, Pithora, Sitanadi.
RAJNANDGAON : Salewara, Taregaon.

6. CHROZOPHORA A. Juss.

- 1a. Prostrate herbs. Leaves eglandular at the base, stellate hairs stipitate ... *C. prostrata* 1
- 1b. Erect herbs. Leaves biglandular at the base, stellate hairs sessile ... *C. rottleri* 2

1. ***Chrozophora prostrata*** Dalz. in Dalz. & Gibbs. *Bombay Fl.* 233. 1861.

Stellately woolly herbs with numerous branches spreading from the base. Leaves broadly ovate or orbicular, 1–3 cm broad, cordate or truncate at the base, pubescent with some stellate hairs above, densely stellately woolly beneath. Flowers in axillary racemes; bracts linear. Capsules ca 7 mm in dia., stellately woolly.

In wastelands; 400 m.

Fl. & Fr. : April.

RAJNANDGAON : Khairagarh.

2. ***C. rottleri* (Geis.) A. Juss.** Euphorb. Gen. 28. 1824. *Croton rottleri* Geis. Crot. Monogr. 54. 1807.

Greyish green, annual, or sometimes perennial herbs. Leaves and stems scabrous which gives itching sensation on touch. Leaves orbicular with 3 rounded lobes, 3–8 cm broad, undulate crenate, long petioled. Flowers yellow. Fruits clothed with stellate hairs.

Common in low lands; 300–400 m.

Fl. & Fr. : April.

DURG : Rajolidih. RAJNANDGAON : Khairagarh.

7. CLEISTANTHUS Hook. f. ex Planch.

Cleistanthus collinus Benth. ex Hook. f. Fl. Brit. Ind. 5 : 274 1887.
Cluytia collina Roxb. Pl. Corom. 2 : 37. t. 169. 1802. 'Karra'.

Shrubs or small trees, crookedly branched, 2 - 10 m high ; bark black, peeling off in small chips ; branches greyish. Leaves leathery, orbicular, obovate or elliptic, 2 - 10 × 2 - 7 cm, glaucous beneath. Flowers small green, appearing with the new leaves. Fruits globose, angular, green, black and wrinkled on drying.

Common in miscellaneous forests ; 300 - 500 m.

Fl. : March - April ; *Fr.* : August - June.

DURG : Budbhumi. RAIPUR : Dhamtari, Dugli, Sitanadi.
 RAJNANDGAON : Baghnadi, Khargaon, Singbari.

Fruits sometimes used as fish - poison.

8. CROTON L.

Croton bonplandianum Baillon in Adansonia 4 : 339. 1864. *C. sparsiflorum* Morong in Ann. N. Y. Acad. Sci. 7 : 221. 1893.

Woody herbs, 10 - 50 cm high, profusely branched from the base. Leaves ovate lanceolate, with 2 glands at the base. Flowers spicate, white, or pale yellow on drying. Fruits green, glandular hairy ; seeds strophiolate, oblong.

Common in wastelands and stream beds ; 300 - 450 m.

Fl. & Fr. : April.

DURG : Durg, Bordih. RAIPUR : Raipur. RAJNANDGAON : Rajnandgaon.

9. EMBLICA Gaertn.

Emblica officinalis Gaertn. Fruct. 2 : 122. t. 108. 1790. *Phyllanthus emblica* L. Sp. Pl. 982. 1753. 'Aonwala.'

Trees up to 7 m high with greyish spreading branches, exfoliating. Leaves small, pinnately arranged, linear, 7-15 mm long; stipules fimbriate. Flowers small, greenish white, densely fascicled. Fruits globose, succulent, yellow or pink when ripe, 2-3 cm across, sour.

In miscellaneous forests along streams; commonly planted in villages; 250-800 m.

Fl. : April ; *Fr.* : January June.

RAIPUR : Dugli, Taurenga. RAJNANDGAON : Chilpi, Baghnadi.

Fruits eaten raw and pickled. Wood used for poles and implements.

10. EUPHORBIA L.

Ia. Succulent trees or shrubs. Leaves small, soon caducous.

2a. Twigs prickly ... *E. nerifolia* 6

2b. Twigs smooth ... *E. tirucalli* 10

1b. Non - succulent herbs. Leaves well developed, persistent.

3a. Leaves on 1-3 cm long petioles, larger ones 5-10 × 2.5-4.5 cm. Involucre with only a solitary well developed gland ... *E. heterophylla* 3

3b. Leaves sessile, or on up to 5 mm long petioles, usually smaller. Involucre with 4-5 well developed glands.

4a. Lower leaves alternate, upper opposite or whorled,

5a. Final ramifications of inflorescence forming a sympodium on which the solitary involucres are axillary ...

E. perbracteata 8

5b. Inflorescence umbellate or dichasial throughout ... *E. dracunculoides* 2

4b. Leaves all opposite.

6a. Leaves all or at least the larger ones 1 - 5 cm long. Gland appendages petaloid or obsolete.

7a. Stem - apices bearing long patent hairs in addition to short appressed hairs. Gland appendages obsolete ...

E. hirta 4

7b. Stem - apices glabrous or pubescent with short appressed or slightly spreading hairs of same size. Gland appendages petaloid, white or pink, 0.3 - 0.5 mm long ...

E. hypericifolia 5

6b. Leaves all 2 - 7 mm long. Gland appendages obsolete.

8a. Fruits glabrous ...

E. orbiculata 7

8b. Fruits hairy.

9a. Fruits on a rather long stalk, soon cernuous, with rather short stiff hairs only on the ribs of the lobes ...

E. chamaesyce 1

9b. Fruits on short stalks, erecto-patent, rather sparsely hairy with longish white hairs throughout ...

E. thymifolia 9

1. *Euphorbia chamaesyce* L. Sp. Pl. 455. 1753. *E. prostrata* Ait. Hort. Kew. 2 : 139. 1789.

Annual slender diffusely branched herbs, frequently with pinkish branches. Leaves oblong - elliptic, 2 - 7 x 1 - 4 mm, crenulate, prominently 3 nerved; stipules ovate, hairy. Involucrum hairy outside. Coccii with spreading hairs on the keel; seeds red brown, 4 - angled.

In moist depressions ; 300 - 350 m.

Fl. & Fr. : August May.

DURG : Balod. RAIPUR : Dhamtari.

2. *E. dracunculoides* Lamk. Encycl. 2 : 428. 1788.

Profusely branched annual glabrous erect herbs, 10 - 15 cm high. Leaves sessile, linear - lanceolate, with an acute, rarely rounded or subcordate base, frequently with a reddish midrib. Flowers yellowish green. Capsules smooth ; seeds ellipsoid.

In wastelands ; 300 m.

Fl. & Fr. : January.

RAIPUR : Dhamtari.

3. *E. heterophylla* L. Sp. Pl. 453. 1753 ; R. Sm. in Kew Bull. 26 : 264. 1972. *E. geniculata* Ortega, Nov. Pl. Descr. Dec. 18. 1797.

Annual herbs, 50 - 80 cm high. Stems fistular, ribbed. Leaves long petioled, oblong - obovate, 7 - 12 cm long, sub entire, shallowly dentate ; petioles 1 - 3 cm long. Involucres 5 - lobed, ovate. Fruits glabrous ; seeds tuberculate.

In wastelands and fallow fields ; 250 - 800 m.

Fl. & Fr. : August - November.

DURG : Balod. RAIPUR : Raipur. RAJNANDGAON : Chilpi, Singhari.

4. *E. hirta* L. Sp. Pl. 454. 1753. *E. pilulifera* auct., Hook. f. Fl. Brit. Ind. 5 : 250. 1887, non L. 1753. *Chamaesyce hirta* (L.) Millsp. Field Mus. Nat. Hist. Bot. Ser. 2 : 333. 1909.

Perennial ascending herbs, very hairy, usually purplish green with age, branches up to 60 cm long. Leaves opposite, elliptic oblong, obovate or oblong - lanceolate, 1 - 3 cm long, serrulate. Involucres minute, crowded, in capitate finally peduncled axillary cymes, hairy. Fruits depressed globose, appressed pubescent.

Common in wastelands ; 300 - 500 m.

Fl. & Fr. : August - April.

DURG : Durg. RAIPUR : Dhamtari, Raipur, Sitanadi.

5. *E. hypericifolia* L. Sp. Pl. 454. 1753. *E. parviflora* L. Syst. Nat. ed. 10, 1047. 1759. *E. indica* Lamk. Encycl. 2 : 423. 1786. *Chamaesyce hypericifolia* (L.) Millsp. Field Mus. Nat. Hist. Bot. Ser. 2 : 302. 1909.

Scandent herbs. Stems frequently red tinged ; branches 5-60 cm long. Leaves oblong or ovate-lanceolate or obovate with an oblique, rounded subcordate base, 3-15 x 2-7 mm, serrate. Lobes of the involucre narrowly lanceolate, acuminate. Ovary and capsules glabrous ; seeds smooth.

In wastelands and miscellaneous forests ; 250-750 m.

Fl. & Fr. : August April.

DURG : Balod. RAIPUR : Simga. RAJNANDGAON : Chilpi, Baghnadi, Rajnandgaon.

6. *E. neriifolia* L. Sp. Pl. 451. 1753. *E. ligularia* Roxb. Fl. Ind. 2 : 465. 1832.

Large erect shrubs, up to 4 m high, with ca 5 cm thick stems at base, and pairs of stipular spines on tubercles. Leaves fleshy, obovate, ca 20 cm long. Involucres yellowish, 3-7 in a cyme ; lobes of involucres broadly cuneate and fimbriate. Anthers sagittate, apiculate. Capsules 3-lobed, lobes compressed.

Along roadsides ; 350 m.

Fl. & Fr. : February.

RAIPUR : Pithora.

7. *E. orbiculata* H. B. K. Nov. Gen. et Sp. 2 : 52. 1817. *E. microphylla* Heyne in Roth, Nov. Pl. Sp. 227. 1821 ; Hook. f. Fl. Brit. Ind. 5 : 252. 1887 p.p. ; non Lamk. 1786. *E. bombaiensis* Santapau in Bull. Bot. Soc. Beng. 8 : 17. 1954.

Small procumbent herbs with many villously hairy stems, 5-10 cm long. Leaves opposite, oblong, 2-7 mm long, entire or toothed ; petioles distinct ; stipules subulate. Involucres minute, lobes ovate, very acute or mucronate, glands distinctly pedicelled. Fruits glabrous ; seeds ovoid, whitish blue.

In wastelands ; 400 m.

Fl. & Fr. : April.

DURG : Talgaon.

8. *E. perbracteata* Gage in Kew Bull. 1914 : 238. 1914.

Annual erect glaucous green herbs, 20 - 50 cm high. Leaves alternate, sessile, linear - oblong, 1.5 - 6.0 cm long, 2 - 5 mm broad, entire. Involucres solitary in the upper forks and cymosely sub-spicate. Capsules 3 lobed, sulcate, *ca* 4 × 5 mm, glabrous.

In wastelands and fallow fields ; 300 - 400 m.

Fl. & Fr. : January April.

RAIPUR : Simga. RAJNANDGAON : Khairagarh.

9. *E. thymifolia* L. Sp. Pl. 454. 1753.

Annual purplish green herbs, with prostrate branches. Leaves opposite, oblong ovate, 4 - 7 mm long, serrate ; stipules subulate, hairy. Involucres small, axillary, green or pinkish, without a common peduncle. Capsules pubescent ; seeds furrowed.

In wastelands ; 300 - 450 m.

Fl. & Fr. : August June.

DURG : Balod, Rajhara dhalli. RAIPUR : Dhamtari, Gariaband, Kasdol. RAJNANDGAON : Baghnadi, Deopura.

10. *E. tirucalli* L. Sp. Pl. 452. 1753.

Profusely branched shrubs with terete polished branches, *ca* 1.5 m high. Leaves small, scaly, caducous. Involucres shortly pedicelled, clustered, in the forks of the smaller branches; glands peltate. Capsules *ca* 5 mm long ; cocci compressed velvety ; seeds ovoid, smooth.

Used as a hedge plant ; 370 m.

Fl. & Fr. : August.

RAIPUR : Sankra.

II. GLOCHIDION Forst.

1a. Leaves pubescent beneath. Fruits 7 - 10 mm across ... *G. velutinum* 3

1b. Leaves glabrous. Fruits 15 - 25 mm across.

2a. Leaves glaucous beneath. Connectives very short.
Fruits much broader than long, deeply lobed ... *G. multiloculare* 2

2b. Leaves not glaucous beneath. Connectives as long as
the anther cells. Fruits suborbicular, scarcely
lobed ... *G. hohenackeri* 1

1. ***Glochidion hohenackeri*** Bedd. Foresters Man. Bot. 193. 1873.
Bradleia lanceolaria Roxb. Fl. Ind. 3 : 697. 1832. *G. lanceolarium* Dalz.
Bombay Fl. 235. 1861 ; *non* Voigt, 1845.

Middle sized evergreen trees, with angular twigs. Leaves coriaceous, dark green usually narrowly elliptic or elliptic-acuminate, 7-12 cm long. Male flowers numerous, clustered, yellowish; anthers 4-6. Female flowers usually 1-3, campanulate, ca 3 mm long. Fruits slightly depressed, 15-18 mm broad; seeds red.

Roadsides ; 450 m.

Fr. : September.

RAJNANDGAON : Salewara.

2. ***G. multiloculare*** Muell. Arg. in Linnaea 32 : 59. 1863.

Dwarf gregarious bushes, 0.9-1.2 m high. Leaves 7.5-12.5 cm long, oblong, linear oblong or obovate, obtuse or sometimes apiculate, sometimes purplish beneath. Male flowers small, shortly pedicelled; female flowers large, stoutly pedicelled. Fruits strongly depressed, 20-25 mm broad; 10-15 lobed; seeds red.

In miscellaneous forests ; 550 m.

Fl. & Fr. : May.

RAIPUR : Khallari.

3. *G. velutinum* Wt. Ic. 5 : 29. t. 1907. 1852.

Medium sized trees with nearly all parts pubescent or tomentose. Leaves elliptic oblong or lanceolate, 5 15 × 3 8 cm, with strong secondary nerves. Flowers in axillary clusters. Male flowers ca 4 mm across, yellow ; stamens 3, connectives long. Female flowers green. Fruits depressed at both ends, deeply lobed ; seeds red.

RAIPUR (cf. Haines, Descr. list of trees, shrubs & econ. herbs, Southern Circle, C.P. 203. 1916).

12. *HOMONOIA* Lour.*Homonoia riparia* Lour. Fl. Cochinch. 637. 1790.

Rigid evergreen shrubs, ca 1.5 m high, with numerous erect branches. Leaves linear lanceolate or linear oblong, 7 25 × 0.5 2.5 cm. Flowers green, in axillary spikes with grey tomentose rachis ; bracts ovate, acuminate, female spikes 5 8 cm long. Capsules tomentose ; seeds bright crimson.

In miscellaneous forests ; 550 m.

Fl. & Fr. : June.

RAIPUR : Taurenga.

13. *JATROPHA* L.

1a. Leaves 5 - angled, margins eglandular. Flowers yellow ... *J. curcas* 1

1b. Leaves palmately 3 - 5 lobed, margins with stipitate viscid glands. Flowers red ... *J. gossypifolia* 2

1. *Jatropha curcas* L. Sp. Pl. 1006. 1753.

Shrubs, 1.5 - 4.0 m high. Leaves long petioled, broadly ovate cor- date, 10 - 15 cm in dia., mature glabrous. Flowers small, yellowish, with a campanulate 5 10 lobed corolla, in terminal cymose panicles ; petals cohering. Capsules subglobose or ellipsoid, ca 25 mm long.

Along cultivated fields & wastelands ; 300 - 450 m.

Fl. : August ; *Fr.* : January.

DURG : Balod. RAIPUR : Sitanadi.

2. *J. gossypifolia* L. Sp. Pl. 1006. 1753.

Shrubs, 1 - 2 m high. Leaves palmately lobed, with yellow viscid glands covering the leaf margins, petioles, and stipules. Flowers small, red, in glandular corymbose cymes ; petals free, stamens 10 - 12 ; Fruits broadly oblong, *ca* 2 cm long, reddish green.

Along roadsides and cultivated fields ; 300 - 380 m.

Fl. & Fr. : April - September.

DURG : Rajhara dhalli. RAIPUR : Dhamtari.

14. KIRGANELIA A. Juss.

Kirganelia reticulata (Poir.) Baill. Etudes Gen. Euph. 614. 1874.
Phyllanthus reticulatus Poir. in Lamk. Encycl. 5 : 298. 1804.

Very leafy sarmentose shrubs, up to 1.5 m high with pinkish branches. Leaves elliptic or oblong, 12 - 35 mm long. Flowers red, campanulate, male and female sub - similar, usually one male and one female in each axil, sometimes racemed. Fruits on slender pedicels, globose, green turning purplish.

In wastelands and deforested areas ; 300 - 400 m.

Fl. & Fr. : August - June.

DURG : Balod. RAIPUR : Dhamtari, Gariaband.

15. MALLOTUS Lour.

Mallotus philippensis (Lamk.) Muell. Arg. in Linnaea 34 : 196. 1865. *Croton philippense* Lamk. Encycl. 2 : 206. 1786. 'Sindoori'.

Trees, 2 - 7 m high. Leaves ovate, 8 - 15 cm long, toothed, pubescent and covered with scarlet glands beneath. Male flowers clustered in 15 - 25 cm long racemes, female racemes 5 - 7 cm long. Capsules 7 - 10 mm dia., coated with reddish mealy powder.

Common in sal and miscellaneous forests ; 400 - 550 m.

Fl. : October - January; *Fr.* : June.

RAIPUR : Sitanadi, Taurenga. RAJNANDGAON : Taregaon.

The red powder on the fruits is used for dyeing.

16. PHYLLANTHUS L.

1a. Anthers subglobose or reniform, horizontally dehiscent.

2a. Filaments more or less free to the base ... *P. virgatus* 6

2b. Filaments entirely connate into a column.

3a. Leaves mostly less than 12 mm long, though sometimes up to 18 mm long. Male sepals ca 0.8 mm long ; female sepals, in fruits, ca 1 mm long ...

P. fraternus 2

3b. Leaves 12 - 18 mm long. Male sepals ca 1.2 mm long ; female sepals, in fruits, 2.0 - 2.5 mm long ...

P. debilis 1

1b. Anthers oblong, vertically dehiscent.

4a. Shrubs ... *P. lawii* 3

4b. Herbs.

5a. Filaments entirely connate into a column. Fruits warty ...

P. urinaria 5

5b. Filaments free above for more than half its length. Fruits smooth. ..

P. maderaspatensis 4

1. *Phyllanthus debilis* Klein ex Willd. Sp. Pl. 4 : 582. 1804.

Perennial herbs, ca 30 cm high, with a woody base. Stems subterete, glabrous ; branchlets subterete or 3-gonous. Flowers white or greenish white, on slender often reflexed pedicels. Fruits oblate, ca 2 mm across ; seeds brown, longitudinally ribbed on the backside, ca 1 mm long.

In sal and miscellaneous forests ; 400 - 450 m.

Fl. & Fr. : August October.

DURG : Bordih. RAIPUR : Gariaband. RAJNANDGAON : Salewara.

2. *P. fraternus* Webster in Contrib. Gray Herb. 176 : 53. 1955.
P. niruri auct., Hook. f. Fl. Brit. Ind. 5 : 298. 1887 ; non L. 1753.

Annual herbs, Stems subterete, glabrous ; branchlets scabridulous on the angles. Leaves oblong with obtuse or rounded ends, glabrous, 5-15 x 3-6 mm ; stipules lanceolate subulate. Flowers numerous axillary, yellowish ; male flowers 1-3 ; females solitary. Fruits oblate ; seeds brown, longitudinally ribbed on the back.

In wastelands ; 500 m.

Fl. & Fr. : May.

RAIPUR : Khallari.

3. *P. lawii* Grah. Cat. Pl. Bombay 181. 1839.

Shrubs with numerous rigid stems, 1.0-1.5 m high ; branchlets spreading, with persistent stipules. Leaves distichous, crowded, linear-oblong, 3-8 mm long, glaucous. Flowers solitary or few together in nearly all the axils, ca 3 mm across, pink ; disk of 3 peltate glands. Fruits globose, 3-4 mm across, smooth.

RAIPUR (cf. Haines, Descr. list of trees, shrubs & econ. herbs Southern Circle, C.P. 201. 1916).

4. *P. maderaspatensis* L. Sp. Pl. 982. 1753.

Annual erect or decumbent herbs, 20-30 cm high. Leaves oblong obovate, 8-20 mm long, with rounded subacute, apiculate apex. Male flowers in fascicles, subsessile ; females axillary and solitary. Capsules smooth, depressed globose, ca 3 mm dia.

In wastelands ; 250-350 m.

Fl. & Fr. : November - April.

DURG : Durg. RAJNANDGAON : Khairagarh, Rajnandgaon, Singhari.

5. *P. urinaria* L. Sp. Pl. 982. 1753.

Pinkish green annual herbs, 10 - 50 cm high. Leaves falcate lanceolate or oblong with a cuneate, rounded or slightly oblique base, apex obtuse or rounded, mucronate. Disk lobes glandular. Female flowers solitary. Fruits globose, purplish green, lobed, tubercled ; seeds transversely ribbed on the back.

In wastelands and miscellaneous forests ; 350 - 750 m.

Fl. & Fr. : August January.

DURG : Balod. RAIPUR : Dhamtari, Singhpur. RAJNANDGAON : Chilpi, Deopura.

6. *P. virgatus* Forst. f. Prodr. 65. 1786. *P. simplex* Retz. Obs. 5 : 29. 1789.

Annual slender herbs, 5 - 30 cm high. Stems narrowly margined. Leaves elliptic lanceolate or oblong with a rounded base, subobtuse, 1 - 3 × 0.3 - 0.6 cm ; petioles ca 1 mm long ; stipules peltate, ovate - triangular. Flowers solitary axillary. Fruits long pedicelled, globose, green.

Along roadside drains ; 300 - 500 m.

Fl. & Fr. : June September.

DURG : Balod. RAIPUR : Dhamtari, Khallari. RAJNANDGAON : Baghnadi, Deopura.

17. RICINUS L.

Ricinus communis L. Sp. Pl. 1007. 1753.

Small trees. Shoots and panicles glaucous. Leaves peltate, orbicular, palmatifid, green, often suffused with red, 2.5 - 5.0 cm in dia. Flowers yellow, in subsessile cymes ; female flowers in 1 - 7 flowered cymes. Capsules 1.2 - 2.5 cm, globose, echinate ; seeds oblong, smooth, mottled.

Commonly cultivated ; 300 m.

Fl. : January ; *Fr.* : June.

RAIPUR : Raipur.

The seeds are used for extracting 'Castor oil'.

18. SAUROPS Blume

Sauropus quadrangularis Muell. Arg. in Linnaea 32 : 73. 1863.

Perennial tufted herbs, *ca* 40 cm high ; branchlets angled. Leaves 1 2 × 0.7 1.2 cm, elliptic oblong or obovate, apiculate. Flowers axillary, white, on long filiform pedicels. Fruits globose, *ca* 8 mm dia. ; cocci rounded on the back, 3-gonous, *ca* 4 mm long, smooth, pale.

In sal forests and wastelands ; 400 550 m.

Fl. & Fr. : August November.

RAIPUR : Chhoora, Sitanadi.

19. SEBASTIANIA Spreng.

Sebastiania chamaelea (L.) Muell. Arg. in DC. Prodr. 15 (2) : 1175. 1866. *Tragia chamaelea* L. Sp. Pl. 1391. 1753.

Annual herbs, 20–40 cm high, with erect or ascending often angled branches. Leaves linear, 2–7 cm long, crenulate. Flowers minute yellowish, in short terminal spikes ; male flowers above, females at the base. Capsules 7–10 mm long, crustaceous subglobose ; seeds ellipsoid oblong, yellow.

In moist depressions and miscellaneous forests ; 300 550 m.

Fl. & Fr. : August November.

DURG : Balod. RAIPUR : Taurenga. RAJNANDGAON : Baghnadi, Deopura.

20. SECURINEGA Comm. ex Juss.

Securinega virosa (Roxb. ex Willd.) Baillon in Adansonia 6 : 334. 1866. *Phyllanthus virosus* Roxb. ex Willd. Sp. Pl. 4 : 578. 1805. *Fluggea microcarpa* Bl. Bijdr. 580. 1825.

Undershrubs or shrubs, up to 2 m high. Stems sulcate. Leaves ovate elliptic, rhomboid or obovate, with an acute or cuneate - rounded base, glaucous beneath, 2-4 × 1.5-2.0 cm; stipules scarious, ovate-lanceolate. Flowers small, green, on filiform pedicels. Fruits depressed globose, milky white when ripe.

In wastelands and along paddy fields ; 300-350 m.

Fl. & Fr. : August October.

RAIPUR : Dhamtari, Raipur. RAJNANDGAON : Singhari.

99. URTICACEAE
(D. M. Verma & M. I. Hanfi)

- | | | |
|---|-----|----------------------|
| 1a. Plants, particularly the inflorescence, clothed with stinging hairs | ... | <i>Girardinia</i> 2 |
| 1b. Plants without stinging hairs. | | |
| 2a. Flower clusters in elongated spikes | ... | <i>Neodistemon</i> 3 |
| 2b. Flower clusters solitary axillary (the uppermost clusters in <i>Pouzolzia</i> may sometimes appear spicate due to gradually decreasing size of leaves). | | |
| 3a. Small slender herbs, 2-20 cm high. Leaves falcately cuneate or hatchet-shaped. Female perianth 3-5-partite | ... | <i>Elatostema</i> 1 |
| 3b. Tall rather stiff herbs, up to 1 m high. Leaves equilateral, linear-lanceolate or the lower ovate-lanceolate. Female perianth tubular, toothed at the mouth | ... | <i>Pouzolzia</i> 4 |

1. ELATOSTEMA J. & G. Forst.

Elatostema cuneatum Wt. Icon. 6 : 35. t. 2091. f. 3. 1853.

Small herbs, 10 - 20 cm high, often rooting near the base. Leaves subsessile, falcately cuneate or hatchet shaped, tip rounded or subacute ; stipules ovate. Flowers green ; the heads of female flowers sessile, solitary, axillary, perianth - segments 3, very short. Achenes ellipsoid, ribbed, yellow.

Among rock boulders, along streams ; 500 m.

Fl. & Fr. : September.

RAJNANDGAON : Deopura.

GIRARDINIA Gaud.

Girardinia zeylanica Decaisne in Jacquem. Voy. Bot. 152. 1844.
G. heterophylla Decaisne var. *zeylanica* Hook. f. Fl. Brit. Ind. 5 : 551. 1888.

Perennial, monoecious herbs, 50 - 70 cm high, clothed with stinging hairs. Leaves entire or 3 - 7 lobed, acuminate, truncate or cordate at the base, more or less appressed hairy, margins inciso serrate ; stipules 7 - 15 mm long. Flowers minute, white, usually in simple spikes ; female flowers aggregated in heads along the rhachis. Fruits green.

On hill tops, among rock boulders ; 550 m.

Fl. & Fr. : October.

RAIPUR : Taurenga.

Its ash is reported highly medicinal for skin diseases like eczema and ring worms.

3. NEODISTEMON Babu & Henry

Neodistemon indicum (Wedd.) Babu & Henry in Taxon 19 : 651. 1970. *Distemon indicum* Wedd. in Arch. Mus. Hist. Nat. Paris 9 : 551. t. 20A. 1857.

Hairy herbs. Leaves membranous, broadly ovate, 5–8 cm long, acuminate, cuneate at the base; petioles 2.5–3.5 cm long. Flowers in interrupted spikes; male flowers minute, tipped with hooked hairs; females strigose. Fruits ca 2 mm long, ovoid or rhomboid, beaked.

In miscellaneous forests; 500 m.

Fl. & Fr. : November.

RAJNANDGAON : Deopura.

4. POUZOLZIA Gaud.

Pouzolzia pentandra (Roxb.) Benn. Pl. Jav. Rar. 64. t. 14. 1838.
Urtica pentandra Roxb. Fl. Ind. 3 : 583. 1832.

Erect perennial herbs, 60–90 cm high. Leaves sessile or shortly petioled, opposite, oblong-lanceolate, 3–10 cm long, acute or acuminate, upper ones much smaller, mostly alternate, linear-oblong. Flowers white, clustered in erect or nodding, terminal, ca 45 cm long spikes; male flowers truncate in bud; female perianth in fruits with 2 or 3 broad lateral wings.

Along streams; 450 m.

Fl. & Fr. : September.

RAJNANDGAON : Salewara.

100. ULMACEAE (D. M. Verma)

- | | |
|--|-----------------|
| 1a. Flowers distinctly pedicelled; perianth lobes in male flowers imbricate, perianth in female and bisexual flowers caducous. Fruits 3–5-angled ... | <i>Celtis</i> 1 |
| 1b. Flowers subsessile; perianth lobes in male flowers induplicate-valvate, perianth in both female and male flowers persistent. Fruits 2-angled ... | <i>Trema</i> 2 |

1. CELTIS L.

Celtis tetrandra Roxb. Fl. Ind. 2 : 63. 1832 ; Hook. f. Fl. Brit. Ind. 5 : 482. 1888, *incl. var. hamiltonii* Hook. f. et *var. mollis* (Planch.) Hook. f. *C. hamiltonii* Planch. in Ann. Sc. Nat. III. 10 : 301. 1848.

Semi deciduous trees with rather slender greyish brown deciduously hairy branches. Leaves ovate elliptic, 5–20 × 2–8 cm, serrate, mostly oblique at the base, with 3–6 pairs of nerves. Inflorescence tomentose. Flowers bisexual or male, 2–3 mm across. Fruits globose, 5–8 mm across, deep red or blackish.

In mixed forests ; 500 m.

Fl. & Fr. : January - February.

RAIPUR : Sitanadi.

2. TREMA Lour.

- | | | |
|------------------------------------|-----|------------------------|
| 1a. Leaves silky tomentose beneath | ... | <i>T. orientalis</i> 1 |
| 1b. Leaves scabrid beneath | ... | <i>T. politioria</i> 2 |

1. **Trema orientalis** (L.) Blume in Mus. Bot. 2 : 62. 1856. *Celtis orientalis* L. Sp. Pl. 1044. 1753.

Trees or shrubs with smooth or fissured greyish bark. Leaves ovate, elliptic or lanceolate, serrate, 5–15 × 2–6 cm, cordate, rounded or truncate at the base, silvery or grey brown tomentose beneath. Flowers unisexual, pentamerous, ca 2 mm long. Drupes ovoid, 3–5 mm long, black.

In mixed forests ; 800 m.

Fl. & Fr. : September.

RAJNANDGAON : Chilpi.

2. **T. politioria** Planch. in Ann. Sc. Nat. ser. III. 10 : 326. 1848.

Small trees with greyish bark and scabrid branchlets. Leaves oblong-lanceolate, 5-12 cm long, acuminate, serrulate, hispid, usually shining above, pale beneath, base rounded or cordate. Flowers in compact cymes. Drupes ovoid, blackish.

In miscellaneous forests ; 450-500 m.

Fl. & Fr. : April-September.

RAIPUR : Sitanadi. RAJNANDGAON : Deopura.

101. MORACEAE
(D. M. Verma & M. I. Hanfi)

- | | |
|--|-----------------------|
| 1a. Flowers hidden in a hollow receptacle (fig) ... | <i>Ficus</i> 2 |
| 1b. Flowers exposed, not in a hollow receptacle. | |
| 2a. Leaves subsessile with scarcely up to 5 mm long petioles, base narrowed. Male flowers in heads, female solitary or 3-4 - together ... | <i>Syzygium</i> 3 |
| 2b. Leaves distinctly petioled with the petioles generally 1.5-8.0 cm long, base more or less rounded or cordate. Male flowers in cylindric spikes, females in heads ... | <i>Broussonetia</i> 1 |

1. *BROUSSONETIA* L'Herit. ex Vent.

Broussonetia papyrifera Vent. Tabl. Regn. Veget. 3 : 547. 1794.

Trees, 9-15 m high, with thick pubescent branches. Leaves long-petioled, usually ovate cordate, acuminate, coarsely dentate, often deeply lobed, especially on younger plants, rough above, pubescent beneath, 7.5-12.0 cm long. Flowers red. Fruiting heads ca 2 cm across, red.

Planted ; 500 m.

Fl. : May.

RAIPUR : Sitanadi.

Used for making paper in China & Japan.

2. FICUS L.

- 1a. Figs stalked.
- 2a. Leaves all or at least in the upper part of the branches opposite ... *F. hispida* 4
- 2b. Leaves all spiral.
- 3a. Leaves very obliquely cordate at the base with one basal lobe large and the other short or absent ... *F. semicordata* 10
- 3b. Leaves acute, rounded or equally cordate at the base.
- 4a. Leaves smooth above. Figs on tubercles on the stem and branches, or on leafless branches ... *F. racemosa* 8
- 4b. Leaves usually scabrid above. Figs axillary.
- 5a. Leaves almost all asymmetric with one side more or less gibbous, acute or cuneate at the base ... *F. tinctoria* 11
ssp. *parasitica*
- 5b. Leaves all symmetric, mostly rounded or cordate at the base.
- 6a. Straggling shrubs ... *F. heterophylla* 3
- 6b. Erect shrubs or trees.
- 7a. Leaves elliptic - oblong ... *F. virens* 12
- 7b. Leaves broadly ovate or orbicular ... *F. palmata* 7
- 1b. Figs sessile.
- 8a. Leaves caudate - acuminate with 2 - 9 cm long acumen ... *F. religiosa* 9
- 8b. Leaves obtuse, acute or shortly mucronate.
- 9a. Leaves densely white tomentose beneath. Figs ca 8 mm across, tomentose ... *F. mollis* 6
- 9b. Plants not as above.
- 10a. Figs 15 - 20 (-30) mm across, ripening red... *F. benghalensis* 2
- 10b. Figs 8 - 12 mm across, ripening pink, purple or black.

- 11a. Aerial roots from the branches developing pillar - roots. Leaves rather thick, acute or obtuse, with prominent basal nerves ; cystoliths on both sides of the lamina ... *F. microcarpa* 5
- t 1b. Plants not as above.
- 12a. Petiole articulate to the lamina ; cystoliths only on the underside of the lamina ... *F. virens* 12
- 12b. Petiole not articulate ; cystoliths only on the upper side of the lamina ... *F. amplissima* 1

1. *Ficus amplissima* J. E. Smith in Rees, Cyclop. 14 : no. 68. 1810.
F. tsieila Roxb. ex Buch. Ham. in Trans. Linn. Soc. London 15 : 149. 1826 ; Roxb. Fl. Ind. 3 : 549. 1832.

Large spreading trees, all parts glabrous. Leaves thinly coriaceous, broadly ovate or elliptic lanceolate, acute or obtusely cuspidate, $7-15 \times 4-9$ cm, base narrowed or rounded ; cystoliths present on the upper surface ; lateral veins 6-10 pairs. Figs axillary and below the leaves, obovoid subglobose, ca 1 cm across. Tepals reddish.

In villages ; 300 m.

RAIPUR : Dhamtari, n.v. (cf. Haines, Descr. list of trees, shrubs & econ. herbs, Southern Circle, C. P. 216. 1916).

2. *F. beughalensis* L. Sp. Pl. 1059. 1753. 'Bargad, Bar.'

Large trees, 7-20 m high, sending down greyish green aerial roots from the branches. Leaves coriaceous, ovate or orbicular-ovate or elliptic, $10-20 \times 5-12$ cm, obtuse, with cystoliths abundant on the surface. Figs sessile, in pairs, axillary, globose, 15-20 mm across, red when ripe.

Frequent along roadsides, sometimes in secondary forests ; 300-550 m.

Fl. & Fr. : throughout the year.

RAIPUR : Dhamtari, Saraipalli, Sitanadi.

3. *F. heterophylla* L. f. Suppl. 442. 1781.

Shrubs, *ca* 3 m high. Leaves membranous, ovate or lanceolate, subentire or denticulate, scabrid on both the surfaces, juvenile 3 many-lobed. Figs solitary, axillary, peduncled, ellipsoid, 12 - 22 × 8 - 17 mm, young scabrid, ripening orange red.

In miscellaneous forests ; 550 m.

Fl. & Fr. : May June.

RAIPUR : Taurenga.

4. *F. hispida* L. f. Suppl. 442. 1781 'Bhuin Gular'.

Shrubs or trees, up to 6 m high, all parts more or less hispid pubescent. Leaves usually opposite, ovate, oblong or subovate, 10 - 30 × 5 - 15 cm, base rounded, cuneate or subcordate, scabrid above, hispid beneath. Figs depressed globose, 15 - 25 mm across, axillary or on up to 1.5 m long clustered leafless hanging or trailing branches.

Along roadsides, streams and in sal forests ; 500 - 550 m.

Fl. & Fr. : January - June.

RAIPUR : Khallari, Sitanadi, Taurenga.

5. *F. microcarpa* L. f. Suppl. 442. 1781. *F. retusa* auct. ; King in Hook. f. Fl. Brit. Ind. 5 : 511. 1888 ; *non* L. 1771.

Large evergreen trees with copious slender aerial roots from the branches, developing pillar roots ; bark grey. Leaves spirally arranged to subdistichous, glabrous or puberulus ; stipules *ca* 15 mm long, glabrous. Figs paired, axillary, sessile, 5 - 9 × 7 - 11 mm, ripening pink to mauve purple and ultimately black. Bristles between the flowers few or abundant.

RAIPUR, n.v. (*cf.* Haines, Descr. list of trees, shrubs and econ. herbs, Southern Circle, C.P. 213. 1916).

6. *F. mollis* Vahl, Symb. Bot. 1 : 82. 1790. *Ficus tomentosa* Roxb. ex Willd. Sp. Pl. 4 : 1136. 1806 ; Miq. Ann. Mus. Bot. Lugd. Bat. 3 : 285. 1867, incl. var. *brevifolia* Miq. et var. *connivens* Miq.

Trees, 8–16 m high, often throwing out small aerial roots. Stems smooth, whitish, young branches brown tomentose. Leaves coriaceous, ovate oblong, 6–14 × 4–8 cm, obtuse or subacuminate, whitish brown tomentose. Figs axillary, paired, depressed globose, ca 8 mm across.

On hill slopes ; 450 m.

Fl. & Fr. : June.

RAIPUR : Gariaband.

7. *F. palmata* Forsk. Fl. Aegypt. Arab. 179. 1775. ‘*Anjir*’.

Bushes or small trees with tomentose twigs ; bark smooth, dull grey. Leaves orbicular ovate, 4–12 cm long, acute or apiculate, denticulate, sometimes 3–5 lobed. Figs axillary, solitary, subglobose or pyriform, ca 2 cm across, pubescent, yellow or purple when ripe. Male flowers on hairy pedicels ; gall flowers sessile or stalked.

Planted ; 450 m.

Fr. : September.

RAJNANDGAON : Rajnandgaon.

8. *F. racemosa* L. Sp. Pl. 922. 1753. *F. glomerata* Roxb. Pl. Corom. 2 : 13. f. 123. 1798. ‘*Gular*’.

Trees, 5–10 m high with spreading branches ; stems and branches greyish brown. Leaves ovate oblong or elliptic lanceolate, 5–15 × 3–7 cm, base acute or rounded. Figs shortly peduncled, pyriform, or sub-globose, 2–3 cm across, red, on main branches of trunk, or on leafless branches, orifice closed by 5–6 apical bracts.

Frequent in wastelands and miscellaneous forests ; 350–500 m.

Fl. & Fr. : May - September.

RAIPUR : Dhamtari, Sitanadi. RAJNANDGAON : Salewara.

The figs are full of small insects and scarcely edible.

9. *F. religiosa* L. Sp. Pl. 1059. ‘*Peepal*’.

Large semi deciduous, with greyish branches. Leaves coriaceous, shining, long-petioled, drooping, ovate, 5–15 cm broad, caudate-

acuminate with 2-9 cm long acumen. Figs in pairs, axillary, sessile, smooth, depressed globose, ca 1 cm across, ripe pink purple or ultimately black.

Common in villages and on roadsides ; 300-650 m.

Fl. & Fr. : May September.

RAIPUR : Borai. RAJNANDGAON : Baghnadi.

Considered sacred by Hindus.

10. *F. semicordata* Buch. Ham. ex J. E. Smith, in Rees, Cyclop. 14 : n. 71. 1810. *F. cunia* Buch. Ham. ex Roxb. Fl. Ind. 3 : 561. 1832. 'Bhuin Gular, Doomar'.

Trees, 5-8 m high with greyish branches ; trunk 20-25 cm thick. Leaves alternate, elliptic to oblong lanceolate, acuminate, entire or serrate, scabrid or smooth on upper surface, more or less pubescent beneath. Figs globose or pyriform, 1-2 cm across, in pairs or clusters on long scaly leafless branches arising from near the base of the trunk, reddish - brown and ribbed when ripe.

Along streams, and in mixed forests ; 400-750 m.

Fl. & Fr. : throughout the year.

RAIPUR : Sitanadi, Taurenga. RAJNANDGAON : Chilpi, Rengakhar, Taregaon.

11. *F. tinctoria* Forst. f. ssp. *parasitica* (Willd.) Corner in Gard. Bull. Singapore, 17 : 476. 1960. *F. parasitica* Willd. Mem. Acad. Roy. Sci. Hist. (Berlin) 2 : 102. 1798. *F. gibbosa* Bl. var. *parasitica* (Willd.) King in Ann. R. Bot. Gard. Calcutta 1 : 6. t. 2a b. 1887.

Large straggling shrubs with copious aerial roots. Leaves elliptic ovate or subrhomboid, 5-15 x 4-7 cm, frequently sinuate, hispidulous, usually scabrid beneath, acute or acuminate. Figs axillary, paired, pyriform subglobose, 8-12 mm across, ripening golden yellow (gall) or red (seed).

In miscellaneous forests ; 400-500 m.

Fl. & Fr. : June - November.

RAIPUR : Khallari. RAJNANDGAON : Deopura.

12. *F. virens* Ait. Hort. Kew. 3 : 451. 1789. *F. infectoria* Roxb. Fl. Ind. 3 : 551. 1832, *non* Willd. 'Gasti'.

Deciduous trees, 4–10 m high, with few or numerous aerial roots. Leaves ovate-lanceolate, 10–20 × 4–9 cm, abruptly obtusely acuminate, rounded or truncate at the base, slightly glossy, with 3–5 basal nerves and 6–8 pairs of lateral nerves. Figs in axillary pairs, subsessile or shortly peduncled, globular, glabrous, 5–10 mm across, creamy white.

In villages ; 300–450 m.

Fl. & Fr. : April–January.

DURG : Baghnadi, Budbhumi, Durg.

Ripe figs eaten raw.

3. STREBLUS Lour.

Streblus asper Lour. Fl. Cochinch. 2 : 615. 1790.

Profusely branched, very leafy dioecious trees, 2–3 m high. Stem greyish with some round blotches. Leaves elliptic or rhomboid, or obovate, irregularly toothed in the upper half, scabrous on both the surfaces. Flowers greyish white; ovary stipitate with two long thread-like stigmas. Fruits pisiform, yellow, edible.

On roadsides ; 350 m.

Fl. & Fr. : May–August.

RAIPUR : Dhamtari.

102. CERATOPHYLLACEAE (V. Chandra)

CERATOPHYLLUM L.

Ceratophyllum demersum L. Sp. Pl. 992. 1753.

Profusely branched, submerged floating aquatic herbs. Leaves whorled, usually 4–9 at the nodes, 10–25 mm long, mostly twice-

forked, segments filiform. Flowers inconspicuous, unisexual, solitary axillary. Fruits ellipsoid or ovoid, compressed, with usually 3 horns.

In ponds and streams ; 300 - 450 m.

Fl. & Fr. : October.

RAIPUR : Dhamtari. RAJNANDGAON : Rajnandgaon.

103. HYDROCHARITACEAE (D. M. Verma)

1a. Stems present. Leaves cauline.

2a. Leaves whorled, or sometimes the lower opposite	...	<i>Hydrilla</i> 2
2b. Leaves all alternate	...	<i>Nechamandra</i> 3
1b. Stems absent. Leaves clustered on rootstocks or stolons.		
3a. Leaves sessile, all linear.		
4a. Flowers unisexual; petals absent; female scapes coiled in fruits	...	<i>Vallisneria</i> 5
4b. Flowers bisexual or unisexual; petals present; female scapes never coiled	...	<i>Blyxa</i> 1
3b. Leaves petiolated, mostly ovate, oblong or suborbicular	...	<i>Ottelia</i> 4

1. BLYXA Thouars

1a. Flowers bisexual. Stamens 3	...	<i>B. aubertii</i> 1
b. Flowers unisexual; stamens 9	...	<i>B. octandra</i> 2

1. *Blyxa aubertii* L. C. Rich. in Mem. Inst. Paris 12. 2 : 19, 77. t. 4. 1812. *B. oryzetorum* Hook. f. Fl. Brit. Ind. S : 661. 1888. *B. griffithii* Planch. ex Hook. f. l. c., p. p. *B. ceylanica* Hook. f. l. c. *Diplosiphon oryzetorum* Decaisne in Jacquem. Voy. Bot. 167. 1844.

Slender aquatic herbs. Leaves 10 - 50 × 0.5 - 1.0 cm. Scape solitary or more, up to 40 cm long; spathe 4 - 7 cm long, 1 flowered. Petals 1 -

2 cm long ; ovary long beaked. Seeds ellipsoid, 1–2 mm long, with 8 longitudinal tubercled ribs.

Along ponds ; 300 m.

Fl. & Fr. : August.

RAIPUR : Raipur, n.v. (*cf.* Unni in *J. Bombay nat. hist. Soc.* 64 : 100. 1967).

2. **B. octandra** (Roxb.) Planch. *ex* Thw. Enum. Pl. Zeyl. 332. 1864. *Vallisneria octandra* Roxb. Pl. Corom. 2 : 34. t. 165. 1802. *B. roxburghii* L. C. Rich. in Mem. Inst. Paris 12. 2 : 23. 1812 ; Hook. *f.* Fl. Brit. Ind. 5 : 661. 1888. *B. griffithii* Planch. *ex* Hook. *f.* I.c. 661, *p.p.*

Aquatic, submerged, dioecious herbs. Leaves linear, 10–50 cm long, 5–10 mm broad, subentire or serrulate. Male spathe tubular ; flowers white ; petals linear ; stamens 8. Female spathe stouter ; petals filiform. Seeds tubercled, acute or shortly tailed.

In ponds & streams, in shallow waters ; 300–550 m.

Fl. & Fr. : September - January.

RAIPUR : Dhamtari, Pithora, Taurenga. RAJNANDGAON : Baghnadi, Singhari.

2. HYDRILLA L.C. Rich.

Hydrilla verticillata (L. f.) Royle, Illustr. t. 376. 1839. *Serpicula verticillata* L. f. Suppl. 416. 1781.

Copiously branched, dioecious, submerged aquatic herbs, with long stolons. Leaves linear-oblong, 8–15×1–2 mm, entire or serrulate, lower often opposite, upper 3–8 nately whorled. Spathes solitary, male subglobose, female cylindrical. Flowers reddish white.

In ponds & rivers ; 300–500 m.

Fl. & Fr. : January.

RAIPUR : Dugli, Kasdol, Taurenga..

3. NECHAMANDRA Planch.

Nechamandra alternifolia (Roxb.) Thw. Enum. Pl. Zeyl. 332. 1864.
Vallisneria alternifolia Roxb. Fl. Ind. 3 : 750. 1832. *N. roxburghii* Planch. Ann. Sci. Nat. Paris 3. 11 : 78. 1849. *Lagarosiphon roxburghii* Benth. Gen. Pl. 3 : 451. 1880.

Slender, aquatic, submerged, dioecious herbs. Leaves linear, 2-5 (10) cm long, ca 3 mm broad. Spathes rather transparent, 2-fid. Perianth biserrate, pinkish; stamens 2-3. Fruits linear oblong, many-seeded.

In ponds; 500 m.

Fl.: November.

RAJNANDGAON: Deopura.

4. OTTELIA Pers.

Ottelia alismoides (L.) Pers. Syn. Pl. 1 : 400. 1805. *Stratiotes alismoides* L. Sp. Pl. 535. 1753.

Submerged annual herbs. Leaves long petioled, upper ovate suborbicular, 5-22×4-21 cm, lower narrower, linear-lanceolate. Spathes elliptic, 2-6 cm long, usually with 5-10 entire or wrinkled wings, sometimes only ribbed. Flowers bisexual; petals spathulate, 20-30×10-13 mm, white with yellow spotted base.

In sluggish streams & pools; 350-550 m.

Fl. & Fr.: November-May.

RAIPUR: Mainpur, Pithora. RAJNANDGAON: Taregaon.

5. VALLISNERIA L.

Vallisneria natans (Lour.) Hara in J. Jap. Bot. 49 : 136. 1974. *Phy-skium natans* Lour. Fl. Cochinch. 663. 1790. *V. gigantea* Graebn. in Bot.

Jahrb. Syst. 49 : 68, 1912, *V. spiralis* auct ; Hook. f. Fl. Brit. Ind. 5 : 660. 1888. *p.p.*, non L. 1753.

Submerged, stoloniferous, dioecious herbs. Leaves 5-40 cm long, 3-6 mm broad. Male spathes ovoid, ca 5 mm long, many flowered, on short scapes ; flowers ca 0.5 mm across, white, detaching and floating. Female spathes cylindrical, ca 1 cm long, on long coiled scapes.

In ponds & river banks ; 300 - 450 m.

Fl. & Fr. : January June.

RAIPUR : Gariaband, Pithora, Simga.

104. BURMANNIACEAE

(D.M. Verma)

Burmannia coelestis D. Don, Prodr. Pl. Nep. 44. 1825.

Annual slender herbs, 5-10 cm high, usually unbranched. Leaves 2-3 at the base, linear-lanceolate, ca 10×2 mm, and a few scale-like upwards. Flowers solitary or few, terminal, ca 1 cm long, with 3 elliptic purplish wings ; perianth lobes minute, yellowish.

On muddy drain slopes ; 450 m.

Fl. & Fr. : January.

RAIPUR : Singhpur.

105. ORCHIDACEAE

(D. M. Verma & P.C. Pant)

1a. Plants epiphytic	...	<i>Vanda</i> 6
1b. Plants terrestrial.		
2a. Inflorescence on a separate leafless shoot.		
3a. Flowering raceme always erect ; lip distinctly 3-lobed, saccate or spurred at the base	...	<i>Eulophia</i> 1
3b. Flowering raceme at first decurved ; lip obscurely 3-lobed, widely ventricose at the base but not spurred	...	<i>Geodorum</i> 2

2b. Inflorescence on central leafy shoot.

4a. Lip spurred.

5a. Upper leaves on the stem passing into ovate bracts. Flowers 5 - 7 cm across ...

Platanthera 5

5b. Leaves not passing into bracts. Flowers 0.3 - 1.5 cm across.

6a. Spur scrotiform, 1 - 2 mm long ; stigmas connate, not borne on processes ...

Peristylus 4

6b. Spur linear - filiform, 10 - 60 mm long ; stigmas free, generally borne on processes ...

Habenaria 3

4b. Lip not spurred ...

Zeuxine 7

1. EULOPHIA R. Br. ex Lindl.

1a. Leaves linear, grass - like. Inflorescence usually a once or twice branched panicle ; bracts smaller than the ovary, herbaceous ...

E. graminea 3

1b. Plants not as above.

2a. Column in the flower produced into a distinct foot.

3a. Flowers golden yellow ; sepals 3 - 4 cm long ...

E. flava 2

3b. Flowers pale green, whitish or pale yellow, with pink - purple marking ; sepals 2.0 - 2.5 cm long ...

E. nuda 6

2b. Column in the flower not or scarcely produced into a foot.

4a. Bract shorter than the ovary. Lip saccate at the base ...

E. explanata 1

4b. Bract as long as or longer than the ovary. Lip with a short bent spur.

5a. Sepals spreading, linear - lanceolate, acuminate, green ...

E. herbacea 4

5b. Sepals erect, ovate, obtuse, yellow brown ...

E. mackinnoni 5

1. *Eulophia explanata* Lindl. Gen. Sp. Orch. 180. 1833.

Pseudobulbs ovoid, annulated, ca 5 cm long. Leaves appearing with late flowers, broadly elliptic lanceolate, acuminate, up to 25 x 10

cm. Racemes arising from the lower part of the pseudobulb ; sheaths dull white. Flowers *ca* 1 cm across, white with faint brown lines ; bracts lanceolate, acuminate.

In miscellaneous forests ; 500 m.

Fl. : May.

RAIPUR : Sitanadi.

2. *E. flava* (Lindl. ex Royle) Hook. *f. Fl. Brit. Ind.* 6 : 7. 1890.
Cyrtopera flava Lindl. ex Royle, *Ill.* 370. t. 88. f. 1. 1839.

Stout herbs with *ca* 5 cm thick creeping tuberous rhizome. Leaves appearing after flowers, elliptic lanceolate, 30 - 50 × 5 - 7 cm, plicate. Racemes 30 - 50 cm long, many flowered, on long stout peduncles. Flowers golden yellow with some brown spots near its saccate base ; lip 3 lobed, lobes oblong suborbicular.

In miscellaneous forests ; 550 m.

Fl. : June.

RAIPUR : Taurenga.

3. *E. graminea* Lindl. Gen. & Sp. Orch. 182. 1833.

Pseudobulbs oboconic. Leaves grass - like, 10 - 20 cm long, 5 - 8 mm broad. Panicle 1 - 2 branched, *ca* 60 cm long, laxly several flowered, on *ca* 40 cm long peduncles. Flowers brownish green ; sepals oblong - lanceolate, *ca* 15 mm long ; lip 3 lobed, side lobes green with brown nerves, midlobe white with purple hairs along the middle.

In miscellaneous forests ; 550 m.

Fl. : October.

RAIPUR : Taurenga.

4. *F. herbacea* Lindl. Gen. & Sp. Orch. 182. 1833.

Tubers ovoid, *ca* 3 cm long. Leaves plicate, linear or elliptic - lanceolate, 15 - 25 cm long. Racemes separate from the leaves, few - flowered, on 40 - 60 cm long peduncles. Flowers *ca* 5 cm across, greenish white ; lip *ca* 2 cm long with small side lobes, spur very short.

In sal forests ; 500 m.

Fl. : May June.

RAIPUR : Sitanadi.

5. *E. mackinnoni* Duthie in J. As. Soc. Beng. 71 : 40. 1902.

Pseudostems up to 20 cm high. Leaves plicate, usually 2, alongwith the flowers, lanceolate, up to 75 cm long, 5-8 cm broad, acuminate. Racemes short peduncled, laxly 8-10 - flowered. Flowers 12-18 mm long ; sepals and petals ovate oblong, yellow tinged with reddish brown, lip 3 lobed, yellow, purple streaked, with three white lamellae.

Fl. : July August.

RAIPUR : n.v. (*cf.* Duthie, Fl. Upp. Gang. Pl. ; repr. ed. 3 : 280. 1960).

6. *E. nuda* Lindl. Gen. & Sp. Orch. 180. 1833.

Tubers large, ovoid. Leaves plicate, elliptic lanceolate, 25-35 cm long. Peduncles separate from the leaves, stout, *ca* 50 cm long ; racemes lax, *ca* 20 cm long, many flowered. Sepals purplish green ; petals white ; lip white or pale yellow flushed with pink purple.

In sal forests ; 500 m.

Fl. : May June.

RAIPUR : Sitanadi.

2. GEODORUM Jackson ex Andr.

Geodorum densiflorum (Lamk.) Schlecht. in Fedde, Repert. 4 : 259. 1929. *Limodorum densiflorum* Lamk. Encycl. 3 : 516. 1791. *G. dilatatum* R. Br. in Ait. Hort. Kew. ed. 2, 5: 207. 1813. *G. purpureum* R. Br. in Ait. Hort. Kew. ed. 2, 5 : 207. 1813.

Tubers globose, *ca* 3 cm across. Leaves elliptic, 15-40 x 4-7 cm, with 3-4 prominent nerves on either sides of the midrib, base tapering to a long sheath. Racemes short, corymbose, drooping when young. Flowers

pale purple or rose coloured ; sepals *ca* 1 cm long ; lip emarginate, disk with a ridge ending in raised yellow calli.

In miscellaneous forests ; 400 - 500 m.

Fl. June. ; *Fr.* : October.

RAIPUR : Chhoora, Mainpur.

3. HABENARIA Willd.

- 1a. Leaves alternate, scattered throughout the stem.
 - 2a. Bracts acuminate, ciliate - margined. Petals entire ... *H. commelinifolia* 1
 - 2b. Bracts acute, eciliate. Petals 2 - partite almost to the base ... *H. digitata* 2
- 1b. Leaves clustered at the base or around the middle of the stem.
 - 3a. Leaves appressed to the ground. Midlobe of the lip narrower than the side lobes ... *H. roxburghii* 6
 - 3b. Leaves erecto - patent, not appressed to the ground. Midlobe of the lip as broad as or broader than the side lobes (except in *H. plantaginea*).
 - 4a. Midlobe of the lip narrower than the side lobes ... *H. plantaginea* 5
 - 4b. Midlobe of the lip as broad as or broader than the side lobes.
 - 5a. Leaves pale yellowish white - margined. Spur about as long as the ovary ... *H. marginata* 4
 - 5b. Leaves not margined. Spur longer than the ovary ... *H. furcifera* 3

1. ***Habenaria commelinifolia* Wall. ex Lindl. Gen. et Sp. Orch.**
325. 1835.

Robust herbs, 40 - 80 cm high. Leaves oblong lanceolate, 7 - 15 cm long, prominently membranous margined. Spikes lax, 10 - 15 cm long. Flowers white, 12 - 18 mm across ; lateral sepals gibbous, deflexed, median sepal orbicular ; lip linear, with two filiform lateral lobes ; spur *ca* 5 cm long.

In mixed and sal forests ; 400 - 800 m.

Fl. & Fr. : September - October.

RAIPUR : Gariaband. RAJNANDGAON : Baghnadi, Chilpi.

2. *H. digitata* Lindl. Gen. et Sp. Orch. 307. 1835 ; Hook. f. Fl. Brit. Ind. 6 : 134. 1890, p.p.

Herbs, 30 - 60 cm high. Leaves elliptic-lanceolate, 5 - 10 cm long, papillously ciliolate, lowest reduced to sheaths. Spikes 8 - 12 cm long. Flowers greenish white ; lateral sepals obliquely ovate, ca 8 mm long ; petals 2-partite almost to the base with linear segments ; lip with 3 linear-filiform lobes, ca 12 mm long ; spur subclavate.

In mixed forests; 300 - 450 m.

Fl. & Fr. : September - October.

RAJNANDGAON : Salewara, Singhari.

3. *H. furcifera* Lindl. Gen. et Sp. Orch. 319. 1835.

Herbs, 30 - 50 cm high. Leaves 3 - 5 clustered near the base of the stem, elliptic-oblong, obovate or suborbicular, 7 - 15 cm long. Spikes 10 - 15 cm long. Flowers greenish, ca 15 mm long ; lip trifurcate, ca 8 mm long, lateral lobes filiform ; spur slightly exceeding the ovary. Capsules fusiform, ca 12 mm long, beaked.

In mixed forests ; 450 - 750 m.

Fl. & Fr. : September.

RAJNANDGAON : Chilpi, Salewara.

4. *H. marginata* Coleb. in Hook. Exotic Bot. t. 136. 1825.

Small herbs, 10 - 20 cm high. Leaves in the lower part of the stem, oblong, 3 - 8 x 1.5 - 3.0 cm. Spikes ca 5 cm long. Flowers yellow or greenish yellow ; sepals ca 6 mm long ; petals falcate ; lip 3-partite, lobes linear ; spur fusiform.

In mixed forests ; 450 m.

Fl. : September.

RAJNANDGAON : Salewara.

5. *H. plantaginea* Lindl. Gen. et Sp. Orch. 323. 1835.

Herbs, 20 - 50 cm high. Leaves 4 - 7, clustered near the base, elliptic - oblong, 5 - 10 × 2 - 3 cm. Spikes 8 - 15 cm long. Flowers white, puberulus; sepals and petals ca 5 mm long; lip ca 10 mm long with a linear mid-lobe and falcately oblong side-lobes; spur slender, ca 3 cm long.

In sal forests ; 500 m.

Fl. & Fr. : October.

RAIPUR : Taurenga.

6. *H. roxburghii* Nicolson in Saldanha & Nicolson, Fl. Hassan District 834. 1976. *H. platyphylla* Spreng. Syst. Veg. 3 : 690. 1826, *nom. superfl.*

Herbs, 20 - 50 cm high. Leaves 2 - 3, appressed to the ground, broadly elliptic or suborbicular, 4 - 8 cm long. Spikes dense, 5 - 10 cm long. Flowers ca 1 cm across, white; sepals ovate - oblong; petals linear; lip with a lanceolate mid-lobe and rounded side-lobes; spur 2 - 3 cm long, clavate at the tip.

In mixed forests ; 450 m.

Fl. & Fr. : September.

RAJNANDGAON : Baghnadi.

4. PERISTYLUS Bl.

1a. Lateral sepals 6 - 10 mm long; lip ca 8 mm long ... *P. constrictus* 1

1b. Lateral sepals 2 - 4 mm long; lip 2 - 4 mm long.

2a. Lip smaller than the sepals, entire or scarcely 3 - lobed ... *P. plantagineus* 3

2b. Lip slightly larger than the sepals, distinctly 3 - lobed ... *P. lawii* 2

1. *Peristylus constrictus* Lindl. Gen. et Sp. Orch. 300. 1835.
Habenaria constricta Hook. f. Fl. Brit. Ind. 6 : 161. 1890.

Stout herbs, 30 - 50 cm high. Leaves clustered near the middle of the stem, elliptic, 7 - 12 cm long, with large sheaths inflated at the mouth. Flowers yellowish or greenish white ; petals *ca* 8 mm long ; lip 3 lobed from the middle, midlobe lanceolate, side lobes narrower ; spur globose, *ca* 2 mm long.

In mixed forests ; 450 m.

Fr. : September.

RAJNANDGAON : Salewara.

2. *P. lawii* Wt. Ic. 5 : 12. t. 1695. 1852. *Habenaria lawii* Hook. f. Fl Brit. Ind. 6 : 162. 1890.

Slender herbs, 15 - 30 cm high. Leaves 3 - 4, above the middle of the stem, suberect, elliptic - lanceolate, 5 - 12 cm long. Spikes 5 - 10 cm long, densely clothed in the lower part with empty bracts (sometimes with abortive flowers). Flowers white ; floral parts *ca* 3 mm long ; spur bulbous.

In mixed forests ; 450 m.

Fl. & *Fr.* : August.

RAJNANDGAON : Salewara.

3. *P. plantagineus* Lindl. Gen. et Sp. Orch. 300. 1835. *Habenaria wightii* Trimen, Cat. Ceyl. Pl. 1885.

Robust herbs, *ca* 60 cm high. Leaves 4 - 8, clustered about the middle of the stem, oblong - lanceolate or broadly elliptic, 7 - 23 x 2 - 9 cm, pinkish beneath. Spikes 10 - 20 cm long, compactly numerous flowered. Flowers pinkish brown ; sepals 2.0 - 5.0 1.5 x 2.5 mm ; lip 2.0 - 3.5 x 2.0 - 3.5 mm.

In mixed forests ; 450 - 800 m.

Fl. & *Fr.* : September.

RAJNANDGAON : Chilpi, Salewara.

5. PLATANTHERA L. C. Rich.

Platanthera susannae (L.) Lindl. Gen. et Sp. Orch. 295. 1835. *Orchis susannae* L. Sp. Pl. 939. 1753. *Habenaria susannae* R. Br. ex Spreng. Syst. Veg. 3 : 622. 1826.

Stout herbs, 0.5 - 1.2 m high. Leaves ovate oblong, 5 - 18 × 2 - 7 cm, yellowish margined. Racemes 15 - 20 cm long, 2 - 6 - flowered. Flowers large, greenish white ; sepals ca 4.5 cm long ; petals ca 3.5 cm long ; lip fan-shaped, ca 5 × 9 cm, fimbriate ; spur cylindrical, 7 - 10 cm long.

In moist shady places ; 350 m.

Fl. & Fr. : October.

RAJNANDGAON : Singhari.

6. VANDA W. Jones ex R. Br.

- | | |
|--|------------------------|
| 1a. Flowers 4 - 5 cm across ; sepals and petals yellowish green or bluish, brown tessellated on the inside ; lip white ... | <i>V. tessellata</i> 1 |
| 1b. Flowers ca 1 cm across ; sepals and petals yellow, not tessellated ; lip pink dotted ... | <i>V. testacea</i> 2 |

1. **Vanda tessellata** (Roxb.) Hook. ex G. Don in Loud. Hort. Brit. 372. 1830. *Epidendrum tessellatum* Roxb. Pl. Corom. 1 : 34. t. 42. 1795. *V. roxburghii* R. Br. in Bot. Reg. 8. t. 516. 1822. 'Badang.'

Epiphytic herbs. Stems 30 - 50 cm long. Leaves coriaceous, distichous, closely packed, linear, complicate, 15 - 20 cm long, keeled. Flowers racemose ; sepals and petals clawed, obovate, with wavy margins ; lip with small acute side lobes and broad truncate notched mid lobe ; spur conical.

Common on roadside trees of *Butea monosperma*, *Diospyros melanoxylon*, *Madhuca longifolia*, *Mangifera indica* and *Terminalia alata* ; 350 - 450 m.

Fl. & Fr. : throughout the year.

DURG : Budbhumi, Dondi. RAIPUR : Dhamtari, Dugli, Pithora.
RAJNANDGAON : Baghnadi, Salewara.

2. *V. testacea* (Lindl.) Reichb. *f.* Gard. Chron. 2 : 166. 1877. *Aerides testaceum* Lindl. Gen. et Sp. Orch. 238. 1835. *V. parviflora* Lindl. Bot. Reg. 30 (misc.) : 45. 1844.

Small epiphytic herbs. Stems 10-15 cm long. Leaves coriaceous, distichous, linear, keeled, 7-10 cm long, premorse at the tip. Flowers in lax few flowered 5-10 cm long racemes ; sepals and petals oblanceolate, ca 8 mm long, wavy margined ; lip with small side-lobes and oblong, ca 5 mm long mid-lobe.

On roadside trees of *Butea monosperma*, *Diospyros melanoxylon*, *Madhuca longifolia* and *Terminalia bellirica* ; 400-500 m.

Fl. & Fr. : April September.

DURG : Dondi. RAIPUR : Taurenga. RAJNANDGAON : Deopura.

7. *ZEUXINE* Lindl.

Zeuxine strateumatica (L.) Schltr. in Fedde, Repert. 1 : 77. 1911.
Orchis strateumatica L. Sp. Pl. 903. 1753. *Z. sulcata* Lindl. Gen. et Sp. Orch. 485. 1840.

Annual terrestrial herbs, 5-15 cm high, with fleshy roots. Stem closely sheathed, often creeping below. Leaves linear, erect, grass-like, 2-5 cm long. Flowers in 2-5 cm long spikes ; sepals ca 5 mm long, lip linguiform, ca 6 mm long, fleshy, green.

In wastelands ; 300 m.

Fl. & Fr. : August.

RAIPUR : Raipur.

106. ZINGIBERACEAE

(D. M. Verma & J. Lal)

- 1a. Leaves spiral ; sheaths closed. Inflorescence compact, terminal on the leafy stem. Lateral staminodes absent ... *Costus* 1
- 1b. Leaves distichous ; sheaths open. Inflorescence compact or open, terminal on the leafy stem or directly from the rhizome. Lateral staminodes present or absent.
- 2a. Inflorescence compact with a terminal plume of barren bracts ; flowering bracts laterally partially connate forming pouches. ... *Curcuma* 2
- 2b. Inflorescence compact or open, without a terminal plume of barren bracts ; bracts all free.
- 3a. Inflorescence open. Stamen much longer than the lip ; staminodes free ... *Globba* 3
- 3b. Inflorescence compact. Stamen shorter than the lip ; staminodes adnate to the lip ... *Zingiber* 4

1. COSTUS L.

Costus speciosus (Koen.) J. E. Smith in Trans. Linn. Soc. 1 : 249. 1791. *Banksia speciosa* Koen. in Retz. Obs. Bot. 3 : 75. 1784. 'Keo-kanda.'

Perennial rhizomatous, 1 - 2 m high. Leaves oblanceolate obovate, 15 - 25 × 6 - 15 cm, pubescent or villous beneath. Spikes ovoid, 4 - 8 cm long ; bracts greenish red becoming bright red on maturity. Calyx green becoming red ; corolla white ; lip broadly obovate, cuneate, 4 - 8 cm long, white with a hairy yellow band at the base, crumpled margined ; connective petaloid.

In sal and mixed forests ; 500 - 600 m.

Fl. : August October ; *Fr.* : up to June.

RAIPUR : Borai, Taurenga.

Tubers eaten by tribals and considered very good for health and digestion.

In one clump in Taurenga (Verma 25165, October, 1976) the whole of the mature spike, including bracts, calyx and capsules, were observed to be pale green, even when dry. This is very unusual. The tribals distinguish it as 'Safed (white) Keo-kanda.'

2. CURCUMA L.

- 1a. Inflorescence central, amidst leaves, with its peduncle enclosed within leaf-sheaths ... *C. pseudomontana* 2
- 1b. Inflorescence lateral, separate from the leafy shoot, usually produced before the leaves, sometimes persisting and found with the leaves.
- 2a. Rhizomes strongly aromatic. Leaves uniformly green ... *C. aromatica* 1
- 2b. Rhizomes almost non-aromatic. Leaves mostly with a purple band on the upper surface along the midrib ... *C. zedoaria* 3

1. *Curcuma aromatica* Salisb. Parad. Lond. t. 96. 1807.

Rhizomes whitish inside, strongly smelling of camphor; some root fibres ending in ellipsoid tubers. Leaves long petioled, $50 - 80 \times 18 - 28$ cm, pubescent beneath. Peduncles ca 25 cm long; spikes ca 15 cm long; lower bracts green, upper pink tipped; coma bracts pinkish white. Corolla lobes and staminodes white with pink tips; lip yellow.

In sal forests; 500 m.

Fl. & Fr. : May June.

RAIPUR : Sitanadi.

2. *C. pseudomontana* Grah. Cat. Pl. Bombay, 210. 1839. *C. montana*-Baker in Hook. f. Fl. Brit. Ind. 6 : 214. 1890 *p. p.*, *non* Roxb. 1820.

Rhizomes yellow inside, faintly aromatic, with several root fibres ending in 2 - 4 cm long ellipsoid tubers. Leaves ca 30 \times 10 cm. Peduncle fully enclosed within leaf-sheaths, ca 25 cm long; flowering bracts greenish white; coma bracts white with purplish tips. Flowers subequalling the bract, white with a yellow obovate lip, ca 20 \times 15 mm.

Rhizomes introduced from Raipur and flowered in the Experimental Garden of the Botanical Survey of India, Allahabad, in August, 1973 (*Verma* 17763).

3. *C. zedoaria* (Christm.) Rosc. in Trans. Linn. Soc. 8 : 354. 1807 *et* Monandr. Pl. t. 109. 1825; Burtt in Gard. Bull. Singapore, 30 : 59 - 62. 1977. *Amomum zedoaria* Christm. in Christm. & Panzer, Linn. Pflanzensyst. 5 : 12. 1779. 'Gainjl'.

Rhizomes pale greenish white or yellowish, faintly aromatic. Leaves $25 - 40 \times 9 - 12$ cm, glabrous. Peduncles 8 - 20 cm long. Spikes 8 - 18 cm long; lower flowering bracts green, upper tipped with purple, coma bracts bright purple, however, all the flowering, and coma bracts becoming

whitish or pure white with age. Flowers equalling the bracts, yellow tipped.

Common in wastelands and forest-floors ; 500 - 550 m.

Fl. : May June.

RAIPUR : Khallari, Sitanandi.

3. GLOBBA L.

- | | | |
|--|-----|-----------------------|
| 1a. Bracts persistent. Anthers with a broad wing on either sides | ... | <i>G. bulbifera</i> 1 |
| 1b. Bracts deciduous. Anthers not winged | ... | <i>G. racemosa</i> 2 |

1. *Globba bulbifera* Roxb. in *Asiat. Res.* 11 : 358. 1810.

Rhizomatous herbs, 30 - 60 cm high. Leaves elliptic-lanceolate or oblong, 7 - 25 × 3 - 8 cm. Panicles 6 - 18 cm long ; bracts foliaceous, lower distant, upper congested, lowest 2 - 7 cm long, usually enclosing a ca 5 mm long globose-ellipsoid bulbil, sometimes upper bracts also enclosing a bulbil. Flowers 25 - 30 mm long, orange-yellow ; filament long, curved.

In mixed and sal forests ; 550 - 750 m.

Fl. & *Fr.* : September October.

RAIPUR : Taurenga. RAJNANDGAON : Chilpi.

2. *G. racemosa* J. E. Sm. *Exot. Bot.* 2 : 115. t. 117. 1804.

Rhizomatous herbs, 40 - 80 cm high. Leaves oblong-lanceolate, 8 - 30 × 3 - 9 cm, pubescent beneath. Panicles 5 - 20 cm long ; bracts 10 - 15 mm long. Flowers 2 - 5 on each branch, ca 30 mm long, yellow or orange-yellow, with a long curved filament. Capsules muricate (or smooth).

In sal forests ; 450 - 550 m.

Fl. & *Fr.* : August - September.

RAIPUR : Khallari. RAJNANDGAON : Salewara.

4. ZINGIBER Boehm.

- | | | |
|--|-----|-----------------------|
| 1a. Spike terminal on the leafy stem | ... | <i>Z. capitatum</i> 1 |
| 1b. Spikes radical or from the base of the leafy stem. | | |

- 2a. Flowering peduncle 10 - 30 cm long, well emerged from the ground ; bracts broad, flat, closely clasping ... *Z. cassumunar* 2
- 2b. Flowering peduncle *ca* 3 cm long, hidden under ground ; bracts narrow, convolute, not closely clasping ... *Z. roseum* 3

1. *Zingiber capitatum* Roxb. in Asiat. Res. 11 : 348. 1810. – ‘Ranala’.

Rhizomatous perennials, 60 - 100 cm high ; rhizomes yellow inside, faintly aromatic. Leaves linear, 10 - 35 cm long, 15 - 25 mm broad, pubescent beneath. Spikes 8 - 13 cm long ; bracts green with red margins, becoming reddish in fruits, lower 4 - 5 cm long. Flowers pale yellow ; lip obovate, *ca* 2 cm long, yellow, with two oblong yellow basal lobes ; anther with a long incurved beak.

In mixed forests ; 400 - 550 m.

Fl. : August ; *Fr.* : September - October.

RAIPUR : Taurenga. RAJNANDGAON : Baghnadi.

2. *Z. cassumunar* Roxb. in Asiat. Res. 11 : 347. t. 5. 1810.

Rhizomatous perennials, 1.0 - 1.5 m high ; rhizomes yellow inside. Leaves linear - lanceolate, 20 - 30 × 2.5 - 3.5 cm, pubescent beneath. Spikes elliptic - ovoid, narrowed at the top, 6 - 13 cm long ; bracts *ca* 3 cm long, pubescent, red brown. Flowers creamy yellow ; corolla lobes *ca* 25 mm long ; lip obovate, *ca* 28 × 25 mm, lateral lobes obliquely elliptic, acute, *ca* 12 × 8 mm ; anther with *ca* 10 mm long beak.

In teak and sal forests ; 450 - 600 m.

Fl. : August ; *Fr.* : January.

RAIPUR : Borai, Sitanadi. RAJNANDGAON : Baghnadi.

3. *Z. roseum* (Roxb.) Rosc. in Trans. Linn. Soc. 8 : 348. 1807. *Amomum roseum* Roxb. Corom. Pl. t. 126. 1802.

Rhizomatous perennials, 1 - 2 m high. Leaves oblong - lanceolate, 25 - 60 × 6 - 13 cm, pubescent beneath. Spikes ellipsoid subglobose, *ca* 5 cm long. Bracts, calyx and corolla red ; corolla tube *ca* 4 cm long ; lip oblong, *ca* 25 × 18 mm, white with pale red streaks throughout along the pale yellow crumpled recurved margins ; basal lobes of the lip small, roundish.

In sal forests ; 550 m.

Fl. : September ; *Fr.* : January.

RAIPUR : Sitanadi.

107. AMARYLLIDACEAE

(D. M. Verma)

CRINUM L.

- | | | |
|--|-----|-----------------------|
| 1a. Leaves 7 - 15 cm broad, all flat. Scape erect | ... | <i>C. asiaticum</i> 1 |
| 1b. Leaves 2 - 5 cm broad, mostly distinctly concave. Scape decinate | ... | <i>C. defixum</i> 2 |

1. *Crinum asiaticum* L. Sp. Pl. 292. 1753.

Robust bulbous herbs with a stout caudex. Bulbs 5-7 cm dia. Leaves coriaceous, clustered, linear-lanceolate, 30-80 cm long. Flowers several, umbelliferous, white; pedicels 5-25 mm long; perianth tube 8-10 cm long, lobes ca 6 cm long; stamens red.

Along streams and in dry forest-floors; 400-500 m.

Fl.: November-May.

RAIPUR: Sitanadi. RAJNANDGAON: Baghnadi.

2. *C. defixum* Ker Gawler in J. Sci. Arts (London) 3: 105. 1817.

Bulbs ovoid, ca 5 cm across. Leaves coriaceous, clustered at the tip of a short caudex, linear, 40-80 cm long, usually very concave above, erect in water, spreading on soil. Flowers several, umbelliferous, white; perianth tube 8-12 cm long, lobes spreading, ca 1 cm broad, usually with inrolled margins; stamens scarlet.

Common along rivers, streams and roadside ditches, usually partly submerged; 250-500 m.

Fl.: September-January.

RAIPUR: Dhamtari, Raipur, Sitanadi. RAJNANDGAON: Baghnadi.

108. HYPOXIDACEAE

(M. J. Hanfi)

CURLIGO Gaertn.

Curculigo orchoides Gaertn. Fruct. 1: 63. t. 16. 1788. 'Kanwa, Kuanpar'.

Perennial herbs. Tubers subcylindrical, ca 5 mm thick. Leaves radical,

plicate, linear lanceolate, 10–30 × 1–3 cm, narrowed below into a short petiole. Flowering scape very short, the flowers appearing almost at the ground level; flowers few, 1–3 opening at a time, yellow, hairy outside, on a beak like hypanthium, upper male with ca 7 mm long tepals, lowest usually female or bisexual with ca 15 mm long tepals.

In sal and mixed forests; 350–800 m.

Fl. & Fr.: August–September.

DURG : Rajhara Dhalli. RAIPUR : Sitanadi. RAJNANDGAON : Chilpi, Khargaon.

109. TACCACEAE

(D. M. Verma)

TACCA J. R. & G. Forest.

Tacca leontopetaloides (L.) O. Ktze. Rev. Gen. Pl. 2: 704. 1891.
Leontice leontopetaloides L. Sp. Pl. 313. 1753. *T. pinnatifida* J. R. & G. Forest. Char. Gen. Pl. 35. t. 35. 1775. 'Bagh mochh.'

Erect perennial herbs. Tuber depressed globose, 2–6 cm across. Leaves 1–3 on 0.2–1.5 m long petioles, palmately 3-lobed, 0.5–1.0 m across, each lobe again divided into numerous variously shaped segments. Scapes 0.2–1.5 m long; involucral bracts 4–12, obovate lanceolate 3–10 × 1–5 cm, green, sometimes purple margined; filiform-bracts many, 15–25 cm long. Flowers drooping, 5–15 mm long, yellow or purplish green.

In sal and mixed forest clearings; 500–800 m.

Fl.: August; *Fr.*: September–October.

RAIPUR : Borai, Taurenga. RAJNANDGAON : Chilpi.

110. DIOSCOREACEAE

(D. M. Verma & M. I. Hanfi)

DIOSCOREA L.

1a. Leaves compound. Stems twining to the left.

2a. Middle leaflet 3-costate. Stamens 6. Capsules 4–6 cm long ... *D. hispida* var. *daemona* 3

- 2b. Middle leaflet 1 - costate. Stamens 3. Capsules 1.5 - 2.0 cm long ... *D. pentaphylla* 5
- 1b. Leaves simple. Stems twining to the right or to the left.
- 3a. Stems twining to the left ... *D. bulbifera* 1
- 3b. Stems twining to the right.
- 4a. Stems unarmed. Leaves elliptic - obovate, obtuse or rounded at the base. Male flower buds pubescent ... *D. oppositifolia* 4
- 4b. Plants not as above.
- 5a. Plants hairy, particularly on the petiole and the inflorescence ... *D. puber* 6
- 5b. Plants glabrous throughout.
- 6a. Male axillary leafless branches much shorter than the axillant leaves ; male flowers *ca* 2 mm apart ... *D. wallichii* 7
- 6b. Male axillary leafless branches, in general, much longer than the axillant leaves ; male flowers touching each other ... *D. glabra* 2

1. *Dioscorea bulbifera* L. Sp. Pl. 1033. 1753. *D. sativa* Thunb. Fl. Jap. 151. 1784.

Climbers. Tuber solitary, subsessile, globose pyriform, 10-15 cm across. Bulbils abundant. Leaves broadly ovate - cordate, subcaudate, 10-30 × 8-28 cm. Male flowering axes on up to 1 m long leafless branches ; flowers whitish or pinkish, fragrant. Female flowering axes axillary, 20-45 cm long. Capsule wings 20-22 × 7-9 mm ; seeds winged at the base.

Common in mixed forests ; 300-550 m.

Fl. & Fr. : August November.

DURG : Bordih, RAIPUR : Dhamtari, Taurenga. RAJNAND-GAON : Khargaon, Salewara, Singhari.

Tubers and bulbils edible.

2. *D. glabra* Roxb. Fl. Ind. 3 : 803. 1832.

Climbers. Tubers solitary or more, on up to 50 cm long stalks, cylindrical, *ca* 4 cm across. Leaves elliptic ovate, 7-9 × 4-6 cm, base rounded or cordate. Male flowering axes on up to 70 cm long leafless branches. Capsules retuse both at the tip and the base, on 3-4 mm long stipes wings 15-18 × 14-20 mm ; seeds winged all around.

In mixed forests ; 450 m.

Fl. & Fr. : January.

RAIPUR : Sitanadi.

Tubers edible.

3. **D. hispida** Dennst. var. **daemona** (Roxb.) Prain & Burk. in Ann. R. Bot. Gard. Calcutta 14 : 192. 1936. *D. daemonia* Roxb. Fl. Ind. 3 : 805. 1832. - 'Baichandi.'

Climbers. Tubers subglobose, up to 30 cm across. Stems deciduously golden hairy, usually prickly. Leaves 3 foliolate ; middle leaflet elliptic oblong or obovate, 10-20 × 8-12 cm, lateral leaflets smaller, 5 costate. Male flowering axes on up to 30 cm long villous leafless axillary branches. Capsules ascending, stramineous ; wings 40-60 × 10-13 mm ; seeds with ca 2 cm long basal wing.

In mixed forests ; 400-500 m.

Fl. : September ; *Fr.* : September-May.

RAIPUR : Gariaband. RAJNANDGAON : Deopura, Salewara.

Tubers poisonous but sometimes eaten after a thorough wash.

4. **D. oppositifolia** L. Sp. Pl. 1033. 1753 ; Hook. f. Fl. Brit. Ind. 6 : 292. 1892 p.p. *D. lanceolata* Heyne ex Hook. f. Fl. Brit. Ind. 6 : 292. 1892.

Climbers. Tuber deeply descending, cylindrical, up to 2 m long. Stems glabrous or deciduously pubescent. Leaves opposite or alternate, elliptic obovate (orbicular), up to 12 cm long. Male spikes grouped in leaf axils, spike axes glabrous or pubescent. Capsule wings 16-24 × 12-17 mm ; seeds winged all around.

In sal forests ; 550 m.

Fl. & Fr. : August.

RAIPUR : Taurenga.

5. **D. pentaphylla** L. Sp. Pl. 1032. 1753. *D. triphylla* L. Sp. Pl. 1032. 1753.

Climbers. Bulbils profuse, globose - ellipsoid. Leaves 3-5 foliolate ; middle leaflet elliptic oblanceolate, up to 15 × 5 cm, outer smaller. Male flowering axes usually on large leafless branches, sometimes axillary ; buds congested. Capsules ascending, pubescent when young ; wings up to 20 × 6 mm ; seeds winged at the base.

Common in sal and mixed forests ; 400 – 500 m.

Fl. : September – November ; *Fr.* : November – January.

RAIPUR : Sitanadi, Taurenga. RAJNANDGAON : Baghnadi, Deopura.

6. *D. puber* Blume, Enum. Pl. Java 1 : 21. 1827. *D. angulata* Roxb. Fl. Ind. 3 : 803. 1832.

Climbers with deciduously creamy white pubescence. Tubers 1 – 2, long stalked, clavate. Bulbils up to 7 cm across, greyish. Leaves ovate-cordate, 10 – 20 × 8 – 15 cm, pulvinous lilac. Male flowering axes on leafless branches ; buds congested. Capsules puberulous ; wings 12 – 18 × 13 – 18 mm ; seeds winged all around.

In sal and mixed forests ; 450 – 600 m.

Fl. & *Fr.* : January.

RAIPUR : Sitanadi, Taurenga.

Tubers edible.

7. *D. wallichii* Hook. f. Fl. Brit. Ind. 6 : 295. 1892.

Climbers. Tubers numerous, fascicled, cylindrical, 0.5 – 1.0 m long, 2 – 7 cm thick. Leaves subcoriaceous, ovate orbicular, cordate, up to 25 cm long, 7 – 9-costate, with translucent dots and dashes. Flowers red-brown. Capsules stramineus with brown flecks ; wings ca 20 × 15 – 18 mm ; seeds winged all around.

In mixed forests ; 550 m.

Fl. : October.

RAIPUR : Taurenga.

III. LILIACEAE

(D. M. Verma)

- 1a. Leaves reduced to spinescent scales ; cladodes present, needle-like ... *Asparagus* 1
- 1b. Leaves normal ; cladodes absent.
 - 2a. Leaf tips circinate ... *Gloriosa* 3
 - 2b. Leaf tips not circinate.
 - 3a. Rootstock short with a fascicle of fleshy roots. Leaves radical ... *Chlorophytum* 2
 - 3b. Rootstock a corm. Leaves cauline ... *Iphigenia* 4

1. ASPARAGUS L.

Asparagus racemosus Willd. Sp. Pl. 2 : 152. 1799. — 'Dash-mool, Das-moor.'

Slender bushy scramblers or climbers with woody prickly branches. Cladodes acicular, triquetrous, deciduous, ca 2 cm long. Raceme axillary, 5 - 10 cm long. Flowers on filiform jointed pedicels, ca 3 mm across, white, scented. Berries globose, 3 - 5 mm dia., scarlet.

In sal and mixed forests ; 400 - 500 m.

Fl. & Fr. : September - January.

RAIPUR : Chhoora, Dugli. RAJNANDGAON : Baghnadi, Taregaon.

Decoction of roots is considered highly medicinal, and a good tonic, and the roots are commonly sold in the markets.

2. CHLOROPHYTUM Ker - Gawler

- 1a. Leaves almost all narrowed into a petiole. Anthers about twice as long as the filaments ... *C. arundinaceum* 1
- 1b. Leaves almost all sessile. Anthers about as long as the filaments ... *C. tuberosum* 2

1. ***Chlorophytum arundinaceum*** Baker in J. Linn. Soc. (Bot.) 15 : 323. 1876.

Perennial herbs with a cluster of fleshy roots. Leaves radical, linear lanceolate, 15 - 60 cm long, 2.5 - 6 cm broad, outer distinctly petioled, inner sometimes subsessile. Scape as long as the leaves ; racemes dense flowered, sometimes shortly branched at the base. Flowers white ; tepals 7 - 10 mm long. Capsules globose, ca 8 mm dia.

In sal forests ; 500 - 650 m.

Fl. & Fr. : August - October.

RAIPUR : Borai, Taurenga.

2. ***C. tuberosum* (Roxb.) Baker** in J. Linn. Soc. (Bot.) 15 : 332. 1876.
***Anthericum tuberosum* Roxb.** Fl. Ind. 2 : 149. 1832.

Perennial herbs with fleshy roots. Leaves radical, linear, 15 - 60 cm long, 1.5 - 4.0 cm broad, usually wavy-margined. Scape 15 - 90 cm long ; racemes often interrupted ; pedicel jointed at or below the middle. Flowers

white ; tepals elliptic, 12–15 mm long. Capsules subglobose, ca 1 cm dia.

In sal forests ; 500 m.

Fl. : May.

RAIPUR : Sitanadi.

3. GLORIOSA L.

Gloriosa superba L. Sp. Pl. 305. 1753.

A very graceful scrambler among bushes with 1–3 m long herbaceous branches from a tuberous rootstock. Leaves lanceolate, 8–15 cm long with a spiral tip. Flowers very attractive, solitary or subcorymbose, long peduncled, drooping, lower half yellow, upper half red, finally the whole becoming red ; tepals 5–8 cm long, 10–15 mm broad, with crisped margins.

Sporadic, in open forests ; 280–500 m.

Fl. & Fr. : August - November.

RAIPUR : Mainpur, Raipur. RAJNANDGAON : Salewara, Singhari.

4. IPHIGENIA Kunth

Iphigenia indica (L.) A. Gray ex Kunth, Enum. Pl. 4 : 213. 1843.
Melanthium indicum L. Mant. 226. 1771.

Perennial grass-like herbs, 5–25 cm high. Corm ca 1 cm across with 3–5 cm long sheathed neck. Leaves few, sessile, linear-lanceolate, 2–15 cm long, 3–7 mm broad. Flowers 1–3, chocolate brown, on 2–5 cm long pedicels ; perianth lobes subulate, ca 7 mm long. Capsules oblong, 1–2 cm long, ribbed.

In wastelands and forest floors ; 250–550 m.

Fl. : August - September ; *Fr.* : August – November.

RAIPUR : Chhoora, Gariaband, Raipur, Taurenga. RAJNANDGAON : Chilpi, Deopura.

112. SMILACACEAE

(D. M. Verma)

SMILAX L.

Smilax zeylanica L. Sp. Pl. 1029. 1753. — ‘*Ram datoona*’

Stout climbers with a pair of stipular tendrils from the tip of the leaf-sheaths ; branches usually prickly. Leaves elliptic - oblong or suborbicular, 10–25 × 8–23 cm, acute or cuspidate, 5–7-costate, reticulately veined. Umbels 1–3 on axillary peduncles. Flowers ca 6 mm long, greyish white. Berries globose, ca 8 mm dia., green.

Common in sal and mixed forests ; 400–500 m.

Fl. : June August ; *Fr.* : November January.

RAIPUR : Dugli, Sitanadi. RAJNANDGAON : Rajnandgaon.

Twigs used for cleaning teeth.

113. PONTEDERIACEAE

(D. M. Verma)

- | | | |
|---|-----|---------------------|
| 1a. Petioles mostly swollen to form bulbous floats. Flowers sessile,
zygomorphic | ... | <i>Eichhornia</i> 1 |
| 1b. Petioles not swollen. Flowers pedicelled, actinomorphic | ... | <i>Monochoria</i> 2 |

1. EICHHORNIA Kunth

Eichhornia crassipes (Mart.) Solms in A. DC. Mon. Phan. 4 : 527. 1883. *Pontederia crassipes* Mart. Nov. Gen. Sp. Pl. 9. t. 4. 1823. *E. speciosa* Kunth, Enum. Pl. 4 : 129. 1843.

Stoloniferous herbs, 15–50 cm high, floating, or rooting in mud. Leaves rosulate, broadly ovate or rhomboid, obtuse, 5–25 cm long and equally broad. Flowers few to many ; perianth lobes unequal, oblong obovate, lilac, posterior longest, ca 3 cm long, with a yellow blotch.

A serious pest choking ponds and drains, not yet common in our area ; 250–450 m.

Fl. & Fr. : April - October.

DURG : Durg. RAIPUR : Gariaband, Raipur, Simga.

2. MONOCHORIA Presl

Monochoria vaginalis (Burm. f.) Prest, Rel. Haenck. 1 : 128. 1827.
Pontederia vaginalis Burm. f. Fl. Ind. 80. 1768. *P. plantaginea* Roxb. Fl. Ind. 2 : 123. 1832. *M. vaginalis* var. *plantaginea* Solms in A. DC. Mon. Phan. 4 : 524. 1883.

Perennials, 10 - 50 cm high, with a short oblique rootstock. Leaf solitary, terminal, with its erect petiole appearing as though a continuation of the stem, ovate or oblong-lanceolate, up to 12 × 7 cm. Raceme partly hidden within the leaf sheath when young, then bursting forth and reflexed. Flowers blue-violet; perianth lobes 8 - 15 mm long.

Along drains, ditches and ponds; 400 - 550 m.

Fl. & Fr.: September - April.

RAIPUR: Taurenga. RAJNANDGAON: Baghnadi, Salewara, Taregaon.

114. COMMELINACEAE

(D. M. Verma)

1a. Bracts spathaceous.

- 2a. Bracts solitary or few, clustered, folded like a boat or a funnel. Petals free; stamens 2 - 3; staminodes present ... *Commellina* 2
- 2b. Bracts several, biserrate, imbricate, secund. Petals connate below into a tube; stamens 6; staminodes absent ... *Cyanotis* 3

1b. Bracts minute or absent.

- 3a. Flowers solitary or 2 - 6 - together in axillary fascicles ... *Amischophacelus* 1
- 3b. Flowers few - several in terminal panicles, or sometimes also panicled in the uppermost leaf-axils ... *Murdannia* 4

1. AMISCHOPHACELUS Rolla Rao & Kammathy

Amischophacelus axillaris (L.) Rolla Rao & Kammathy in J. Linn. Soc. (Bot.) 59 : 306. 1966. *Commelina axillaris* L. Sp. Pl. 42. 1753. *Cyanotis axillaris* D. Don, Prodr. Fl. Nepal. 46. 1825.

Slender perennial creeping herbs with ascending branches 10 - 75 cm long. Leaves linear or ensiform, 4.0 - 15.0 × 0.3 - 1.2 cm; sheaths 5 - 10 mm long, swollen and almost fully enclosing the flowers. Flowers blue or

pink ; corolla tube *ca* 1 cm long, lobes ovate, *ca* 5 mm long ; filaments blue-bearded. Capsules 3 celled.

Common in moist places along roads and cultivated fields ; 300 – 800 m.

Fl. & Fr. : August January.

DURG : Balod. RAIPUR : Balodabazar, Dhamtari, Raipur. RAJ-NANDGAON : Baghnadi, Chilpi.

2. COMMELINA L.

- 1a. Spathes, in natural folded condition, navicular, 2 - 6 times longer than broad, margins free or connate only at the base.
 - 2a. Leaves linear-lanceolate, about 9 - 13 times longer than broad. Seeds appendiculate at both the ends ... *C. attenuata* 1
 - 2b. Leaves lanceolate or ovate-lanceolate, about 3 - 4 times longer than broad. Seeds not appendiculate.
 - 3a. Seeds smooth ... *C. hastata* 4
 - 3b. Seeds rugose.
 - 4a. Spathes one to several ; cincinni unbranched. Capsules 2-celled, 2-seeded ... *C. suffruticosa* 6
 - 4b. Spathes one to two ; cincinni bifid. Capsules 3-celled, 5-seeded ... *C. diffusa* 3
- 1b. Spathes, in natural folded conditions, funnel-shaped, about as long as broad, margins connate almost to the top.
 - 5a. Leaves acute, obtuse or rounded at the tip, pubescent to villous on both the surfaces ... *C. benghalensis* 2
 - 5b. Leaves subcaudate-acuminate at the tip, glabrous above, glabrous or pubescent beneath.
 - 6a. Spathes cuneate, mostly not very unequal sided, sessile or on up to 6 mm long peduncles. Seeds smooth ... *C. paludosa* 5
 - 6b. Spathes cordate or truncate, very unequal sided, on 10 - 20 mm long peduncles. Seeds plicate-rugose ... *C. suffruticosa* 6

1. *Commelina attenuata* Koen, ex Vahl, Enum. 2 : 168. 1806.

Slender ascending herbs. Leaves linear, usually conduplicate, 3.5 - 7.0 × 0.3 - 0.7 cm, acute or acuminate. Spathes 20 - 35 mm long, caudate-acuminate, minutely dotted, hairy inside. Flowers small, blue. Capsules 2 -

1 celled, each cell 1 - 2 seeded ; seeds subterete with a pale soft appendage at each end.

In wastelands among rock boulders ; 440 - 550 m.

Fl. & Fr. : August - September.

RAIPUR : Dhamtari. RAJNANDGAON : Baghnadi.

2. *C. benghalensis* L. Sp. Pl. 41. 1753.

Slender ascending herbs with stems up to 1 m long. Leaves sessile or petioled, elliptic, ovate or suborbicular, 1 - 8 × 1 - 4 cm. Spathes terminal or leaf-opposed, 8 - 17 mm long and equally broad, gibbous. Flowers blue or lilac, sometimes there are subterranean leafless branches bearing white cleistogamous flowers.

In wastelands and among bushes ; 300 - 450 m.

Fl. & Fr. : August - January.

DURG : Balod. RAIPUR : Dhamtari, Dugli, Raipur.

3. *C. diffusa* Burm. f. Fl. Ind. 18. t. 7. f. 2. 1768. *C. nudiflora* auct., non L. 1753.

Stems slender, up to 1 m long, red brown streaked. Leaves lanceolate, 3.5 - 7.5 × 1.0 - 2.5 cm ; sheaths often ciliate. Spathes 17 - 40 mm long, cordate at base. Flowers blue or white, ca 1 cm across. Capsules ca 5 mm long, apiculate ; seeds of 2-seeded cell ca 1.5 mm long and those of 1-seeded cell ca 2.5 mm long.

In wastelands ; 300 - 450 m.

Fl. & Fr. : August - November.

RAIPUR : Chhoora, Dhamtari. RAJNANDGAON : Baghnadi, Rajnandgaon.

4. *C. hasskarlii* Clarke, Comm. et Cyrt. Beng. 13. t. 3. 1874.

Slender diffuse herbs. Leaves lanceolate, 3 - 8 cm long, acute ; sheaths ciliate. Spathes solitary, leaf-opposed, 1.0 - 2.5 cm long, cordate at the base. Flowers blue, in bifid cincinni. Capsules quadrate, apiculate ; seeds cylindric, 3 - 4 mm long.

In roadside ditches and along cultivated fields ; 300 - 450 m.

Fl. & Fr. : November - January.

RAIPUR : Dugli. RAJNANDGAON : Singhari.

5. *C. paludosa* Blume, Enum. Pl. Java ed. 1, 2. 1827. *C. obliqua* Buch.-Ham. ex D. Don, Prodr. Fl. Nep. 45. 1825; non Vahl, 1806.

Diffuse ascending herbs; stems up to 3 m long. Leaves obliquely lanceolate, 5.0–20.0 × 1.5–5.5 cm. Spathes 3–8 clustered together, 15–30 mm long, usually red brown margined. Flowers blue violet or white, ca 18 mm across. Capsules 2–3 celled, 1–3 seeded.

Common in sal and mixed forests; 300–500 m.

Fl. & Fr.: October–January.

RAIPUR: Gariaband, Taurenga. RAJNANDGAON: Deopura, Singhari.

6. *C. suffruticosa* Blume, Enum. Pl. Java ed. 1, 3. 1827.

Usually stout tufted herbs. Leaves lanceolate, 7–15 × 2–5 cm, glabrous or pubescent beneath. Spathes solitary or several clustered together, 10–15 mm long. Flowers white, 6–12 in unbranched cincinni. Seeds ellipsoid, ca 3.5 mm long.

In sal and mixed forests; 500–600 m.

Fl. & Fr.: August–September.

RAIPUR: Sitanadi. RAJNANDGAON: Deopura.

3. CYANOTIS D. Don

- | | |
|--|-------------------------|
| 1a. Bracts and sepals glabrous, or ciliolate on the margins only ... | <i>C. cristata</i> 1 |
| 1b. Bracts and sepals silky ... | <i>C. fasciculata</i> 2 |

1. *Cyanotis cristata* (L.) D. Don, Prodr. Fl. Nep. 46. 1825. *Commelinia cristata* L. Sp. Pl. 42. 1753.

Perennial trailing herbs. Stems up to 60 cm long. Leaves oblong-lanceolate, 5–10 × 1–2 cm, ciliolate margined. Flowers blue violet, in sessile or long peduncled cincinni; corolla tube 5–7 mm long, lobes 3–4 mm long. Seeds trigonous, blackish, pitted.

Common in sal and mixed forests, wastelands and walls; 300–800 m.

Fl. & Fr.: August–September.

DURG: Bordih. RAIPUR: Dhamtari, Sitanadi. RAJNANDGAON: Chilpi, Baghnadi.

2. *C. fasciculata* (Heyne ex Roth) J. A. & J. H. Schult. in R. & S. Syst. Veg. 7 : 1152. 1830. *Tradescantia fasciculata* Heyne ex Roth, Nov. Pl. Sp. 189. 1821.

Annual floccose herbs. Stems 5-30 cm long. Leaves linear-lanceolate, 1.0-8.0 × 0.5-1.2 cm. Cincinni 5-15 mm long; peduncles solitary or more together, up to 3 cm long. Flowers blue, purple or pink, ca 6 mm across. Capsules ca 4 mm long; seeds rugulose.

In wastelands and mixed forests; 300-450 m.

Fl. & Fr.: August - September.

DURG: Balod. RAIPUR: Balodabazar. RAJNANDGAON: Baghnadi.

4. MURDANNIA Royle

- | | | |
|--|-----|-----------------------|
| 1a. Leaves on the stem reduced to bladeless sheaths | ... | <i>M. edulis</i> 1 |
| 1b. Leaves on the stem with well developed blades. | | |
| 2a. Flowers 1-3 in axillary fascicles; pedicels twice-jointed | ... | <i>M. vaginata</i> 4 |
| 2b. Flowers several panicled, or sometimes a few axillary; pedicels not - or once - jointed. | | |
| a. Leaf margins usually wavy. Bracts persistent. Stamens 3. Seeds 3-7 in each cell | ... | <i>M. spirata</i> 3 |
| 3b. Leaf margins not wavy. Bracts caducous. Stamens 2. Seeds 2 in each cell | ... | <i>M. nudiflora</i> 2 |

1. *Murdannia edulis* (Stokes) Faden in Taxon 29 : 77. 1980. *Commelinia edulis* Stokes, Bot. Materia Med. 1 : 184. 1812. *C. tuberosa* Lour. Fl. Cochinch. 1 : 40. 1790, non L. 1753. *C. scapiflora* Roxb. Fl. Ind. 1 : 178. 1820. *Aneilema scapiflorum* Kostel. in Allg. Med. - Pharm. Fl. 1 : 127. 1831. *M. scapiflora* Royle, Illustr. 403, t. 95. 1839.

Roots fusiform. Radical leaves lanceolate, wavy margined, 10-25 cm long, 3-15 mm broad. Stems 1-5 together, separate from the leaves, 20-40 cm long with a few 2-5 cm long apiculate sheaths. Panicles 5-15 cm long. Flowers blue-mauve; petals 8-12 mm long. Seeds unisexual, reticulate.

In sal forests; 550 m.

Fl. & Fr.: June.

RAIPUR: Taurenga.

2. *M. nudiflora* (L.) Brenan in Kew Bull. 7 : 189. 1952. *Commelina nudiflora* L. Sp. Pl. 41. 1753, p. p. *Aneilema nudiflorum* Wall. ex Hook. f. Fl. Brit. Ind. 6 : 378. 1892. *M. malabarica* Brueckn. in E. & P. Pflanzenfam. ed. 2, 15a : 173. 1930. *Tradescantia malabarica* L. Sp. Pl. ed. 2, 412. 1762.

Slender diffuse ascending herbs. Stems 5-50 cm long. Leaves usually linear lanceolate, 3-10 cm long, rarely ovate lanceolate. Panicles terminal and in upper leaf axils. Flowers 2-12 in each cincinnus at the tips of 1-7 cm long branches, whitish, pink, purple or blue, ca 6 mm across.

Common in moist depressions along roadsides and in forests ; 300-800 m.

Fl. & Fr. : August November.

DURG : Balod. RAIPUR : Dhamtari, Sitanadi. RAJNANDGAON : Chilpi, Baghnadi, Deopura, Khargaon, Taregaon.

3. *M. spirata* (L.) Brueckn. in E. & P. Pflanzenfam. ed. 2, 15a : 173. 1930. *Commelina spirata* L. Mant. 2 : 176. 1771. *Aneilema spiratum* R. Br. Prodr. 271. 1810.

Erect or ascending, usually diffuse herbs, 5-30 cm high. Leaves oblong-lanceolate or ovate, 1.0-4.0 × 0.4-1.0 cm, with an auricled amplexicaul base, usually wavy. Panicles 1.5-4.0 cm long, usually divaricately branched. Flowers pink, blue or purple (sometimes white). Seeds rugulose.

In moist depressions and forest floors ; 300-500 m.

Fl. : August January ; *Fr.* : January May.

DURG : Talgaon. RAIPUR : Dhamtari, Singhpur, Sitanadi. RAJNANDGAON : Baghnadi.

4. *M. vaginata* (L.) Brueckn. in E. & P. Pflanzenfam. ed. 2, 15a : 173. 1930. *Commelina vaginata* L. Mant. 2 : 177. 1771. *Aneilema vaginatum* R. Br. Prodr. 271. 1810.

Erect or ascending herbs. Leaves linear lanceolate, 4.0-20.0 × 0.4-1.0 cm, sometimes sparsely hairy beneath. Flowers 1-3 together, fascicled in the axils of a few distant 8-15 mm long linear lanceolate bracts, blue violet, ca 8 mm across ; stamens 2, staminodes 4. Seeds rugose.

In moist wastelands ; 300 m.

Fl. & Fr. : August October.

RAIPUR : Raipur, Sharma 143026H (Herb. Sci. Coll. Raipur).

115. ARECACEAE

(P. C. Pant)

PHOENIX L.

- | | | |
|-----------------------------------|-----|------------------------|
| 1a. Undershrubs, 0.5 - 1.0 m tall | ... | <i>P. acaulis</i> 1 |
| 1b. Trees, 8 - 16 m tall | ... | <i>P. sylvestris</i> 2 |

1. *Phoenix acanthis* Buch. Ham. ex Roxb. in Trans. Linn. Soc. Lond. 15 : 87. 1826. 'Jungle Chhina.'

Stem ovoid, almost underground, *ca* 20 cm thick, clothed with petiole bases. Leaves up to 75 cm long; petioles *ca* 30 cm long with long pale yellow compressed spines; leaflets almost opposite, 20 - 30 cm long. Drupes oblong - ellipsoid, 15 - 20 mm long, orange red becoming blue black on ripening, flesh scanty.

In sal forests ; 500 m.

Fr. : June.

RAIPUR : Taurenga.

Leaves used for thatching and mat making ; fruits eaten.

2. *P. sylvestris* (L.) Roxb. Fl. Ind. 3 : 787. 1832. *Elate sylvestris* L. Sp. Pl. 1189. 1753. - 'Khajuri'.

Tall trees, trunk 20-40 cm across, clothed with petiole bases, and with a crown of 2 - 4 m long greyish green leaves. Leaflets in several fascicles lying in different planes, 15 - 45 × 2 - 3 cm, the lowest converted into long spines. Male flowers white, scented. Female inflorescence ultimately drooping. Drupes oblong, *ca* 15 mm long, orange to reddish brown, flesh sweet, scanty.

Scattered in villages ; 500 m.

Fr. : May.

RAIPUR : Sitanadi.

Leaves used for thatching and mat making ; fruits eaten.

116. PANDANACEAE

(P. C. Pant)

PANDANUS Parkinson

Pandanus fascicularis Lamk. Encycl. 1 : 372. 1785.

A dioecious bush or a small tree, with stilt roots. Leaves spirally crowded at the tips, sessile, ensiform, caudate acuminate, 1-2 m long, 3-9 cm broad, margins and midrib spiny. Spathes white. Male inflorescence much branched, sweet scented, each branch subtended by a spathe. Female inflorescence stout, unbranched. Drupes connate into 4-7 cm long yellowish orange phalanges.

RAIPUR (*cf.* Unni in J. Bombay nat. hist. Soc. 64 : 100. 1967.)

Detailed study required. See Stone in Matthew, Flora Tamilnadu Carnatic 2 : 1680. 1983, for discussions on nomenclature and identity.

117. TYPHACEAE

(D. M. Verma)

TYPHA L.

Typha angustata Bory & Chaub. in Exped. Sci. Moree, Bot. 1 : 338. 1833. *T. angustifolia* auct., non L.

Aquatic, rhizomatous, monoecious, 1-3 m tall herbs. Leaves radical, distichous, concavo convex below, flattening above, up to 1 m long, 5-10 mm broad. Inflorescence an interrupted spike, the lower part pistillate and upper part staminate, each subtended, by a caducous foliaceous spathe; male perianth of 3 hairs, female perianth of several capillary bristles.

In marshes ; 300 m.

Fl. : April.

DURG : Durg.

118. ARACEAE

(D. M. Verma)

- 1a. Free floating herbs. Leaves many in a rosette, sessile, obovate - oblong ... *Pistia* 5
- 1b. Attached herbs. Leaves not as above.
 - 2a. Leaves simple, appearing alongwith the flowers.
 - 3a. Aquatic. Leaves linear - lanceolate ... *Cryptocoryne* 4
 - 3b. Terrestrial. Leaves ovate - oblong.

- 4a. Leaves peltate, cordate or sagittate at the base.
Stamens fused ... *Colocasia* 3
- 4b. Leaves not peltate, hastate at the base. Stamens free ... *Theriophonum* 7
- 2b. Leaves pedately lobed, often, appearing after flowers.
- 5a. Leaves appearing after flowers ; segments of the pedatipartite leaf pinnatisect. Spadix appendaged or not.
- 6a. Spadix appendaged. Placentation basal ... *Amorphophallus* 1
- 6b. Spadix not appendaged. Placentation axile ... *Plesmonium* 6
- 5b. Leaves appearing alongwith the flowers ; segments of the pedatipartite leaf not pinnatisect. Spadix appendaged ... *Arisaema* 2

1. AMORPHOPHALLUS Bl. ex Decaisne

Amorphophallus sylvaticus (Roxb.) Kunth, Enum. 3 : 34. 1841. *Arum sylvaticum* Roxb. Fl. Ind. 3 : 511. 1832. *Synantherias sylvatica* Schott, Gen. Aroid. t. 28. 1858. 'Bhait dhain'.

Tuber *ca* 7 cm across. Leaf solitary, *ca* 30 cm across, leaflets lanceolate, 5–20 cm long. Peduncle *ca* 30 cm long. Spathe 12–15 cm long, convolute except at the top, outside green, inside with a purple blotch, or throughout purple with age. Spadix stipitate ; female part *ca* 3 cm long, stigmas yellow ; neuter part *ca* 2 cm long, neuter flesh - coloured ; male part *ca* 5 cm long, brown ; appendage cylindric, *ca* 12 cm long, brown.

In sal and mixed forests ; 450–600 m.

Fl. : May June. ; *Lvs.* : August.

RAIPUR : Borai, Sitanadi, Taurenga.

Petioles eaten as 'Chutney'.

2. ARISAEMA Mart.

Arisaema tortuosum (Wall.) Schott in Schott & Endl. Melet. Bot. 17. 1832. *Arum tortuosum* Wall. Pl. Asiat. Rar. 2 : 10. t. 111. 1830. - 'Bagh jandhra'.

Tubers depressed globose, 2 - 6 cm across. Leaves usually 2 ; petiole 15 - 80 cm long, clasping the peduncle ; leaflets ovate oblong, median 5 - 15 × 1 - 4 cm. Spatha green, tube 2 - 5 cm long, limb ovate-lanceolate 3 - 6 × 2 - 3 cm. Appendage 15 - 25 cm long, sigmoidly curved at the base, green, tapering to a slender tip.

In forest clearings ; 600 m.

Fl. : August.

RAIPUR : Borai.

3. COLOCASIA Schott

Colocasia esculenta (L.) Schott in Schott & Endl. Melet. Bot. 18. 1832. *Arum esculentum* L. Sp. Pl. 965. 1753. *C. antiquorum* Schott in Schott & Endl. Melet. Bot. 18. 1832.

Rhizome hard, tuberous, often stoloniferous. Leaves radical, long petioled, peltate, ovate or triangular, 10 - 30 cm long, pale or glaucous beneath. Spatha tube green, accrescent, 3 - 5 cm long, limb lanceolate, convolute, 12 - 15 cm long, yellow, deciduous. Spadix ca 10 cm long, including ca 1.5 cm long appendage, female and male parts separated by a zone of neuters.

Usually cultivated for its edible tubers ; 300 - 450 m.

Fl. : August - September.

RAJNANDGAON : Khargaon, Salewara.

4. CRYPTOCORYNE Fischer ex Wydler

Cryptocoryne retrospiralis (Roxb.) Wydler in Linnaea 5 : 428. 1830 ; Kunth, Enum. 3 : 12. 1841. *Ambrosinia retrospiralis* Roxb. Fl. Ind. 3 : 492. 1832.

Small aquatic purplish green rhizomatous herbs. Leaves linear lanceolate, crisped, 5 - 40 cm long, 3 - 18 mm broad. Spathes shortly peduncled, subequaling the leaves, greyish green, streaked with purple, limb linear, twisted. Spadix tip adhering to the septum of the tube.

In shallow water and marsh ; 250 m.

Fl. & *Fr.* : October.

RAIPUR : Simga.

5. PISTIA L.

Pistia stratiotes L. Sp. Pl. 963. 1753.

Floating stoloniferous herbs with rosettes of leaves. Leaf rosettes 2-10 cm across ; leaves flabellately nerved, brown papillose in the upper part and white woolly in the lower part. Spathe inconspicuous, 10 - 15 mm long, yellowish green. Spadix as long as the leaves, adnate to the spathe tube at the base.

In ponds ; 250 - 450 m.

Fl. : November.

RAIPUR : Raipur. RAJNANDGAON : Baghnadi.

6. PLESMONIUM Schott

Plesmonium margaritiferum (Roxb.) Schott, Aroid. 1 : 34. 1856.
Arum margaritiferum Roxb. Fl. Ind. 3 : 512. 1832.

Tuber depressed globose, 5 - 7 cm across. Leaf solitary, appearing after the flowers, 20 - 40 cm across, ultimate leaf segments linear lanceolate, 8 - 15 cm long, 5 - 20 mm broad. Scape 20 - 60 cm high. Spathe ovate - deltoid, folded, ca 10 cm long, green flushed with purple inside. Spadix stipitate, exserted, female and male zones separated by neuters.

In sal forests ; 500 - 750 m.

Fl. : June July ; Lvs. : June September.

RAIPUR : Taurenga. RAJNANDGAON : Chilpi.

7. THERIOPHONUM Bl.

Theriophonum minutum (Willd.) Baill. Hist. Pl. 13 : 457. 1895. *Arum minutum* Willd. Sp. Pl. 4 : 484. 1805. *T. crenatum* Bl. Rumph. 1^o: 128. 1837.

Tuber globose, ca 2 cm across. Petiole slender, ca 20 cm long ; lamina hastate, side lobes ovate - lanceolate, ca 4.0 × 1.5 cm, midlobe ovate - oblong, ca 8 × 4 cm. Peduncle ca 8 cm long. Spathe convolute, ca 8 × 3 cm, pale green, margins crenulate. Spadix ca 5 cm long ; stamens red ; neuters on both sides of the male zone, subulate, red, lower ca 4 mm long, upper ca 2 mm long ; appendage ca 3 cm long, purplish black.

In miscellaneous forests ; 300 m.

Fl. & Fr. : August.

RAIPUR : Dhamatari.

119. LEMNACEAE

(D. M. Verma & M. I. Hanfi)

1a. Roots present.

2a. Root solitary on each thallus	...	<i>Lemna</i> 1
2b. Roots several on each thallus	...	<i>Spirodela</i> 2
1b. Roots absent	...	<i>Wolffia</i> 3

1. LEMNA L.

Lemna perpusilla Torrey, Fl. New York 2 : 245. 1843. *L. paucicostata* Engelm. in Gray. Man. Bot. ed. 5, 681. 1867. *L. minima* Blatt. & Hallb. in J. Ind. Bot. Soc. 2 : 50. 1921. *L. blatteri* McCann in J. Bombay nat. hist. Soc. 43 : 153. 1942. *L. eleanorae* McCann, ibid. 43 : 154. 1942.

Small aquatic plants, free floating on the surface ; root sheathed and winged. Thallus ovate oblong, 1.5-4.0 × 0.7-2.5 mm, asymmetrical, pale green, 3 nerved ; daughter thalli several closely adhering. Flowering cavity lateral with an open spathe enclosing two staminate flowers and one pistillate flower.

In slow flowing or stagnant water ; 500 m.

RAIPUR : Taurenga.

2. SPIRODELA Schleid.

Spirodela polyrhiza (L.) Schleid. in Linnaea 13 : 392. 1839. *Lemna polyrhiza* L. Sp. Pl. 970. 1753.

Small aquatic plants, free floating on the surface ; roots several, a few mm long, arising from a thickening on the thallus. Thallus broadly ovate or orbicular, 1-3 mm long and equally broad, 5-11 nerved,

usually purple beneath. Flowering pouch lateral, with a small open spathe, 2-3 staminate flowers, and a solitary pistillate flower.

Common in stagnant water; 300 m.

RAIPUR : Raipur.

3. WOLFFIA Horkel ex Schleid.

Wolffia globosa (Roxb.) Hartog & van der Plas in *Blumea* 18 : 367. 1970. *Lemna globosa* Roxb. *Fl. Ind.* 3 : 565. 1832. *W. arrhiza* auct., Hook. *f. Fl. Brit. Ind.* 6 : 557. 1893, *non* Horkel ex Wimmer, 1857.

Minute free floating aquatic plants. Thallus thick, almost globular with a flattened upper surface, 1.0 - 1.5 mm long, dark green above, paler elsewhere, budding pouch in a circular lateral pit. Inflorescence on the upper surface in a simple median pit, with one staminate and one pistillate flower.

RAIPUR (*cf.* Unni in *J. Bombay nat. hist. Soc.* 64 : 100. 1967).

120. ALISMATACEAE

(D. M. Verma)

- | | | |
|---|-----|---------------|
| 1a. Pistils inserted on a large globular or oblong receptacle.
Achenes compressed | ... | Sagittaria 3 |
| 1b. Pistils inserted on a small inconspicuous receptacle. Achenes swollen. | | |
| 2a. Leaves sagittate. Flowers male and bisexual. Achene with two lateral air-chambers | ... | Limnophyton 2 |
| 2b. Leaves cordate. Flowers all bisexual. Achene without air-chambers | ... | Caldesia 1 |

1. CALDESIA Parl.

Caldesia parnassifolia (L.) Parl. *Fl. Ital.* 3 : 599. 1858. *Alisma parnassifolium* L. *Syst. ed. 12, 3* : 230. 1768. *A. reniforme* D. Don, *Prodr. Fl. Nepal.* 22. 1825.

Aquatic herbs. Leaves floating, broadly elliptic ovate or suborbicular, 3-8 cm long, deeply cordate with rounded basal lobes, 13-17-costate; petioles 15-40 cm long. Panicle long peduncled, pyramidal, ca 30 cm long, with branches and flowers in whorls of 2-4. Flowers white;

petals *ca* 5 mm long ; pistils 5 - 8 ; style persistent. Achenes *ca* 3 mm long, ribbed.

In ponds ; 400 m.

Fl. & Fr. : November - May.

RAJNANDGAON : Taregaon.

2. LIMNOPHYTON Miq.

Limnophyton obtusifolium (L.) Miq. *Fl. Ind. Bat.* 3 : 242. 1855.
Sagittaria obtusifolia L. Sp. Pl. 993. 1753.

Aquatic herbs. Leaves floating, pellucid punctate, broadly sagittate with triangular acute basal lobes ; apical lobe 7 - 12 cm long ; petioles septate, up to 40 cm long. Peduncle ribbed, hairy. Panicle pyramidal. Flowers whorled, white ; bracts and pedicels mostly reflexed after anthesis ; sepals elliptic, obtuse, 4 - 6 mm long ; petals suborbicular ; pistils 15 - 20. Achenes obovate, *ca* 5 mm long.

In mud, along ponds ; 300 - 450 m.

Fl. & Fr. : November - January.

RAIPUR : Dhamtari. RAJNANDGAON : Rajnandgaon.

3. SAGITTARIA L.

Sagittaria guayanensis H. B. K. ssp. *lappula* (D. Don) Bogin in Mem. N. Y. Bot. Gard. 9 : 192. 1955. *S. lappula* D. Don, Prodr. Fl. Nepal. 22. 1825.

Annual aquatic herbs. Leaves ovate, deeply cordate, 3 - 10 × 2 - 8 cm, apex rounded ; basal lobes about two-third as long as the apical lobe. Racemes, including the peduncle, 6 - 40 cm long. Flowers white, in the upper whorls male, in the lower whorls bisexual ; sepals *ca* 10 mm long ; petals obovate suborbicular, 12 - 18 mm long. Achenes 3 - 4 mm long, beaked and winged.

In marsh and shallow water ; 400 - 550 m.

Fl. & Fr. : June - September.

RAIPUR : Sitanadi. RAJNANDGAON : Baghnadi.

121. BUTOMACEAE

(D. M. Verma)

TENAGOCHARIS Hochst.

Tenagocharis latifolia (D. Don) Buchen. in Abh. Naturw. ver. Bremen 2 : 1. 1868. *Butomus latifolius* D. Don, Prodr. Fl. Nepal. 22. 1825. *Butomus lanceolatus* Roxb. Fl. Ind. 2 : 315. 1832. *Butomopsis latifolia* Kunth, Enum. Pl. 3 : 165. 1841. *Butomopsis lanceolata* Kunth, Enum. Pl. 3 : 165. 1841.

Perennial aquatic herbs with a short rootstock. Leaves long petioled, oblanceolate, 5–15 × 2–6 cm. Peduncle 25–50 cm long, usually bearing a single whorl of 3–30 flowers, sometimes flowers in two whorls; pedicels unequal, 5–14 cm long. Flowers white; sepals 4–9 mm long; petals slightly longer; pistils 5–7, cohering at the base. Fruits 9–12 mm long, shortly beaked.

In shallow water and marsh along ponds; 300–550 m.

Fl. & Fr.: October–April.

RAIPUR: Dhamtari, Gariaband, Taurenga, RAJNANDGAON: Rengakhar, Talgaon.

122. NAJADACEAE

(D. M. Verma & M. I. Hanfi)

NAJAS L.

- | | | |
|---|-----|----------------------|
| 1a. Sheath auricles more than twice as long as broad. Male flowers naked | ... | <i>N. graminea</i> 1 |
| 1b. Sheath auricles mostly broader than long. Male flowers enclosed in a spathe | ... | <i>N. indica</i> 2 |

1. **Najas graminea** Del. Descr. Egypt. Hist. Nat. 2 : 282. t. 50. f. 3. 1813.

Slender submerged aquatic herbs rooting at the base. Leaves linear, 2.5–3.5 cm long, 0.7–1.0 mm broad, margins spinulous; sheath auricles ca 2.0 × 0.7 mm. Male flowers: anther elliptic, ca 1.5 mm long, 'perianth lobes' globular. Female flowers: spathe absent; pistil ca 2 mm long. Seeds ca 2.5 mm long, areolate.

In roadside ditches; 300 m.

Fl. & Fr. : August.

RAIPUR : Balodabazar.

2. *N. indica* (Willd.) Cham. in Linnaea 4 : 501. 1829. *Caulinia indica* Willd. Mem. Ac. R. Sc. Berl. 89. t. 1. f. 3. 1801. *N. falciculata* Braun in J. Bot. 2 : 278. f. 4. 1864. *N. minor* Hook. f. Fl. Brit. Ind. 6 : 569. 1893, *pro maj. parte*; *non* All. 1785.

Annual submerged aquatic herbs, rooting below. Leaves linear, flat or subterete, 2 - 5 cm long, 0.8 - 1.2 mm broad, margins usually conspicuously spinulous toothed; sheath auricles mostly small and rounded, sometimes triangular. Male flowers : spathe ca 3 mm long; anther sessile. Female flower : spathe absent or 2 - 3 mm long; pistil ca 2 mm long. Seeds areolate.

In ponds and streams ; 250 - 450 m.

Fl. & Fr. : September.

RAIPUR : Dhamtari, Kasdol, Taurenga. RAJNANDGAON : Baghnadi.

123. APONOGETONACEAE

(D. M. Verma)

APONOGETON L. f.

1a. Ovules 2	...	<i>A. crispus</i> 1
1b. Ovules ca 8	...	<i>A. natans</i> 2

1. *Aponogeton crispus* Thunb. Nov. Gen. 4 : 73. 1781; Hook. f. Fl. Brit. Ind. 6 : 564. 1893, *p. p.*

Aquatic tuberous herbs. Submerged leaves ovate with cordate or truncate base, or linear, 3 - 30 cm long, 2 - 6 cm broad, margins straight, waved or crisped; floating leaves rare, oblong - obovate, up to 7 × 2 cm. Spike solitary, rather lax flowered. Flowers white or pink; tepals obovate, ca 2 × 2 mm.

In ponds ; 300 m.

RAIPUR : Raipur, n. v. (*cf.* Unni in J. Bombay nat. hist. Soc. 64 : 100. 1967).

2. *A. natans* (L.) Engl. & Krause in Engl., Pflanzenrch. heft 24 : 11. 1906. *Saururus natans* L. Mant. 2 : 227. 1771. *A. monostachyon* L. f. Suppl. 214. 1781.

Aquatic tuberous herbs. Submerged leaves linear lanceolate, up to 6.5×1.5 cm, base cuneate, midrib broad with 2-3 parallel nerves on either sides; floating leaves linear lanceolate with usually cordate base, up to 11×3 cm. Spike 3-7 cm long, dense flowered, on 15-40 cm long peduncle. Flowers white, pink or lilac; tepals spatulate, $1.5-2.0 \times 0.5$ mm.

Common in ponds and rivers; 250-350 m.

Fl. & Fr.: August-October.

DURG: Balod. RAIPUR: Raipur, Simga.

124. POTAMOGETONACEAE

(D. M. Verma)

POTAMOGETON L.

- | | | |
|--|-----|------------------------|
| 1a. Leaves all filiform, 0.1-0.15 cm broad | ... | <i>P. pectinatus</i> 4 |
| 1b. Leaves, at least those well-developed, linear, lanceolate or oblong, 0.3-3.5 cm broad. | | |
| 2a. Leaves all sessile, crisped and serrulate margined | ... | <i>P. crispus</i> 1 |
| 2b. Leaves mostly petiolate, neither crisped nor serrulate margined. | | |
| 3a. Leaves, at least the upper, floating, coriaceous, mostly broadly elliptic-oblong | ... | <i>P. nodosus</i> 3 |
| 3b. Leaves all submerged, membranaceous, mostly linear-oblong | ... | <i>P. mucronatus</i> 2 |

1. *Potamogeton crispus* L. Sp. Pl. 126. 1753.

Slender aquatic perennials with dichotomously branched stems. Leaves distichous, submerged, linear oblong, semi-amplexicaul, 2-7 cm long, 3-7 mm broad, 3(-5) nerved. Spikes 5-10 mm long, 5-8-flowered. Flowers greenish, ca 2 mm long. Drupelets ca 3 mm long, beaked.

RAIPUR, n.v. (*cf.* Unni in *J. Bombay nat. hist. Soc.* 64 : 100. 1967).

2. *P. mucronatus* Presl, Epimel. Bot. 245. 1851.

Perennial submerged aquatic herbs. Leaves all submerged, translucent, 5-10 cm long, 1-2 cm broad, with a rounded base and acute or

cuspidate tip ; petioles 1-2 cm long. Peduncle long, pinkish ; spike *ca* 3 cm long, many flowered. Sepals suborbicular, *ca* 2 mm across, greenish. Drupelets *ca* 3 mm long, shortly beaked.

In ponds ; 550 m.

Fl. & Fr. : June.

RAIPUR : Taurenga Deodarha.

3. *P. nodosus* Poir. Encycl. Suppl. 4 : 535. 1816. *P. indicus* Roxb. Fl. Ind. 1 : 471. 1820, *non* Roth, 1818.

Aquatic perennials with long slender stolons. Leaves mostly floating, some submerged ; floating leaves 3-8 × 2-3 cm, with 2-5 cm long petioles ; submerged leaves narrower and with shorter petioles. Spikes 3-4 cm long, peduncle pinkish. Flowers green ; sepals *ca* 2 mm long. Drupelets 3-4 mm long.

In ponds and rivers, in shallow water ; 300 - 600 m.

Fl. & Fr. : October - June.

RAIPUR : Kasdol, Taurenga.

4. *P. pectinatus* L. Sp. Pl. 127. 1753.

Slender profusely branched submerged aquatic perennials. Leaves narrowly linear or filiform, 2-10 cm long, with thickened inrolled margins. Spikes 5-20 mm long, interrupted, on a filiform peduncle. Drupelets obovoid, *ca* 4 mm long, ridged, shortly beaked.

In rivers, in shallow water ; 300 m.

Fl. & Fr. : January.

RAIPUR : Kasdol.

125. ERIOCAULACEAE

(D. M. Verma)

ERIOCAULON L.

- | | | |
|---|-----|----------------------|
| 1a. Anthers white or yellowish | ... | <i>E. cinereum</i> 2 |
| 1b. Anthers black. | | |
| 2a. Involucral bracts longer than the floral bracts, erect throughout | ... | <i>E. achiton</i> 1 |

- 2b. Involucral bracts shorter than the floral bracts, recurved or reflexed on maturity.
- 3a. Leaves usually more or less red. Involucral bracts about two - third as broad as long. Floral bracts cuspidate - acuminate ... *E. quinquangulare* 3
- 3b. Leaves always green. Involucral bracts about half or less as broad as long. Floral bracts obtuse or acute ... *E. solyanum* 4

1. *Eriocaulon achiton* Koern. in Linnaea 27 : 630. 1856.

Stemless herbs. Leaves rosulate, 1.5 - 2.0 cm long, ca 2 mm broad. Peduncles 3 - 7 cm long, ribbed. Heads subglobose, ca 2.5 mm broad; receptacle villous; involucral bracts ca 2 mm long, stramineus. Male flowers: sepals 2; petals obsolete. Female flowers: sepals 2; petals 2 - 3, narrowly oblanceolate, or absent.

Along drains; 450.

Fl. & Fr. : October.

RAIPUR : Chhoora.

2. *E. cinereum* R. Br. Prodr. 254. 1810. *E. sieboldianum* Sieb. & Zucc. ex Steud. Syn. Pl. 2 : 272. 1855.

Stemless herbs. Leaves rosulate, 3 - 6 cm long, 1.0 - 1.5 mm broad. Peduncles several, 5 - 12 cm long, 5 ribbed. Heads 2.5 - 3.5 mm broad; receptacle glabrous or sparsely hairy; floral bracts glabrous. Male flowers: sepals 3, connate or one free; petals minute. Female flowers: sepals and petals 2 - 3, subulate, or absent.

In moist to muddy places; 300 - 500 m.

Fl. & Fr. : September - November.

RAIPUR : Abhanpur, Gariaband, Saraipalli. RAJNANDGAON : Baghnadi, Deopura.

3. *E. quinquangulare* L. Sp. Pl. 129. 1753.

Stemless herbs. Leaves rosulate, 2 - 10 cm long, 2 - 5 mm broad, alongwith the sheaths, mostly entirely or partly red, sometimes entirely green. Peduncles twisted, ribbed, 5 - 27 cm long. Heads subglobose, 3 - 5 mm broad, rarely slightly elongated; receptacle villous; involucral bracts 1.5 - 2.0 mm long; floral bracts ciliate at the tip. Male flowers: sepals linear - oblanceolate, one petal larger than the others.

In drains and ditches; 400 - 600 m.

Fl. & Fr. : September - January.

RAIPUR : Dugli, Gariaband, Singhpur, Taurenga. RAJNANDGAON : Baghnadi.

4. *E. solyanum* Royle, Ill. 409. t. 97. f. 1. 1838. *E. trilobum* Buch. Ham. ex Hook. f. Fl. Brit. Ind. 6 : 583. 1893.

Stemless herbs. Leaves rosulate, 1-8 cm long, 1.5-6.0 mm broad. Peduncles one or several, 3-20 cm long. Heads 2.5-6.0 mm broad, receptacle villous; involucral bracts 2-4 mm long; floral bracts ciliate at the tip. Male flowers: calyx lobes ciliate; petals small. Female flowers: sepals oblanceolate, ciliate, at the tip; petals linear, ciliate.

In drains and ditches; 300-550 m.

Fl. & Fr.: October-January.

RAIPUR : Abhanpur, Dugli, Pithora, Singhpur, Sitanadi.
RAJNANDGAON : Deopura.

126. CYPERACEAE

(D. M. Verma & V. Chandra)

- 1a. Flowers unisexual; nuts enclosed within an utricle ... *Carex* 2
- 1b. Flowers unisexual or bisexual; nuts naked.
 - 2a. Nuts borne on a 3-lobed or band-like disk ... *Scleria* 10
 - 2b. Nuts without the above disk.
 - 3a. Perianth present.
 - 4a. Perianth of scales and bristles.
 - 5a. Inflorescence capitate; hypogynous scales 2, hyaline ... *Lipocarpha* 8
 - 5b. Inflorescence paniculate, hypogynous scales 3, thick ... *Fuirena* 6
 - 4b. Perianth of bristles only.
 - 6a. Inflorescence reduced to a solitary spikelet ... *Eleocharis* 4
 - 6b. Inflorescence anthelate ... *Scirpus* 9
 - 3b. Perianth absent.
 - 7a. Nuts crowned by the persistent style-base which is articulated with the nut proper ... *Bulbostylis* 1
 - 7b. Nuts not crowned by the persistent style-base; style-base continuous or articulated.

- 8a. Style articulated with the ovary, usually swollen at the base and usually fimbriate ... *Fimbristylis* 5
- 8b. Style continuous with the ovary, neither swollen nor fimbriate.

 - 9a. Glumes distichous ... *Cyperus* 3
 - 9b. Glumes spiral.

 - 10a. Inflorescence distinctly terminal, of sessile glomerules ... *Kyllingiella* 7
 - 10b. Inflorescence pseudo-lateral, spikelets capitate or anthelate ... *Scirpus* 9

1. BULBOSTYLYS Kunth

- 1a. Spikelets several together, congested in a head. Nuts smooth ... *B. barbata* 1
- 1b. Spikelets all solitary. Nuts transversely wrinkled ... *B. densa* 2

1. *Bulbostylis barbata* (Rottb.) Clarke in Hook. f. Fl. Brit. Ind. 6 : 651. 1893. *Scirpus barbatus* Rottb. Progr. 27. 1772. *Stenophyllum barbatus* Cooke, Fl. Pres. Bombay 2 : 887. 1908.

Tufted annuals, up to 20 cm high. Leaves short, filiform. Heads 5-18 mm across; spikelets ovate-oblong, 3-8 × 1.0-1.5 mm; glumes ovate, mucronulate, keeled. Stamen 1. Nuts broadly obovate, triquetrous, whitish to stramineous.

In wastelands ; 300-400 m.

Fl. & Fr. : August-May.

RAIPUR : Dhamtari, Raipur. RAJNANDGAON : Baghnadi.

2. *B. densa* (Wall.) Hand. Mazz. in Karsten & Schenk, Vegetationsb. 20. 7 : 16. 1930. *Scirpus densus* Wall. in Roxb. Fl. Ind. 1 : 231. 1820. *B. capillaris* var. *trifida* Clarke in Hook. f. Fl. Brit. Ind. 6 : 652. 1893.

Small filiform annuals. Anthela simple or subcompound, lax; spikelets oblong-ovate or oblong, 3-6 × 1.8-2.3 mm; glumes ovate, muticous, keeled. Stamens 2. Nuts obovate, triquetrous, stramineous.

In wastelands ; 300 m.

Fl. & Fr. : August.

RAIPUR : Raipur.

2. CAREX L.

1. a. Leaves all along the stem, 4 - 13 mm broad. Inflorescence paniculate. Utricles 1.5 - 2.0 mm long ... *C. cruciata* 1
 1b. Leaves basal, 2 - 8 mm broad. Inflorescence racemose. Utricles 3.5 - 4.0 mm long ... *C. speciosa* 2

1. *Carex cruciata* Wahlenb. in Vet. Akad. Handl. Stockh. 24 : 149. 1803. *C. condensata* Nees in Wt. Contr. Bot. Ind. 123. 1834. *C. cruciata* var. *argocarpus* Clarke in Hook. f. Fl. Brit. Ind. 6 : 715. 1894.

Perennials, 30 - 150 cm high. Panicles 15 - 45 (58) cm long ; spikelets sessile, androgynous, 6 - 15 mm long ; male part 3 - 7 × 1 mm ; female part 3 - 9 × 3 mm. Utricles subsessile, ellipsoid, ovoid oblong or subglobose, abruptly beaked. Nuts subsessile, ellipsoid, 1.5 - 2.0 mm long, blackish brown.

In sal & miscellaneous forests ; 450 - 500 m.

Fl. & Fr. : August - October.

RAIPUR : Sitanadi, Taurenga.

2. *C. speciosa* Kunth, Enum. 2 : 504. 1837.

Perennials, 5 - 55 cm high. Spikelets subsessile, androgynous, 1 - 2 cm long ; male parts 3 - 7 × 1.0 - 1.5 mm ; female parts 4 - 6 mm thick. Utricles subsessile, ellipsoid, subabruptly beaked. Nuts shortly stipitate, narrowly obovoid ellipsoid, 3.5 - 4.0 mm long, stramineous to ultimately brown.

In sal forests ; 400 - 450 m.

Fl. & Fr. : May - June.

RAIPUR : Khallari, Sitanadi.

3. CYPERUS L.

- 1a. Style 2 - fid. Nuts lenticular.
 2a. Inflorescence capitate of sessile glomerules ; each spikelet maturing a solitary nut.
 3a. Keel of the glume distinctly winged.
 4a. Keel of the glume with a broad hyaline, deeply lobed crest ... *C. metzii* 17
 4b. Keel of the glume with a spinulose crest ... *C. kyllingia* 16

- 3b. Keel of the glume not winged.
- 5a. Rhizome short. Heads usually three, rarely one or five. Stamens 2 ... *C. triceps* 31
- 5b. Rhizome horizontally creeping. Head solitary. Stamens 1 - 2(-3) ... *C. brevifolius* 3
- 2b. Inflorescence panicle or capitate, each spikelet maturing several nuts.
- 6a. Glumes mucronate.
- 7a. Robust perennials. Leaves flat, 6 - 16 mm broad. Glumes 5 - 7 - nerved ... *C. alopecuroides* 1
- 7b. Slender annuals. Leaves canaliculate, 1 - 2 mm broad. Glumes 3 - 5 - nerved.
- 8a. Inflorescence of dense glomerules contracted into a head ... *C. pygmaeus* 26
- 8b. Inflorescence a simple or subcompound anthela ... *C. pumilus* 25
- 6b. Glumes muticous.
- 9a. Nuts with transverse wavy lines ... *C. diaphanus* 9
- 9b. Nuts puncticulate or finely reticulate
- 10a. Glumes usually with a depression on each side; keel arcuate ... *C. sanguinolentus* 28
- 10b. Glumes without depression, keel straight ... *C. flavidus* 13
- 1b. Style 3 - fid. Nuts trigonal.
- 11a. Rhachilla of the spikelets caducous, the spikelets thus falling off as a whole along with the persistent glumes.
- 12a. Anthelas compound or decompound. Spikes globose.
- 13a. Spikelets linear-lanceolate, 6 - 16 mm long, each maturing 4 - 14 nuts ... *C. compactus* 5
- 13b. Spikelets elliptic-oblong, 3 - 4 mm long, each maturing 1 - 2 nuts ... *C. pseudokyllingioides* 24
- 12b. Anthelas simple. Spikes cylindrical ... *C. cyperoides* 8
- 11b. Rhachilla of the spikelets persistent, the glumes acropetally caducous.
- 14a. Nuts linear-oblong with almost parallel sides. Stamen 1 ... *C. castaneus* 4
- 14b. Nuts obovoid-oblong to subglobose. Stamens 1 - 3.
- 15a. Inflorescence capitate.

- 16a. Spikes globose ; glumes very small, up to 0.8 mm long, orbicular or broadly ovate ... *C. difformis* 10
- 16b. Spikes broadly ovoid ; glumes larger, 3 - 5 mm long, ovate or ovate-lanceolate.
- 17a. Spikelets green. Stigmas *ca* 0.5 mm long ... *C. compressus* 6
- 17b. Spikelets pale stramineous or almost white. Stigmas *ca* 2 mm long ... *C. niveus* 18
- 15b. Inflorescence anthelate with distinct rays.
- 18a. Spikelets spicate, the rachis several times longer than the spikelets.
- 19a. Glumes as broad as long.
- 20a. Rachis of the spike smooth ; keel 3 - 5 - nerved, smooth ... *C. iria* 15
- 20b. Rachis of the spike scabrid ; keel 7 - nerved, winged with serrate margins at the top ... *C. alutatus* 2
- 19b. Glumes about half or less as broad as long.
- 21a. Rachis hispidulous.
- 22a. Inflorescence simple or sub-compound. Spikelets 10 - 35 mm long. Nuts *ca* 1.5 mm long ... *C. procerus* 23
- 22b. Inflorescence compound. Spikelets 6 - 12 mm long. Nuts 1.0 - 1.2 mm long... *C. pilosus* 21
- 21b. Rachis glabrous.
- 23a. Spike penicillate, 2 - 5 mm broad with ascending spikelets ... *C. nutans* var. *eleusinoides* 19
- 23b. Spikes cylindrical, 10 - 15 mm broad with spreading spikelets ... *C. exaltatus* 12
- 18b. Spikelets digitate or very shortly spicate, the rachis obscure, or much shorter than to about as long as the spikelets.
- 24a. Nuts corky - thickened on angles ... *C. platystylis* 22

- 24b. Nuts not coky - thickended on angles.
- 25a. Spikelets digitate, 3 - 10 mm long.
- 26a. Rhachilla hidden by the ascending and appressed glumes ; glumes 1.0 - 1.5 mm long ... *C. halpan* 14
- 26b. Rhachilla visible between the widely spreading glumes ; glumes 0.7 - 1.0 mm long ... *C. tenuispica* 30
- 25b. Spikelets shortly spicate, 6 - 60 mm long.
- 27a. Anthelas simple ; glumes distinctly mucronate.
- 28a. Spikelets squarrose ; glumes ca 1.2 mm long ... *C. squarrosus* 29
- 28b. Spikelets not squarrose, glumes 3 - 4 mm long ... *C. compressus* 6
- 27b. Anthelas simple or compound ; glumes muticous or mucronulate.
- 29a. Stems stout, 4 - 8 mm thick in the middle. Leaves absent or solitary.
- 30a. Bracts all short, rarely as long as the anthela ... *C. corymbosus* 7
- 30b. Lower bracts much exceeding the anthela ... *C. pangorei*
- 29b. Stems slender to stout, 1 - 5 mm thick in the middle. Leaves two - several.
- 31a. Spikelets acicular, ca 1 mm broad ;

glumes 1.5 - 2.0 mm long	...	<i>C. distans</i> 11
31b. Spikelets compressed, <i>ca</i> 2 mm broad ; glumes 3.0 - 3.5 mm long	...	<i>C. rotundus</i> 27

1. *Cyperus alopecuroides* Rottb. Progr. 20. 1772. *Juncellus alopecuroides* Clarke in Hook. f. Fl. Brit. Ind. 6 : 595. 1893.

Stout perennials, up to 1 m high ; stem trigonous. Anthela compound or decompound, or sometimes contracted ; bracts foliaceous. Spikes digitate ; spikelets ovate or oblong lanceolate, 12-30 flowered, 4-6 mm long ; glumes ovate, apiculate, 5-7-nerved. Nuts lenticular, obovoid, apiculate, reddish brown, *ca* 1.5 × 1 mm.

Along drains ; 300-400 m.

Fl. & Fr. : September January.

RAIPUR : Raipur. RAJNANDGAON : Rajnandgaon.

2. *C. alulatus* Kern in Reinwardtia 1 (4) : 463. f. 1. 1952. *C. iria* sensu Clarke, Ill. Cyp. t. 14. 1909. *C. iria* var. *rectangularis* Kuekenth. Pflanzent. heft 101 : 152. 1935.

Annual herbs, up to 30 cm high. Leaves as long as or longer than the stem. Anthela simple or compound ; spikelets oblong, 3-7 × *ca* 2 mm ; glumes ovate, imbricate ; stamens 2. Nuts obovoid, apiculate, reddish-brown, *ca* 1 mm long.

In roadside ditches ; 400-500 m.

Fl. & Fr. : August May.

RAIPUR : Khallari, Sitanadi. RAJNANDGAON : Deopura.

3. *C. brevifolius* (Rottb.) Hassk. Cat. Hort. Bog. 24. 1844. *Kyllinga brevifolia* Rottb. Descr. & Ic. 13. t. 4. f. 3. 1773.

Perennials with long creeping sympodial rhizomes. Stems approximate to distant, up to 30 cm high. Leaves much shorter than to equalling the stem, 1-3 mm broad. Spikelets compressed, 2.5-3.5 × 1 mm ; glumes mucronulate, keeled. Nuts lenticular, obovate, apiculate, yellowish brown, *ca* 1 mm long.

In moist shady places ; 250-450 m.

Fl. & Fr. : September - April.

DURG : Durg. RAIPUR : Raipur. RAJNANDGAON : Baghnadi.

4. *C. castaneus* Willd. Sp. Pl. 1 : 278. 1797.

Annuals up to 15 cm high. Anthela usually simple, often reduced to a solitary head : spikelets linear oblong, *ca* 1.5 mm broad ; glume long spathulate, chestnut brown ; stamen 1. Nuts linear oblong with almost parallel sides, *ca* 1 mm long, castaneus.

In wastelands ; 350 m.

Fl. & Fr. : October.

RAIPUR : Pithora.

5. *C. compactus* Retz. Obs. 5 : 10. 1789. *Mariscus microcephalus* Presl, Rel. Haenk. 1 : 182. 1828.

Perennials, up to 80 cm high. Leaves septate - nodulose, 5-10 mm broad ; sheath spongy. Spikelets in numerous globose heads, linear lanceolate ; glumes oblong lanceolate, muticous, 3-4 mm long, brown. Stamens 3. Nuts oblong - linear, trigonous, 1.5-2 mm long, brown.

Along roadside drains ; 500 m.

Fl. & Fr. : October.

RAIPUR : Taurenga.

6. *C. compressus* L. Sp. Pl. 46. 1753.

Annuals, or sometimes perennials, 5-10 cm high. Anthela simple, lax ; spikelets linear or oblong, compressed, green ; glumes ovate, mucronate, strongly keeled, 3-4 \times *ca* 2 mm. Stamens 3. Nuts broadly obovoid, shortly apiculate, *ca* 1.5 \times 1.0 mm, dark brown to blackish.

In wastelands ; 300-500 m.

Fl. & Fr. : August-May.

RAIPUR : Dhamtari, Raipur. RAJNANDGAON : Deopura.

7. *C. corymbosus* Rottb. Descr. & Ic. 42. t. 7. f. 4. 1773.

Perennials, 0.5-1.0 m high. Stems faintly septate. Leaves absent or solitary. Anthela compound ; spikelets linear, subterete, 6-40 \times 1 mm ; glumes ovate oblong, obtuse, 3-5-nerved, 2.5-3.0 mm long. Nuts trigonous, *ca* 1.5 mm long, black.

RAIPUR, n.v. (*cf.* Unni in *J. Bombay nat. hist. Soc.* 64 : 100. 1967).

8. *C. cyperoides* (L.) Kuntze, Rev. Gen. Pl. 3, 2 : 333. 1898. *Scirpus cyperoides* L. Mant. 2 : 181. 1771. *Mariscus sieberianus* Nees ex Clarke in Hook. f. Fl. Brit. Ind. 6 : 622. 1893.

Perennials, 25 - 50 cm high with short branched rhizomes. Leaves 3 - 6 mm broad. Spikes sessile or subsessile, green, in terminal simple anthela; spikelets linear lanceolate, 3 - 5 mm long; glumes oblong-ovate, keel 3 nerved. Stamens 3. Nuts linear, slightly curved, apiculate, rufous to castaneous.

Along sal & miscellaneous forests, and wastelands; 300 - 600 m.

Fl. & Fr. : August - May.

RAIPUR : Balodabazar, Borai, Dhamtari. RAJNANDGAON : Baghnadi.

9. *C. diaphanus* Schrad. ex J.A. Schultes var. *latespicatus* (Boeck.) Kern in Steenis, Fl. Males. ser. 1. 7 (3) : 653. 1974. *C. latespicatus* Boeck. in Flora 42 : 441. 1859. *Pycreus latespicatus* Clarke in Hook. f. Fl. Brit. Ind. 6 : 590. 1893.

Annuals, 6 - 40 cm high. Anthela simple, contracted or evolute; spikelets 3 - 6 together, oblong lanceolate, 10 - 17 × 3 - 4 mm; glumes ovate oblong, muticous, castaneous or purplish, 2.5 - 3.5 mm long, keel 3 nerved. Stamens 2. Nuts stipitate, broadly obovoid, transversely undulately zonate, ca 1.5 mm long.

Along sal forests; 500 m.

Fl. & Fr. : October - January.

RAIPUR : Mainpur, Sitanadi.

10. *C. difformis* L. Cent. Pl. 2 : 6. 1756.

Annuals, 10 - 65 cm high with reddish roots. Leaves 2 - 5 mm broad. Anthela simple; spikes dense, globose; spikelets stellately spreading, linear oblong, glumes orbicular or broadly obovate, muticous, 3-nerved. Stamens (1) 2. Nuts obovoid, 0.5 - 0.8 mm long, stramineous or pale brown.

In moist depressions; 300 - 500 m.

Fl. & Fr. : April - May.

DURG : Durg. RAIPUR : Dhamtari, Sitanadi. RAJNANDGAON : Baghnadi.

11. *C. distans* L. f. Suppl. 103. 1781.

Perennials, up to 1 m high ; rhizome shortly creeping. Leaves shorter than to equalling the stem, 5-8 mm broad. Anthela compound or decom-pound ; spikelets linear, 6-60 mm long ; rhachilla winged ; glumes appressed, oblong ovate or elliptic, reddish brown. Stamens 3. Nuts ellipsoid, ca 1.5 × 0.5 mm, deep brown.

In stream beds ; 500 m.

Fl. & Fr. : August.

RAIPUR : Sitanadi.

12. *C. exaltatus* Retz. Obs. 5 : 11. 1789.

Perennials, up to 1.8 m high. Leaves 8-15 mm broad. Anthela compound or decom-pound ; spikes digitate, spikelets subdistichous, linear-lanceolate, 5-10 × 1.5-2.0 mm ; glumes ovate, mucronate, keeled. Stamens 3. Nuts ellipsoid, stipitate, 0.6-0.8 mm long, yellowish brown.

Along drains ; 450-800 m.

Fl. & Fr. : September - October.

RAIPUR : Mainpur. RAJNANDGAON : Chilpi, Rajnandgaon.

13. *C. flavidus* Retz. Obs. 5 : 13. 1789. *C. globosus* All. Fl. Pedem. 49. 1789 ; *non* Forsk. 1775. *Pycreus capillaris* Nees in Linnaea 9 : 283. 1834.

Annuals or sometimes perennials, up to 60 cm high. Leaves 1.2 mm broad. Anthela simple or decom-pound ; spikelets linear, 10-20 × 2 mm ; glumes oblong - ovate, keeled, 1.0-2.5 × 1.0-1.5 mm. Stamens 2. Nuts lenticular, oblong - obovate, 0.8-2.2 mm long, fuscous to dark castaneous.

Along ditches ; 350-450 m.

Fl. & Fr. : September - April.

DURG : Dondi, Rajolidih. RAJNANDGAON : Baghnadi.

14. *C. halpan* L. Sp. Pl. 45. 1753. ('haspan').

Perennials. Stems solitary or tufted, 8-70 cm high. Leaves 2-5 mm broad. Anthela compound or decom-pound ; spikelets stellately spreading, 5-10 × 1.0-1.5 mm ; glumes ovate oblong, muticous, keeled, 1.0-1.5 mm long, margins inrolled. Stamen 1. Nuts broadly ovoid, shortly apiculate, ca 0.5 mm long, granulate to verruculose, whitish.

In moist depressions ; 400-500 m.

Fl. & Fr. : September - January.

RAIPUR : Indagaon, Singhpur. RAJNANDGAON : Baghnadi.

15. *C. iria* L. Sp. Pl. 45. 1753.

Annuals, or rarely perennials, 5–50 (–80) cm high. Leaves shorter than to exceeding the stem, 3–8 mm broad. Anthela simple or compound; spikelets oblong, 3–8 × 1.5–2.0 mm; glumes broadly ovate, mucronulate, keel 3–5 nerved. Stamens 2–3. Nuts obovoid ellipsoid, stipitate, triquetrous, 1.0–1.5 mm long, dark brown to black.

In moist wastelands; 300–600 m.

Fl. & Fr.: August–April.

RAIPUR: Borai, Dhamtari, Raipur, Sankra, Sitanadi, Taurenga.
RAJNANDGAON: Deopura, Salewara.

16. *C. kyllingia* Endl. Cat. Hort. Ac. Vindob. 1: 94. 1842. *Kyllinga monocephala* Rottb. Descr. & Ic. 13. t. 4. f. 4. 1773. *K. nemoralis* (Forst.) Dandy ex Hutch. in Fl. West trop. Africa ed. 1, 2: 487. 1936. *Thyrocephalon nemorale* J. R. & G. Forst. Char. Gen. Pl. 130. 1776.

Perennials, 3–40 cm high. Leaves 2–5 mm broad. Inflorescence capitate; spikelets ovate elliptic, 3.0–3.5 × 1.5 mm; glumes red-dotted all over; keel winged in the upper half, wings denticulate-serrate. Stamens 3. Nuts lenticular, oblong, yellowish brown to castaneous, 1.0–1.5 mm long.

In sal forests; 600 m.

Fl. & Fr.: August.

RAIPUR: Borai.

17. *C. metzii* (Hochst. ex Steud.) Mattf. & Kuekenth. in Pflanzenrh. heft 101: 612. 1936. *Kyllinga metzii* Hochst. ex Steud. Syn. Cyp. 70. 1855. *K. squamulata* Thonn. ex Vahl, Enum. Pl. 2: 381. 1806.

Tufted annuals, up to 35 cm high. Leaves usually exceeding the stem, ca 2 mm broad. Inflorescence capitate; spikes 1–3; spikelets ca 2 mm long; glumes acute, keeled, keel winged by a broad hyaline incise toothed crest, ca 1 mm long. Nuts suborbicular, brown.

RAIPUR, n. v. (cf. D. K. Tiwari in Proc. 47th Ind. Sci. Congr. pt. 3: 408. 1960).

18. *C. niveus* Retz. Obs. 5: 12. 1788.

Perennials, up to 75 cm high. Leaves shorter than to equalling the stem, 1.5–2.5 mm broad. Inflorescence capitate; spikelets oblong elliptic, obtuse, 10–25 × 4–6 mm; glumes ovate lanceolate, mucronulate, 4–5 mm long. Stamens 3. Nuts subsessile, obovoid, ca 1.5 mm long, deep brown.

In sal and miscellaneous forests ; 450 - 500 m.

Fl. & Fr. : May.

RAIPUR : Khallari, Taurenga.

19. *C. nutans* Vahl var. *eleusinoides* (Kunth) Haines, Bot. Bihar & Orissa 5 : 898. 1924. *C. eleusinoides* Kunth, Enum. 2 : 39. 1837. *C. nutans* ssp. *eleusinoides* Koyama, Gardens Bull. Singapore, 30 : 136. 1977.

Perennials, 30 - 120 cm high. Leaves 6 - 15 mm broad. Anthela compound, lax ; spikelets few flowered, linear oblong, 5 - 8 × 1.5 - 2.0 mm ; glumes elliptic oblong, mucronate, 1.5 - 2.0 mm long. Stamens 3. Nuts obovoid, ca 1.5 mm long.

In stream beds ; 300 - 550 m.

Fl. & Fr. : August - January.

RAIPUR : Balodabazar, Sitanadi, Taurenga.

20. *C. pangorei* Rottb. Descr. & Ic. 3. t. 7. f. 3. 1773. *C. tegetum* Roxb. Fl. Ind. 1 : 208. 1832.

Perennials up to 1 m high. Leaves usually all reduced to bladeless sheaths, sometimes the upper one bearing a blade up to 20 cm long. Anthela compound or decompound ; spikelets linear, 12 - 28 × 2.5 - 3.0 mm ; glumes elliptic oblong, keeled, ca 3 mm long. Stamens 3. Nuts narrowly obovoid oblong, ca 1.5 mm long, blackish brown.

In stream beds ; 300 - 550 m.

Fl. & Fr. : September - April.

RAIPUR : Simga, Taurenga. RAJNANDGAON : Baghnadi.

21. *C. pilosus* Vahl, Enum. Pl. 2 : 354. 1806.

Perennials up to 1 m high. Leaves canaliculate, 4 - 10 mm broad. Anthela compound ; spikelets elliptic or linear lanceolate, compressed, 6 - 12 × 1.5 - 2.0 mm ; glumes ovate, muticous or mucronulate, 5 - 7-nerved. Stamens 3. Nuts obovoid or ellipsoid, stipitate, ca 1 mm long, blackish brown.

Along roadside drains ; 500 m.

Fl. & Fr. : October.

RAIPUR : Mainpur.

22. *C. platystylis* R. Br. Prodr. 214. 1810.

Perennial aquatic herbs with up to 1 m long floating stems. Leaves septate nodulose, ca 1 cm broad. Anthela compound or decompound; spikelets numerous, congested, ovate lanceolate, 5 - 20 mm long; glumes ca 2 mm long, mucronate. Nuts ellipsoid.

In tanks ; 300 m.

Fl. & Fr. : October.

RAIPUR : Raipur.

23. *C. procerus* Rottb. Descr. & Ic. 29. t. 5. f. 3. 1773.

Perennials up to 1.2 m high. Leaves canaliculate, 9 - 15 mm broad. Anthela simple or subcompound; spikelets oblong to broadly linear, 10 - 35 mm long; glumes ovate or elliptic, 2.5 - 3.0 mm long, ca 7 - nerved, reddish brown. Stamens 3. Nuts obovoid or ellipsoid, ca 1.5 mm long, blackish brown.

In low lying wastelands ; 400 m.

Fl. & Fr. : September.

RAJNANDGAON : Baghnadi.

24. *C. pseudokyllingioides* Kuekenth. in Engl. Pflanzenr. *hefi* 101 : 501. 1936. *Courtoisia cyperoides* Nees in Wt. Contr. 92. 1834.

Annuals, 8 - 50 cm high. Leaves equalling the stems, 1.5 - 4.0 mm broad. Anthela compound or decompound; spikes subglobose; spikelets elliptic - oblong, 3 - 4 × 1.2 - 1.5 mm; glumes elliptic, mucronate, keeled, 2.5 - 3.0 mm long. Stamens 3. Nuts fusiform, 2.3 - 2.7 mm long, deep brown.

In fallow fields ; 350 - 450 m.

Fl. & Fr. : September - January.

RAIPUR : Dhamtari, Dugli. RAJNANDGAON : Baghnadi.

25. *C. pumilus* L. Cent. Pl. 2 : 6. 1756. *Pycreus pumilus* Nees ex Clarke in Hook. f. Fl. Brit. Ind. 6 : 591. 1893, *quoad. basion.*, *excl. descr.* *P. nitens* Nees, Nov. Act. Nat. Cur. 19. Suppl. 1 : 53. 1843.

Annuals, 12 - 20 cm high. Leaves 1 - 2 mm broad. Anthela simple or sub-compound; spikelets oblong linear, strongly compressed, 8 - 30 - flowered, 5 - 10 × 1.5 - 2.5 mm; glumes ovate, 1.0 - 1.7 mm long, keel 3 - 5 nerved. Stamen usually 1, rarely 2. Nuts oblong - obovate, ca 0.5 mm long, shining brown to castaneous.

In wastelands ; 300 - 550 m.

Fl. & Fr. : August - April.

DURG : Talgaon. RAIPUR : Dhamtari, Raipur, Taurenga. RAJ-NANDGAON : Baghnadi.

26. *C. pygmaeus* Rottb. Descr. & Ic. 20, t. 14, f. 4 - 5. 1773. *Juncellus pygmaeus* Clarke in Hook. f. Fl. Brit. Ind. 6 : 596. 1893. *C. michelianus* ssp. *pygmaeus* Asch. & Graebn. Syn. 2, 2 : 273. 1903.

Tufted annuals, up to 25 cm high. Leaves 1 - 2 mm broad. Inflorescence capitate ; spikelets ovate to lanceolate, 10 - 20-flowered, 3 - 5 × 1.5 - 2.0 mm ; glumes lanceolate, keeled, 3 - 5 nerved, ca 2 mm long. Stamens 1 - 2. Nuts oblong, ca 1 mm long, pale brown.

In wastelands ; 300 - 400 m.

Fl. & Fr. : January - June.

RAIPUR : Dhamtari, Pithora.

27. *C. rotundus* L. Sp. Pl. 45. 1753. - 'Motha'.

Perennials, 10 - 40 cm high. Stolons with intermittent ellipsoid aromatic tubers. Stems compressed, trigonous. Leaves 2 - 5 mm broad. Anthela simple or compound : spikelets 10 - 35 × 1.5 - 2.0 mm, red-brown, often curved ; rhachilla winged ; glumes ovate, 3.0 - 3.5 mm long. Stamens 3. Nuts 1.5 - 1.7 mm long, blackish.

In moist wastelands ; 300 - 500 m.

Fl. & Fr. : August - May.

RAIPUR : Balodabazar, Dhamtari, Khallari, Raipur.

Tubers highly medicinal.

28. *C. sanguinolentus* Vahl ssp. *cryptostachys* (Miq.) Kern in Reinwardt. 3 : 57. 1954. *C. eragrostis* var. *cryptostachys* Miq. Fl. Ind. Bat. 3 : 257. 1856.

Annuals or perennials, up to 60 cm high. Leaves 2 - 4 mm broad. Inflorescence more or less open, or when capitate with many spikelets ; spikelets 2.2 - 2.5 mm broad, ovate or oblong-lanceolate ; glumes ovate, keeled, with a distinct depression on either sides, ferruginous, 1.5 - 2.0 mm long. Stamens 2. Nuts broadly obovate, ca 1 mm long, brown to blackish.

River banks ; 300 m.

Fl. & Fr. : October.

RAIPUR : Simga.

29. *C. squarrosus* L. Cent. Pl. 2 : 6. 1756. *C. aristatus* Rottb. Descr. Pl. Rar. Progr. 22. 1772. *Mariscus squarrosus* Clarke in Hook. f. Fl. Brit. Ind. 6 : 623. 1893.

Annuals, 1 - 10 cm high. Leaves 1 - 2 mm broad. Inflorescence usually reduced to a single hemispherical head ; spikelets oblong linear, strongly compressed, 5 - 15 × 3 - 4 mm ; glumes elliptic-ovate, 5 - 9-nerved, ferruginous to fuscous. Stamen 1. Nuts oblong obovoid to almost linear, stipitate, 0.5 - 1.0 mm long, greyish brown.

In wastelands ; 300 - 500 m.

Fl. & Fr. : August - May.

RAIPUR : Dhamtari, Raipur. RAJNANDGAON : Deopura.

30. *C. tenuispica* Steud. Syn. 2 : 11. 1855. *C. flavidus* auct., Clarke in J. Linn. Soc. (Bot.) 21 : 122. t. 3. f. 25. 1884 ; non Retz. 1789.

Annuals, 3 - 40 cm high. Leaves 2 - 4 mm broad. Anthela compound or decompound ; rays 2 - 10 ; spikelets linear oblong, compressed, 3 - 8 × 1.0 - 1.5 mm ; glumes laxly arranged, ovate, slightly keeled towards the tip, ca 1 mm long. Stamens 1 (- 2). Nuts broadly obovoid, stipitate, ca 0.5 mm long, tubercled, marble - white.

In ditches ; 450 m.

Fl. & Fr. : September.

RAJNANDGAON : Baghnadi.

31. *C. triceps* Endl. Cat. Hort. Ac. Vindob. 1 : 94. 1842. *Kyllinga triceps* Rottb. Descr. & Ic. 14. t. 4. f. 6. 1773.

Perennials, 5 - 40 cm high. Leaves 1-3 mm broad. Inflorescence capitate, of (1-) 3 (- 5) dense heads : central head sub-globose, 5 - 8 × 5 mm, lateral ones globose, somewhat smaller ; spikelets oblong, ca 2 mm long, pale green to whitish; glumes ovate oblong. Stamens 2. Nuts oblong, ca 1 mm long, yellowish brown.

In wastelands ; 300 - 650 m.

Fl. & Fr. : August - September.

RAIPUR : Boiai, Simga. RAJNANDGAON : Baghnadi.

4. ELEOCHARIS R. Br.

- 1a. Somewhat stout herbs with 2 - 10 mm thick stems. Spikelets about as thick as the stems, subcylindric ; glumes coriaceous.
- 2a. Stems terete, transversely septate. Nuts smooth ... *E. dulcis* 4
- 2b. Stems triquetrous, not septate. Nuts trabeculate.
- 3a. Perianth bristles 6 - 7 Nuts constricted below the apex into a short neck ... *E. acutangula* 1
- 3b. Perianth bristles 3 - 4. Nuts without neck ... *E. spiralis* 8
- 1b. Slender herbs with filiform, up to 1.5 mm thick stems. Spikelets markedly thicker than the stem, ovoid - oblong ; glumes membranous.
- 4a. Stigmas 2. Nuts lenticular.
- 5a. Spikelets 5 - 20 mm long. Nuts ca 1.5 mm long ... *E. palustris* 6
- 5b. Spikelets 3 - 5 mm long. Nuts ca 0.5 mm long.
- 6a. Glumes keeled. Bristles glistening white ... *E. atropurpurea* 2
- 6b. Glumes scarcely keeled. Bristles reddish - brown ... *E. geniculata* 5
- 4b. Stigmas 3. Nuts trigonous.
- 7a. Perianth bristles 4, Nuts ca 1.5 mm long ; style base 1.2 - 1.5 mm long ... *E. palustris* 6
- 7b. Perianth bristles 6. Nuts ca 1 mm long ; style base ca 0.3 mm long.
- 8a. Nuts cancellate ; style - base as broad as the nut... *E. retroflexa* 7
- 8b. Nuts smooth ; style - base narrow ... *E. congesta* 3

1. *Eleocharis acutangula* (Roxb.) Schult. in R. & S. Mant. 2 : 91. 1824. *Scirpus acutangulus* Roxb. Fl. Ind. 1 : 216. 1820. *E. fistulosa* Schult. in R. & S. Mant. 2 : 39. 1824.

Perennial, tufted, 30 - 70 cm high. Spikelet cylindrical, dusky green, 2.0 - 3.5 cm long ; glumes ovate, many - nerved, 4.2 - 4.5 × 2.2 - 3.2 mm. Perianth bristles 6 - 7, rusty brown. Stamens 2 - 3. Nuts obovate, 1.5 - 2.0 mm long, epidermal cells transversely oblong in ca 15 vertical rows on either face ; style - base ovate deltoid.

In marshy places ; 350 m.

Fl. & Fr. : October.

RAIPUR : Saraipalli.

2. *E. atropurpurea* (Retz.) Presl, Rel. Haenk. 1 : 196. 1828, excl. specim. cit. *Scirpus atropurpureus* Retz. Obs. 5 : 14. 1789.

Annuals, 4-15 cm high. Stems sulcate. Spikelets oblong ovoid, somewhat angular, 2-4 × 1.5-2.0 mm; glumes elliptic, keeled, sides purplish. Perianth bristles 3(-6), retrorsely scabrous or almost smooth, whitish; stamens 1-2. Nuts obovate, 0.5-0.6 mm long, shining black; style base disciform or depressed conical.

In wastelands; 300-600 m.

Fl. & Fr.: August-June.

RAIPUR: Dhamtari, Kasdol, Raipur, Taurenga. RAJNANDGAON: Baghnadi.

3. *E. congesta* D. Don, Prodr. 41. 1825; Kern in van Steenis, Fl. Males. ser. 1. 7(3) : 532. 1974. *E. afflata* Steud. Syn. 2 : 76. 1855. *E. subvivipara* Boeck. in Linnaea 36 : 424. 1870. *E. congesta* var. *subvivipara* Koyama in J. Fac. Sci. Univ. Tokyo III. 8 : 90. 1962. *E. chaetaria* var. *subvivipara* Fischer in Gamble, Fl. Pres. Madras 3 : 1648. 1931.

Annuals or perennials, very slender or stout, 5-40 cm high. Spikelets ovoid or lanceolate, 3-9 × 1.5-3.0 mm; glumes oblong, ovate to lanceolate scarcely keeled, pale ferruginous. Stamens 2(-3). Nuts obovoid 0.8-1.0 mm long, yellowish.

In marshy places; 450 m.

Fl. & Fr.: September.

RAJNANDGAON: Baghnadi.

4. *E. dulcis* (Burm. f.) Hensch. Vita Rumph. 186. 1833. *Andropogon dulce* Burm. f. Fl. Ind. 219. 1768. *E. plantaginea* R. & S. Syst. 2 : 150. 1817. *E. equisetina* Presl, Rel. Haenk. 1 : 195. 1828.

Perennials, up to 1 m high. Stems transversely septate. Spikelets cylindrical, 15-60 × 3-6 mm; glumes appressed, obovate oblong, many-nerved, 4.0-6.5 mm long. Perianth bristles 6-8, retrorsely scabrous, light brown; stamens 3. Nuts obovate, 1.5-2.0 × 1.2-1.5 mm, shining brown; style-base triangular.

In marshy places; 300-400 m.

Fl. & Fr.: October.

RAIPUR: Pithora, Sankra.

5. *E. geniculata* (L.) R. & S. Syst. 2 : 150. 1817. *Scirpus geniculatus* L. Sp. Pl. 48. 1753. *E. capitata* R. Br. Prodr. 225. 1810.

Annuals, 5-40 cm high. Spikelets oblong-ovoid, 4-8×3.0-3.5 mm; glumes broadly elliptic, scarcely keeled, 1-nerved, sides tinged with purple. Perianth bristles 6-8, ferruginous to brown; stamens 2-3. Nuts obovate, smooth, ca 1 mm long, shining black. Style-base conical.

In stream beds. 300-500 m.

Fl. & Fr. : January.

RAIPUR : Raipur, Sitanadi.

6. *E. palustris* (L.) R. Br. Prodr. 224. 1810. *Scirpus palustris* L. Sp. Pl. 47. 1753.

Perennials, 10-40 cm high. Spikelets ovoid or sub-cylindric, 5-20×3-5 mm; glumes ovate-lanceolate, muticous, 3-4 mm long. Perianth bristles 4, subequal; stamens 3 or sometimes 1-2. Nuts obovoid, smooth, 1.2-1.7 mm long, stramineous brownish, style-base oblong-conic, 1.2-1.5 mm long.

Along drains; 400 m.

Fl. & Fr. : April.

DURG : Talgaon.

7. *E. retroflexa* (Poir.). Urb. Symb. Ant. 165. 1900. *Scirpus retroflexus* Poir. in Lamk. Encycl. 6: 753. 1804. *E. chaetaria* R. & S. Syst. Veg. 2: 154. 1817.

Annuals, 5-20 cm high. Spikelets ovoid, 2.5-5×1.5-2.5 mm; glumes ovate, keeled, with green mid-rib and purplish sides. Perianth bristles 6, retrorsely scabrous, whitish or yellowish; stamens 3. Nuts obovoid, ca 1 mm long, stramineous, the surface cells subquadrate in 6-10 vertical rows on each face; style-base depressed-conic.

In ditches, 400 m.

Fl. & Fr. : May.

RAIPUR : Dokal.

8. *E. spiralis* (Rottb.) R. & S. Syst. 2: 155. 1817. *Scirpus spiralis* Rottb. Descr. & Ic. 45. t. 15. f. 1. 1773.

Perennials, 20-60 cm high. Spikelets cylindrical, terete, yellowish, 15-35×3-5 mm; glumes broadly cuneate-obovate, faintly many-nerved, stramineous to light brown. Perianth bristles 4-6, ferruginous; stamens 3. Nuts obovate, ca 1.5 mm long, stramineous to deep brown, epidermal cells in ca 20 vertical rows on each face; style-base triangular.

In wastelands ; 400 m.

Fl. & Fr. : September.

RAJNANDGAON : Deopura.

5. FIMBRISTYLIS Vahl

1a. Stigmas 2.

2a. Nuts linear with almost parallel sides ... *F. tetragona* 11

2b. Nuts obovoid or suborbicular.

3a. Leaves ligulate, ligule a fringe of short hairs.

4a. Inflorescence with 1 - 2(-3) spikelets. Nuts smooth ... *F. schoenoides* 10

4b. Inflorescence usually with several spikelets. Nuts trabeculate.

5a. Nuts 1.2 - 1.7 mm long, surface cells arranged in 12 - 16 vertical rows on each face ; anthers ca 0.7 mm long ...

F. alboviridis 2

5b. Nuts 0.6 - 1.2 mm long, surface cells arranged in 5 - 10 vertical rows on each face ; anthers 0.7 - 1.0 mm long.

6a. Spikelets angular, 1.0 - 1.5 mm broad ... *F. bisumbellata* 3

6b. Spikelets terete, 2.5 - 3.0 mm broad ... *F. dichotoma* 4

3b. Leaves eligulate ... *F. aestivalis* 1

1b. Stigmas 3.

7a. Glumes all spiral.

8a. Spikelets in clusters of 2 - 5, or sometimes a few solitary ... *F. falcata* 5

8b. Spikelets all solitary.

9a. Leaves equitant; laterally compressed ... *F. littoralis* 7

9b. Leaves not equitant, dorsoventrally flattened ... *F. millacea* 8

7b. Glumes lower distichous or subdistichous, upper spiral.

10a. Inflorescence of 1(-3) spikelets. Nuts 2 - 3 mm long... *F. ovata* 9

10b. Inflorescence of many spikelets. Nuts ca 1 mm long... *F. fusca* 6

1. *Fimbristylis aestivalis* (Retz.) Vahl, Enum. Pl. 2 : 288. 1806.
Scirpus aestivalis Retz. Obs. 4 : 12. 1786.

Annuals, 3-20 cm high. Stems angular. Leaves setaceous, up to 0.5 mm broad. Anthela compound, rarely simple; spikelets solitary, ovoid or oblong lanceolate, 3-7 × 1.0-1.5 mm; glumes ovate, mucronulate, 1.2-1.5 mm long, keel 3-nerved. Stamen 1. Nuts elliptic or obovate, ca 0.5 mm long, stramineus.

In wastelands; 350-450 m.

Fl. & Fr.: May-June.

RAIPUR: Dhamtari, Dokal, Gariaband, Pithora.

2. *F. alboviridis* Clarke in Hook. *f. Fl. Brit. Ind.* 6 : 638. 1893.

Annuals, 20-50 cm high. Stem obtusangular. Leaves 1-2 mm broad. Anthela simple or subcompound, loose; spikelets solitary, ovoid, 4-11 × 2.0-2.5 mm; glumes broadly ovate, muticous, ca 2 mm long. Stamen 1. Nuts obovate, ca 1 mm long, verruculose, stramineus, epidermal cells in 12-16 vertical rows on either face.

River-banks; 300 m.

Fl. & Fr.: October.

RAIPUR: Simga.

3. *F. bisumbellata* (Forsk.) Bub. Dodec. 30. 1850. *Scirpus bisumbellatus* Forsk. *Fl. Aeg. Arab.* 1 : 15. 1775. *F. dichotoma* auct., Clarke in Hook. *f. Fl. Brit. Ind.* 6 : 635. 1893; *non* Vahl, 1806.

Annuals, up to 25 cm high. Leaves flat, 1-2 mm broad. Anthela compound or decompound, loose; spikelets solitary, oblong obovoid, 3-8 mm long; glumes broadly ovate, mucronulate, sharply keeled, ca 1.5 mm long. Stamen 1. Nuts obovate, trabeculate, 0.4-0.7 mm long, stramineus, epidermal cells in 5-9 vertical rows on each face.

In wastelands; 300-350 m.

Fl. & Fr.: January-May.

DURG: Durg. RAIPUR: Dhamtari, Kasdol.

4. *F. dichotoma* (L.) Vahl, Enum. Pl. 2 : 287. 1806, *p. p.* *Scirpus dichotomus* L. Sp. Pl. 50. 1753. *F. diphyllea* Vahl, Enum. Pl. 2 : 289. 1806; Clarke in Hook. *f. Fl. Brit. Ind.* 6 : 636. 1893. *S. diphyllus* Retz. Observ. 5 : 15. 1789.

Annuals or perennials, 10-100 cm high. Leaves flat, 1.5-5.0 mm broad. Anthela simple or subcompound; spikelets ovoid, globose, terete, 5-11 × 2.5-3.0 mm; glumes broadly ovate, mucronulate, scarcely

keeled. Stamens 1 - 3. Nuts obovate, trabeculate with 5 - 10 longitudinal ribs on either face, whitish to stramineus, *ca* 1 mm long.

Along forests, cultivated fields & streams ; 300 - 800 m.

Fl. & Fr. : August April.

DURG : Durg. RAIPUR : Dhamtari, Raipur, Singhpur, Taurenga.
RAJNANDGAON : Baghnadi, Chilpi.

5. *F. falcata* (Vahl) Kunth, Enum. 2 : 239. 1837. *Scirpus falcatus* Vahl, Enum. Pl. 2 : 275. 1806. *F. junciformis* Kunth, Enum. 2 : 239. 1837.

Perennials with shortly creeping rhizome, 10 - 40 cm high. Leaves short, 1.5 - 3.0 mm broad. Anthela compound or decompound ; spikelets ovoid, angular, 3 - 6 mm long ; glumes broadly ovate, apiculate, keeled, 2.0 - 2.5 mm long. Stamens 3. Nuts obovoid, shortly stipitate, 0.8 - 1.0 mm long, verruculose to almost smooth, whitish or stramineus.

In wastelands ; 300 - 500 m.

Fl. & Fr. : August May.

RAIPUR : Khallari, Raipur.

6. *F. fusca* (Nees) Clarke in Hook. f. Fl. Brit. Ind. 6 : 649. 1893.
Abildgaardia fusca Nees in Wt. Contr. 95. 1834.

Perennials, 18 - 25 cm high. Leaves much shorter than the stems, 1 - 4 mm broad. Anthela compound to supradecomound ; spikelets solitary, lanceolate, 5 - 10 × 2.0 - 2.5 mm ; glumes lanceolate, 1 nerved, 4.0 - 6.5 × 2.0 - 2.5 mm ; stamens 3. Nuts obovoid, shortly stipitate, densely verruculose, whitish to brownish, *ca* 1 mm long.

Along streams ; 500 m.

Fl. & Fr. : May.

RAIPUR : Khallari.

7. *F. littoralis* Gaud. in Freyc. Voy. Bot. 413. 1826. *F. miliacea* Vahl, Enum. Pl. 2 : 287. 1806, *excl. basion.* ; Clarke in Hook. f. Fl. Brit. Ind. 6 : 644. 1893.

Annuals or perennials, 10 - 50 cm high. Leaves equitant, 1 - 3 mm broad. Anthela lax or rather dense, compound or decompound ; spikelets solitary, subglobose, 2 - 5 × 1.5 - 2.5 mm ; glumes ovate-oblong, muticous, 3-nerved, 1.0 - 1.5 mm long ; stamens 1 - 2. Nuts narrowly obovoid, shortly stipitate, *ca* 0.5 mm long, stramineus, verruculose, transversely lineolate.

Along ponds and streams ; 300 - 500 m.

Fl. & Fr. : September - April.

DURG : Durg. RAIPUR : Dhamtari. RAJNANDGAON : Baghnadi, Deopura, Salewara.

8. *F. miliacea* (L.) Vahl, Enum. Pl. 2 : 287. 1806, *quoad basion*. *Scirpus miliaceus* L. Syst. ed. 10, 868. 1759. *F. quinquangularis* Kunth, Enum. 2 : 229. 1837 ; Clarke in Hook. f. Fl. Brit. Ind. 6 : 644. 1893.

Annuals or perennials, 20 - 90 cm high. Leaves shorter than to equalling the stems, 2 - 3 mm broad. Anthela lax, compound or decom-pound ; spikelets all or nearly all solitary, oblong ovoid, 1.5 - 5.0 × 1 - 2 mm ; glumes ovate, mucronulate, 1 - 2 mm long ; stamens 1 - 2. Nuts broadly ellipsoid to subglobose, 0.4 - 0.8 × 0.3 - 0.5 mm, densely verruculose, minutely transversely lineolate by the transversely linear surface cells arranged in 4 - 6 vertical rows on either face, stramineus to pale brown.

River banks ; 300 m.

Fl. & Fr. : October.

RAIPUR : Simga.

9. *F. ovata* (Burm. f.) Kern in Blumea 15 : 126. 1967. *Carex ovata* Burm. f. Fl. Ind. 194. 1768. *F. monostachyos* Hassk. Pl. Rar. Jav. 61. 1848. ('*monostachya*').

Perennials, 10 - 40 cm high. Leaves one third to half as long as the stem, 0.5 - 1.0 mm broad. Anthela reduced to a solitary (- 3) spikelets ; spikelets ovate or ovate-lanceolate, 6 - 15 × 3 - 6 mm ; glumes broadly ovate, 4.5 - 6 mm long, stamens 2 - 3. Nuts obovoid, stipitate, 2 - 3 × 1.2 - 2.0 mm, tuberculate, yellowish-brown.

In sal forests and wastelands ; 300 - 500 m.

Fl. & Fr. : August - May.

RAIPUR : Balodabazar, Khallari, Raipur.

10. *F. schoenoides* (Retz.) Vahl, Enum. Pl. 2 : 285. 1806. *Scirpus schoenoides* Retz. Obs. 5 : 14. 1789.

Perennials, 10 - 50 cm high. Leaves 0.5 - 1.0 mm broad. Anthela simple or reduced to a solitary spikelet ; spikelets broadly ovoid, terete, 4 - 8 × 3.0 - 4.5 mm ; glumes broadly ovate or suborbicular, muticous or mucronulate, 2.5 - 3.3 mm long ; stamens 3 - 2. Nuts stipitate, obovoid, ca 1.5 mm long, stramineus.

Along roadside drains ; 300 - 450 m.

Fl. & Fr. : September - October.

RAIPUR : Dhamtari, Simga, RAJNANDGAON : Baghnadi, Salewara.

II. *F. tetragona* R. Br. Prodr. 226. 1810.

Annuals or perennials, 10 - 60 cm high. Leaves absent. Spikelets solitary, terminal, ovoid globose, terete, 6 - 18 × 4 - 6 mm ; glumes broadly ovate, 3 - 5 mm long ; stamens 1 - 2. Nuts long stipitate, linear oblong, 1.5 - 2.0 × 0.5 mm, stramineus, trabeculate due to surface cells being arranged in ca 9 vertical rows.

Along roadside drains ; 300 - 450 m.

Fl. & Fr. : August - October.

RAIPUR : Dhamtari, Pithora, Simga. RAJNANDGAON : Baghnadi.

6. *FUIRENA* Rottb.

Fuirena ciliaris (L.) Roxb. Fl. Ind. 1 : 184. 1820. *Scirpus ciliaris* L. Mant. 2 : 182. 1771. *F. glomerata* Lamk. Encycl. 1 : 150. 1791.

Annuals, 10 - 40 cm high. Leaves linear lanceolate, 3 - 8 mm broad, ciliate on the margins, 3 - 4 - nerved. Inflorescence of 1 - 2 clusters ; glumes obovate - oblong, 1.5 - 1.7 mm long, hairy. Perianth biserrate ; bristles scaberulous to almost smooth ; scales distinctly clawed, subquadrate, cordate or hastate at the base. Nuts stipitate, elliptic or obovate, ca 0.5 mm long, beaked.

Along streams & drains ; 350 - 500 m.

Fl. & Fr. : October - May.

DURG : Taigaon. RAIPUR : Dokal, Dugli, Pithora, Sitanadi.

7. *KYLLINGIELLA* R. Haines & K. Lye

Kyllingiella microcephala (Steud.) R. Haines & K. Lye in Bot. Not. 131 (1) : 176. 1978. *Kyllinga microcephala* Steud. in Flora 25 : 597. 1842. *Scirpus microcephalus* Dandy in Andrews, Fl. Pl. Sudan III : 366. 1956.

Isolepis kyllingioides A. Rich., Tent. Fl. Abyss. 2 : 502. 1851. *Scirpus kyllingioides* Boeck. in Linnaea 36 : 733. 1870.

Perennials, up to 15 cm high. Leaves *ca* 1 mm broad. Inflorescence a single head ; spikelets ovoid lanceolate ; glumes ovate - lanceolate to oblong - lanceolate, keeled, 3 - 5 nerved. Nuts obovoid oblong, minutely puncticulate.

In sal forests ; 600 m.

Fl. & Fr. : October.

RAIPUR : Borai.

8. LIPOCARPHA R. Br.

Lipocarpha chinensis (Osb.) Kern in Blumea Suppl. 4 : 167. 1958. *Scirpus chinensis* Osb. Dagb. Ostind. Resa 220. 1757. *L. argentea* R. Br. ex Nees in Linnaea 9 : 287. 1835.

Annuals or perennials, 20 - 50 cm high. Leaves usually much shorter than the stems, 2 - 4 mm broad. Spikelets 3 - 6, ovoid, terete, 5-8 mm long, congested into a head ; glumes spathulate, purplish lineolate, 1.8 - 2.8 mm long ; scales oblong, 5 - 7 nerved, 1.8 - 2.0 mm long. Stamens 1(- 2). Nuts oblong - obovate, 1.0 - 1.2 mm long, stramineous to fuscous.

In ditches ; 450 m.

Fl. & Fr. : September.

RAJNANDGAON : Salewara.

9. SCIRPUS L.

- | | |
|--|--------------------------|
| 1a. Spikelets squarrose by the recurved mucros of the glumes ; the mucro about as long as or longer than the main body ... | <i>S. squarrosum</i> 6 |
| 1b. Spikelets not squarrose ; the mucro absent, or if present then much smaller. | |
| 2a. Inflorescence subtended by several foliaceous bracts, not continuous with the stem. | |
| 3a. Leaves all clustered at the base ; glumes 2.2 - 3.0 mm long ... | <i>S. grossus</i> 2 |
| 3b. Leaves scattered all along the stem ; glumes 5 - 7 mm long ... | <i>S. maritimus</i> 5 |
| 2b. Inflorescence subtended by a single bract, similar to and continuous with the stem. | |
| 4a. Stem and bract transversely septate, flowering nearer to the base ... | <i>S. articulatus</i> 1 |
| 4b. Stem and bract not septate, flowering nearer to the top. | |
| 5a. Perianth - bristles present ... | <i>S. juncoides</i> 3 |
| 5b. Perianth - bristles absent ... | <i>S. lateriflorus</i> 4 |

1. *Scirpus articulatus* L. Sp. Pl. 47. 1753. *Schoenoplectus articulatus* Palla in Bot. Jahrb. 10 : 299. 1888.

Annuals or perennials, 5-35 cm high. Stems spongy, transversely septate. Leaves absent. Inflorescence capitate; spikelets ovoid-oblong, 8-17 × 4-5 mm; glumes broadly ovate to suborbicular, 3.5-5.0 mm long. Nuts obovoid, triquetrous, transversely wavy wrinkled, ca 1.5 × 1.0 mm.

In marshy places; 300-500 m.

Fl. & Fr.: September-June.

DURG: Budbhumi. RAIPUR: Dugli, Pithora, RAJNANDGAON: Baghnadi.

2. *S. grossus* L. f. Suppl. 104. 1781. *S. kysor* Roxb. Fl. Ind. 1: 230. 1832. *S. grossus* var. *kysor* Clarke in Hook. f. Fl. Brit. Ind. 6: 660. 1893.

Perennials, up to 2 m high. Stems triquetrous below, almost 3-winged above. Leaves clustered at the base, 7-30 mm broad. Anthela compound to supradecomound; spikelets ovoid-oblong, 4-10 × 2.7-3.5 mm; glumes ovate, 2.2-3.0 mm long; bristles 3-6, unequal, plumose when young, sparsely retrorsely scabrid on maturity. Nuts oblong-obvoid, 1.2-1.7 mm long.

RAIPUR, n.v. (cf. Tiwari & Maheshwari in Ind. For. 90: 624. 1964).

3. *S. juncoides* Roxb. Fl. Ind. 1: 218. 1820. *S. erectus* auct., Clarke in Hook. f. Fl. Brit. Ind. 6: 656. 1893; non Poir. 1829. *Schoenoplectus juncoides* Palla, Bot. Jahrb. Syst. 10: 229. 1888.

Perennials or annuals, up to 80 cm high. Leaves absent. Inflorescence capitate; spikelets ovoid-oblong, 7-18 × 5.0-6.5 mm; glumes broadly ovate to suborbicular, mucronate, 3-4 mm long. Perianth-bristles 5-6, unequal, retrorsely scabrid; stamens 3-2. Nuts broadly obovate, apiculate, faintly transversely wavy wrinkled, 1.7-2.2 mm long.

In shallow water; 350 m.

Fl. & Fr.: April.

DURG: Durg.

4. *S. lateriflorus* Gmel. Syst. Veg. 1: 127. 1791. *S. supinus* var. *uninodis* Clarke in Hook. f. Fl. Brit. Ind. 6: 656. 1893. *Schoenoplectus lateriflorus* Lye in Bot. Not. 124: 290. 1971.

Annuals, up to 35 cm high. Leaves absent. Inflorescence capitate; spikelets oblong-obvoid, 5-10 mm long, ca 2.5 mm broad; glumes ovate, mucronate, 2.0-2.5 mm long, stramineous with purplish dots along the midrib; perianth absent; stamens 3. Nuts obovate, compressed trigonous, transversely wavy wrinkled, 1.2-1.4 mm long.

In shallow water; 250-450 m.

Fl. & Fr. : throughout the year.

DURG ; Talgaon. RAIPUR : Dhamtari, Kasdol. RAJNAND-GAON : Baghnadi.

5. *S. maritimus* L. Sp. Pl. 51. 1753.

Perennials, 0.3 - 2.0 m high. Leaves up to 12 mm broad. Anthela usually simple or compound, sometimes almost capitate bearing few spikelets ; spikelets solitary or in clusters of 3 - 8, ovoid oblong, 10 - 15 (-40) × 4 - 7 mm ; glumes ovate, awned, 5 - 7 mm long. Perianth-bristles (0 -) 3 - 6, unequal, retrorsely scabrid. Nuts narrowly obovoid, 2.5 - 3.5 mm long, beaked, smooth.

River banks ; 300 m.

Fl. & Fr. : June.

RAIPUR : Kasdol.

6. *S. squarrosus* L. Mant. 2 : 181. 1771. *Rikliella squarrosa* Raynal in Adansonia ser. 2, 13 : 154. 1973.

Annuals, 5 - 30 cm high. Leaves flat, 0.5 - 1.0 mm broad. Inflorescence capitate, pseudolateral ; spikelets oblong, 3 - 7 × 3 mm, squarrose ; glumes obovate rhomboid, aristate, 1.0 - 1.2 mm long. Perianth absent ; stamens 1 (- 2). Nuts obovate or oblong obovate, apiculate, ca 0.5 mm long.

In moist depressions ; 350 - 450 m.

Fl. & Fr. : January - May.

RAIPUR : Dhamtari, Sitanadi.

10. *SCLERIA* Berg.

1a. Inflorescence spiciform, unbranched	...	<i>S. pergracilis</i> 4
1b. Inflorescence paniculate.		
2a. Nuts cancellate, beaked	...	<i>S. biflora</i> 1
2b. Nuts neither cancellate nor beaked.		
3a. Nut disk broad, 3 - lobed	...	<i>S. levigata</i> 2
3b. Nut disk a narrow ring	...	<i>S. lithosperma</i> 3

1. *Scleria biflora* Roxb. Fl. Ind. 3 : 573. 1832.

Annuals, 15 - 75 cm high. Leaves 3 - 8 mm broad. Panicles 2 - 4 ;

spikelets unisexual or sometimes male and bisexual ; males linear lanceolate, ca 3 mm long, females obovoid, ca 4.5 mm long ; glumes ovate, mucronulate. Nuts globose, cancellate, beaked, 2.0 - 2.5 mm broad ; disk lobes lanceolate, reaching half the nut.

In miscellaneous forests ; 400 m.

Fl. & Fr. : September.

RAJNANDGAON : Baghnadi.

2. *S. levis* Retz. Obs. 4 : 13. 1786. *S. hebecarpa* Nees in Wt. Contr. 117. 1834. *S. hebecarpa* var. *pubescens* Clarke in Hook. f. Fl. Brit. Ind. 6 : 689. 1894.

Perennials, 30 - 100 cm high. Leaves 3 - 8 mm broad. Panicles 2 - 3 ; spikelets unisexual, in clusters of 2 - 4 ; males lanceolate, 3 - 4 mm long, females ovate, 4 - 6 mm long ; glumes ovate, 3.5 - 4.0 mm. long. Nuts ovoid globose, apiculate, 2.0 - 2.5 mm long, smooth or slightly rugulose, pubescent ; disk lobes often bidentate at the top.

In sal forests ; 500 m.

Fl. & Fr. : October.

RAIPUR : Taurenga.

3. *S. lithosperma* (L.) Sw. Prodr. 18. 1788. *Scirpus lithospermus* L. Sp. Pl. 51. 1753.

Perennials, 40 - 90 cm high. Leaves often somewhat aggregated towards the middle, 1 - 4 mm broad. Inflorescence paniculate ; spikelets bisexual, solitary or in clusters of 2 - 3 ; stamens 1 (-2). Nuts ovoid to oblong - ovoid, obtusely trigonous, 2.0 - 2.5 \times 1.5 - 2.0 mm, smooth, shining ; disk reduced to a narrow minutely glandular ring.

In sal forests ; 500 m.

Fl. & Fr. : October.

RAIPUR : Taurenga.

4. *S. pergracilis* (Nees) Kunth, Enum. 2 : 354. 1837. *Hypoporum pergracile* Nees, Edinb. New Phil. Journ. 17. n. 34 : 267. 1834.

Annuals, 25 - 50 cm high. Leaves narrowly linear, 0.5 - 2.0 mm broad. Inflorescence linear, spiciform unbranched ; spikelets bisexual, obovate, 2.5 - 3.0 mm long ; glumes oblong obovate, acute, keeled ; stamens 2. Nuts obovoid, subterete, apiculate, lacuno rugose, white ; disk obsolete.

RAIPUR, Lawrie (DD).

127. POACEAE

(GRAMINEAE)

(D. M. Verma)

- 1a. Tall arborescent or shrubby plants. Culms woody. Leaves with a pseudo - petiole articulated with the sheath. Spikelets mostly arranged in head - like alternate clusters along branches of pseudo - inflorescence.
- 2a. Spikelets falling off as a whole ; rhachilla internodes very short, not disarticulating ; lemmas successively longer upwards ... *Dendrocalamus* 19
- 2b. Spikelets not falling off as a whole but breaking up at maturity ; rhachilla internodes up to half the length of the lemma, promptly disarticulating ; lemmas all subequal ... *Bambusa* 7
- 1b. Usually herbaceous plants, sometimes tall reed - like. Culms not woody. Leaves neither with a pseudo - petiole nor articulated with the sheath. Spikelets not arranged as above.
- 3a. Spikelets two - flowered, falling entire at maturity, with the upper floret bisexual and the lower male or barren.
- 4a. Spikelets unisexual ; female spikelets enclosed in a hardened glossy fruit - case.
- 5a. Fruit - case formed by leaf - sheath ... *Cox* 15
- 5b. Fruit - case formed mainly by lower glume and to a small extent by the internode of the rhachis ... *Chionachne* 12
- 4b. Spikelets bisexual, or if unisexual then the female spikelet not enclosed in a fruit - case.
- 6a. Spikelets usually in pairs with one sessile and the other pedicelled, those of each pair usually dissimilar (the pedicelled sometimes much reduced), rarely solitary and all alike ; glumes as long as the spikelet and enclosing the florets, more or less rigid and firmer than the hyaline lemmas, upper lemma often awned.
- 7a. Spikelets solitary ... *Dimeria* 23
- 7b. Spikelets in pairs, one sessile and the other pedicelled, or one short - and the other long - pedicelled (sometimes the pedicelled reduced to scale),

- 8a. Pedicels and rhachis internodes stout, 3 - angled, rounded or flattened and thickening upwards ; upper lemma awnless.
- 9a. Sessile spikelet spherical ... *Hackelochloa* 33
- 9b. Sessile spikelet not spherical.
- 10a. Sessile spikelets broadly winged on the keels of the lower glume ... *Manisuris* 44
- 10b. Sessile spikelets not winged as above.
- 11a. Axis of the spikes tough, not breaking up ... *Hemarthria* 34
- 11b. Axis of the spikes, fragile, breaking up on maturity.
- 12a. Sessile spikelets in pairs at each node of the axis ... *Mnesithea* 46
- 12b. Sessile spikelets solitary at each node of the axis.
- 13a. Spikelets in pairs, one sessile and the other pedicelled ... *Rottboellia* 59
- 13b. Spikelets solitary, sessile, the pedicelled spikelet suppressed or rudimentary with the pedicels fused to the internodes ... *Ophiuros* 47
- 8b. Pedicels and rhachis internodes slender, filiform or linear, if thickened upwards then with the upper lemma awned.
- 14a. Spikelets of each pair alike, the sessile and the pedicelled both bisexual.
- 15a. Spikelets in silky panicles, arranged along a central axis, often contracted and spike-like.
- 16a. Culms 0.1 - 1.2 m high. Panicle spike-like, its numerous primary branches bearing very short secondary racemes ; raceme rhachis not breaking up at maturity ... *Imperata* 38
- 16b. Culms 2 - 4 m high. Panicle rather open, racemes flexuous, 3 - 15 cm long, many crowded upon the primary panicle branches or borne directly on the main axis ; raceme rhachis breaking up at maturity ... *Saccharum* 60
- 15b. Spikelets in distinct racemes, these solitary or several and digitate or subdigitate.
- 17a. Raceme solitary ... *Polygonatherum* 57
- 17b. Racemes two or more.

- 18a. Upper lemma deeply bifid at the apex ; lower glume flat with inflexed margins ... *Eulalia* 31
- 18b. Upper lemma scarcely notched at the apex ; lower glume convex ... *Eulaliopsis* 32
- 14b. Spikelets of each pair different, the sessile bisexual, the pedicelled male or sterile, sometimes the pedicelled much reduced or suppressed.
- 19a. Racemes arranged in a panicle with its common axis longer than the lowest raceme, not supported by spathes.
- 20a. Sessile spikelet dorsally compressed.
- 21a. Pedicels and rhachis internodes with a translucent median line ... *Capillipedium* 10
- 21b. Pedicels and rhachis internodes solid ... *Sorghum* 66
- 20b. Sessile spikelet laterally compressed or terete.
- 22a. Racemes reduced to one sessile and two pedicelled spikelets, rarely with one or two additional pairs below ... *Chrysopogon* 14
- 22b. Racemes composed of many pairs of spikelets ... *Vetiveria* 73
- 19b. Racemes solitary, paired or sub-digitate, often supported by spathes.
- 23a. Fertile lemma awned from low down on the back ... *Arthraxon* 5
- 23b. Fertile lemma awned from the tip or from the sinus of the 2 - lobed tip, or awnless.
- 24a. Inflorescence a short (up to 3 cm long) one - few - noded condensed raceme of 3 - 11 spikelets ; inflorescences usually combined into a leafy pseudo - inflorescence consisting of many racemes.
- 25a. Raceme of three spikelets, articulated with a short peduncle ; one spikelet sessile, bisexual ; two spikelets pedicelled, of which one is rudimentary and one male or bisexual ... *Apluda* 3
- 25b. Raceme not as above, of 7 - 11 spikelets of which lower 4 form a kind of involucre.

- 26a. Raceme falling off as a whole ; fertile spikelet neither with indurated nor with pungent base ... *Iseilema* 41
- 26b. Raceme not falling off as a whole, the involucral spikelets persistent ; fertile spikelet with sharp or indurated bearded base ... *Themeda* 69
- 24b. Inflorescence not as above.
- 27a. Inflorescence of a solitary spike or raceme.
- 28a. Upper glume of the sessile spikelet with 7 - 12 mm long awn ... *Sekima* 64
- 28b. Upper glume of the sessile spikelet awnless or with short awn.
- 29a. Awn of the upper lemma of the sessile spikelets 6 - 12 cm long ... *Heteropogon* 35
- 29b. Awn of the upper lemma of the sessile spikelets absent, or up to 3 cm long.
- 30a. Lower one several sessile spikelets awnless ; upper lemma of the higher sessile spikelets consisting of an awn with a stipe-like base (body of the lemma) ... *Dichanthium* 21
- 30b. All the sessile spikelets awned ; upper lemma of the sessile spikelets consisting of an awn with 2 - lobed base (body of the lemma) ... *Schizachyrium* 62
- 27b. Inflorescence of two or more spikes or racemes.
- 31a. Inflorescence of two short racemes inside a spathe-like leaf ; inflorescences united into leafy panicles ... *Cymbopogon* 16
- 31b. Inflorescence not as above.
- 32a. Pedicelled ; spikelet reduced to a stipesessile spikelet awned ; lower glumes transversely ribbed ... *Thelepogon* 68
- 32b. Spikelets not as above.
- 33a. Joints of the rhachis and pedicels of the pedicelled spikelets stout, more or less triquetrous ... *Ischaemum* 40
- 33b. Joints of the rhachis and pedicels of the pedicelled spikelets capillary.

- 34a. Pedicels and rhachis internodes with a translucent median line ... *Bothriochloa* 8
- 34b. Pedicels and rhachis internodes solid ... *Dichanthium* 21
- 6b. Spikelets usually solitary, rarely paired, all more or less similar; glumes usually membranous, the lower mostly smaller or sometimes suppressed; lower lemma mostly resembling the upper glume in texture, upper lemma papery to very tough and rigid, usually awnless.
- 35a. Spikelets all or some of them subtended by one - many bristles or spines.
- 36a. Bristles persisting on the axis after the spikelets have fallen ... *Setaria* 65
- 36b. Bristles or spines falling with the spikelets.
- 37a. Bristle solitary, formed by the prolongation of the branch beyond the terminal spikelet ... *Pseudoraphis* 57
- 37b. Bristles or spines numerous, formed by modified branchlets.
- 38a. Bristles united at the base into a hard cup ... *Cenchrus* 11
- 38b. Bristles free to the base ... *Pennisetum* 54
- 35b. Spikelets not subtended by bristles or spines.
- 39a. Inflorescence a panicle, open, or contracted and spike - like.
- 40a. Inflorescence an open elliptic - ovoid panicle ... *Panicum* 51
- 40b. Inflorescence a cylindrical spike - like panicle.
- 41a. Spikelets more or less gibbous; upper lemma and palea indurated and closed at the apex ... *Sacciolepis* 61
- 41b. Spikelets lanceolate; upper lemma and palea membranous, gaping at the apex ... *Hymenachne* 37
- 39b. Inflorescence consisting of one - sided spikes or racemes, these digitate or scattered, sometimes solitary; the racemes sometimes with short secondary branchlets (*Echinochloa* spp.)
- 42a. Upper lemma chartaceous or cartilaginous, usually flat with hyaline margins.
- 43a. Spikelets awned ... *Alloteropsis* 2
- 43b. Spikelets not awned ... *Digitaria* 22

- 42b Upper lemma crustaceous or coriaceous, usually with narrow inrolled margins clasping the edge of the palea.
- 44a. Spikelets with a bead - like swelling at its base ... *Eriochloa* 30
- 44b. Spikelets passing smoothly into the pedicel without a bead - like swelling.
- 45a. Lower glume present.
- 46a. Lower glume turned towards the rhachis, the back of the upper lemma turned away from it, hence, the spikelets adaxial ... *Brachiaria* 9
- 46b. Lower glume turned away from the rhachis, the back of the upper lemma facing it, hence, the spikelets abaxial.
- 47a. Glumes acuminate or awned, rarely acute ; upper lemma not mucronate.
- 48a. Leaves linear ... *Echinochloa* 25
- 48b. Leaves ovate - lanceolate ... *Oplismenus* 48
- 47b. Glumes not awned, if acuminate then the upper lemma mucronate.
- 49a. Upper lemma mucronate ... *Urochloa* 72
- 49b. Upper lemma acute ... *Paspalidium* 52
- 45b. Lower glume absent ... *Paspalum* 53
- 3b. Spikelets one - many - flowered, breaking up at maturity above the more or less persistent glumes, or if falling entire then the spikelets neither two-flowered nor with the upper floret bisexual and the lower male or barren.
- 50a. Spikelets containing one fertile floret with or without 1 - 2 male or barren florets.
- 51a. Glumes very minute or suppressed.
- 52a. Aquatic free floating grasses. Leaves ovate - oblong ; sheaths inflated ... *Hygroryza* 36
- 52b. Terrestrial or aquatic attached grasses. Leaves linear ; sheaths not inflated.
- 53a. Tips of the pedicel with two minute lips. Fertile lemma supported by two empty scales ... *Oryza* 50
- 53b. Tips of the pedicel without lips. Fertile lemma not supported by scales ... *Leersia* 42

- 51b. Glumes usually well - developed.
- 54a. Spikelets falling entire at maturity, either singly or in clusters.
- 55a. Spikelets awned ... *Perotis* 55
- 55b. Spikelets not awned ... *Tragus* 71
- 54b. Spikelets breaking up at maturity above the persistent glumes.
- 56a. Inflorescence of one or more racemes or spikes.
- 57a. Inflorescence of pedunculate groups of spikelets secund and distant on a tough solitary axis ... *Melanocenchrus* 45
- 57b. Inflorescence not as above ; spikelets subsessile, biseriate.
- 58a. Spikelets more or less sunk in the rachis *Oropetium* 49
- 58b. Spikelets not sunk in the rachis.
- 59a. Lemmas awned.
- 60a. Spikelets 1 - flowered ... *Schoenfeldia* 63
- 60b. Spikelets 2 - 4 - flowered ... *Chloris* 13
- 59b. Lemmas not awned ... *Cynodon* 17
- 56b. Inflorescence a panicle, sometimes contracted and spikelike.
- 61a. Spikelets 1 - flowered.
- 62a. Lemmas bearing a 3 - branched awn ... *Aristida* 4
- 62b. Lemmas not awned ... *Sporobolus* 67
- 61b. Spikelets 2 - 3-flowered, the lower 1 - 2 florets may be reduced to minute chaffy scales at the base of the fertile lemma.
- 63a. Tall reed - like grasses with 1.5 - 3.5 m high culms. Spikelets small, 1.2 - 1.8 mm long ; rhachilla produced beyond the upper floret ... *Thysanolaena* 70
- 63b. Slender grasses with 0.1 - 1.0 m high culms. Spikelets large, 4 - 14 mm long ; rhachilla not produced beyond the upper floret ... *Arundinella* 6
- 50b. Spikelets containing two or more fertile florets.
- 64a. Tall reed - like grasses with large plumose panicles ... *Phragmites* 56
- 64b. Slender grasses without large plumose panicles.
- 65a. Spikelets two flowered ; lemmas hardened or leathery, not awned ... *Isachne* 39
- 65b. Spikelets nearly always three - or more - flowered ; lemmas membranous or awned.

- 66a. Lemmas 2 - toothed at the apex, hairy along the nerves ... *Leptochloa* 43
- 66b. Lemmas entire at the apex, or if 2 - toothed (*Acrachne*) then glabrous along the side nerves.
- 67a. Spikelets in dense globose clusters, awned ... *Elytrophorus* 27
- 67b. Spikelets not in globose clusters ; awned or awnless.
- 68a. Glumes aristate ; spikelets sessile on the flattened branches of a narrow panicle ... *Dinebra* 24
- 68b. Glumes obtuse, acute or acuminate, or if aristate then the spikelets in solitary or more and digitate spikes.
- 69a. Spikelets in open, contracted or spike - like panicles, rarely in solitary secund spike (*Eragrostiella*).
 70a. Inflorescence a panicle, sometimes spike-like ... *Eragrostis* 29
- 70b. Inflorescence a solitary secund spike ... *Eragrostiella* 28
- 69b. Spikelets sessile or very shortly pedicelled, loosely to densely imbricate in digitate or racemose arranged spikes or spike - like racemes, rarely in solitary spikes (*Dactyloctenium*, *Eleusine*).
 71a. Inflorescence of numerous spikes crowded into a long narrow dense panicle ; spikelets falling entire at maturity ... *Desmostachya* 20
- 71b. Inflorescence not as above ; spikelets breaking at maturity.
- 72a. Rhachis of the spike terminating in a sharp point ... *Dactyloctenium* 18
- 72b. Rhachis of the spike terminating in a spikelet.
- 73a. Lemmas toothed at the apex by the excurrent nerves ... *Acrachne* 1
- 73b. Lemmas entire at the apex ... *Eleusine* 26

1. ACRACHNE Chiov.

Acraчhne racemosa (Heyne ex R. & S.) Ohwi in Bull. Tokyo Sci. Mus. no. 18 : 1. 1947. *Eleusine racemosa* Heyne ex R. & S. Syst. 2 : 583. 1817. *E. verticillata* Roxb. Fl. Ind. I : 346. 1820.

Annual, tufted, erect or ascending, 20 - 70 cm high. Spikes digitate or subdigitate, secund, 2 - 10 cm long ; spikelets closely imbricating, 6 - 10 mm long, 6 - 15 flowered ; glumes unequal, 1 - 3 mm long, lower acute - mucronate, upper acuminate awned.

Common in cultivated fields ; 450 m.

Fl. & Fr. : June.

RAIPUR : Gariaband.

Reported to be a good fodder grass.

2. ALLOTEROPSIS Presl

Alloteropsis cimicina (L.) Stapf in Prain, Fl. Trop. Afr. 9 : 487. 1919. *Milium cimicinum* L. Mant. 2 : 184. 1771. *Axonopus cimicinus* P. Beauv. Ess. Agrost. 154, 167. 1812.

Annual, hairy, erect or ascending, 20 - 80 cm high. Leaves ovate-lanceolate, 3 - 15 cm long, 5 - 15 mm broad with somewhat amplexicaul base and tuberculate hairy margins. Racemes several, usually whorled. Spikelets 4 - 5 mm long ; upper glume ciliate margined ; palea papillose.

In wastelands and along cultivated fields ; 400 - 500 m.

Fl. & Fr. : August - September.

DURG : Balod. RAIPUR : Sitanadi. RAJNANDGAON : Baghnadi.

3. APLUDA L.

Apluda mutica L. Sp. Pl. 82. 1753. *A. aristata* L. Amoen. Acad. 4 : 303. 1756. *A. varia* Hack. in DC. Monogr. Phan. 6 : 197. 1889.

Perennial, rather slender, 40-130 cm high, rooting at the lower nodes. Each raceme enclosed within a spatheole, and many such racemes together forming a 5-30 cm long interrupted pseudo panicle; raceme comprising of one sessile and two pedicelled spikelets, sessile spikelet 3-5 mm long, with its upper lemma awned or not.

In wastelands & forest margins ; 350-600 m.

Fl. & Fr. : September-June.

RAIPUR : Borai, Pithora, Sitanadi. RAJNANDGAON : Deopura.

4. ARISTIDA L.

- 1a. Lateral awns much reduced and of a different texture from the central awn, or absent ... *A. redacta* 2
- 1b. Lateral awns well developed, of the same texture as the central awn.
 - 2a. Glumes long awned, the awn 3-5 mm long ... *A. setacea* 3
 - 2b. Glumes shortly awned, the awn at the most 2 mm long ... *A. adscensionis* 1

1. *Aristida adscensionis* L. Sp. Pl. 82. 1753.

Tufted annuals or perennials with a short rootstock, 10-60 cm high. Leaves usually folded, ca 2 mm broad. Panicles contracted, 4-25 cm long. Spikelets green or purplish; lower glume 1-3 mm long, upper 5-10 mm long; central awn 7-25 mm long, laterals as long or shorter.

In wastelands, on sand or red morrum ; 300-400 m.

Fl. & Fr. : October-May.

DURG : Talgaon. RAIPUR : Dhamtari, Sankra.

2. *A. redacta* Stapf in Kew Bull. 1892 : 85. 1892.

Tufted erect annuals, 10-40 cm high. Leaves usually folded, 5-15 cm long, ca 1.5 mm broad. Panicles contracted or effuse, 7-20 cm long. Glumes subequal, 8-12 mm long, acuminate or shortly awned; lemma passing into the rather swollen and twisted column with 15-25 mm long awn, lateral awns usually absent.

On sand deposits ; 350 m.

Fl. & Fr. : October.

RAIPUR : Sankra.

3. *A. setacea* Retz. Obs. Bot. 4 : 22. 1786. 'Bhend.'

Tufted perennials, 50 - 100 cm high. Culms often fastigiately branched. Leaves rolled, 15 - 30 cm long, ca 3 mm broad; sheaths polished, yellow, open at the ramifications. Panicles contracted, 20 - 40 cm long. Lower glume up to 17 mm long, upper up to 20 mm long; lemma rather rigid at the base of the trifid awn, central awn 20 - 35 mm long.

Along forest margins ; 400 - 500 m.

Fl. & Fr. : September - January.

DURG : Balod. RAIPUR : Chhoora, Dugli.

5. ARTHRAXON P. Beauv.

- | | |
|--|-------------------------|
| 1a. Spikelets laterally compressed ; lower glume of the sessile spikelet not keeled ; anthers 2, 0.3 - 0.6 mm long ... | <i>A. lancifolius</i> 1 |
| 1b. Spikelets not laterally compressed ; lower glume of the sessile spikelet 2 - keeled ; anthers 3, 2.5 - 3.5 mm long ... | <i>A. prionodes</i> 2 |

1. *Arthraxon lancifolius* (Trin.) Hochst. in Flora 39 : 188. 1856. *Andropogon lancifolius* Trin. in Mem. Acad. Sci. Petersb. ser. 6, 2 : 271. 1832. *Arthraxon microphyllus* Hook. f. Fl. Brit. Ind. 7 : 147. 1896, non (Trin.) Hochst.

Slender annuals, 10 - 30 cm long, usually trailing. Leaves ovate-lanceolate, 1 - 4 cm long. Racemes two several, 1 - 2 cm long, rhachilla ciliate. Sessile spikelets 2 - 4 mm long ; awns 5 - 8 mm long ; pedicelled spikelets 1 - 2 mm long or suppressed.

In mixed forests ; 450 m.

Fl. & Fr. : October.

RAIPUR : Gariaband.

2. *A. prionodes* (Steud.) Dandy in Andrews, Fl. Pl. Sudan 3 : 399. 1956. *Andropogon prionodes* Steud. Syn. Pl. 1 : 383. 1854. *Andropogon serrulatus* A. Rich. Tent. Fl. Abyss. 2 : 458. 1851, non Link, 1827.

Perennial, trailing, 30-70 cm long, with a short silky rootstock. Leaves narrowly ovate-lanceolate, 2-6 cm long, tuberculate ciliate-margined. Racemes two several, 4-6 cm long. Sessile spikelets 5-6 mm long, spinulous on the keel; awn 8-12 mm long.

In rock crevices; 600 m.

Fl. & Fr.: October.

RAIPUR : Taurenga.

6. ARUNDINELLA Raddi

- | | | |
|--|-----|--------------------|
| 1a. Upper lemma with two setae, one on each side of the awn at the tip | ... | <i>A. setosa</i> 2 |
| 1b. Upper lemma with a single awn without any setae | ... | <i>A. pumila</i> 1 |

1. *Arundinella pumila* (Hochst. ex A. Rich.) Steud. Syn. Pl. 1: 114. 1854. *Acratherum pumilum* Hochst. ex A. Rich. Tent. Fl. Abyss. 2: 414. 1851.

Erect tufted annuals, 20-70 cm high. Leaves linear-lanceolate, 10-20 cm long. Panicle open, profusely branched, 5-20 cm long. Spikelets 1.5-2.0 mm long; glumes up to 1.7 mm long, glabrous or hispidulous; upper lemma ca 0.8 mm long, with ca 2 mm long awn.

In sal forests; 400-500 m.

Fl. & Fr.: October January.

RAIPUR : Chhoora, Sitanadi.

2. *A. setosa* Trin. Gram. Panic. 63. 1826. *A. capillaris* Hook. f. Fl. Brit. Ind. 7: 74. 1896. *Milium cimicinoides* Roxb. ex Hook. f. Fl. Brit. Ind. 7: 70. 1896.

Perennials, 30-80 cm high with tuberous rootstocks. Leaves linear, hairy at the base. Panicle effuse with capillary branches. Spikelets 5-6 mm long; lower glume ca 4 mm long, upper ca 5 mm long; upper lemma coriaceous, 2-toothed, awn 8-10 mm long.

On hill slopes; 500 m.

Fl. & Fr.: September.

RAJNANDGAON : Deopura.

7. **BAMBUSA** Schreb.

Bambusa arundinacea (Retz.) Willd. Sp. Pl. 2 : 245. 1799.

Bambos arundinacea Retz. Obs. Bot. 5 : 24. 1789.

Tall arborescent bamboo, with thorny culms up to 20 m high and 5 - 10 cm thick. Leaves linear lanceolate, 5 - 12 cm long, auricles bristly; culm sheath 20 - 30 × 10 - 20 cm, dark brown hairy, apiculate. Spikelets lanceolate, ca 15 mm long, 3 - 6 flowered; lemma ca 8 mm long.

In wastelands ; 300 m.

Fl. & Fr. : August.

RAIPUR : Pithora.

8. **BOTHRIOCLOA** O. Ktze.

1a. Inflorescence with a long central axis	...	<i>B. bladhii</i> 1
1b. Inflorescence subdigitate	...	<i>B. pertusa</i> 2

1. **B. bladhii** (Retz.) S. T. Blake in Proc. R. Soc. Queensland 80 : 62. 1969 ; Cope in Nasir & Ali, Fl. Pakistan no. 143 : 284. 1982. *Andropogon bladhii* Retz. Obs. Bot. 2 : 27. 1781. *A. intermedius* R. Br. Prodr. 202. 1810. *A. punctatus* Roxb. Fl. Ind. 1 : 268. 1820. *A. glaber* Roxb. Fl. Ind. 1 : 271. 1820. *A. odoratus* Lisboa in J. Bombay nat. hist. Soc. 4 : 123. 1889. *B. intermedia* A. Camus in Ann. Soc. Linn. Lyon, n. s. 76 : 164. 1931. *B. glabra* A. Camus, l. c. *B. odorata* A. Camus, l. c. 165. *B. intermedia* var. *punctata* Keng, Clav. Gram. Prim. Sin. 244. 1957. *Dichanthium intermedium* Dewet & Harlan in Amer. J. Bot. 53 : 97. 1966. *D. bladhii* Clayton in Kew Bull. 32 : 3. 1977.

Tufted perennials, 40 - 150 cm high. Leaves 10 - 55 cm long, 2 - 12 mm broad. Inflorescence with a central axis 4 - 20 cm long and numerous racemes in irregular whorls upon simple or branched peduncles. Sessile spikelet 3 - 4 mm long, lower glume with or without a pit.

Along forest margins ; 450 - 500 m.

Fl. & Fr. : January.

RAIPUR : Singhpur, Sitanadi.

2. *B. pertusa* (L.) A. Camus in Ann. Soc. Linn. Lyon, n. s., 76 : 164. 1931. *Holcus pertusus* L. Mant. 2 : 301. 1771. *Andropogon pertusus* Willd. Sp. Pl. 4 : 922. 1806. *Dichanthium pertusum* Clayton in Kew Bull. 32 : 4. 1977.

Stoloniferous perennials with up to 60 cm long erect or ascending culms. Leaves 2-5 mm broad. Racemes 3-8, subdigitate, shortly peduncled, 2.5-5.5 cm long. Sessile spikelets 3.5-4.5 mm long, lower glume glossy, 1 or 2 pitted; awn 15-20 mm long.

In wastelands; 300 m.

Fl. & Fr. : August - October.

RAIPUR : Balodabazar, Raipur.

9. BRACHIARIA (Trin.) Griseb.

- | | |
|--|---------------------|
| 1a. Spikelets 2.5-3.5 mm long, lower glume one-third to one-half the length of the spikelet ... | <i>B. ramosa</i> 1 |
| 1b. Spikelets 1.5-2.2 mm long, lower glume one-eighth to one-fourth the length of the spikelet ... | <i>B. reptans</i> 2 |

1. *Brachiaria ramosa* (L.) Stapf in Prain, Fl. Trop. Afr. 9 : 542. 1919. *Panicum ramosum* L. Mant. 1 : 29. 1767.

Tufted annuals. Culms ascending, 10-70 cm long, very slender or stoutish. Leaves linear-lanceolate, 4-10 cm long, 10-15 mm broad. Racemes 3-8 scattered along 1-10 cm long common axis, each 2-9 cm long, lower sometimes branched. Spikelets elliptic, white ciliate at the base.

On dilapidated walls; 250 m.

Fl. & Fr. : August.

RAIPUR : Arang.

2. *B. reptans* (L.) Gardner & Hubbard in Hook. Icon. Pl. t. 3363. 1938. *Panicum reptans* L. Syst. ed. 10, 870. 1759. *P. prostratum* Lamk. Tab. Encycl. 1 : 171. 1791.

Tufted annuals. Culms ascending, 20-60 cm long, rooting at the lower nodes. Leaves lanceolate, 2-5 cm long, 4-8 mm broad. Racemes 4-10 scattered along 1-6 cm long common axis, each 1.5-3.5 cm long.

Spikelets elliptic, crowded, white ciliate at the base ; lower glume usually truncate.

In roadside ditches ; 250 m.

Fl. & Fr. : August.

RAIPUR : Raipur.

10. CAPILLIPEDIUM Stapf

Capillipedium assimile (Steud.) A. Camus in LeComte, Fl. Gen. Indo-Chine 7 : 314. 1922. *Andropogon assimilis* Steud. in Zoll. Syst. Verz. 58. 1854 *et in* Syn. Pl. 1 : 397. 1854.

Usually slender perennials, erect or straggling, with up to 2 m long culms. Panicles 5–12 cm long with capillary branches bearing short racemes. Sessile spikelets 1.8–2.5 mm long, scabrid or pubescent; awn 6–12 mm long ; pedicellate spikelets 3.0–4.5 mm long.

In mixed forests ; 450 m.

Fl. & Fr. : January.

RAIPUR : Singhpur.

11. CENCHRUS L.

Cenchrus ciliaris L. Mant. 302. 1771.

Perennials, 15–40 cm high. Leaves 3–5 mm broad. Spikes terminal, 3–5 cm long ; spikelets ca 5 mm long ; involucral bristles 6–15 mm long, antrorsely scabrid, inner rather slender, ciliate - margined.

In wastelands ; 300 m.

Fl. & Fr. : October.

RAIPUR : Raipur.

12. CHIONACHNE R. Br.

Chionachne koenigii (Spreng.) Thw. Enum. 357. 1864. *Coix koenigii* Spreng. Syst. 1 : 239. 1825. *Coix barbata* Roxb. Fl. Ind. 3 : 569. 1832. *Polytoca barbata* Hook. f. Fl. Brit. Ind. 7 : 102. 1896.

Robust monoecious perennials, 1 - 3 m high. Leaves scabrid above and on the margins, and with irritant hairs beneath. Inflorescence a much branched leafy panicle with spathes and spathioles. Racemes 2 - 4 cm long, entirely male or with a solitary female spikelet at the base.

In wastelands ; 450 - 750 m.

Fl. & Fr. : September - January.

RAIPUR : Dugli. RAJNANDGAON : Chilpi.

13. CHLORIS Sw.

- 1a. Spikes flexuous and drooping, 15 - 25 cm long. Spikelets 5 - 6 mm long, dorsally compressed ... *C. dolichostachya* 1
- 1b. Spikes straight and ascending, 2 - 10 cm long ; spikelets 2 - 4 mm long, laterally compressed ... *C. virgata* 2

1. *Chloris dolichostachya* Lag. Gen. et Sp. Pl. 5. 1816. *C. incompleta* Roth, Nov. Pl. Sp. 60. 1821.

Erect or ascending perennials, up to 1 m high. Leaves 5 - 10 mm broad, acuminate. Inflorescence of 4 - 6 or more digitate flexuous spikes. Spikelets 2 flowered, 5 - 7 mm long ; lower lemma scabrid with up to 12 mm long awn ; upper lemma scale-like, bearded, with 2 - 4 mm long awn.

In wastelands & mixed forests ; 400 - 500 m.

Fl. & Fr. : November - May.

RAIPUR : Sitanadi. RAJNANDGAON : Baghnadi.

2. *C. virgata* Sw. Fl. Ind. Occ. 1 : 203. 1797.

Erect or ascending annuals, up to 1 m high. Leaves 2 - 6 mm broad ; basal sheaths strongly keeled. Inflorescence of 4 - 12 digitate spikes. Spikelets 2 - 3 flowered ; lowest lemma obliquely obovate, 3 - 4 mm long, ciliate, with 5 - 15 mm long awn ; second lemma ca 2 mm long with 5 - 12 mm long awn.

In cultivated fields ; 300 - 600 m.

Fl. & Fr. : August - October.

RAIPUR : Balodabazar, Taurenga.

14. CHRYSOPOGON Trin.

- 1a. Pedicels less than half the length of the sessile spikelet ... *C. fulvus* 1
- 1b. Pedicels more than half the length of the sessile spikelet ... *C. verticillatus* 2

1. ***Chrysopogon fulvus*** (Spreng.) Chiov. Fl. Somalia 1 : 327. 1829.
Pollinia fulva Spreng. Pugil. 2 : 10. 1815. *C. montanus* Trin. in Spreng. Neue Entdeck. 2 : 93. 1821.

Erect perennials, *ca* 50 cm high. Inflorescence a dense panicle. Sessile spikelets 4 - 6 mm long, upper glume keeled, awned, with long golden brown hairs along the keel; pedicelled spikelets *ca* 4 mm long, lower glume pubescent and awned; pedicels villous.

Along paddy fields; 300 m.

Fl. & Fr. : October.

RAIPUR : Simga.

2. ***C. verticillatus*** (Roxb.) Trin. ex Steud. Nom. Bot. ed. 2, 1 : 360. 1840. *Andropogon verticillatus* Roxb. Fl. Ind. 1 : 267. 1820.

Tufted perennials, *ca* 1 m high. Leaves 5 - 20 mm broad, pubescent and with longer caducous hairs, spinulous or scabrid marginated. Panicles bright yellowish with chestnut brown awns, branches subverticillate. Spikelets *ca* 5 mm long.

Among boulders; 600 m.

Fl. & Fr. : October.

RAIPUR : Taurenga.

15. COIX L.

Coix aquatica Roxb. Fl. Ind. 3 : 571. 1832.

Robust succulent monoecious perennials with 2 - 4 m long culms, partly creeping or floating and partly erect. Leaves glandular hairy above. Inflorescence subtended by an ovoid bead-like cupule; female raceme enclosed within the cupule; male raceme exserted from its mouth. Lower glume of the male spikelets conspicuously winged.

Along roadside drains ; 400 - 750 m.

Fl. & Fr. : September - January.

RAIPUR : Dugli, Taurenga. RAJNANDGAON : Chilpi, Singhati.

16. CYMBOPOGON Spreng.

Cymbopogon martinii (Roxb.) Wats. in Atkins. Gaz. N. W. Ind. 10 : 392. 1882. *Andropogon martinii* Roxb. Fl. Ind. 1 : 280. 1820. *A. schoenanthus* L. var. *martinii* Hook. f. Fl. Brit. Ind. 7 : 204. 1896. *C. motia* Gupta in Proc. Ind. Acad. Sci., Sect. B, 71 : 92. 1970. *C. martinii* var. *sofia* Gupta, l.c. 27. 'Takari'.

Tufted perennials, up to 2 m high, with a short rootstock. Leaves linear-lanceolate, 1 - 3 cm broad, aromatic. Pseudo-panicle up to 40 cm long ; racemes 15 - 20 mm long. Sessile spikelet 4 - 5 mm long, lower glume with a V-shaped groove at the back ; upper lemma bifid, with a 12 - 18 mm long awn.

In wastelands & mixed forests ; 300 - 800 m.

Fl. & Fr. : October - April.

RAIPUR : Dhamtari, Sitanadi. RAJNANDGAON : Chilpi, Deopura.

Two morphologically indistinguishable varieties are known in cultivation ; the variety known as "Motia" (diploid) yields Palmerosa oil and the variety known as "Sofia" (tetraploid) yields Ginger-grass oil.

17. CYNODON Rich.

- | | |
|---|----------------------|
| 1a. Ligule membranous, ciliolate on the upper edge. Hairs on the lemma usually clavate ; anthers ca 0.5 mm long ... | <i>C. arcuatus</i> 1 |
| 1b. Ligule a short scarious-ciliolate rim. Hairs on the lemma not clavate : anthers more than 1 mm long ... | <i>C. dactylon</i> 2 |

1. *Cynodon arcuatus* Presl, Rel. Haenk. 1 : 290. 1830. *C. intermedius* Rang. & Tad. in J. Bombay nat. hist. Soc. 26 : 304. 1918. *C. dactylon* var. *intermedius* Fischer in Gamble, Fl. Pres. Madras 10 : 1835. 1934.

Non-rhizomatous, widely creeping, stoloniferous perennials ; culms 20 - 40 cm long. Leaves linear-lanceolate, 4 - 15 cm long, 3 - 6 mm

broad, glaucous green ; ligule *ca* 0.5 mm long. Racemes usually 4 - 8, whorled, 5 - 10 cm long, flexuous. Spikelets *ca* 2 mm long ; glumes lanceolate, 1 nerved.

In wastelands ; 600 m.

Fl. & Fr. : August.

RAIPUR : Sitanadi.

2. *C. dactylon* (L.) Pers. Syn. Pl. 1 : 85. 1805. *Panicum dactylon* L. Sp. Pl. 1 : 58. 1753. 'Doob'.

Stoloniferous perennials with slender underground rhizome ; culms 10 - 40 cm long. Leaves 2 - 10 cm long, 2 - 4 mm broad, scaberulous ; ligule a short ciliolate rim *ca* 0.3 mm long. Racemes 4 - 6, whorled, slender, 2 - 7 cm long ; spikelets *ca* 2 mm long ; lemma silky pubescent on the keel.

Common lawn grass, and in wastelands ; 300 - 500 m.

Fl. & Fr. : throughout the year.

RAIPUR : Chhoora, Dhamtari, Pithora, Sitanadi.

18. DACTYLOCTENIUM Willd.

Dactyloctenium aegyptium (L.) Willd. Enum. Hort. Berol. 1029. 1809 ; P. Beauv. Ess. Agrost. 15. 1812. *Cynosurus aegyptius* L. Sp. Pl. 1 : 72. 1753. *Eleusine aegyptia* Desf. Fl. Atlant. 1 : 85. 1798.

Annuals with 3 - 70 cm long erect or ascending culms rooting at the lower nodes, sometimes stoloniferous. Leaves papillose - hispid. Spikes 1 - 9, whorled, 0.5 - 6.5 cm long, rachis produced into a pointed extension. Spikelets 2 - 4 mm long ; upper glume with a 1 - 3 mm long awn. Grains obovoid, transversely rugose.

Common in wastelands ; on sand, red morrum or clayey lowlands ; 300 - 450 m.

Fl. & Fr. : August - June.

DURG : Bordih. RAIPUR : Balodabazar, Dhamtari, Sankra, Simga. RAJNANDGAON : Baghnadi.

19. DENDROCALAMUS Nees

Dendrocalamus strictus (Roxb.) Nees in Linnaea 9 : 476. 1834.
Bambos stricta Roxb. Pl. Corom. 1 : 58. t. 80. 1795. 'Baans'.

Deciduous densely tufted bamboo with solid or slightly hollow culms 4 - 15 m high and 3 - 7 cm thick. Rootstock copiously branched. Culm sheaths 8 - 30 cm long, golden brown hairy on the back, ciliate - margined. Leaves linear - lanceolate, 3 - 25 cm long, pubescent beneath. Spikelets in globose heads, the heads in long spikes ; lemma spinescent, with a tuft of hairs.

In sal forests ; 400 - 500 m.

Fl. & Fr. : January - June.

RAIPUR : Sitanadi. RAJNANDGAON : Baghnadi.

20. DESMOSTACHYA (Stapf) Stapf

Desmostachya bipinnata (L.) Stapf in Thiselt. Dyer, Fl. Cap. 7 : 632. 1900. *Briza bipinnata* L. Syst. Nat. ed. 10, 2 : 875. 1759. *Poa cynosuroides* Retz. Obs. 4 : 20. 1786. *Eragrostis cynosuroides* P. Beauv. Ess. Agrost. 162. 1812.

Perennial, rhizomatous, 40 - 70 cm high. Leaves rolled, 4 - 8 mm broad ; lower leaf - sheaths densely imbricating. Inflorescence 15 - 40 cm long, purplish stramineus. Spikelets clustered or distant, 3 - 10 mm long, 3 - 17 flowered.

In low lands ; 500 m.

Fl. & Fr. : May.

RAIPUR : Sitanadi.

21. DICHTHANTHIUM Will.

Dichanthium annulatum (Forssk.) Stapf in Prain, Fl. Trop. Afr. 9 : 178. 1917. *Andropogon annulatus* Forssk. Fl. Aegypt. Arab. 173. 1775.

Perennial, geniculately ascending ; culms 20 - 80 cm long. Racemes shortly peduncled, two several, subdigitate, 3 - 7 cm long; sessile spikelet 2 - 6 mm long ; lower glumes villous ; upper lemma with 8 - 20 mm long awn.

Common in wastelands ; 300 - 600 m.

Fl. & Fr. : November - June.

RAIPUR : Balodabazar, Sitanadi. RAJNANDGAON : Deopura.

Reported to be an excellent fodder grass.

22. DIGITARIA Haller

- 1a. Spikelets binate in the centre of the racemes, 2.0 - 3.5 mm long.
 - 2a. Lower glume absent or very obscure ... *D. setigera* 4
 - 2b. Lower glume distinct, 0.2 - 0.4 mm long ... *D. ciliaris* 2
- 1b. Spikelets ternate in the centre of the raceme, 1.0 - 1.8 mm long.
 - 3a. Hairs on the spikelets verrucose, i. e. covered with warty growths as if sprinkled with fine grains of sand ... *D. longiflora* 3
 - 3b. Hairs on the spikelets clavate at the tip.
 - 4a. Tip of the pedicel with a corona of hairs up to 1 mm long ... *D. stricta* 5
 - 4b. Tip of the pedicel glabrous ... *D. abludens* 1

I. *Digitaria abludens* (R. & S.) Veldk. in Blumea 21 : 53, 1973. *Panicum abludens* R. & S. Syst. Veg. 2 : 457. 1817. *Paspalum granulare* Trin. ex Spreng. Neue Entdeck. 2 : 47. 1821. *Paspalum pedicellare* Trin. ex Hook. f. Fl. Brit. Ind. 7 : 19. 1896. *D. pedicellaris* Prain, Bengal Pl. 1181. 1903. *D. granularis* Henr. Monogr. Digitaria 302. 1950.

Erect or ascending annuals, 10 - 60 cm high. Racemes 1 - 5, each 2 - 7 cm long, arranged along a 1 - 4 cm long common axis ; rhachis almost wingless. Spikelets elliptic obovate, 1.2 - 1.5 mm long ; lower glume absent, upper glume and lower lemma with minutely clavate hairs between the nerves.

In wastelands, mixed forests and on walls ; 300 - 500 m.

Fl. & Fr. : August - October.

RAIPUR : Arang, Balodabazar, Dhamtari, Taurenga.

2. *D. ciliaris* (Retz.) Koel, Descr. Gram. 27. 1802 ; Cope in Nasir & Ali, Fl. Pakistan no. 143 : 228. 1982. *Panicum ciliare* Retz. Obs. Bot. 4 : 16. 1786. *D. biformis* Willd. Enum. Pl. 92. 1809. *Panicum adscendens* Kunth, Nov. Gen. Sp. 1 : 97. 1816. *Paspalum sanguinale* var. *ciliare* Hook. f. Fl. Brit. Ind. 7 : 15. 1896. *D. adscendens* Henr. in Blumea 1 : 92. 1934.

Slender ascending annuals usually rooting at the lower nodes. Racemes 2 - 12, digitate, 2 - 15 cm long ; rhachis broadly winged, triquetrous. Spikelets 2.5 - 3.5 mm long, glabrous, villous or ciliate ; upper glume 2 - 3 mm long ; nerves of the lower lemma smooth.

In wastelands, farms and along ponds ; 250 - 350 m.

Fl. & Fr. : August.

RAIPUR : Balodabazar, Dhamtari.

3. *D. longiflora* (Retz.) Pers. Syn. Pl. 1 : 85. 1805. *Paspalum longiflorum* Retz. Obs. Bot 4 : 15. 1786.

Slender ascending annuals or perennials with stoloniferous base. Culms 10 - 30 cm long. Racemes usually 2, sometimes up to 4, digitate, 2 - 4 cm long ; rhachis ribbon-like ; tips of pedicels discoid. Spikelets 1.0 - 1.8 mm long ; lower glume a hyaline rim, upper as long as the spikelet.

In wastelands ; 250 m.

Fl. & Fr. : August.

RAIPUR : Pithora.

4. *D. setigera* Roth ex R. & S. Syst. Veg. 2 : 474. 1817. *Panicum pruriens* Trin. Gram. Pan. 77. 1826. *Paspalum sanguinale* var. *pruriens* Hook. f. Fl. Brit. Ind. 7 : 15. 1896.

Slender ascending annuals. Culms 20 - 70 cm long. Racemes 1 - 4, digitate (or up to 15 on a common axis), 4 - 11 cm long ; rhachis winged, sometimes hairy. Spikelets elliptic-lanceolate, 2.0 - 3.5 mm long ; upper glume one-eighth to one-third as long as the spikelet, faintly 3-nerved ; lower lemma silky pubescent.

In wastelands & forest clearings ; 500 m.

Fl. & Fr. : August.

RAIPUR : Dhamtari.

5. *D. stricta* Roth ex R. & S. Syst. Veg. 2 : 474. 1817. *Paspalum royleanum* Nees ex Hook. f. Fl. Brit. Ind. 7 : 18. 1896. *D. royleana* Prain, Bengal Pl. 1182. 1903.

Tufted erect annuals, 25-60 cm high. Leaves linear, with sparse tubercle based hairs. Racemes 3-10, subdigitate, 4-10 cm long; rhachis and pedicels narrowly winged. Spikelets elliptic obovate, 1.0-1.5 mm long, usually with clavate hairs; lower glume absent, upper present or absent. Fruit ellipsoid, shining chestnut brown or black.

In rock crevices; 600 m.

Fl. & Fr.: October.

RAIPUR : Taurenga.

23. DIMERIA R. Br.

- | | | |
|--|-----|-------------------------|
| 1a. Spikelets <i>ca</i> 4 cm long; upper glume narrowly winged on the keel | ... | <i>D. connivens</i> 1 |
| 1b. Spikelets <i>ca</i> 2 mm long; upper glume not winged | ... | <i>D. ornithopoda</i> 2 |

1. *Dimeria connivens* Hack. in DC. Mon. Phan. 6 : 689. 1889.

Annual, tufted, 8-30 cm high; culms erect or ascending. Leaves with long scattered tubercle-based hairs. Spikes 1-2, erect, 1-4 cm long; rhachis flat, purplish. Spikelets with a tuft of hairs at the base; glumes ciliate; awn 8-10 mm long.

Along paddy fields and in rock crevices; 400-600 m.

Fl. & Fr.: October.

RAIPUR : Pithora, Taurenga.

2. *D. ornithopoda* Trin. Fund. Agrost. 166. t. 14. 1820.

Annual, tufted, 5-25 cm high. Leaves with long scattered deciduous tubercle-based hairs. Spikes erect, usually 2, sometimes 1 or 3, slender, 1-4 cm long; rhachis flat. Spikelets with a tuft of hairs at the base; glumes long hairy along the keel; awn *ca* 7 mm long.

In rock - crevices; 600 m.

Fl. & Fr.: October.

RAIPUR : Taurenga.

24. DINEBRA Jacq.

Dinebra retroflexa (Vahl) Panzer in Denkschr. Acad. Muench. 1813. 270. t. 12. 1814. *Cynosurus retroflexus* Vahl, Symb. Bot. 2. : 20. 1791. *D. arabica* Jacq. Fragm. 77. t. 121/1. 1809.

Slender erect or straggling annuals ; culms up to 1 m long. Leaves glandular. Inflorescence 8-20 cm long, composed of several spikes ; spikes ascending or ultimately divaricate, 1-5 cm long. Spikelets imbricate, ca 6 mm long, hairy ; lemmas mucronate.

In wastelands ; 450 m.

Fl. & Fr. : September.

RAJNANDGAON : Ram Sagar.

25. ECHINOCHLOA P. Beauv.

1a. Ligule absent	...	<i>E. colona</i> 1
1b. Ligule a fringe of hairs, at least in the lower leaves	...	<i>E. stagnina</i> 2

1. **Echinochloa colona** (L.) Link, Hort. Berol. 2 : 209. 1833. *Panicum colonum* L. Syst. Nat. ed. 10, 2 : 870. 1759. 'Jheepa'.

Annual, erect or ascending, 10-80 cm high. Inflorescence linear, 1-15 cm long, usually of several 4-rowed approximate or distant 1-3 cm long racemes. Spikelets ovate elliptic, 1.5-3.0 mm long ; lower lemma acute or cuspidate.

Common along cultivated fields, roadside puddles and streams ; 300-800 m.

Fl. & Fr. : August - May.

DURG : Balod. RAIPUR : Dhamtari, Kasdol, Raipur, Taurenga. RAJNANDGAON : Baghnadi, Chilpi, Singhari, Taregaon.

2. **E. stagnina** (Retz.) P. Beauv. Ess. Agrost. 53, 161, 171. 1812 *Panicum stagninum* Retz. Obs. Bot. 5 : 17. 1789.

Annuals or perennials with 30-90 cm long spongy ascending culm. Inflorescence 5-20 cm long, of 3-7 secund racemes 1-3 cm long. Spikelets ovate, ca 4 mm long, hispid ; lower lemma with up to 1 cm long awn.

Along ponds, partly submerged ; 450 m.

Fl. & Fr. : January.

RAIPUR : Dugli.

26. ELEUSINE Gaertn.

- 1a. Spikes 9 - 15 mm wide ; spikelets ovate, non - shattering.
Grains plump, almost globose, usually brown ... *E. coracana* 1
- 1b. Spikes 3 - 7 mm wide ; spikelets elliptic, disarticulating between the florets. Grains elliptic - oblong, blackish ... *E. indica* 2

1. *Eleusine coracana* (L.) Gaertn. *Fruct.* 1 : 8. t. 1. f. 11. 1788.
Cynosurus coracanus L. *Syst. ed.* 10, 2 : 875. 1759. - 'Maria'.

Robust tufted annuals, 40 - 100 cm high. Spikes 3 - 7, digitate, suberect with rather incurved tips, ca 4 cm long. Spikelets congested, awnless, 3 - 4 mm long. Grains usually exposed, ca 2 mm dia., with a black hilum, and slightly flattened on one side.

Cultivated ; 350 m.

Fl. & Fr. : October.

RAIPUR : Indagaon.

Grains used for preparing a local alcoholic beverage.

2. *E. indica* (L.) Gaertn. *Fruct.* 1 : 8. 1788. *Cynosurus indicus* L. *Sp. Pl.* 1 : 72. 1753.

Tufted annuals with erect or ascending 15 - 60 cm long culms. Leaves usually folded. Spikes usually several, digitate or subdigitate, sometimes solitary, slender, erect, 4 - 10 cm long. Spikelets 5 - 7 mm long, 3 - 7 flowered.

Along drains and ditches ; 250 - 500 m.

Fl. & Fr. . August - May.

RAIPUR : Raipur, Sitanadi. RAJNANDGAON : Deopura.

Considered to be a good fodder grass.

27. ELYTROPHORUS P. Beauv.

Elytrophorus spicatus (Willd.) A. Camus in LeComte, Fl. Gen. Indo-Chine 7 : 547. 1923. *Dactylis spicata* Willd. in Ges. Naturf. Freunde Berlin, Neue Schrift 3 : 416. 1801. *E. articulatus* P. Beauv. Ess. Agrost. 67. t. 14. f. 2. 1812.

Tufted erect annuals, 7 - 30 cm high. Spikelets scarcely 2 mm long, awned, in oblong sessile bright green clusters which are densely or interruptedly packed along a central rhachis thus forming a spiciform panicle.

In roadside ditches and paddy fields ; 300 - 450 m.

Fl. & Fr. : January June.

DURG : Talgaon. RAIPUR : Dhamtari, Dugli, Pithora.

28. ERAGROSTIELLA Bor

- | | | |
|--|-----|--------------------------|
| 1a. Leaves from the basal sheaths long, reaching the base of inflorescence | ... | <i>E. nardoides</i> 3 |
| 1b. Leaves from the basal sheaths short, never reaching the base of the inflorescence. | | |
| 2a. Leaves filiform. Keel of the palea broadly winged | ... | <i>E. bifaria</i> 1 |
| 2b. Leaves broader. Keel of the palea not broadly winged | ... | <i>E. brachyphylla</i> 2 |

1. **Eragrostiella bifaria** (Vahl) Bor in Ind. For. 66 : 270. 1940. *Poa bifaria* Vahl, Symb. Bot. 2 : 19. 1791. *P. coromandeliana* Koen. ex Rottl. in Ges. Naturf. Freunde Berlin, Neue Schrift 4 : 191. 1803. *Eragrostis coromandeliana* Trin. in Mem. Acad. Sci. Petersb. ser. 6, 1 : 415. 1830.

Erect, tufted, 20 - 50 cm high. Leaves convolute, filiform, basal 3 - 8 cm long. Spikelets bifarious, erect, elliptic, 4 - 7 mm long, grey ; lower glume lanceolate, scaberulous on the keel, upper glume broader ; lemmas ca 2.5 mm long ; wings of the palea keel ciliate.

In wastelands and forest clearings ; 550 m.

Fl. & Fr. : August.

RAIPUR : Dhamtari.

2. **E. brachyphylla** (Stapf) Bor in Ind. For. 66 : 270. 1940. *Eragrostis brachyphylla* Stapf in Hook. f. Fl. Brit. Ind. 7 : 327. 1896.

Perennials, 25-45 cm high. Leaves almost all in a basal cluster, 5-10 cm long, ca 2.5 mm broad. Spikelets linear-oblong, closely packed, 5-20 mm long, secund in 8-20 cm long spikes; glumes subequal, ca 1 mm long.

In wastelands ; 300 m.

Fl. & Fr. : October.

RAIPUR : Raipur, *Sharma* 139105H (Herb. Sci. Coll. Raipur).

3. *E. nardooides* (Trin.) Bor in Ind. For. 66 : 270. 1940. *Eragrostis nardooides* Trin. in Mem. Acad. Sci. Petersb. ser. 6, 1 : 415. 1830.

Erect, tufted, 20-60 cm high. Leaves convolute, needle-like, 15-30 cm long. Inflorescence 10-20 cm long with a wiry rhachis. Spikelets erect, imbricating or distant, 5-8 mm long, stramineous; lemmas ca 2 mm long.

On hill slopes ; 500 m.

Fl. & Fr. : September.

RAJNANDGAON : Deopura.

29. ERAGROSTIS Wolf

- 1a. Spikelets breaking up from above downwards; rhachis fragile.
- 2a. Keels of the palea ciliate.
 - 3a. Panicles spiciform, or compact and dense.
 - 4a. Lemmas cuspidate ... *E. ciliata* 3
 - 4b. Lemmas obtuse ... *E. coarctata* 4
 - 3b. Panicles effuse.
 - 5a. Culms and leaves more or less viscous ... *E. viscosa* 13
 - 5b. Culms and leaves not viscous ... *E. tenella* 11
- 2b. Keels of the palea scabrid or smooth, never ciliate.
 - 6a. Panicle branches mostly solitary. Spikelets densely clustered, 6-14-flowered; lemma ca 1 mm long ... *E. diarrhena* 5
 - 6b. Panicle branches more or less whorled. Spikelets loose, scattered, few-flowered; lemma less than 1 mm long. ... *E. japonica* 7

1b. Spikelets breaking up from below upwards ; rhachis tough.

7a. Annuals.

8a. Lemmas up to 1.5 mm long.

9a. Spikelets more or less fascicled on the primary or secondary branches, or shortly pedicelled in narrow racemes ; spikelets all pointing forwards ...

E. gangetica 6

9b. Spikelets not fascicled, seated on long pedicels in ample panicles with filiform branches which are fascicled at the lowest node ; spikelets all spreading ...

E. pilosa 10

8b. Lemmas more than 1.5 mm long.

10a. Spikelets 2 mm or more broad.

11a. Leaf sheaths bearded at the mouth, margins usually glandular. Spikelets grey. Grains subglobose ...

E. ciliolansis 2

11b. Leaf sheaths not bearded at the mouth, margins not glandular. Spikelets green or reddish purple. Grains obovoid or ellipsoid, compressed ...

E. unioloides 12

10b. Spikelets 0.7 - 2.0 mm broad.

12a. Spikelets 1.5 - 2.0 mm broad ...

E. minor 8

12b. Spikelets 0.7 - 1.2 mm broad ...

E. pilosa 10

7b. Perennials.

13a. Lemmas 2.0 - 2.5 mm long ...

E. zeylanica 14

13b. Lemmas 1.2 - 1.8 mm long.

14a. Spikelets 2.0 - 2.5 mm broad ...

E. atrovirens 1

14b. Spikelets ca 1 mm broad ...

E. nutans 9

1. *Eragrostis atrovirens* (Desf.) Trin. ex Steud. Nom. Bot. 1 : 562.
1840. *Poa atrovirens* Desf. Fl. Atlant. 1 : 73. t. 14. 1798.

Tufted perennials, 30 - 80 cm high. Panicles ovate oblong, 5 - 25 cm long with ascending primary branches. Spikelets 3 - 10 mm long, greyish green (sometimes yellowish or dark green and purple tinged) ; rhachilla visible ; palea deciduous.

In moist places ; 300 - 800 m.

Fl. & Fr. : August - April.

DURG : Seoni. RAIPUR : Dhamtari. RAJNANDGAON : Baghnadi, Chilpi.

2. *E. ciliatensis* (All.) Lut. ex F.T. Hubb. in Philipp. J. Sci. C., Bot. 8 : 159. 1913. *Poa ciliatensis* All. Fl. Pedem. 2 : 246. 1785. *E. major* Host, Gram. 181. 1802.

Slender annuals, 10 - 70 cm high. Leaf margins usually warty. Panicles ovate, 5 - 15 cm long, usually glandular on branchlets and pedicels. Spikelets 2 - 4 mm broad, yellowish green or greyish, lemmas broadly ovate; paleas persistent.

In wastelands ; 300 m.

Fl. & Fr. : May.

RAIPUR : Dhamtari.

3. *E. ciliata* (Roxb.) Nees, Agrost. Bras. 512. 1829. *Poa ciliata* Roxb. Fl. Ind. 1 : 336. 1820.

Perennials, 30 - 100 cm high with a horizontal rootstock. Panicles dense, spiciform, 4 - 10 cm long. Spikelets 2 - 4 mm long; glumes, lemmas and paleas all ciliate; lower lemma mucronate.

RAIPUR : Nawapara n.v. (*cf.* Haines, Descr. list of trees, shrubs & econ. herbs, Southern Circle, C.P. XV 1916).

4. *E. coarctata* Stapf in Hook. f. Fl. Brit. Ind. 7 : 313. 1896.

Perennials with a short creeping rootstock; culms tufted, erect or ascending, 20 - 80 cm long. Panicles dense, sub-spiciform, 7 - 12 cm long; rhachis bearded at the nodes. Spikelets *ca* 3 mm long; glumes, lemmas and paleas all ciliate.

In wastelands ; 300 - 550 m.

Fl. & Fr. : October - May.

RAIPUR : Dhamtari, Indagaon, Khallari.

5. *E. diarrhena* (Schult.) Steud. Syn. Pl. 1 : 266. 1854. *Poa diarrhena* Schult. Mant. 2 : 616. 1827. *E. koenigii* Link, Hort. Berol. 2 : 294. 1833. *E. interrupta* var. *koenigii* Stapf in Hook. f. Fl. Brit. Ind. 7 : 316. 1896.

Slender, tufted, erect or ascending, 10 - 70 cm high. Panicles linear oblong, 12 - 35 cm long, with mostly solitary branches. Spikelets clustered, *ca* 2 mm long, 6 - 14 - flowered; lemma *ca* 1 mm long.

In wastelands & cultivated fields ; 300 - 450 m.

Fl. & Fr. : January June.

RAIPUR : Dhamtari, Dugli, Pithora, Raipur.

6. *E. gangetica* (Roxb.) Steud. Syn. Pl. 1 : 266. 1854. *Poa gangetica* Roxb. Fl. Ind. 1 : 341. 1820. *E. stenophylla* Stapf in Hook. f. Fl. Brit. Ind. 7 : 318. 1896 p.p., non Hochst. ex Miq. 1851.

Tufted erect annuals, 50 - 120 cm high. Panicles narrowly oblong, 10 - 25 cm long, fairly dense with capillary branches and spikelets, mostly pointing upwards. Spikelets 4 - 7 mm long, several - flowered, slate-grey ; lemmas 1.0 - 1.3 mm long with prominent lateral nerves.

In river - beds ; 300 - 450 m.

Fl. & Fr. : September - May.

RAIPUR : Dhamtari, Dugli. RAJNANDGAON : Baghnadi.

7. *E. japonica* (Thunb.) Trin. in Mem. Acad. Sci. Petersb. ser. 6, 1 : 405. 1830. *Poa japonica* Thunb. Fl. Jap. 51. 1784. *E. interrupta* var. *tenuissima* Stapf ex Hook. f. Fl. Brit. Ind. 7 : 316. 1896.

Erect tufted annuals or perennials, 10 - 90 cm high. Leaves flat, 3 - 5 mm broad. Panicles 4 - 30 cm long, branches mostly in dense remote pseudo whorls, bare towards the base. Spikelets ca 2 mm long, rhachilla fragile.

In moist depressions ; 350 m.

Fl. & Fr. : October.

RAIPUR : Pithora.

8. *E. minor* Host, Gram. Austr. 4 : 15. 1809 ; T.A. Cope in Nasir & Ali, Fl. Pakistan no. 143 : 95. 1982. *E. poaeoides* P. Beauv. Ess. Agrost. 162. 1812. *E. multiflora* Aschers. var. *pappiana* Chiov. in Annur. R. 1st bot. Roma 8 : 65. 1903. *E. pappiana* Chiov. l.c. 371. 1908.

Tufted annuals, 10 - 40 cm high. Leaves usually with a row of warty glands on the margins. Panicle ovate, 5 - 15 cm long, usually glandular on branchlets and pedicels. Spikelets pale green, greyish or purplish ; glumes 1.0 - 1.5 mm long.

In forest clearings ; 480 - 550 m.

Fl. & Fr. : May June.

RAIPUR : Sitanadi, Taurenga.

9. *E. nutans* (Retz.) Nees ex Steud. Nom. Bot. ed. 2, 563. 1840. *Poa nutans* Retz. Obs. Bot. 4 : 19. 1786. *E. stenophylla* auct., p.p.; non Hochst. 1851.

Perennials, 30 - 100 cm high. Panicles contracted, up to 12 cm long, up to 3 cm wide. Spikelets crowded, ascending, ca 1 mm wide, green or greyish, dense flowered; lemmas oblong, ca 1.3 mm long with straight lateral nerves. Grains terete.

In sandy river beds ; 300 - 500 m.

Fl. & Fr. : May June.

RAIPUR : Dhamtari, Khallari.

10. *E. pilosa* (L.) P. Beauv. Ess. Agrost. 162, 175. 1812. *Poa pilosa* L. Sp. Pl. 68. 1753.

Loosely tufted erect or ascending annuals, 10 - 50 cm high. Leaves flat. Panicles ovate elliptic, 5 - 20 cm long, the lower branches usually whorled, and with long white hairs in the axils. Spikelets 3 - 6 mm long, greyish or pale green.

In moist depressions ; 300 - 450 m.

Fl. & Fr. : October - June.

RAIPUR : Dhamtari, Kasdol.

11. *E. tenella* (L.) P. Beauv. ex R. & S. Syst. 2 : 576. 1817. *Poa tenella* L. Sp. Pl. 69. 1753. "Bhurbhusi".

Slender erect or ascending tufted annuals; culms 5 - 40 cm long. Panicles open, elliptic or pyramidal, 2 - 12 cm long, branches with yellowish glands. Spikelets 1.5 - 2.5 mm long, 4 - 8 flowered; palea keels ciliate.

In wastelands, river - beds and ditches ; 280 - 450 m.

Fl. & Fr. : October June.

RAIPUR : Dhamtari, Dugli, Kasdol, Pithora. RAJNANDGAON : Baghnadi.

Considered to be a good fodder grass, the seeds being particularly nutritious.

12. *E. unioloides* (Retz.) Nees ex Steud. Syn. Pl. I : 264. 1854. *Poa unioloides* Retz. Obs. Bot. 5 : 19. 1789.

Tufted erect or ascending annuals or perennials, 10 - 60 cm high. Panicles 5 - 20 cm long, fairly dense and oblong, or open and ovate. Spikelets ovate, 3 - 10 × 2 - 4 mm, usually purple tinged; lemmas broadly ovate suborbicular.

Common in wastelands and along drains and rivers ; 300 - 800 m.

Fl. & Fr. : September April.

DURG : Rajolidih. RAIPUR : Balodabazar, Dugli. RAJNAND-GAON : Chilpi, Baghnadi.

13. *E. viscosa* (Retz.) Trin. in Mem. Acad. Sci. Petersb. ser. 6, 1 : 397. 1830. *Poa viscosa* Retz. Obs. Bot. 4 : 20. 1786. *E. tenella* var. *viscosa* Stapf in Hook. f. Fl. Brit. Ind. 7 : 315. 1896.

Tufted erect annuals, 10 - 30 cm high. Leaves glandular on the keel, the margins and the sheath. Panicle ovate oblong, 5 - 10 cm long, with sticky yellowish glands. Spikelets 1.5 - 4.0 mm long, purplish or stramineous; glumes ca 0.8 mm long; palea keel ciliate.

In wastelands ; 450 m.

Fl. & Fr. : January.

RAIPUR : Dugli.

14. *E. zeylanica* Nees & Mey. in Nov. Act. Nat. Cur. 19, Suppl. 1 : 204. 1843. *E. elongata* auct., non Jacq. 1813.

Culms tufted, ascending, 10 - 25 cm long. Panicle branches short, distant, spreading. Spikelets 6 - 12 mm long, usually dense, glumes ca 2 mm long, cuspidate; palea curved, apiculate, with ciliolate margins.

Along paddy fields ; 400 m.

Fl. & Fr. : October.

RAIPUR : Pithora.

30. ERIOCHLOA Kuauth

Eriochloa procera (Retz.) C.E. Hubbard in Kew Bull. 1930 : 256. 1930. *Agrostis procera* Retz. Obs. 4 : 19. 1786. *E. polystachya* auct., Hook. f. Fl. Brit. Ind. 7 : 20. 1896, non Kunth 1816.

Erect or ascending annuals, 20 - 60 cm high. Racemes 2 - 7 cm long, few to several scattered along 5 - 15 cm long axis. Spikelets lanceolate, *ca* 3 mm long, acute or acuminate. Lower glume absent; upper lemma with a 0.3 - 0.5 mm long mucro.

In moist depressions; 300 m.

Fl. & Fr. : April.

DURG : Durg.

31. EULALIA Kunth

Eulalia trispicata (Schult.). Henr. in Blumea 3 : 453. 1940. *Andropogon trispicatus* Schult. Mant. 2 : 452. 1824.

Perennial, tufted; culms 30 - 100 cm high. Racemes 2 - 12, subdigitate, 5 - 11 cm long, brownish, with white hairs on the joints. Spikelets elliptic-oblong, 2.5 - 3.5 mm long; lower glume pilose; upper lemma deeply bifid, long awned.

RAIPUR : Shihora, n.v. (*cf.* Haines, Descr. list of trees, shrubs & econ. herbs, Southern Circle, C.P. 247. 1916).

32. EULALIOPSIS Honda

Eulaliopsis binata (Retz.) C.E. Hubbard in Hook. Icon. Pl. t. 3262. 1935. *Andropogon binatus* Retz. Obs. Bot. 5 : 21. 1789. *Spodiopogon angustifolius* Trin. in Mem. Acad. Sci. Petersb. ser. 6, 2 (3) : 300. 1832. *Ischaemum angustifolium* Hack. in DC. Monogr. Phan. 6 : 241. 1889. *Pollinidium angustifolium* Haines, Bot. Bihar & Orissa 1020. 1924 - 'Bagai'.

Tufted perennials, 40 - 80 cm high with white woolly basal sheaths. Leaves long, convolute. Racemes 2 - 4, subdigitate, 2 - 4 cm long, brown hairy. Spikelets 3.5 - 4.5 mm long, glumes toothed, upper mucronate; upper lemma with 6 - 9 mm long awn.

Along streams, in rock crevices; 450 m.

Fl. & Fr. : June.

RAIPUR : Khallari.

33. HACKELOCHLOA O. Ktze.

Hackelochloa granularis (L.) O. Ktze. Rev. Gen. Pl. 2 : 776. 1891.
Cenchrus granularis L. Mant. 2 : 575. 1771. *Manisuris granularis* L. f. Nov.
 Gram. Gen. 37. 1779.

Annual, erect, 5 - 30 cm high. Leaves subamplexicaul, linear lanceolate, hispid. Racemes 5 - 12 mm long, fragile, numerous and aggregated into a spatheate false panicle; internodes flattened, cupuliform above. Sessile spikelet ca 1 mm long; upper glume crested at the apex.

Along forests and paddy fields; 400 - 500 m.

Fl. & Fr. : September.

RAJNANDGAON : Baghnadi, Deopura.

34. HEMARTHRIA R. Br.

Hemarthria compressa (L. f.) R. Br. Prodr. 207. 1810. *Rottboellia compressa* L. f. Suppl. 114. 1781.

Stoloniferous perennials; culms 50 - 120 cm long, rooting at the lower nodes. Racemes in the upper leaf-axils, tough, suberect, 3 - 8 cm long, dorso ventrally compressed. Spikelets narrowly elliptic-oblong; lower glume 3 - 4 mm long, obtuse or bidenticulate.

In paddy-fields; 300 - 450 m.

Fl. & Fr. : August - September.

RAIPUR : Balodabazar. RAJNANDGAON : Baghnadi.

35. HETEROPOGON Pers.

Heteropogon contortus (L.) P. Beauv. ex R. & S. Syst. 2 : 836. 1817.
Andropogon contortus L. Sp. Pl. 2 : 1045. 1753. - "Sukla ghas".

Erect tufted perennials, 30 - 100 cm high. Racemes usually long exserted, 3 - 8 cm long, often in pseudo panicles, awns long, chestnut brown, spirally twisted. Sessile spikelets 6 - 8 mm long with a pungent rufously bearded callus.

Along forest margins ; 450 m.

Fl. & Fr. : October.

RAIPUR : Gariaband.

Considered to be a good fodder grass before flowering.

36. HYGRORYZA Nees

Hygroryza aristata (Retz.) Nees ex Wt. & Arn. in Edinb. New Phil. J. 15 : 380. 1833. *Pharus aristatus* Retz. Obs. 5 : 23. 1789.

Aquatic, floating, mat forming perennials. Culms spongy, with whorls of feathery roots at the nodes. Leaves ovate oblong, 2-7×1-2 cm. Panicles ovate, 3-6 cm long. Spikelets sessile, long awned.

In ponds ; 300-550 m.

RAIPUR : Arang. RAJNANDGAON : Baba Talab.

Considered to be a good fodder grass.

37. HYMENACHNE P. Beauv.

Hymenachne pseudointerrupta C. Muell. in Bot. Z. 19 : 333. 1861.
Panicum myuros Hook. f. Fl. Brit. Ind. 7 : 39. 1896 ; non Link, 1791.

Stout aquatic perennials. Culms partly creeping, usually spongy and with tufts of feathery roots at the nodes. Leaves lanceolate, cordate, 20-40×1-2 cm. Panicles dense with appressed branches, up to 30×3 cm. Spikelets awned, ca 6 mm long.

RAIPUR : Raipur n.v. (cf. Unni in J. Bombay nat. hist. Soc. 64 : 101. 1967).

38. IMPERATA Cyr.

Imperata cylindrica (L.) Raeuschel. Nom. Bot. ed. 3, 10. 1797 ; Cope in Nasir & Ali, Fl. Pakistan no. 143 : 252. 1982. *Lagurus cylindricus* L. Syst. ed. 10, 2 : 878. 1759. *I. arundinacea* Cyr. Pl. Rar. Neap. 2 : 27. t. 11. 1792. *I. koenigii* (Retz.) P. Beauv. var. *major* Nees, Fl. Afr. Austr. 90

1841. *I. cylindrica* var. *major* C.E. Hubbard, Grasses Maur. Prodr. 96.
1840. 'Chhir ghas'.

Erect rhizomatous perennials 30–80 cm high. Leaves mostly basal, 10–40 cm long, 3–8 mm broad. Panicles spiciform, cylindrical, 7–13 cm long, 15–18 mm across, copiously silky white hairy. Spikelets ca 5 mm long; glumes as long as the spikelets.

In forest clearings, low lands, along drains and paddy fields, colonising where ever it grows; 300–750 m.

Fl. & Fr. : August June.

RAIPUR : Balodabazar, Borai, Dugli, Sitanadi, Taurenga. RAJ-NANDGAON : Malaidah.

Young shoots relished by cattle, old shoots used for thatching.

39. ISACHNE R. Br.

Isachne globosa (Thunb.) O. Ktze. Rev. Gen. Pl. 2 : 778. 1891.
Millum globosum Thunb. Fl. Jap. 49. 1784.

Slender ascending perennials, rooting at the lower nodes. Leaves scattered, 5–10 cm long. Panicles lax, 3–12 cm long. Spikelets subglobose, ca 2 mm long; glumes about as long as the florets, shortly hairy; lemmas elliptic oblong, with incurved edges.

Along paddy fields; 350 m.

Fl. & Fr. : October.

RAIPUR : Dhamtari.

40. ISCHAEMUM L.

- | | |
|--|---------------------|
| 1a. Margins of the lower glume of the sessile spikelets expanded below the middle ... | <i>I. indicum</i> 1 |
| 1b. Margins of the lower glume of the sessile spikelets narrowly and evenly inturned from base to apex ... | <i>I. rugosum</i> 2 |

1. *Ischaemum indicum* (Houtt.) Merrill in J. Arn. Arb. 19 : 320. 1938. *Phleum indicum* Houtt. in Nat. Hist. II. 13 : 198. t. 90. f. 2. 1782. *I. ciliare* Retz. Obs. Bot. 6 : 36. 1791.

Erect or ascending with up to 50 cm long culms. Leaves 5–10 cm long. Spikes rather stout, 2–3 together, 2–5 cm long, long-peduncled. Spikelets ca 4 mm long; lower glume winged at the top, upper glume coriaceous, long acuminate.

In drains and sandy river-beds; 250–700 m.

Fl. & Fr.: November–June.

RAIPUR: Dhamtari, Dugli, Gariaband. RAJNANDGAON: Baghnadi, Malaidah.

2. *I. rugosum* Salisb. Icon. Stirp. Rar. 1. t. 1. 1791.

Slender straggling annuals. Culms 10–50 cm long. Racemes paired, terminal and axillary, 3–8 cm long; internodes and pedicels clavate, ciliate. Sessile spikelet 4–6 mm long; lower glume coriaceous and transversely ridged below; upper lemma with 15–20 mm long awn.

In wastelands and sandy river-beds; 300–450 m.

Fl. & Fr.: January–May.

RAIPUR: Dhamtari. RAJNANDGAON: Baghnadi.

41. ISEILEMA Anderss.

- | | |
|---|------------------------|
| 1a. Spatheoles smooth. Sessile spikelets 4–5 mm long ... | <i>I. laxum</i> 1 |
| 1b. Spatheoles tuberculate on the midrib. Sessile spikelets 2.5–3.0 mm long | <i>I. prostratum</i> 2 |

1. *Iseilema laxum* Hack. in DC. Monogr. Phan. 6: 682. 1889.

Erect or suberect slender perennials. Culms 25–70 cm high; nodes, at least the lower, glabrous. Leaves up to 18 cm long, sometimes ciliate at the base. Pseudo panicles long, with distant spathes; spatheoles 8–10 mm long. Sessile spikelets rather contracted at the base.

In moist depressions and paddy fields; 250–450 m.

Fl. & Fr.: August–April.

DURG: Durg. RAIPUR: Dugli, Raipur.

Considered to be one of the best fodder grass in the area.

2. *I. prostratum* (L.) Anderss. in Nova Acta R. Soc. Scient. Upsal. ser. 3, 2 : 251. 1856. *Andropogon prostratus* L. Mant. 2 : 304. 1771. *A. wightii* Nees ex Steud. Syn. Pl. 1 : 400. 1855. *J. wightii* Anderss. in Nova Acta R. Soc. Scient. Upsal. ser. 3, 2 : 251 1856.

Slender ascending perennials. Culms 15 - 60 cm long; nodes usually bearded. Pseudo panicles linear, 5 - 30 cm long; spatheole 7 - 12 mm long. Homogamous spikelets all pedicelled, male 3 - 4 mm long; sessile spikelets bearded at the base; awn 5 - 12 mm long.

Along drains and mixed forests; 400 - 500 m.

Fl. & Fr. : August - November.

RAIPUR : Pithora, Taurenga. RAJNANDGAON : Deopura.

42. LEERSIA Swartz

Leersia hexandra Swartz, Prodr. 21. 1788.

Slender perennials. Culms 20 - 50 cm long, rooting at the lower nodes. Panicles open, flexuous, 5 - 10 cm long, with capillary branches. Spikelets closely imbricating, 2.5 - 3.5 mm long, laterally compressed; glumes absent; lemmas spinulosely ciliate.

In muddy places; 450 m.

Fl. & Fr. : January.

RAIPUR : Dugli.

43. LEPTOCHELOA P. Beauv.

Leptochloa panicea (Retz.) Ohwi in Bot. Mag. Tokyo 55 : 311. 1941. *Poa panicea* Retz. Obs. Bot. 3 : 11. 1783. *L. filiformis* Hook. f. Fl. Brit. Ind. 7 : 298. 1896; non P. Beauv. 1812.

Slender ascending tufted annuals, 25 - 100 cm high. Leaves up to 25 cm long, papillate - pilose. Racemes several, slender, ascending, 4 - 11 cm long. Spikelets closely imbricating, ca 2 mm long; glumes acute or mucronulate; lemmas 2 - toothed.

In wastelands; 500 m.

Fl. & Fr. : January.

RAIPUR : Sitanadi.

44. MANISURIS L.

Manisuris clarkei (Hack.) Bor *apud* Santapau, Fl. Khandala 357. 1953. *Rottboellia clarkei* Hack. In Oestr. Bot. Zeitschr. 41 : 8. 1891.

Erect annuals, 20-80 cm high. Leaves narrowly lanceolate, 8-15 cm long, 7-13 mm broad. Racemes solitary, axillary, 1-3 cm long; rhachis fragile, joints pyriform. Sessile spikelets closely imbricating, ca 3 mm long; lower glume umbonate, winged on both sides above the middle.

In miscellaneous forests and stream beds; 400-550 m.

Fl. & Fr. : October.

RAIPUR : Chhoora, Gariaband, Taurenga.

45. MELANOCENCHRIS Nees

Melanocenchrus jacquemontii Jaub. & Spach, Ill. Pl. Or. 4 : 36. 1851.

Slender tufted annuals, 3-10 cm high. Leaves convolute, ca 1.5 mm broad, with tubercle based hairs at the base. Inflorescence of shortly peduncled 6-8 mm long secund heads scattered along the rhachis. Spikelets 5-8 in a head; glumes, including the awn, 6-8 mm long, with white or purplish hairs.

In wastelands, on red morrum; 250 m.

Fl. & Fr. : August.

RAIPUR : Balodabazar.

46. MNESITHEA Kunth

Mnesithaea laevis (Retz.) Kunth, Rev. Gram. 1 : 154. 1829. *Rottboellia laevis* Retz. Obs. Bot. 3 : 11. 1783. *R. perforata* Roxb. Pl. Corom. 2 : 43. t. 182. 1798.

Shortly rhizomatous perennials, 30-80 cm high. Leaves flat, abruptly acute. Racemes solitary, terminal and axillary, 3-6 cm long; rhachis fragile. Sessile spikelets ca 3 mm long; lower glume wingless; pedicelled spikelet absent, the pedicel fused to the internode at its upper end.

On sandy river - banks ; 400 m.

Fl. & Fr. : October.

RAIPUR : Deori.

47. OPHIUROS Gaertn. f.

Ophiuros exaltatus (L.) O. Ktze. Rev. Gen. Pl. 2 : 780. 1891. *Aegilops exaltata* L. Mant. 2 : 575. 1771. *O. corymbosus* Gaertn. f. Fruct. 3 : 4. t. 181. 1805.

Tufted perennials, 40 - 100 cm high, with a creeping rhizome. Leaves linear, up to 5 mm broad, glabrous. Spikes corymbose, slender, 5 - 10 cm long, ca 1 mm across. Spikelets ca 2.5 mm long, equalling the joint ; glumes with longitudinal rows of pits.

Along drians ; 350 m.

Fl. & Fr. : August.

RAIPUR : Dhamtari.

48. OPLIMENUS P. Beauv.

Oplismenus compositus (L.) P. Beauv. Ess. Agrost. 54, 7168, 7169. 1812. *Panicum compositum* L. Sp. Pl. 1 : 57. 1753.

Tufted perennials with 20 - 70 cm long rambling culms. Leaves ovate - lanceolate, 5.0 - 11.0 × 1.5 - 2.5 cm. Inflorescence axillary and terminal, 10 - 25 cm long ; racemes distant; 3 - 12 cm long. Spikelets 3 - 4 mm long, in distant pairs ; glumes with 3 - 10 mm long viscid awns.

In sal forests ; 500 m.

Fl. & Fr. : January.

RAIPUR : Sitanadi.

49. OROPETIUM Trin.

- | | | |
|--|-----|------------------------|
| 1a. Spikes 2 - 5 cm long. Lemmas glabrous | ... | <i>O. thomaeum</i> 1 |
| 1b. Spikes 1.0 - 1.5 cm long. Lemmas hirsute | ... | <i>O. villosulum</i> 2 |

1. *Oropetium thomaeum* (L. f.) Trin. Fund. Agrost. 98. 1820. *Nardus thomaea* L. f. Suppl. 105. 1781.

Small tufted perennials, 3 - 7 cm high. Leaves convolute, filiform, 1 - 3 cm long, ca 0.5 mm broad. Spikes terminal, straight or curved, ca 1 mm thick, with a tough wavy rhachis. Spikelets embedded, 1.5 - 2.0 mm long; lemmas obovate, ca 0.8 mm long.

In dry gravelly wastelands ; 250 - 300 m.

Fl. & Fr. : August.

RAIPUR : Dhamtari, Raipur.

2. *O. villosulum* Stapf ex Bor in Kew Bull. 1949 : 571. 1950.

Slender purplish green annuals, 3 - 5 cm high. Leaves filiform, rolled, 1 - 2 cm long, ca 0.5 mm broad. Spikes terminal, almost straight, ca 1 mm thick with a rather spongy rhachis. Spikelets embedded in two rows in the hollows of the wavy rhachis, 1.0 - 1.5 mm long ; tips of the upper glume spreading.

In dry uplands, on red morrum ; 250 m.

Fl. & Fr. : August.

RAIPUR : Balodabazar.

50. ORYZA L.

Oryza rufipogon Griff. Notul. 3 : 5. 1851.

Erect annuals, 30 - 60 cm high. Leaves flat, 10 - 30 cm long, 5 - 10 mm broad ; ligule membranaceous, lower 10 - 15 mm long. Panicles narrow, dense, 8 - 12 cm long. Spikelets caducous, oblong, ca 8 mm long, with 5 - 8 cm long awns.

Along ponds and ditches ; 250 - 450 m.

Fl. & Fr. : September - October.

RAIPUR : Simga. RAJNANDGAON : Baghnadi.

Very similar to the cultivated *Oryza sativa* L. The grains eaten in times of scarcity.

51. PANICUM L.

- 1a. Leaves lanceolate, cordate, usually ciliate at the base.
Lower glume about three - fourth the length of the
spikelet ... *P. notatum* 1
- 1b. Plants not as above.
- 2a. Spikelets widely gaping at maturity ; lower glume cuspidate - acuminate ... *P. trypheron* 5
- 2b. Spikelets never gaping ; lower glume acute or obtuse.
- 3a. Aquatic perennials. Spikelets narrowly lanceolate,
acute ; lower glume nerveless ... *P. paludosum* 2
- 3b. Terrestrial annuals. Spikelets elliptic - oblong,
acute or obtuse.
- 4a. Wild. Spikelets caducous, 2 - 3 mm long,
often giant and deformed due to being
diseased ... *P. psilopodium* 3
- 4b. Cultivated. Spikelets sub - persistent, 2.0 -
3.5 mm long ... *P. sumatrense* 4

1. **Panicum notatum** Retz. Obs. Bot. 4 : 18. 1786. *P. montanum* Roxb.
Fl. Ind. 1 : 315. 1820.

Erect perennials with a short rootstock, 30 - 80 cm high. Leaves 7 - 15 cm long, 1.2 - 2.5 cm broad ; ligule obscure. Panicle effuse, up to 30 cm long and equally broad, with long capillary branches and pedicels. Spikelets ca 2.5 mm long ; lower glume ca 2 mm long, 3 - 5 - nerved.

In mixed forests ; 450 m.

Fl. & Fr. : January.

RAIPUR : Dugli.

2. **P. paludosum** Roxb. Fl. Ind. 1 : 310. 1820. *P. proliferum* Hook. f.
Fl. Brit. Ind. 7 : 50. 1896, *non* Lamk. 1797.

Aquatic perennials. Culms 20 - 90 cm long, spongy, creeping and rooting below. Leaves narrowly linear lanceolate, with loose sheaths. Panicles 10 - 25 cm long, lower branches whorled. Spikelets 3 - 4 × 1 mm ; lower glume orbicular, hyaline, ca 0.8 mm long.

Along ponds and reservoirs ; 400 m.

Fl. & Fr. : April.

DURG : Talgaon.

3. *P. psilopodium* Trin. Gram. Pan. 217 1826; Hook. f. Fl. Brit. Ind. 7 : 46, 1896, *incl. var. coloratum* Hook. f., *l. c.* 47; Cope in Nasir & Ali, Fl. Pakistan no. 143 : 170. 1982.

Tufted annuals. Culms slender, firm or sometimes spongy, 15–60 cm high. Leaves linear or narrowly lanceolate, 3–10 mm broad, usually glabrous but sometimes quite hairy. Panicles 5–20 cm long, usually spreading. Spikelets usually glabrous, sometimes hairy, often some are diseased and up to 7 × 4 mm. Grains ca 1.8 mm long.

In lowlands, river-beds, mixed forests and along paddy-fields; 250–800 m.

Fl. & Fr. : August–January.

RAIPUR : Balodabazar, Raipur, Sitanadi. RAJNANDGAON : Chilpi, Deopura.

4. *P. sumatrense* Roth ex R. & S. Syst. 2 : 434. 1817. *P. miliare* auct., *non* Lamk. 1791. *P. attenuatum* Willd. Enum. Pl. 1033. 1809, *non* Moench. 1802. *P. simplex* Rottl. ex Trin. Gram. Pan. 216. 1826, *non* Willd. 1825.

Slender tufted annuals, 30–60 cm high. Leaves glabrous or hairy. Panicles 8–20 cm long, contracted. Spikelets elliptic-lanceolate, acute or cuspidate; lower glume broadly ovate with a subamplexicaul base, ca 1 mm long. Grains 2.0–2.5 mm long.

Cultivated; 500 m.

Fl. & Fr. : November.

RAJNANDGAON : Niwaspur.

It is thought to be a cultivated form of *P. psilopodium* Trin. from which it is difficult to distinguish in the herbarium specimens.

5. *P. trypheron* Schult. Mant. 2 : 244. 1824. *P. tenellum* Roxb. Fl. Ind. 1 : 309. 1820, *non* Lamk. 1791.

Tufted annuals, 25–50 cm high. Leaves linear or linear-lanceolate, hispid. Panicles lax, ovate or oblong, 10–20 cm long. Spikelets elliptic-oblong, 2.8–3.5 mm long; lower glume about two third as long as the spikelet; upper lemma yellowish, shining.

In wastelands; 400 m.

Fl. & Fr. : September.

RAJNANDGAON : Baghnandi.

52. PASPALIDIUM Stapf

- | | | |
|---|-----|-----------------------|
| Ia. Lower floret male, with a palea ; upper lemma
granulose | ... | <i>P. flavidum</i> 1 |
| 1b. Lower floret sterile, without a palea ; upper lemma
rugulose | ... | <i>P. punctatum</i> 2 |

1. ***Paspalidium flavidum* (Retz.) A. Camus** in LeComte, Fl. Gen. Indo Chine 7 : 419. 1922. *Panicum flavidum* Retz. Obs. Bot. 4 : 15. 1786.

Tufted perennials. Culms erect or ascending from a prostrate base, 5 - 100 cm long. Leaves 2 - 8 mm broad, acute or obtuse. Inflorescence 2 - 30 cm long ; spikes one several, 3 - 25 mm long, usually distant by 2 - 4 - times their own length. Spikelets ovoid, 2 - 3 mm long.

In wastelands & forest clearings ; 250 - 600 m.

Fl. & Fr. : August May.

RAIPUR : Balodabazar, Borai, Raipur. Sitanadi. RAJNANDGAON : Salewara.

2. ***P. punctatum* (Burm. f.) A. Camus** in LeComte, Fl. Gen. Indo. Chine 7 : 419. 1922. *Panicum punctatum* Burm. f. Fl. Ind. 26. 1768.

Perennials with creeping or floating spongy rhizomes. Culms 20 - 80 cm long. Leaves 3 - 6 mm broad, acute or long acuminate. Inflorescence 10 - 30 cm long ; spikes several, more or less distant, 1 - 5 cm long. Spikelets ellipsoid, 2 - 3 mm long.

In moist places ; 300 m.

Fl. & Fr. : September.

RAIPUR : Raipur.

53. PASPALUM L.

- | | | |
|---|-----|---------------------------|
| 1a. Spikelets ovate - lanceolate ; upper glume herbaceous;
pubescent | ... | <i>P. paspalodes</i> 1 |
| 1b. Spikelets broadly obovate or suborbicular ; upper glume
papery, usually glabrous | ... | <i>P. scrobiculatum</i> 2 |

1. *Paspalum paspalodes* (Michx.) Scribner in Mem. Torrey Bot. Club 5 : 29. 1894 ("*paspaloides*"). *Digitaria paspalodes* Michx. Fl. Bor. Amer. 1 : 46. 1803. *P. distichum* auct., non L. Syst. ed. 10, 2 : 855. 1759, *nom. confus.*

Creeping perennials. Culms 10 - 50 cm long. Racemes 2, each 2 - 6 cm long. Spikelets in two rows on a flattened rachis, plano convex, 2.5 - 3.5 mm long, green; lower glume often present as a small scale; lower lemma like the upper glume but glabrous.

Along ponds ; 300 m.

RAIPUR : Raipur, n. v. (cf. Unni in J. Bombay nat. hist. Soc. 64 : 101. 1967).

2. *P. scrobiculatum* L. Mant. 1 : 29. 1767 ; Cope in Nasir & Ali, Fl. Pakistan no. 143 : 213. 1982. *P. orbiculare* Forst. Fl. Inst. Austr. Prodr. 7. 1786. *P. commersonii* Lamk. Tab. Encycl. 1 : 175. t. 43/1. 1791. *P. cartilagineum* Presl, Rel. Haenk. 1 : 216. 1830 - 'Kodo'.

Perennials, 10 - 100 cm high, usually erect, sometimes with a procumbent base. Leaves 3 - 7 (- 15) mm broad, with a filiform tip. Racemes one - several, digitate or scattered along a common axis, lowest 3 - 8 (- 15) cm long. Spikelets biseriate, 1.5 - 3.0 mm long, green becoming brown, lower glume absent.

Cultivated for its edible grains which are harmful under certain conditions ; 300 - 400 m.

Fl. & Fr. : August - April.

DURG : Balod. RAIPUR : Abhanpur, Pithora, Taurenga.
RAJNANDGAON : Deopura, Singhari.

A highly polymorphic species and variations in several characters has been discussed in detail by Clayton (in Kew Bull. 30 : 101. 1975). However, it would be of interest to mention, as an additional variation, that in two collections (Abhanpur, Verma 24980 and Taurenga, Verma 25166) the upper glumes and the lower lemmas are quite pubescent, thus bringing these specimens very close to *Paspalum paspalodes* (Michx.) Scribner.

54. PENNISETUM L. C. Rich. ex Pers.

- 1a. Rhachis not winged ; bristles all glabrous ... *P. hohenackeri* 1
- 1b. Rhachis winged below the involucre ; inner bristles plumose.
 - 2a. Spikelets in clusters of 1 - 5 within the involucre, at least one of the spikelets upon a pedicel 1 - 3 mm long ... *P. pedicellatum* 2
 - 2b. Spikelets solitary and sessile within the involucre ... *P. polystachion* 3

1. *Pennisetum hohenackeri* Hochst. ex Steud. Syn. Pl. I : 103. 1854.
P. alopecuros Nees ex Steud. Syn. Pl. I : 102. 1854.

Erect tufted perennials, 50 - 100 cm high. Leaves long, folded, rigid, 1 - 3 mm broad. Panicles linear, 10 - 18 cm long ; rhachis ribbed, scaberulous ; involucre enclosing a solitary sessile spikelet. Spikelets linear-lanceolate, 6 - 8 mm long.

In shady places ; 500 m.

Fl. & Fr. : September - November.

RAJNANDGAON : Deopura.

2. *P. pedicellatum* Trin. in Mem. Acad. Sci. Petersb. ser. 6, 3 : 184. 1834.

Erect annuals 0.6 - 1.2 m high. Leaves flat, 4 - 8 mm broad. Spikes 10 - 12 cm long, excluding the bristles, 8 - 12 mm thick, white or usually pale purple; rhachis puberulus; involucral bristles unequal, outer small, scabrous, inner longer, woolly plumose in the lower part, longest ca 1 cm long. Spikelets 4 - 6 mm long.

In stream-beds and forest-clearings ; 400 - 550 m.

Fl. & Fr. : October - November.

RAIPUR : Taurenga. RAJNANDGAON : Deopura, Taregaon.

3. *P. polystachion* (L.) Schult. Syst. Veg. Mant. 2 : 146. 1824 ('*polystachyon*'). *Panicum polystachion* L. Syst. ed. 10, 2 : 870. 1759. *Pennisetum setosum* auct. p.p., non (Swartz) L. C. Rich. 1805.

Slender erect annuals, 25 - 50 cm high. Leaves 3 - 6 mm broad. Spikes rather flexuous, 5 - 10 cm long, excluding the bristles, 6 - 8 mm thick, whitish or pale green ; involucral bristles unequal, outer small,

scabrous, inner longer, woolly in the lower part, longest 15 - 25 mm long. Spikelets 2.0 - 2.5 mm long.

On roadsides ; 400 m.

Fl. & Fr. : October.

RAIPUR : Pithora.

55. PEROTIS Ait.

Perotis indica (L.) O. Ktze. Rev. Gen. Pl. 2 : 787. 1891. *Anthoxanthum indicum* L. Sp. Pl. 28. 1753.

Loosely tufted slender perennials with 20 - 70 cm long spreading culms. Leaves ovate lanceolate, amplexicaul, 2 - 7 cm long, 4 - 10 mm. broad. Spikes solitary, 3 - 25 cm long. Spikelets linear, 2.0 - 2.5 mm long, ultimately horizontally spreading ; glumes long awned.

In rock-crevices; 550 m.

Fl. & Fr. : October.

RAIPUR : Taurenga.

56. PHRAGMITES Adans.

Phragmites karka (Retz.) Trin. ex Steud. Nom. Bot. ed. 2, 2 : 324. 1841. *Arundo karka* Retz. Obs. Bot. 4 : 21. 1786.

Tall perennial reeds with a creeping rhizome. Culms 2 - 5 m high. Leaves 30 - 50 cm long, 1 - 3 cm broad. Panicles 20 - 40 × 10 - 20 cm, profusely branched and silky hairy. Spikelets ca 1 cm long, rhachilla hairs ca 5 mm long ; upper glume ca 5 mm long.

Along streams ; 500 - 550 m.

Fl. & Fr. : November - June.

RAIPUR : Taurenga. RAJNANDGAON : Deopura.

57. POGONATHERUM P. Beauv.

Pogonatherum crinitum (Thunb.) Kunth, Enum. Pl. 1 : 478. 1833. *Andropogon crinitus* Thunb. Fl. Jap. 40. t. 7. 1784.

Slender tufted perennials, 15–30 cm high. Leaves 1–5 cm long, 1–3 mm broad. Racemes flexuous, 1–3 cm long, fragile. Spikelets narrowly elliptic, 1.3–2.0 mm long; callus bearded with ca 2 mm long white hairs, upper lemma bearing 8–20 mm long flexuous awns.

In rock crevices; 550 m.

Fl. & Fr.: June.

RAIPUR : Taurenga.

58. PSEUDORAPHIS Griff.

Pseudoraphis spinescens (R. Br.) Vickery in Proc. Roy. Soc. Queensl. 62, n. 7 : 69. 1952. *Panicum spinescens* R. Br. Prodr. 193. 1810. *Panicum asperum* Koen. in Naturforscher 23 : 209. 1788, non Lamk. 1778. *Chamaeraphis spinescens* Poir. in Lamk. Encycl. Meth. Bot. Suppl. 2 : 189. 1811. *Pseudoraphis aspera* Pilger in Notizbl. Bot. Gard. Berlin 10 : 210. 1928.

Aquatic, floating, or creeping in mud, with up to 1 m long branched culms rooting at the lower nodes; nodes hairy. Leaves 3–8 cm long, 3–5 mm broad, scaberulous. Panicles 6–10 cm long, branches undulate, scabrid. Spikelets subulate, 5–6 mm long; lemma of the lower floret aristate.

Along streams; 300 m.

Fl. & Fr.: August.

RAIPUR : Raipur.

59. ROTTBOELLIA L. f.

Rottboellia exaltata L. f. Nova Gram. Gen. 37. 1779.

Erect annuals, 0.3–2.0 m high with stilt roots and coarsely hispid basal sheaths. Leaves 25–45 cm long, 1–2 cm broad. Racemes 5–15 cm long, with a terminal tail of reduced spikelets, gathered into a spatheate pseudo panicle. Sessile spikelets elliptic; lower glume 4–5 mm long; upper glume winged at the tip.

In stream - beds and mixed forests ; 400 - 600 m.

Fl. & Fr. : October - November.

RAIPUR : Chhoora, Taurenga. RAJNANDGAON : Deopura.

60. SACCHARUM L.

Saccharum spontaneum L. Mant. 2 : 183. 1771. 'Kaans'.

Tall rhizomatous perennials. Culms 2 - 4 m high. Leaves up to 2 m long, 5 - 7 mm broad, tapering at the base into a narrowly winged petiole. Panicles 20 - 40 cm long, silky white hairy, narrow, with articulated branches ; racemes 3 - 12 cm long. Spikelets 3 - 5 mm long : glumes subcoriaceous, equal ; upper lemma shortly awned.

Along streams and swampy places ; 350 - 550 m.

Fl. & Fr. : August - October.

DURG : Balod. RAIPUR : Dugli, Pithora, Taurenga. RAJNANDGAON : Deopura.

Commonly used for thatching.

61. SACCIOLEPIS Nash

- | | | |
|--|-----|------------------------|
| 1a. Culms usually spongy below. Spikelets 4 - 5 mm long, lower glume about one - third as long as the spikelet, 5 - nerved | -- | <i>S. interrupta</i> 2 |
| 1b. Culms never spongy. Spikelets 2.0 - 3.5 mm long, lower glume about half as long as the spikelet, 3 - nerved | ... | <i>S. indica</i> 1 |

1. **Sacciolepis indica** (L.) A. Chase in Proc. Biol. Soc. Wash. 21 : 8. 1908. *Aira indica* L. Sp. Pl. 1753, in "Errata". *Panicum indicum* L. Mant. Pl. 2 : 184. 1771 ; non Mill. 1769. - 'Sanwa ghaas'.

Slender erect or ascending annuals, 15 - 50 cm high. Panicles very narrow, spike like, 1 - 7 cm long, ca 4 mm across, pale green or frequently purple. Spikelets crowded, ovoid, acuminate, sometimes slightly curved, usually more or less hispid.

In drains and lowlands ; 400 - 450 m.

Fl. & Fr. : October - January.

RAIPUR : Dugli, Gariaband.

Scarcely distinguishable from *Sacciolepis myosuroides* (R. Br.) A. Camus which has subglobose glabrous spikelets.

2. *S. interrupta* (Willd.) Stapf in Prain, Fl. Trop. Afr. 9 : 757. 1920. *Panicum interruptum* Willd. Sp. Pl. 1 : 341. 1798.

Robust perennials. Culms spongy below, 50 - 100 cm high. Panicles narrow, spike like, 6 - 25 cm long, ca 8 mm thick, continuous or frequently interrupted. Spikelets crowded, subsessile, ellipsoid, ultimately spreading, hispidulous or glabrous.

Along ponds ; 250 - 500 m.

Fl. & Fr. : November - January.

RAIPUR : Raipur. RAJNANDGAON : Deopura, Singhari.

62. SCHIZACHYRIUM Nees

Schizachyrium brevifolium (Sw.) Nees ex Buese in Miq. Pl. Junghn. 359. 1854. *Andropogon brevifolius* Sw. Prodr. Veg. Ind. Occ. 26. 1788. *A. parviflorus* Roxb. Fl. Ind. 1 : 277. 1820.

Slender much branched straggling annuals. Culms 20 - 40 cm long. Leaves linear - lanceolate, 1.5 - 3.0 cm long, obtuse, becoming reddish on maturity. Racemes few in each leaf - axil, 1 - 2 cm long, joints of the racemes 2 - 3 mm long ; spathe subtending the raceme linear. Spikelets 3.0 - 3.5 mm long, shortly awned.

In wastelands ; 500 m.

Fl. & Fr. : October.

RAJNANDGAON : Deopura

63. SCHOENEFELDIA Kunth

Schoenfeldia gracilis Kunth, Rev. Gram. 1 : 283. t. 53. 1830. *S. pallida* Edgew. in J. Asiatic Soc. Beng. 21 : 183. 1852. *Chloris pallida* Hook. f. Fl. Brit. Ind. 7 : 289. 1896. *C. myosuroides* Hook. f. Fl. Brit. Ind. 7 : 290. 1896.

Erect or ascending tufted annuals, 10 - 50 cm high. Spikes 1 - 4, slender, often flexuous, 3 - 15 cm long, pale. Spikelets 3 - 5 mm long ; glumes shortly aristate, lower 2.5 - 4.5 mm long, upper 3 - 5 mm long ; lemma ca 2 mm long with 2 - 4 cm long awn.

In wastelands ; 350 m.

Fl. & Fr. : October.

RAIPUR : Sankra.

64. SEHIMA Forsk.

Sehima nervosum (Rottl.) Stapf in Prajn, Fl. Trop. Africa 9 : 36. 1917. *Andropogon nervosus* Rottl. *apud* Willd. in Verh. Ges. Naturf. Fr. Berlin, Neue Schr. 4 : 218. 1803. *Ischaemum laxum* R. Br. Prodr. 205. 1810.

Perennials, 50 - 120 cm high. Leaves 10 - 50 cm long, 3 - 6 mm broad. Raceme solitary, 6 - 18 cm long ; peduncle with widened ciliate apex ; rhachis jointed. Sessile spikelets 7 - 9 mm long, ciliate, yellowish, upper lemma with 3 - 5 cm long awn ; pedicelled spikelets ciliate, purple tinged.

In wastelands ; 300 m.

Fl. & Fr. : October.

RAIPUR : Raipur, Nanda 1862 (DD).

An excellent fodder grass.

65. SETARIA P. Beauv.

- | | | |
|--|-----|--------------------------|
| 1a. Bristles retrorsely barbed, adhering to clothings | ... | <i>S. verticillata</i> 3 |
| 1b. Bristles antrorsely barbed, not adhering to clothings. | | |
| 2a. Inflorescence a distinctly branched panicle | ... | <i>S. intermedia</i> 1 |
| 2b. Inflorescence a cylindric false spike | ... | <i>S. pumila</i> 2 |

1. *Setaria intermedia* R. & S. Syst. Veg. 2 : 489. 1817. *Panicum tomentosum* Roxb. Fl. Ind. 1 : 303. 1820. *S. tomentosa* Kunth, Rev. Gram. 1 : 47. 1829.

Slender tufted ascending annuals, 15 - 60 cm high. Leaves 2 - 10 mm broad, usually scabrid on both the surfaces. Panicles 3 - 10 cm long, ca 5 mm broad, branched at least at the base ; bristles 3 - 10 mm long. Spikelets broadly ellipsoid, 1.5 - 2.0 mm long ; upper lemma rugose.

In wastelands ; 300 - 400 m.

Fl. & Fr. : August.

RAIPUR : Arang, Dhamtari.

2. *S. pumila* (Poir) R. & S. Syst. Veg. 2 : 891. 1817 ; Cope in Nasir & Ali, Fl. Pakistan no. 143 : 181. 1982. *Panicum pumilum* Poir. in Lamk. Encycl. Meth. Bot. Suppl. 4 : 273. 1816. *P. pallide-fuscum* Schüm. Beskr. Guin. Pl. 58. 1827. *S. pallide-fusca* Stapf & Hubb. in Kew Bull. 1930 : 259. 1930. *S. glauca* auct., non (L.) P. Beauv. - 'Neori'.

Slender or rather stout tufted annuals. Culms 5 - 80 cm high. Leaves 3 - 30 cm long, smooth or scaberulous. Panicles 1 - 10 cm long, 4 - 8 mm thick ; bristles 3 - 12 mm long, yellowish brown. Spikelets 2.0 - 2.5 mm long ; glumes one third to two third the length of the spikelets ; upper lemma usually rugose corrugate.

Common in farms, wastelands and forest clearings ; 250 - 550 m.

Fl. & Fr. : August - October.

RAIPUR : Arang, Balodabazar, Dhamtari, Pithora.

RAJNANDGAON : Baghnadi.

3. *S. verticillata* (L.) P. Beauv. Ess. Agrost. 51, 178. 1812. *Panicum verticillatum* L. Sp. Pl. ed. 2, 1 : 82. 1762.

Tufted annuals. Culms 10 - 80 cm long, ascending. Leaves linear-lanceolate, 4 - 20 cm long, 4 - 12 mm broad, usually scaberulous. Panicle linear, spiciform or untidily lobed, 2 - 12 cm long ; bristles 3 - 8 mm long. Spikelets ellipsoid, 1.5 - 2.5 mm long ; upper lemma finely rugose.

In wastelands ; 500 m.

Fl. & Fr. : January.

RAIPUR : Sitanadi.

66. SORGHUM Moench.

Sorghum halepense (L.) Pers. Syn. 1 : 101. 1805 ; Cope in Nasir & Ali, Fl. Pakistan no. 143 : 295. 1982. *Holcus halepensis* L. Sp. Pl. 1047. 1753. *Andropogon halepensis* Brot. Fl. Lusit. 1 : 89. 1804. *A. miliaceus* Roxb. Fl. Ind. 1 : 276. 1820. *S. miliaceum* Snowden in J. Linn. Soc. (Bot.) 55 : 207. 1955.

Rhizomatous erect perennials. Culms simple or branched, 0.5 - 3.0 m high. Leaves 20 - 100 cm long, 5 - 40 mm broad. Panicles open, pyramidal, 10 - 50 cm long, branches capillary. Spikelets ellipsoid, 4.5 - 5.5 mm long, yellow, purple or brownish, usually hairy; lower glume toothed, upper long-awned.

Along streams & paddy fields; 300 - 500 m.

Fl. & Fr.: October - January.

RAIPUR : Rajim, Sitanadi.

An obnoxious weed, sometimes poisonous.

67. SPOROBOLUS R. Br.

1a. Panicle contracted, subspiciform	...	<i>S. fertilis</i> 2
1b. Panicle effuse.		
2a. Stamens 2	...	<i>S. diander</i> 1
2b. Stamens 3	...	<i>S. tenuissimus</i> 3

1. *Sporobolus diander* (Retz.) P. Beauv. Ess. Agrost. 26, 147, 178.
1812. *Agrostis diandra* Retz. Obs. Bot. 5 : 19. 1789.

Tufted perennials with a small rootstock. Culms usually erect, 15 - 70 cm high. Leaves usually convolute, up to 25 cm long. Panicles 4 - 20 cm long, the branches suberect or spreading. Spikelets lanceolate, 1.2 - 1.5 mm long; lower glume ca 0.5 mm long, upper ca 0.7 mm long.

In wastelands; 300 - 550 m.

Fl. & Fr.: August.

RAIPUR : Dhamtari.

2. *S. fertilis* (Steud.) Clayton in Kew Bull. 19 : 291. 1965. *Agrostis fertilis* Steud. Syn. Pl. 1 : 170. 1854. *S. indicus* auct.; Bor, Grasses Burma, Ceylon, Ind. & Pak. 630. 1960, non (L.) R. Br. 1810.

Erect tufted perennials, 0.5 - 1.0 m high. Leaves flat or convolute, tapering to a long filiform tip. Panicles dense, spiciform, somewhat interrupted, 20 - 40 cm long; primary branches erect and appressed to the main axis, up to 5 cm long. Spikelets ca 2 mm long, green or purplish; lower glume hyaline, ca 0.5 mm long. Grains obovoid, ca 0.8 mm long.

On roadsides; 550 m.

Fl. & Fr. : October.

RAIPUR : Taurenga.

3. *S. tenuissimus* (Schrank) O. Ktze. Rev. Gen. Pl. 3 : 369. 1893.
Panicum tenuissimum Schrank in Denkschr. Bot. Ges. Regensb. 2 : 26. 1822.

Tufted erect perennials, 5 - 60 cm high. Leaves usually convolute, up to 20 cm long. Panicles pyramidal, 3 - 17 cm long, its branches spreading, filiform. Spikelets oblong - ellipsoid, ca 1 mm long ; upper glume about two third as long as the lemma.

Common in wastelands ; 250 - 600 m.

Fl. & Fr. : August - January.

RAIPUR : Arang, Borai, Dhamtari, Dugli, Pithora.

68. THELEPOGON Roth ex R. & S.

Thelepogon elegans Roth ex R. & S. Syst. Veg. 2 : 788. 1817.

Erect annuals, 10 - 150 cm high. often supported by stilt roots. Leaves lanceolate, cordate, 5 - 20 cm long, 5 - 30 mm broad, ciliate-margined. Racemes 4 - 15 cm long, lower verticillate. Sessile spikelets 5 - 13 mm long, glumes rugose ; upper lemma with 15 - 25 mm long awn.

RAIPUR, n.v (cf. S. D. N. Tiwari in Ind. For. 89 : 601. 1963).

69. THEMEDA Forssk.

- | | | |
|---|-----|--------------------------|
| 1a. Involucral spikelets 7 - 9 mm long | ... | <i>T. triandra</i> 3 |
| 1b. Involucral spikelets 4.5 - 5.5 mm long. | | |
| 2a. Branching strict. Clusters many in numerous fascicles | | <i>T. quadrivalvis</i> 2 |
| 2b. Branching very effuse. Clusters very few in few small superposed fascicles on the filiform branches | ... | <i>T. laxa</i> 1 |

1. *Themeda laxa* (Anderss.) A. Camus in Bull. Mus. Hist. Nat. Paris 26 : 423. 1920. *Anthistiria laxa* Anderss. In Nov. Act. Sci. Upsal. ser. 3, 2 : 243. 1856.

Slender, profusely branched, 60 - 120 cm high. Panicles very lax and leafy, of sub-solitary or 3 - 4 small heads one over the other in verticilliform clusters on filiform branches. Involucral spikelets with

glabrous callus; glumes mainly in the upper part with long white tubercle-based hairs; awns 3–4 cm long.

Along paddy fields; 450 m.

Fl. & Fr. : September.

RAJNANDGAON : Baghnadi.

2. *T. quadrivalvis* (L.) O. Ktze. Rev. Gen. Pl. 2 : 794. 1891.
Andropogon quadrivalvis L. in Murr. Syst. Veg. ed. 13, 758. 1774.
Anthistiria ciliata L. f. Suppl. 113. 1781.

Tufted annuals, 1–2 m high. Culms erect or geniculate at the base. Leaves ca 5 mm broad, glaucous beneath. Panicle dense, of several 3–8 cm long partial panicles with small leaves. Glumes of the involucral spikelets with white tubercle based hairs in the upper part; awns 3–4 cm long.

In wastelands and sal forests; 400–600 m.

Fl. & Fr. : October - January.

RAIPUR : Dugli, Taurenga.

3. *T. triandra* Forssk. Fl. Aegypt. - Arab. 178. 1775. *Anthistiria imberbis* Retz. Obs. Bot. 3 : 11. 1783. *T. imberbis* Cooke, Fl. Pres. Bombay 2 : 993. 1908.

Perennials with shortly creeping rhizomes, 0.5–2.5 m high. Culms polished stramineous. Leaves 20–40 cm long, 3–6 mm broad. Panicle lax, leafy, slender; partial panicles consisting of fan-shaped fascicles or a system of fan-shaped fascicles. Glumes of the involucral spikelets deciduously hairy, scarcely tubercled; awns 3–5 cm long.

Along drains, paddy fields and in forest clearings; 300–600 m.

Fl. & Fr. : November - June.

RAIPUR : Dugli, Khallari, Taurenga. RAJNANDGAON : Singhari.

70. THYSANOLAENA Nees

Thysanolaena maxima (Roxb.) O. Ktze. Rev. Gen. Pl. 2 : 794. 1891.
Agrostis maxima Roxb. Fl. Ind. 1 : 319. 1820. *T. agrostis* Nees in Edinb. New Phil. J. 18 : 180. 1835, nom. superfl., based on *Agrostis maxima* Roxb. - 'Phool baharu.'

Erect perennials, reed-like, 1.5 - 3.5 m high. Leaves lanceolate, sub-amplexicaul, 30 - 50 × 3 - 6 cm. Panicles open, 20 - 50 cm long. Spikelets tardily breaking up above the glumes and between the florets, lanceolate, 1.2 - 1.8 mm long; glumes hyaline; upper lemma ciliate-margined.

Along streams; 500 m.

Fl. & Fr. : January - May.

RAIPUR : Sitanadi.

Several panicles are tied together and commonly used as a broom.

71. TRAGUS Haller

Tragus roxburghii Panigrahi in Kew Bull. 29 : 495. 1974. *Lappago biflora* sensu Roxb. Fl. Ind. 1 : 284. 1820, quoad. descript. excl. typ. *T. biflorus* sensu Schult. Syst. Veg. Mant. 2 : 205. 1824, quoad descript., excl. typ.

Tufted spreading perennials. Culms 5 - 15 cm long, rooting at the lower nodes. Leaves linear-lanceolate, 10 - 25 × 1 - 3 mm, ciliate-margined. Panicle spike-like, 1 - 3 cm long, consisting of several pairs of subopposite spikelets. Spikelets ca 3 mm long, pinkish; upper glume clothed with ca 0.7 mm long prickles.

In wastelands ; 300 m.

Fl. & Fr. : August.

RAIPUR : Abhanpur.

72. UROCHLOA P. Beauv.

Urochloa panicoides P. Beauv. Ess. Agrôst. 53, t. 11/l. 1812; Cope in Nasir & Ali Fl. Pakistan no. 143 : 209. 1982. *Panicum javanicum* Poir. in Lamk. Encycl. Meth. Bot. Suppl. 4 : 274. 1816. *U. pubescens* Kunth, Rev. Gram. 1 : 31. 1829. *U. marathensis* Henr. in Meded. Rijks. Herb. 43 : 2. 1922, incl. var. *velutina* Henr. *U. panicoides* var. *pubescens* Bor, Grasses Burma, Cey. Ind. Pak. 372. 1960.

Tufted annuals. Culms usually ascending and rooting below, 10 - 70 cm long. Leaves linear-lanceolate, 2 - 15 cm long, 5 - 15 mm

broad, glabrous or pubescent, margins ciliate at the base. Racemes 2 - 7 on a short common axis, each 1 - 6 cm long. Spikelets mostly solitary, sometimes paired, 3 - 5 mm long, glabrous or pubescent.

In wastelands and paddy - fields ; 250 - 300 m.

Fl. & Fr. : August.

RAIPUR : Arang, Balodabazar, Simga.

73. VETIVERIA St.-Vincent

Vetiveria zizanioides (L.) Nash in Small, Fl. South-east U.S. 67. 1903. *Phalaris zizanioides* L. Mant. 2 : 183. 1771. *Andropogon squarrosus* Hook. f. Fl. Brit. Ind. 7 : 186. 1896, *non* L. f. 'Khal, Khas.'

Erect tufted perennials with a stout rhizome. Culms 1 - 2 m high. Leaves coarse, up to 1 m long, 4 - 10 mm broad. Panicle contracted, purplish green, 15 - 30 cm long, with whorls of 2 - 5 cm long fragile racemes. Sessile spikelets 4 - 5 mm long, lower glume spinulose ; pedicelled spikelet smaller, male.

In river-beds, along drains and forests, in moist places ; 400 - 550 m.

Fl. & Fr. : September - June.

RAIPUR : Sitanadi, Taurenga. RAJNANDGAON : Baghnadi.

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CORRIGENDA

Page	Line	For	Read
v	2	Mareh	March
vii	33	resultad	resulted
viii	5	spp.	ssp.
x	16	<i>Legerstroemia</i>	<i>Lagerstroemia</i>
x	27	<i>latifolius</i>	<i>latifolia</i>
xii	4	hydophytes	hydrophytes
xii	9	spp.	ssp.
29	4	Calpham	Clapham
89	17	<i>A. vaginalis</i> 9	<i>A. vaginalis</i> 6
90	20	<i>A. rugosus</i> Willd. DC.	<i>A. rugosus</i> (Willd.) DC.
105	35	<i>I. astragalina</i> 8	<i>I. astragalina</i> 2
206	9	<i>pyramidalis</i> (D. Don)	<i>pyramidalis</i> D. Don
212	2	<i>latifolia</i>	<i>latifolia</i>
214	20	<i>J. pubescens</i>	<i>J. multiflorum</i>
264	2	V <i>rhabicum</i>	Verbascum
364	12	—	BURMANNIA L.
418	25	cryptostachys	cyrtostachys
433	38	<i>Pegonatherum</i>	<i>Pogonatherum</i>
489 col. 2	26	<i>conyzoides</i> L.	<i>conyzoides</i> L.
490 col. 2	16	<i>Anagallis</i>	<i>Anagallis</i>
491 col. 2	49	<i>cimicinus</i>	<i>cimicinus</i>
493 col. 1	27	<i>Juncea</i> (L.) Czern. Coss.	<i>juncea</i> (L.) Czern. & Coss.
493 col. 2	1	<i>Buchnera</i> L.	<i>Buchnera</i> L. 253, 255
495 col. 1	39	<i>Citrullus lanatus</i> (Thunb.) Mansf.	<i>Citrullus lanatus</i> (Thunb.) Mansf.
503 col. 2	43	<i>aristata</i>	<i>aristata</i>