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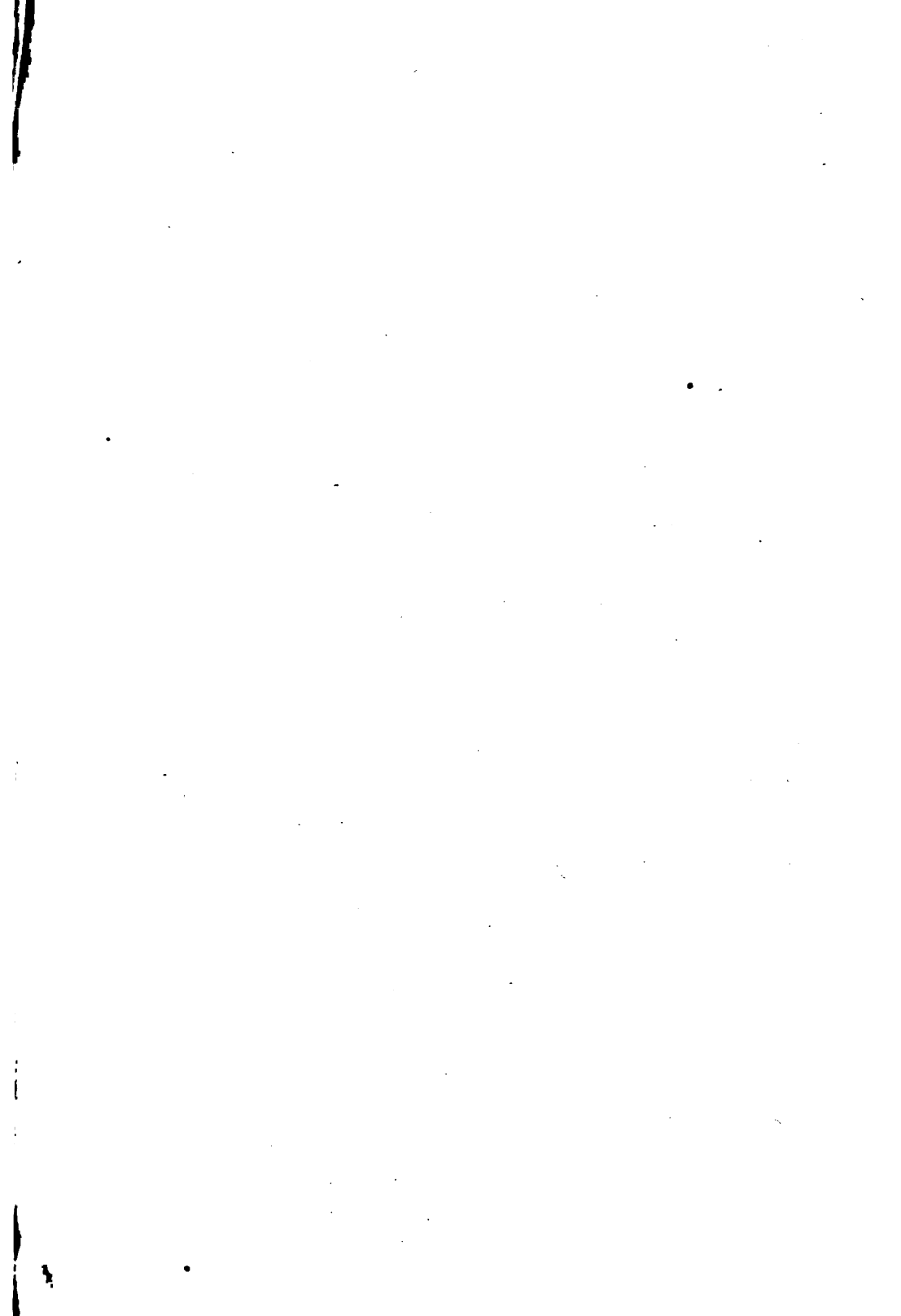
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#

PLANTS OF CHUTIA NAGPUR INCLUDING JASPUR AND SIRGUJA.

By *J. J. WOOD, M.B., SURGN. LIUT.-COL., I.M.S., RETIRED.*

INTRODUCTION.

THE area dealt with in the following lists is Chutia Nagpur, including the province so named as at present politically understood, but to this province, as being physiographically part of the same region, we must annex Santalia.

¹ V. Ball. 1880.

The total area of Chutia Nagpur is
44,000 square miles.¹

The topography of this region is perhaps a little difficult; but if we take one section north and southerly, and another east and west, these will show the elevations and be, I hope, easily understood.

The sections are diagrams and not to scale.

It is only polite to start from the capital, and Hooker's "Himalayan Journals"² is the best and cheapest* guide from Calcutta as far as Paras-

² Chaps. I and II.

nath Hill and the Dunwah pass on the Grand Trunk Road, and on to Rohtasgurh and the Son River. Our east to west section is further south. It shows the rise from Calcutta to Ranigunge collieries, crosses the Damuda there, and passes by the wooded hill of Pachete and rocky Rogonathpur to Purulia.

From this point the Bāgmūndi hills are seen to the south and Parasnath on the distant north horizon. The section shows a gentle rise to Jhālḍa, where very fine examples of those striking, domeshaped porphyritic³ gneiss rocks occur which

³ V. Ball.

are characteristic of Chutia Nagpur, particularly here and on the Lohardugga and Hazaribagh plateaus.

A little further on we cross the Subarnarekha River—river of golden sand—flowing south, and reach Sillee, where there are more of the rounded knobs of gneiss; one group resembling a fist was well named "Knuckles" by Mr. T. F. Peppé.

*It is on sale, illustrations, maps and all, for 10½d., by the Grand Colosseum Warehouse Co., 60 and 70, Jamaica Street, Glasgow, etc.

From Calcutta to Sillee we have been passing through a cultivated country of chiefly rice-land and have not encountered much scrub jungle or forest woodland; but here the jungle proper may be said to begin, as we rise the Lohardugga plateau—the first step up, to two thousand feet—and the road passes through hilly, wooded country until we get to rice-land again at the top. For about twenty miles this wooded ascent continues and wherever the Lohardugga plateau descends to the plains a similar belt of wood is found.

The section now passes through the Lohardugga plateau for between 50 and 60 miles close on the 2,000 level. To the North, a dozen miles off, is seen Bāra Gai, a mountain about 4,000 feet high; and closer to Ranchi are several belt-shaped gneiss hills. As we approach the town of Lohardugga there appears against the western sky a level line which we may call the 3,000 level. North, to the right, it ends in hills which dip into Toree and Palamow, some thousand feet below us, where the Damuda River on the east and the Koel River on the west have their sources. On the south, left, the sky-line seems to go on for ever.

The sides of this plateau are here steeper-looking than the ascent from Sillee to the Lohardugga level. Here we have no continuous table-land like that just passed over or like Hazaribagh, for within these higher lands are wide level valleys at, say, 2,500 feet, reached by passes through the steeper wall. I cannot do better than quote here Dalton's "Descriptive Ethnology of Bengal," page 221 :—

"The country jointly occupied by the Mundas proper and the Oraons extends in a westerly direction to longitude $84^{\circ} 30'$ east, and on reaching that meridian at about latitude $23^{\circ} 15'$ north, we find ourselves in the centre of a dependency of Chutia Nagpur, called Barwah, connected and bounded by the plateau of Chutia Nagpur, Sirguja, and Jashpur, a combination of hill and dale, well-cultivated plains and forest-clad mountains, just suited, to the mixed population that dwell in it."

Arrived in one of these valleys, a still higher level-topped arrangement is observed, with sides densely-clad with jungle. Whereas some hills can attain to flat tops at 3,000 feet—such as Netter Hāt, which boasts to cultivate tea—others carry on higher and closely approach four thousand feet. These, called Pāts, are open plains with a few scattered bushes, and are still more broken up than the 3,000 level. The Jamera Pāt is a good example, and further south the Main Pāt rises to 3,850 feet from the Sirguja Plain, which is about the 2,000 level. It measures 16 miles by 12. The tops of the Pāts, now used as pasturage, were once good hunting ground for Nilgai and Antelope.

I can give no better description of the lie of the Chutia Nagpur plateau than Hooker's, written in 1848,¹ of which the following is a *loc. cit.* précis. His Parasnath range I take the liberty to call also the Chutia Nagpur plateau; thus—"The Plateau is the north-eastern continuation of that range which crosses the Peninsula from the Gulf of Cambay to Rajmehal. It meets the Kymore about 82° east longitude at Amarkantak—7,000-8,000 feet high,² and further west the southern range forms the Satpura. The Parasnath range is the longer of the two, as the north-east Vindhya or Kymore ends at Fort Chunar.

The Kymore consists of sandstone beds overlying limestone, whereas the Parasnath group consists of metamorphic gneiss through which granite protrudes. The Grand Trunk Road as above crosses the east end alone of the range with a very gradual ascent over the alluvial plains of the west of the Hooghly, then over laterite and the sandstone of the coal measures, succeeded by the granitic table-land. A little beyond the coal-field the average height is 1,130 feet, which is continued for upwards of 100 miles to the Dunwah pass. Here the descent, from 1,360 to 620 feet, is sudden to the plains, which continue those of the Ganges up the Son till beyond Rohtasgurrh, where the level is under 350 feet.

The Chutia Nagpur plateau differs in its climate and botany equally from the Gangetic plains to the north and from Orissa on the south.

The north and the south section begins at the Ganges, passes through the Rajmehal hills and Santalia to Giridi coal pits, crosses the Barakar river flowing east, and then rises gradually for 20 miles or so to the foot of the hill, then to 4,480 feet at the peak of Parasnath and falls on the south side to about 1,000 feet, the level of Tope Chaney or Doomree, where we may consider ourselves landed upon the Hazaribagh plateau.

This plateau is not so well defined as that of Lohardugga to the south is, and it does not so uniformly approach the 2,000 level. From the base of Parasnath the section rises to Hazaribagh, cutting across the drainage, which all flows to the east, and passing through open country with patches of jungle.

At Hazaribagh, about 2,000 feet, knobs of gneiss appear, and hills, such as Seetagarha and Jūmra where tea is cultivated. Scrub jungle is met with, but most of the ground is open and under cultivation. Between Hazaribagh and the southern edge of this plateau, some five-and-twenty miles, the scrub and other jungle increases in frequency, until it becomes the rule by the roadside, and the well-wooded

Damuda River valley is reached at Ramgurh, quite off the plateau but by no steep ghat. I suppose that 500 feet would cover its height above the sea.

The coal measures are met with here, where they are worked on a small scale. They occur more or less from Ranigunge right up to the source of the river and carry over into Palamow along the Koel basin to be worked on the Son at Dehri. The section now runs through the Bāragai range, which is wooded to the summits at 3,000 to 4,000 feet. Like Parasnath, this range runs east and west. The finest view of the mountain is from the north, for one gets from the north side fuller value, so to speak, because the Damuda valley at about 500 feet is the foreground. The same hill viewed from the south has a foreground of 2,000 feet and is not so grand.

From Ramgurh the country is level and pretty open to the foot of the Lohardugga plateau—5 miles or so. A pretty steep ascent on a bicycle road takes us to Chutu Palu on the top—some 5 miles further. The ghat is as usual jungle and tree-clad and is grand botanical ground. Once on the table-land the story is as before in crossing it from east to west. It is a shallow basin drained by the Subarnarekha river on the east and the South Koel on the west. The Damuda of course takes the northern drainage.

The foundation is gneiss; remarkable examples of the bell structure are seen at Ranchi, also at Lohardugga and Palkot. The country is terraced for rice where the ground is suitable, and in the cold weather dalls, mustard and sirguja are generally cultivated.

Patches of scrub-jungle are passed through, and such trees are in evidence as religion or advantage have saved from the woodman's axe. This continues for some sixty miles, when, after a slight rise the southern lip of the basin is passed over between hills, which here, as usual, edge the plateau—among tree-jungle which accompanies us until the 500-foot level is reached towards Chakardarpur Railway Station in Singbhum and rice-land is again arrived at.

Much of District Manbhum is quite off the plateau, but in the south-west it meets and mixes with the higher lands of Singbhum and of Lohardugga where, about the 2,000 level, the three districts meet. Much of Singbhum is also on the plains level, but parts of it rise to 2,900 and even 3,500 feet. It is so irregular that I shall not attempt to describe it in detail.

A note on the rivers, in which I follow Hooker, and I have done. The chief rivers from the Chutia Nagpur plateau, the great watershed of Western Bengal, flow north-west or south-east, a few comparatively insignificant streams running north to the Ganges.

Those flowing to the north-west are the Mohun, the Pangun and the North Koel, which feed the Son. Those to the south-east are the South Koel and the Sunk, which unite to form the Brahmani, the Mahanadi—branches—the Subarnarekha and the Damuda.

To the Chutia Nagpur plateau we are indebted for the innumerable lovely rapids and waterfalls which these rivers or their affluents show on every side of it. The finest perhaps is the Hundrughag on the Subarnarekha, not far from Sillee, among charming sylvan scenery. The height of this fall is given as 320 feet."

II.—INDEX TO THE PLANTS OF CHUTIA NAGPUR.

THIS Index to the Plants of Chutia Nagpur is founded on my own collections, mostly and kindly named by Dr. King and Dr. Prain of the Calcutta Herbarium.

It has been put together in hope that it may help botanists, collectors of plants and others interested. For use *practically* in the field, the list is intended to be bound interleaved so as to admit of the necessary additions and corrections.

The explanation of Synonyms is as follows :—

“*Local.*”—Where the native language is doubtful, *e. g.*, Mündāri, Urāon or Hindī. Mündāri is closely allied to Santāli.

“*Vern.*”—For vernacular where the language is ascertained, *e. g.*, S. Santāli, B. Bengāli, K. Kōl, H. Hindī.

The Descriptive Catalogue of Economic Products for the London Exhibition of 1886, by the Rev. A. Campbell, annotated by Dr. G. Watt, has been freely made use of. Mr. Campbell's Santāli¹ names of plants have not been *Indexed* in the body of my (catalogue or) Index along with the others, but separately as an appendix to this paper.

(*Abelmoschus esculentus*, *W. & A.*); *Malvaceæ*, *Hibiscus esculentus*, *Linn.*

Local.—Ram turui, ram jingi.

Vern.—Dhenrus, B.

Lady's fingers, Eng.

Abrus precatorius, *Linn.*; *Leguminosæ*.

Vern.—Arak Kawet, Pond Kawet, S.; (the seeds) Rati, H.

Local.—Karjani.

Abutilon indicum, *G. Don.*; *Malvaceæ*.

Vern.—Miru baha, S.

Acacia arabica, *Willd.*; *Leguminosæ*.

Vern.—Gabur, S.

Local.—Babul;—not a common plant in Chutia Nagpur.

Acacia Catechu, *Willd.*; *Leguminosæ*.

Local.—Kadir gach, khair, kāt, kātch.

Vern.—Khalyar, S.; Khair, H.

Catechu, Eng.

A neat and pretty hedge, when kept well cut.—*Firminger.*

*Note.*¹—I suppose that Mr. Campbell uses “*Kol*” for all the P Kolarian languages other than Santāli.—J. J. W., August 1899.

- Acacia Farnesiana, *Willd.*; Leguminosæ.
 Local,—Babul.
Vern.—Gabur, S.
- Acacia Intsia, *Willd.*; *Var. caesia, W. & A.*; Leguminosæ.
 Local,—Arar. Kondro janum, S.; Kundaru, K.
- Acacia pennata, *Willd.*; Leguminosæ.
 Local,—Arai, ? Khardara.
Vern.—Undaru, S.; Arar, Karwar, Kundaru, K.
- Acacia speciosa. Siris tree (Firminger) appears to be absent
 from Chutia Nagpur.
- Achyranthes aspera, *Linn.*; Amarantaceæ.
Vern.—Chipchirit, S.; Apang, B.
 Local,—Chinchiri, tirchiti.
- Achimenes, *sp.*; Gesneraceæ.
- Achras Sapota, *Linn.*; Sapotaceæ.
- Aconitum heterophyllum, *Wall.*; Ranunculaceæ.
Vern.—Atis, the root, H., *q.v.*
- Acorns calamus, *Linn.*; Aroideæ.
Vern.—Buch, B.
- Acrocephalus capitatus, *Benth.*; Labiatæ.
- Adam's needle, *Yucca aloifolia*, Liliaceæ. Cult. in gardens.
- Adenostemma viscosum, *Forst.*; Compositæ.
 Local,—Saki.
- Adhatoda Vasica, *Nees.*; Acanthaceæ.
- Adiantum lunulatum, *Burm.*; Filices.
 Local,—Bhui nim, Patal chata.
Vern.—Dodhari, S.
- Adina cordifolia, *Hook. f.*; Rubiaceæ.
 Local,—Kārām.
Vern.—Karam, S.; Kurumba, Komba sanke, K.
- Ad ka phar; Stereospermum suaveolens, *DC.*; Bignoniaceæ.
 Local,—Padar, Papre, Siris (z), (so).
Vern.—Pader, S.
- Aeginetia indica, *Linn.*; Orobanchaceæ.
Vern.—Pathu orot, S.
- Aegle Marmelos, *Correa.*; Rutaceæ.
 Local,—Bel.
Vern.—Sinjo, S.; Bel, H.
- Aerides odoratum, *Lour.*; Orchideæ. Got at Sandi-Mandi

- Aerua lanata*, *Fuss.*; Amarantaceæ.
Local,—Jar ka bariari.
- Agave americana*, *Linn.*; Amaryllideæ.
Vern.—Kantala, Ram Kanta, H. Cult. for fibre near Hazari-
bagh Jail by Govt.
American aloe, Eng.
- Agaricus*, *sp.*; Fungi.
- Agia; *Drosera Burmanni*, *Vahl.*; Droseraceæ.
- Aglaia undulata*, *Miq.*; Meliaceæ.
- Agor; *Dillenia pentagyna*, *Roxb.*; Dilleniaceæ.
Local,—Gulgul, Korkot.
- Ailanthus excelsa*, *Roxb.*; Simarubeæ.
Local,—Gur Karam.
- Air plant; *Bryophyllum calycinum*, *Salisb.*; Crassulaceæ.
- Ajuga macrosperma*, *Wall.*; Labiatæ.
- Akori; *Leea aspera*, *Wall.*; Ampelideæ.
Vern.—Hat kan, S.
- Alangium Lamarckii*, *Thwaites.*; Cornaceæ.
Local,—Dela Kanta.
Vern.—Dhela, S., K., H.
- Albizzia Lebbek*, *Benth.*; Leguminosæ.
Local,—Siris.
Vern.—Chapot Siris, S.
- Albizzia myriophylla*, *Benth.*; Leguminosæ.
Vern.—Kanta siris, S., K., H.
- Albizzia odoratissima*, *Benth.*; Leguminosæ.
Vern.—Jang siris.
- Albizzia stipulata*, *Boiv.*; Leguminosæ.
Vern.—Chapot kera serom, S.
- Alisma reniforme*, *D. Don.*; Alismaceæ.
- Allamanda*, *sp.*; Apocynaceæ.
- Allium*, *sp.*; Liliaceæ.
Local,—Piaj.
Onion, Eng.
- Allmania nodiflora*, *Br.*; Amarantaceæ.
- Alocasia indica*, *Schott.*; Aroideæ. *Arum Indicum* *Lour.* (Roxb.)
Cult. in gardens.
Vern.—Mankanda, Mankachu, B.
- Aloysia citriodora*, *Ort.*; Verbenaceæ.
Lemon-scented verbena, Eng.; cult. in gardens.
- Astonia scholaris*, *Br.*; Apocynaceæ.
Vern.—Chatni, S.; chatan bomudu, K.

- Alternanthera sessilis*, *Br.*; Amarantaceæ.
Vern.—Garundi arak, S.
- Althæa rosea*, *Willd.*; Malvaceæ.
 Hóllyhock, Eng.
Vern.—Gool Khaira, H. Cult. in gardens.
- Alu; *Solanum tuberosum*, *Linn.*; Solanaceæ.
 Local,—Aru, Alua.
 The Potato.
 Potatoes cult. by natives in fields: the leaves and shoots used as sag (vegetable).
- Alysicarpus rugosus*, *DC.*; Leguminosæ.
Alysicarpus vaginalis, *DC.*; Leguminosæ.
 Local,—Angul.
- Am; *Mangifera indica*, *Linn.*; Anacardiaceæ.
 The Mango.
 Local,—Awm, Ool.
Vern.—Ul, S.; Am, H., B.
- Amarantus gangeticus*, *Linn.*; Amarantaceæ.
Vern.—Arak gandhari, gandhari arak, S.
- Amarantus paniculatus*, *Linn.*; Amarantaceæ.
Vern.—Larka baha, S.
- Amarantus spinosus*, *Linn.*; Amarantaceæ.
Vern.—Janum arak, S.
- Amarantus tristis*, *Linn.*; Amarantaceæ.
Vern.—Pond gandhari, S.
- Amat chingar; *Desmodium triflorum*, *DC.*; Leguminosæ.
 Local,—Chingar Amat.
- Amla: see Aonla; *Phyllanthus Emblica*, *Linn.*; Euphorbiaceæ.
- Ammannia baccifera*, *Linn.*; Lythraceæ.
Vern.—Dad mari, H.
- Ammannia multiflora*, *Roxb.*; Lythraceæ.
- Ammannia pentandra*, *Roxb.*; *var. fimbriata*, *Wight*, and *var. illecebroides*, *Arn.*; Lythraceæ.
 Local,—Khet gulab.
- Ammannia peploides*, *Spreng.*; Lythraceæ.
- Amomum melegueta*, *Roscoe.*; Scitamineæ
 Grains of Paradise. Melegueta Pepper. } Not known to me as
 } cult. in Chota Nagpur gardens. Watt says "cultivated to a small extent in Indian gardens."
- Amoora Rohituka, *W. & A.*; Meliaceæ.
Vern.—Harin hara, Harin khana, H.; Sikru, K.

Amorphophallus campanulatus, *Blume.*; *Aroideæ.*

Vern.—Zamin kand, Pers. & H.; Ol, S., B.; Kanda, H.

Ampelopsis quinquefolia, *Miehx.*—*Vitis hederacea*, *Ehrb.* *Ampe-
lideæ.*

Amra; *Spondias mangifera*, *Willd.*; *Anacardiaceæ.*

Hog plum of many Europeans: Wild and cult. (Fl. Br. Ind.).

Ananas sativa, *Linn.*; *Bromeliaceæ.*

The Pineapple.

Local,—Ananas.

Andrographis paniculata, *Nees.*; *Acanthaceæ.*

The Creat, Eng.

Local,—Charayeta (not *chiretta*).

Vern.—Kalmeg, B., H., S.

“Great confusion between this and *Chiretta*” proper
(Watt.) *Ophelia Chireta*, *Gris.*

Andropogon (scandens, L.); *annulatus, Forsk.*; *Gramineæ.*

Andropogon (citriodorus, DC.); *Gramineæ.*

(*citratus DC.*) which is *A. Schœnanthus*, *Linn., q.v.*

Lemon grass, E.

Local,—Bara khera, bharando kher-ghans.

Andropogon contortus, Linn.; *Gramineæ.*

Spear grass, E.

Vern.—Sauri ghas, S.; Khar, Kher, H.

Kher ghans in Chytia Nagpur is not *spear grass* but a large
6-foot plant, whose roots are with difficulty got rid of in cul-
tivation.

Andropogon Gryllus, Linn.; *Gramineæ.*

Local,—Dhori ban.

Andropogon montanus Roxb.; *Gramineæ.*

Local,—Ghora ghans, leringhi ghans.

Andropogon serratus, Thunb.; *Gramineæ.* *Var. nitidus, Hack.*

Local,—Phul, bārhi. Brooms are made of it in Jaspur.

Andropogon Schœnanthus, Linn.; *Gramineæ.* *Var. versicolor
Hack.*

Vern.—Nanha dhuri ghas, S

Geranium,—Rusa oil, Oil of ginger-grass; Lemon grass.

Local,—Rata ban, Bāra kher, bharando kher-ghans, v.s., Bara
kher, etc., also applied to *A. citriodorus, DC.*

Andropogon micranthus, Kunth.; *Gramineæ.* *A. capilliflorus
(C. & Watt.)*

Andropogon pertusus, Willd.; *Gramineæ.*

Vern.—Kada chandi ghas, S.

Andropogon, sp.; *Gramineæ.*

- Ancilema nudiflorum*, *Br.*; Commelinaceæ.
Angelica glauca, *Edgw.*; Umbelliferæ.
Vern.—Oponom, S.; Chora or Chura, Pb.
Angiopteris evecta, *Hoffm.*; Filices.
 Mhowdi Hill, v. v. cult. by T. F. Peppe at Rauchi. Also tree ferns, names not got.
 Mr. Bournan says the fronds grow to 15 feet at Mhowdi Hill.
- Anisochilus carnosus*, *Wall.*; Labiatæ.
Vern.—Gitil ran, S.
 Local,—Pipar, chota pipar.
Anisomeles ovata, *Br.*; Labiatæ.
Vern.—Surgi baha, S.
Ankæ, *Ankæ daru*, Local,—(undetermined). The root bruised with water is applied to *snake-bites*.
Anogeissus acuminata, *Wall.*; Combretaceæ.
Vern.—Gara hesel, pandri, pausi, K.
Anogeissus latifolia, *Wall.*; Combretaceæ.
 Local,—Dhaunta.
Vern.—Hesel, S.; Dhawa, K., H.
Anona reticulata, *Linn.*; Anonaceæ.
 The Bullock's heart, E.
Vern.—Ram phül, H.; Gom, S.
Anona squamosa, *Linn.*; Anonaceæ.
 The Custard apple, E.
Vern.—Sitaphül, sarifa, sari phül, H.; Mandar gom, S.
Anotis calycina, *Hk. f.*; Rubiaceæ.
Anthocephalus Cadamba, *Miq.*; Rubiaceæ.
 Local,—Kadam.
Vern.—Sanko, K.
Olim (Nancka C., *Roxb.*)
Antidesma acuminatum, *Wt.*; Euphorbiaceæ.
Antidesma Bunius, *Spreng.*; Euphorbiaceæ.
 Local,—Matha.
Antidesma diandrum, *Roth.*; Euphorbiaceæ.
 Local,—Mutter sag.
Vern.—Mutta, B.; Matha arak, S.; Antua sag, H.
Antidesma Ghesaembilla, *Gærtn.*; Euphorbiaceæ.
Vern.—Limtoa, B. Umtoa, Hazaribagh; Mata sure, K.
Antigonon leptopus *Hook & Arn.*; Polygonaceæ.
 Sandwich Island Climber, Eng. Cult. in gardens.
Aonla; *Phyllanthus Emblica*, *Linn.*; Euphorbiaceæ.
 Embelic Myrobalan, E.
 Local,—also Amla, Amra.

- Apium graveolens*, *Linn.*; Umbelliferæ.
Vern.—Chanu, B.; Ajmud, H.
 Celery, E.
- Apluda varia*, *Hack.*; *Sub-species aristata*, *Hack.*; Gramineæ.
Vern.—Durhi ghas, S.
- Arachis hypogæa*, *Linn.*; Leguminosæ.
 Earth nut, pea nut.
Vern.—Chine badam, B.
- Arai; *Acacia pennata*, *Willd.*; Leguminosæ.
Vern.—Arar, (2) Karnar; Undaru, S.; Kundaru, (2) K.
- Arak Kawet, S.; *Abrus precatorius*, *Linn.*; Leguminosæ.
 Local,—Karjani.
Vern.—Pond Kawet, S.; Rati, H., the seeds.
 This is a *Santali word* almost the only one in *my* Index.
- Arar (1); *Acacia Intsia*, *Willd.*; Leguminosæ, *g. v.*
Vern.—Kondro janum, S.; Kundaru, (1) K.
 ? Local,—Kardara, see also Arai, *A. pennata*.
- Ardisia humilis*, *Vahl.*; *var. arborescens*, *Wall.*; Myrsineæ.
 Local,—Lilibaha, Mormori.
- Areca Catechu, *Linn.*; Palmæ.
 Areca nut, Betel nut.
 Local,—Sopari.
- Argemone mexicana*, *Linn.*; Papaveraceæ.
 Local,—H. & B. Sial kanta. Gokhula janum, S.
 At kuti janum, S.; Ujar kata, H.
- Arguni; *Phyllanthus Niruri*, *Linn.*; Euphorbiaceæ.
 Local.—Jiran ban or ban jiran. *Vide* Arjun and Arjuni, *infra*.
- (Argyreia) = *Lettsonia aggregata*, *Roxb.*; Convolvulaceæ.
Argyreia Daltoni, *Clarke*; Convolvulaceæ.
 Local,—Chitti.
- Argyreia nervosa*, *Boj.*; Convolvulaceæ.
 Elephant creeper; Eng.
- Argyreia speciosa*, *Sweet*; Convolvulaceæ.
Vern.—Kedok Arak, S.; Paila sag, H.; Bonpovariya, B.; Watt.
 Elephant creeper, Eng.
- Arhar; *Cajanus indicus*, *Spreng.*; Leguminosæ.
 Local,—Rahar dall.
- Aristida Cumingiana*, *Trin. & Rupr.* (capillacea, *Lamk.*);
 Gramineæ.
 Local,—Lud ludi ban.
- Aristolochia indica*, *Linn.*; Aristolochiæ.
Vern.—Isharmul, H.; Bhedi janetet, S.
 Indian birth-wort, Eng.

- Arjun ; Terminalia Arjuna, *Bedd.* ; Combretaceæ.
Local,—Arjuni. *Vide* Arjuni, *supra*.
- Arjuni ; Vicoa auriculata, *Trin.* ; Compositæ. *Vide* Arjun and Arguni, *supra*.
- Arnotto ; Bixa Orellana, *Linn.* ; Bixineæ.
Local,—Anatto.
Vern.—Latkan, H. ; Kong Kuombi, S.
- Artemisia parviflora, *Roxb.* ; Compositæ.
Vern.—Bang sing, S.
- Artocarpus incisa, *Linn.* ; Urticaceæ.
The Bread Fruit.
Vern.—Rata del, Singh.
- Artocarpus integrifolia, *Linn. f.* ; Urticaceæ.
The Jack fruit.
Local,—Katal, Phatkal, Kanthal.
Vern.—Katol, Panas, H. ; Kanthar, S. ; Poros, K. ; Panasa, Sanskrit.
- Artocarpus Lakoocha, *Roxb.* ; Urticaceæ.
Vern.—Dahu, H., S., K. ; Dhau, H.
- Aru ; see Alu. The Potato.
- Arundinella, *sp.* ; Gramineæ.
Vern.—Buru lukni ghas, S.
- Arundo donax, *Linn.* ; Gramineæ.
Vern.—Gaba nul, B.
- Asan ; Terminalia tomentosa, *Roxb.* ; Combretaceæ.
Vern.—At'na, Uraon ; Aans, H. (*Roxb.*) ; Piasal, usan, B. ; atnak, S. ; matnak, K. ; Asan, H.
- Asparagus racemosus, *Roxb.* ; Liliaceæ.
H. & Local,—Satawar. Satamuli, Sans. & B.
- Asplenium drepanophyllum, *Baker.* ; Filices.
- Asplenium oxyphyllum, *Hk.* ; Filices.
- Atchkamba ; Ocimum, *sp.* : Labiatæ.
Local,—Achkamba.
- Atis ; Aconitum heterophyllum, *Wall.* ; Ranunculaceæ.
Vern.—Atis, atvika,* H. ; Jadvar, Arab.
Not a Chutia Nagpur plant,—the root is much used in medicine.
- Atkuti-janum, S. ; Argemone mexicana *Linn.* ; Papaveraceæ.
Local,—Sial Kanta and H. & B. ; Ujar hata, S.
- At'na, Uraon ; Terminalia tomentosa, *Roxb.* ; Combretaceæ.
Local,—Asan, *q. v. supra*.

* NOTE—Ativisha, Sans. ; Nir-bishi (properly applied to poisonous Aconites), Nepal.

Atylosic mollis, *Benth.*; Leguminosæ.

Local,—Ram kurti.

Vern.—Bir malhan S.

Atylosia scarabaeoides, *Benth.*; Leguminosæ.

Local,—Ban kurti. Bir horek, S.

Avena sativa, *Linn.* *Var. orientalis*; Gramineæ.

Oats, Eng.

Oats are not much cultivated in Chutia Nagpur.

Averrhoa Carambola, *Linn.*; Geraniaceæ.

Local, B. & H. Kāmraṅga.

Cultivated in gardens. The sour variety alone noticed in C. N.

Arinopus cimicius, *Beauv.* (*Panicum cimicinum Retz.*) Gramineæ.

{ Babul ; }
{ Babula ; } *Acacia arabica*, *A. Farnesiana*, *q.v.*

Babirung; *Embelia robusta*, *Roxb.*; Myrsinæ.

Local,—also Sasapora.

Bael; *Aegle Marmelos*, *Correa*; Rutaceæ.

Vern.—Sinjo, S.; Bel, H.

Bagberenda; *Jatropha Curcas*, *Linn.*; Euphorbiaceæ.

Baghur; *Capparis horrida*, *Linn.*; Capparidæ.

Local,—Bagnei? Bag nahin or "Wait a bit."

Bahera; *Terminalia belerica*, *Roxb.*; Combretaceæ.

Local,—Bohora, lupun. Lopong, S.; behra, H.

Bahuar; *Cordia Myxa*, *Linn.*; Boraginæ.

Bainsa phūl; *Strobilanthes auriculatus*, *Nees.*; Acanthaceæ.

Bajra; *Pennisetum typhoideum*, Gramineæ.

Bakain; *Melia Azedarach*, *Linn.*; Meliaceæ.

Local,—Belaiti bakain.

Bākleri; *Flueggia microcarpa*, *Blume.*; Euphorbiaceæ.

(*Securinea obovata*, *Muell.*)

Bāktchi phūl; *Lettsonia setosa*, *Roxb.*; Convolvulaceæ.

Baliospermum axillare, *Blume.*; Euphorbiaceæ.

Bamboo; *Bambusa*, etc., *sp.*; Gramineæ.

Local—Bāṅs Katanga, K.; Mak, Mat, S.; Pepesiman, K.

Ban-; Wild or jungli.

Ban, Wild or jungli, is sometimes put *after* the name.

Bān aonla; *Phyllanthus Niruri*, *Linn.*; Euphorbiaceæ.

Local,—Banjiran, jiran bān, arguni.

Bān aru; *Dioscorea glabra* *Roxb.*; Dioscoreaceæ.

Bān bhainsa; *Fimbristylis ferruginea*, *Vahl.*; Cyperaceæ.

Local,—Bhainsa ban.

Bān dudhi, *Cephalostigma Schimperii*, *Hochst.*; Campanulaceæ.

- Bān jatni, —jat'ngi ; *Bidens pilosa*, *Linn.*; Compositæ.
 Ban jira ; *Knoxia corymbosa*, *Willd.*; Rubiaceæ.
 Local—Kakar.
- Bān jiran ; *Phyllanthus Niruri*, *Linn.* ; Euphorbiaceæ.
 Local, —Ban aṅal, arguni, jiran bān.
- Bān kājūr ; *Phœnix acaulis*, *Ham.* ; Palmæ
 Bān kapas ; *Thespesia Lampas* *Dalb. & Gibs.* ; Malvaceæ.
 Local, —Kul kudāri.
- Ban kundri ; *Zehneria Hookeriana*, *Arn.* }
 Zehneria umbellata, *Thw.* } Cucurbitaceæ.
- Ban kūrti ; *Atylosia scarabæoides*, *Benth.* ; Leguminosæ.
 Ban methi ; *Crotalaria albida*, *Heyne.* ; Leguminosæ.
 Ban Munga ; *Dalbergia cultrata*, *Grah.* ; Leguminosæ.
 Ban pāt ; *Corchorus olitorius*, *Linn.* ; Tiliaceæ.
 Jews mallow, E.
- Ban pawan ; Not identified.
 Local, —Jungli aru.
- Ban piāj ; *Curculigo, latifolia*, *Dryand.* ; Amaryllideæ.
 Local, —Kanakanda.
- Ban simār ; *Millettia auriculata*, *Baker.* ; Leguminosæ.
 Ban sirsa ; *Cleome viscosa*, *Linn.* ; Capparideæ.
 Local, —Iurutia.
- Ban sirsu ; *Laggera flava*, *Benth.* ; Compositæ.
 Ban toolsi }
 Ban tulsi } ; *Ocimum gratissimum*, *Linn.* ; Labiatæ.
 Local, —Dimbu phūl, Kala tulsi.
- Bana hata ; *Stereospermum suaveolens*, *D. C.* ; Bignoniaceæ.
 Local, —Adka phūr, Padar, Pandar, Papre, Siris.
- Banana ; *Musa sapientum*, *Linn.* ; Scitamineæ.
 The Plantain.
 Local, —Kela.
- Banda ; Parasites such as *Loranthus*, *Viscum* and *Vanda*.
 Bāndār lathi ; *Cassia Fistula*, *Linn.* ; Leguminosæ.
 Bāra dudhi ; *Holarrhena antidysenterica*, *Wall.* ; Apocynaceæ.
 Holarrhena.
 Local, —Bar ki dudhi, Dudhi, koreia.
 Vern. —Hat, S., K., H.
- Bāra ginjen : *Garuga pinnata*, *Roxb.* ; Burseraceæ.
 Local, —Kenkar.
- Bāra kher ; *Andropogon Schoenanthus*, *Linn.* ; Gramineæ.
 Local, —Bharāndō kher.
Andropogon citriodorus, *DC.*

- Bārāngi ; *Oxalis corniculata* *Linn.*; Geraniaceæ.
 Barango ; *Conyza ? stricta*, *Willd.*; Compositæ.
 (*C. absinthæfolia*, *DC.*; *Japonica*, *Less.*; *veronicæfolia* *Wall.*)
 Barbaria ; *Spilanthes Acmella*, *Linn.*; Compositæ.
 Barkanda ; see Būrkūnda.
 Barkidudhi ; see Bāra dudhi.
 Barleria cristata, *Linn.*; Acanthaceæ.
 Local.—Gokura.
 Barleria Prionitis, *Linn.*; Acanthaceæ.
 Vern.—Kanta phul, S.
 Barleria strigosa, *Willd.*, Acanthaceæ.
 Vern.—Reila baha, S.
 Barringtonia acutangula, *Gærtn.*; Myrtaceæ.
 Vern.—Hingol, hinjor, S.; Sprung, K.
 Basella rubra, *Linn.*; Chenopodiaceæ.
 Local.—Chota pui ság.
 Bassia latifolia ; *Roxb.*; Sapotaceæ.
 Local.—Mahua.
 Vern.—Matkom, S.; Mandukum, K.; Mahul, B.
 Bauhinia acuminata, *Linn.*; Leguminosæ.
 Local.—Kaimo.
 Vern.—Kachnar. H.; Kanchan, B.
 Mountain Ebony, E.
 Bauhinia racemosa, *Linn.*; Leguminosæ.
 Vern.—Kachnal, H.; Kaimu, K.; Gotouli, Oraon ; Katmauli,
 Loh.
 Bauhinia retusa, *Ham.*; Leguminosæ.
 Vern.—Jinjit, S., Kandla, semla, H.; Kaimu, Loh ; Laba, K.;
 Twar, Oraon ; Tewar, Pal.
 Local.—Kāchnār.
 The flowers are eaten, Sitonga Jaspur.
 Bauhinia tomentosa, *Linn.*; Leguminosæ.
 Vern.—Kachnar, H.
 Bauhinia VahlII, W. & A. ; Leguminosæ.
 Local.—Chope, the bark. Jom, S.; Lama rung, K.; Maljan
 &c., H.
 Bauhinia purpurea, *Linn.*; Leguminosæ.
 Local.—Kuinar and Kacoar.
 Vern.—Kaniar, H.; Koiral, B.; Singyàra, S.; Buruju, K.;
 Koinar, Lohardugga.
 Bauhinia variegata, *Linn.*; Leguminosæ.
 Vern.—Kachnar, Kaniar, H.; Jingya, Jinjir, S.; Singya, K.; Kun-
 dol, Bhumji ; Rakta Kanchan, B.

- Beal ; *Pterocarpus Marsupium*, *Roxb.* ; Leguminosæ.
 Bean ; *Faba vulgaris*. *Vicia Faba*, *Linn.* ; Leguminosæ.
 Haricot kidney Bean. Paras Bean, Local.—*Phaseolus vulgaris*, *L.*
Beaumontia grandiflora, *Wall.* ; Apocynaceæ.
Begonia picta, *Sm.* ; Begoniaceæ.
Vern.—Dhiri jhapak, S.
 Bel ; *Aegle Marmelos*, *Correa.* ; Rutaceæ.
 Local,—Bael.
Vern.—Sinjo, S.
 Belati ; *adj.* English ; so B. bakain, B. bengan.
 Belati bakain ; *Melia Azedarach*, *Linn.* ; Meliaceæ.
 Local,—Bakain.
 Belati bengan ; *Solanum Melongena*, *Willd.* ; Solanaceæ.
 Belwa ; *Semecarpus Anacardium*, *Willd.* ; Anacardiaceæ.
 Local, & S.,—Soso.
 Belwa lung ; *Cordia Macleodii*, *H. f. & T.*, Boraginææ.
 Bende ; *Panicum antidotale*, *Retz.* ; Gramineæ.
 Local,—Bere.
 Bendo ; (1) *Spatholobus Roxburghii*, *Bth.* ; Leguminosæ.
 Bendo ; (2) *Pueraria tuberosa*, *DC.* ; Leguminosæ.
 Bengan ; *Solanum longum*, *Roxb.* ; Solanaceæ.
 Local,—Brinjal, Belati bengan.
 The egg plant.
 Bengadaru ; *Grewia tiliaolia*, *Vahl.* ; Tiliaceæ.
 Benguria ; *Eclipta alba*, *Hassk.* ; Compositæ.
 Benincasa cerifera, *Savi.* ; Cucurbitaceæ.
 The White Gourd Melon.
Vern.—Gol Kadu, H. ; Kumra, chal komra, B.
 Bera kanda ; *Hibiscus cancellatus*, *Roxb.* ; Malvaceæ.
 Bere ; *Panicum antidotale*, *Retz.* ; Gramineæ.
 Local,—Bende.
 Beri ; *Casearea tomentosa*, *Roxb.* ; Samydaceæ. •
 Beri lat ; *Triumfetta rhomboidea*, *Jacq.* ; Tiliaceæ.
 Betel nut ; see Areca.
 Bhaïsa ban ; *Fimbristylis ferruginea*, *Vahl.* ; Cyperaceæ.
 Bharando kher ; *Andropogon Schoenanthus*, *Linn.* ; Gramineæ.
 Local,—Bara kher. Rata-bân. Nana dhuri gha, S.
 Bharo pochi ; *Elytrophorus articulatus*, *Beauv.* ; Gramineæ.
 Bhawat ; *Eriolæna spectabilis*, *Planch.* ; Sterculiaceæ.
 Bherendi ; *Sporobolus diander*, *Beauv.* ; Gramineæ.
 Bhita-Chonoria ; *Rivea ornata*, *Chois.* ; Convolvulaceæ.

- Bhui nim; *Adiantum lunulatum*, *Burm.*; Filices.
 Bhūr Khünd; *Hymenodictyon excelsum*, *Wall.*; Rubiaceæ.
 Local,—Burkund.
Vern.—Bhor kond, S.
- Bhurundi ban; *Ischæmum ciliare*, *Rets.*; Gramineæ.
 Buseri; *Siegesbeckia orientalis*, *Linn.*; Compositæ.
 Bhut raj; *Lygodium scandens*, *Sw.*; Filices.
 Bichra (1); *Grewia salvifolia*, *Heyne.*; Tiliaceæ.
 Bichra (2); *Kydia calycina*, *Roxb.*; Malvaceæ.
Vern.—Posta olak, S.; Pala dhamin, K.
 Dhamin is applied to wood suitable for Banghy sticks—J.J.W.
 See *Grewia*, a green hedge plant like *Dodonæa* in leaf, from
 Delhi or up country cult.
- Bichua. Not determined.
 Local,—Kaptin, Bichua.
- Bidens pilosa*, *Linn.*; Compositæ.
 Local,—Ban jatni.
- (*Bignonia*) now *Oroxylum indicum*, *g.v.*
Bignonia venusta, *Ker-Gawl.*; Bignoniaceæ.
 Cult. exotic, common. Not in *Fl. Brit. Ind.*
- Bilei gori; *Leucas mollissima*, *Wall.*; Labiatæ.
Biophytum sensitivum, *DC.*; Geraniaceæ.
- Bitchua; Bichua, *g.v.*; not determined.
 Local,—Bichua, Kaptin.
 Somewhat like *Dodonæa* in leaf. *cf.* *Ficus Sp.*
- Bixa Orellana*, *Linn.*; Bixineæ.
 Local,—Anatto-Arnotto, Eng.
 Local,—Latkan; Cult.
Vern.—Kuog kuombi, S.
- Blumea fasciculata*, *DC.*; Compositæ.
Vern.—Rondoc, S.
- Blumea glomerata*, *DC.*; Compositæ.
Vern.—Gada pach wani, S.
- Blumea lacera*, *DC.*; Compositæ.
Var. a C. B. Clarke. *canescens*, *Hk. f.*
Vern.—Kakronda, jungli muli, H., Kukursunga, B.
- Bœrhaavia diffusa*, *Roxb.*; Nyctagineæ.
Bombax malabaricum, *D.C.*; Malvaceæ.
 Silk cotton tree, E.
 Local,—Simal, Simar. W. Ind. Ceiba. Edel, S.
Bonnaya brachiata, *Link & Otto.*; Scrophularineæ.

- Borassus flabellifer*, *Linn.* ; *Palmeæ*.
Local,—Targach, Tal, Tari.
Fan or toddy-palm, E.
- Boswellia serrata*, *Roxb.* ; *Burseraceæ*.
Local,—Sally, salei. The gum,—Lobān.
Olibanum, E.
Salga, S., H., K.
- Bowr ; *Ficus retusa*, *Linn.* ; *Urticaceæ*.
Local,—Buru hesa.
The aerial roots from the branches become stringy and long and fine below. I saw no instance of their forming *supports* such as the *Bār* tree *Ficus bengalensis* has.
- Brahmini ; *Desmodium polycarpum*, *DC.* ; *Leguminosæ*.
Local,—Karangi, karjani.
- Brassica* species, cultivated ; *Cruciferæ*.
Cabbage, cauliflower, knol khol, Eng.
Local,—Kūbi, phūl kūbi, gol. kūbi.
Olim (*Sinapis*), *e.g.*, (*S. alba*) and (*nigra*).
Local,—Rai ; ? turi. Turnip, E.
Local,—Sālgūm.
- Brassica campestris*, *Linn.* ; *Cruciferæ*.
Vern.—Lutni, thadia turi, S.
- Brassica juncea*, *H. f. & T.* ; *Cruciferæ*.
Local,—Rai. Mustard, E.
Vern.—Rai, S.
- Breynia patens*, *Benth.* (*Melanthesopsis patens*, *Muell.*) ; *Euphorbiaceæ*.
Breynia rhamnoides, *Muell.* ; *Euphorbiaceæ*.
Vern.—Kadrapala, karki, S.
- Bridelia retusa*, *Spreng.* ; *Euphorbiaceæ*.
Local,—Kari, kasei, kawj.
- Bridelia tomentosa*, *Blume* ; *Euphorbiaceæ*.
- Brinjal ; *Solanum species* ; *Solanaceæ*.
Local,—Bengan.
Egg plant, Eng.
Solanum Melongena, *Linn.* ; *S. longum*, *Roxb.*
- Bryonia laciniosa*, *Linn.* ; *Cucurbitaceæ*.
- Bryophyllum calycinum*. *Crassulaceæ*.
Air-plant, E. Flrs. pale green tinged with red (Firminger).
- Buchanania latifolia*, *Roxb.* ; *Anacardiaceæ*.
Local,—Pial pāti, Peyār.
- Buchnera hispida*, *Ham.* ; *Scrophularineæ*.

Buettneria herbacea, *Roxb.* ; Sterculiaceæ.

Vern.—Diku Sindur, kambraj, S.

Bougainvillea spectabilis, *Willd.* ; Nyctagineæ. Cult.

Buktchi phul; *Lettsonia setosa*, *Roxb.* ; Convolvulaceæ.

Bupleurum falcatum, *Linn.* ; Umbelliferæ.

Bürkünd; *Hymenodictyon excelsum*, *Wall.* ; Rubiaceæ.

Vern.—Bhor Kond, S.

Burmannia cœlestis, *Don.* ; Burmanniaceæ.

Com. in moist situations. Stem very hairy, flowers dark blue (C. & W.).

Bur'ndo ghans; *Panicum colonum*, *Linn.*

Bürra; Bära means greater or the large one.

Local,—Burka.

Thus, Barra gingen; *Garuga pinnata*, *Roxb.*

Bursera serrata, *Colebr.* ; Burseraceæ. *Wall.*

Vern.—Armu, S.

Bursi. Not determined.

Buru hesa; *Ficus retusa*, *Linn.* ; Urticaceæ.

Local,—Bowr.

Burui; *Gardenia gummifera*, *Linn. f.* ; Rubiaceæ.

Butea frondosa, *Roxb.* ; Leguminosæ.

Local,—Pâlas, pārās, murut.

Vern.—Murup, dare murup, S.; Dhak, B.

(*Butea superba*, *Roxb.*) is the same species, only scandent.

Local,—Palas, paras. Nari murup, S.

Butomopsis lanceolata, *Kunth.* ; Xyridæ.

Local,—Kui phul.

Cæsalpinia Bonducella, *Fleming* ; Leguminosæ.

Cæsalpinia Coriaria, *Kth.* ; Leguminosæ.

Not a native of Brit. India; A S. American plant.

Cæsalpinia, pulcherrima Sw. ; Leguminosæ.

Olim (*Poinciana p. Linn.*) Cult. Common in gardens.

Cæsulia axillaris, *Roxb.* ; Compositæ.

Local,—Ghetia, kena.

Cajanus indicus, *Roxb.* ; Leguminosæ.

Local,—Rahar dall.

Vern.—Raher S.; Laher H.; Oroha, B.

Dall-pulse. Cult. Three varieties of *Cajanus indicus*, *vis.*,

Maghi, ripe in January; Chaitati, ripe in March; Aghauni, ripe in November.

Callicarpa arborea, *Roxb.* ; Verbenaceæ.

- Callicarpa macrophylla*, *Vahl.*; Verbenaceæ.
Vern.—Budhi ghasit, S.
- Callistemon linearis*, *DC.*; Myrtaceæ. Terai Callistemon.
- Calotropis gigantea*, *Br.*; Asclepiadeæ.
 Local,—Mādar, Phatli.
Vern.—Akauna, S.
- Camellia theifera*, *Griff.* Ternstroemiaceæ.
 Tea, Eng.
 Local,—Cha.
Camellia Thea, *Link.*; is the *earliest* name.
 The tea plant or bush. Cultivated at Seetagunha near Hazaribagh, at 2,000 feet.
- Canavalia ensiformis*, *DC.*; Leguminosæ.
Vern.—Tihon, S.
- Canna indica*, *Linn.*; Scitamineæ. Cult.
- Canscora decussata*, *DC.*; Gentianaceæ.
- Canscora diffusa*, *R. Br.*; Gentianaceæ.
- Canthium didymum*, *Roxb.*; Rubiaceæ.
Vern.—Garbha gojha, S.
- Capparis horrida*, *Linn.*; Capparidææ.
 Local,—Bag nahin. Buru asaria, S. Cult.
- Capsicum frutescens*, *Linn.*; Solanaceæ.
 Local,—Lal meritch.
 Chili, pepper, capsicum, Eng.
- Captin*, *vide* Kaptin; undetermined.
 Local,—Kaptin, Bitchua.
 A green hedge, like *Dodonæa*. Cult. from Delhi or up country; not collected; seen as hedge two to three feet high near Juspurnagar, 2,000 or 2,500.
- Cardiospermum Halicacabum*, *Linn.*; Sapindaceæ.
 Local,—Gal phuli.
Vern.—Putki malla, S.
- Careya arborea*, *Roxb.*; Myrtaceæ.
 Local,—Kumbi.
Vern.—Kumbir, S., K., H.
- Carica Papaya*, *Linn.*; Passifloreæ.
 Local,—Papita.
 Papaw, E. Exotic.
- Carissa Carandas*, *Linn.*; Apocynaceæ,
 Local,—Kārānda. Karwak janum, S.
- Carissa spinarum*, *A. DC.*; Apocynaceæ.
 Local,—Garsul, Kārānda, Korōnda, Kūrūnda, Carūnda.

- Carissa diffusa*, *Roxb.* "A state of *Carissa Carandas*, *Linn.*" so *Brandis*.
- Carthamus tinctorius*, *Linn.*; *Compositæ*.
Local,—Kūsūm (1).
Safflower, *Eng.*
Used as a dye. Cult. Another Kūsūm (2) is *Schleichera trijuga*, *Willd.*; *Sapindaceæ*.
- Carūnda*; *Carissa species*; *Apocynaceæ*.
Local,—Kūrūnda.
- Casearea tomentosa*, *Roxb.*; *Samydaceæ*.
Local,—Beri, corcho, ride, S.; Bong corcho, K.
- Cassia Fistula*, *Linn.*; *Leguminosæ*.
Local,—Amaetas, Bandar lathi.
Vern.—Nuruic, S.
Umaltās, Pudding-pipe. Tree (*Firminger*) Bandar lowri, local.
- Cassia glauca*, *Lamk.*; *Leguminosæ*.
Var. suffruticosa, *Kænig.*
Vern.—Bheda dereng, S.
- Cassia mimosoides*, *Linn.*; *Leguminosæ*.
Local,—Masturia, Masuria, Patwa ghas, S.; Chota aura, H.; Otleondro? S.
- Cassia Tora*, *Linn.*; *Leguminosæ*.
Vern.—Chakooda arak, S.
- Cassytha filiformis*, *Linn.*; *Laurineæ*.
Vern.—Alag jari, S.
- Catechu; see *Acacia catechu*,—and *Kut.*
- Cedrela Toona*, *Roxb.*; *Meliaceæ*.
Local,—Tooni.
Vern.—Alga-jari, S.
- Celastrus paniculata*, *Willd.*; *Celastrineæ*.
Local,—Kujili.
Vern.—Kujri, S. & H.
- Celosia argentea*, *Linn.*; *Amarantaceæ*.
Local,—Siliari.
Vern.—Sirgit arak, S.
- Centipeda orbicularis*, *Lour.*; *Compositæ*.
Vern.—Bedi achim, S.
- Centranthera hispida*, *Br.*; *Scrophularineæ*.
Centunculus tenellus, *Duby.*; *Primulaceæ*.

Cephalostigma hirsutum, *Edgew.*; Campanulaceæ.

Cephalostigma Hookeri, *Clarke*; Campanulaceæ.

Cephalostigma Schimperii, *Hochst.*; Campanulaceæ.

Local,—Bān dudhi, dudhi bān.

Ceratopteris thalictroides, *Brong*; Filices.

Chal; Shorea robusta, *Roxb.*; Dipterocarpeæ.

Local,—Sākua, sāl; sarei, sarjūm, sarjom, S.; Sakhua, sal, H.

Chāmpa, (1); Michelia Champaca, *Linn.*; Magnoliaceæ.

Champa, (2); Plumeria acutifolia, *Poir.*; Apocynaceæ.

Champa (2) is often used locally for *Plumeria*, which is properly *Gulainchi*, Local.

Chapka; Selaginella rupestris, *Spring*; Lycopodiaceæ.

Chara foetida, *A. Br.*; Characeæ.

Charayeta; Andrographis paniculata, *Nees*; Acanthaceæ.

The "*Creat*" Mulubai, Kulmeg, B., H., S.

Not *chiretta*, (*Ophelia chireta*, *Roxb.*) but used for it.

Chātian; Microrhynchus divaricata; Compositæ.

Scorzonera divaricata, *Turoz*.

Cheilanthes farinosa, *Kaul.*; Filices.

Local,—Pātāl chatta.

Vern.—Nanha, dodhari, S.

Cheilanthes tenuifolia, *Sw.*; Filices.

Chenopodium album, *Mog.*; Chenopodiaceæ.

Vern.—Bhatua arak, S.; Khartua sag, H.

Cheri gora; Pavetta indica, *Linn.*; Rubiaceæ.

Local,—Indirjow, Menda. Andirjow.

Another Indirjow is *Nerium antidysentericum*, now *Holar-rhena*, *Wall.*

Cheur; Homonia riparia, *Lour.*; Euphorbiaceæ.

Chikni; Glochidion lanceolare, *Dals.*; Euphorbiaceæ.

Chimti ka sag. ? ? ?

Local,—Pāgūla.

Chinchiri; Achyranthes aspera, *Linn.*; Amarantaceæ.

Local,—Tirchiti.

Vern.—Chipchirit, S.

Chingar amat; Desmodium triflorum, *DC.*; Leguminosæ.

Local,—Amat chingar.

Chiryta; Holoptelea integrifolia, *Planch.*; Urticaceæ.

(*Ulmus integrifolia*, *Roxb.*)

- Chitchiri ; *Diospyros melanoxyton*, *Roxb.* ; Ebenaceæ.
 Local,—Khend, Tiril.
Vern.—Terel, S.
 A bonfire of Khend makes beautiful *Bengal fire*.
- Chitour ; *Justicia Betonica*, *Linn.* ; Acanthaceæ.
 Local,—Chitaor.
- Chitti ; *Argyrea Daltoni*, *Clarke* ; Convolvulaceæ.
Chloris *sp.* ; Gramineæ.
Cholorophytum *sp.* ; Liliaceæ.
- Chota brahmini ; *Euphorbia dracunculoides*, *Lamk.* ; Euphorbiaceæ.
- Chota dudhi ; *Ichnocarpus frutescens*, *Br.* ; Apocynaceæ.
 Local,—Guri lerung.
- Chota pui sag ; *Basella rubra*, *Linn.* ; Chenopodiaceæ, includes (*Basella alba*, *Linn.* ; and also *Roxb.*)
- Chota pipar ; *Anisochilus carnosus*, *Wall.* ; Labiataæ.
- Choulra ; *Bombax malabaricum*, *DC.* ; Malvaceæ.
 Silk cotton tree ; *Ceiba*, W. Indies.
 Local,—Simäl, Simar.
Vern.—Edel, S. ; Simal, Simur, K., H.
- Chrozophora plicata, *A. Fuss* ; Euphorbiaceæ.
Vern.—Pangs nari, S.
- Chrysanthemum indicum*, *D.C.* ; Compositæ.
Chrysanthemum coronarium, *Linn.* ; Compositæ.
Chrysanthemum indicum, *Linn.* ; Compositæ.
- Chûnki ; *Asplenium oxyphyllum*, *Hk.* ; Filices.
- Cicer arietinum*, *Linn.* ; Leguminosæ.
 Local,—Bût, chenna.
Vern.—Bût, S., H.
- Cissampelos Pareira*, *Linn.* ; Menispermaceæ.
 Local,—Parhi.
Vern.—Tejo malla, S.
- Cleisanthus collinus*, *Benth* ; Euphorbiaceæ.
Vern.—Kangalli, S.
- Clematis nutans*, *Royle* ; Ranunculaceæ.
Vern.—Bonga Khanti, S.
- Cleome monophylla*, *Linn.* ; Capparideæ.
Vern.—Hurhura (potherb), Kedar jhawar (medicine), S.
- Cleome viscosa*, *Linn.* ; Capparideæ.
- Clerodendron infortunatum*, *Linn.* ; Verbenaceæ.
Vern.—Barni, Varni, Kharbari, S.

- Clerodendron phlomoides*, *Linn. f.*; Verbenaceæ.
Vern.—Pan jot, S.
- Clerodendron serratum*, *Spreng.*; Verbenaceæ.
Vern.—Saram lutur, S.
- Clerodendron Siphonanthus*, *R. Br.*; Verbenaceæ.
 Local,—Parola.
- Clerodendron Thomsoni*. Verbenaceæ; Cult.
- Clitoria ternatea*, *Linn.*; Leguminosæ.
 Mussel shell creeper, E.
- Cocculus villosus*, *DC.*; Menispermaceæ.
- Cochlospermum Gossypium*, *DC.*; Bixineæ.
 Local,—Sisi baha, ūdūl.
Vern.—Hopo, S.; Galgal, K. and H.
- Coffea arabica*, *Linn.*; Rubiaceæ.
 Local,—Kaphè.
 Cultivated first on a large scale at Seetagarha,—unsuccessfully, now a few bushes near bungalows is the rule.
- Coix Lachryma-Jobi*, *Linn.*; Gramineæ.
Vern.—Jargadi, S.
 Job's tears, E.
Coix gigantea, *Koen.* = *Coix Lachryma-Jobi*, *Linn.*
- Colebrookia oppositifolia*, *Smith.*; Labiataæ.
Vern.—Bursa pakor, Bhainsa, S.
- Colocasia antiquorum*, *Schott.*; Aroideæ.
 Local,—Katchū.
- Combretum decandrum*, *Roxb.*; Combretaceæ.
 Local,—Gorūnda.
Vern.—Aten, S.
- Commelina benghalensis*, *Linn.*; Commelinaceæ.
Vern.—Kana arak, S.
- Commelina salicifolia*, *Roxb.*; Commelinaceæ.
- Commelina suffruticosa*, *Bl.*; Commelinaceæ.
Vern.—Dare orsa, S.
- (*Conocarpus*) = *Anogeissus latifolia*, *Wall.*; Combretaceæ.
 Local,—Dhaunta.
Vern.—Hesel, S.; Dhawa, K. and H.
- Convolvulus pentanthus*, *Jacq.* (*Ipomœa semperflorens* Firmin-ger.) Cult.
- Convolvulus pluricaulis*, *Chois.*; Convolvulaceæ.
- Conyza (absinthifolia, DC.)* = *stricta, Wall.*; Compositæ.
- Corchorus capsularis*, *Linn.*; Tiliceæ.
 The Jute of commerce. Ghinalta pat. B.
 Not cultivated in C. N. that I know of.

- Corchorus olitorius, *Linn.* ; Tiliaceæ.
Vern.—Jute (2), pāt, bānpāt, B.
 Jew's mallow, E.
 (Putto, Sans. Pat, B. *Roxb.*)
- Corchorus *sp.* ; Tiliaceæ.
Vern.—Bir narcha, S.
 Leaves used as a potherb (Campbell and Watt).
 A 3rd Jute = *Crotalaria juncea*.
- Cordia Macleodii, *Hk. f. & T.* ; Boragineæ.
 Local.—Belwa lung.
Vern.—Jugia, S.
- Cordia Myxa, *Linn.* ; Boragineæ.
 Local.—Büch.
Vern.—Buch, S.
- Costus speciosus, *Sm.* ; Scitamineæ.
Vern.—Orop, S.
- Cotton ; *Gossypium herbaceum*, *Linn.* ; Malvaceæ.
Vern.—Kāpās, H., Cotton wool, Rui.
- Cowhage ; *Mucuna pruriens*, *DC.* ; Leguminosæ.
 Local.—Keinli.
- Crinum *sp.* ; Amaryllidaceæ.
Vern.—Sikyom baha, S.
 "The root is the size of a good-sized turnip." (Camp.)
- Crotalaria alata, *Ham.* ; Leguminosæ.
Vern.—Marangjhunka, S.
- Crotalaria albida, *Hayne.* ; Leguminosæ.
 Local.—Ban methi.
- Crotalaria calycina, *Schrank.* ; Leguminosæ.
Vern.—Mota bir jhunka, S.
- Crotalaria juncea, *Linn.* ; Leguminosæ.
 Local.—Sūnpāt ; jute (3).
Vern.—Sūn, B.
- Crotalaria prostrata, *Roxb.* ; Leguminosæ.
 Local.—Jinjānia.
Vern.—Katio-jhunka, nanha jhunka, S.
- Crotalaria striata, *DC.* ; Leguminosæ.
Vern.—Sonjhunka, S. ; son, san, H.
- Croton oblongifolius, *Roxb.* ; Euphorbiaceæ.
 Local.—Pūtri.
Vern.—Gote, S. ; poter, K.
 A strong element in scrub jungles—usually.
- Cryptolepis Buchanani, *R. & S.* ; Asclepiadeæ.
Vern.—Utri dudhi, S.

- Cryptostegia grandiflora*, Br., Asclepiadaceæ.
Vern.—Chaluk Churi.
 A large climber ; large purple flrs. Hazaribagh garden. Cult.
Cucumis Melo, Linn.; Cucurbitaceæ.
 Cucumber, E. Local, Kādū.
Vern.—Tarbūj, S. Cult.
Curculigo latifolium, Dryand.; Amaryllideæ.
 Local,—Kawa Kanda.
Curcuma (cordata), Wall.; Scitamineæ.
Vern.—Sar'nga, S.
Curcuma, sp.; Scitamineæ.
Vern.—Bir sasang, orsorin, S.
Curcuma longa, Linn.; Scitamineæ.
 Turmeric, Eng.
Vern.—Hūldi, H. & B. Cultivated.
Curcuma petiolata, Roxb.; Scitamineæ.
Cuscuta chinensis, Lamk.; Convolvulaceæ.
Cuscuta reflexa, Roxb.; Convolvulaceæ.
 Cutch ; *Acacia Catechu*, Willd. q.v.; Leguminosæ.
Vern.—Alag jare, S.
 See kāt Khajjars-Khair, H.
 Catechu, Eng.
Cyamopsis psoralioides, DC. Leguminosæ.
Vern.—Buru raher, S. Cultivated.
Cyanotis axillaris, R. & S.; Commelinaceæ.
Cyanotis cristata, Schultes f.; Commelinaceæ.
Cyanotis tuberosa, Schultes f.; Commelinaceæ.
Vern.—Merom chunchi, sim dochok, hodo jereng arak, S.
Cyathocline lyrata, Cass.; Compositæ.
 Local,—Chikni.
Vern.—Bereng phul, S.
Cynodon dactylon, Pers.; Gramineæ.
Vern.—Dhobi ghans, H., dhub ghans, S.
Cynoglossum denticulatum, A. DC.; Boragineæ.
Vern.—Parwa cetchirip, parwa lata, S.
Cyperus alopecuroides, Roxb.; Cyperaceæ.
Cyperus distans, Linn. f.; Cyperaceæ.
Cyperus Iria, Linn.; Cyperaceæ.
 (Cyperus) *Juncellus lævigatus*, Clarke.; Cyperaceæ.
Cyperus niveus, Retz.; Cyperaceæ.
Vern.—Bir Mutha, S.
Cyperus (pumilus), Linn.; Cyperaceæ.

- Cyperus rotundus*, *Linn.*; Cyperaceæ.
Vern.—Tandi sura, Mutha, S.
- Cyperus tegetum*, *Roxb.*; Cyperaceæ.
Vern.—Sura, S.
- Dædalacanthus nervosus*, *T. Anders.*; Acanthaceæ.
Dædalacanthus purpurascens, *T. Anders.*; Acanthaceæ.
 Dahu; A large yellow-leaved tree.
- Dak dawa*, *Oroxylum indicum*, *Bth*; Bignoniaceæ.
Vern.—Banahatak, S.; Bhal supti, H.
 Local,—Gingen, sicut.
- Dalbergia cultrata*, *Grah.*; Leguminosæ.
 Local,—Ban munga.
- Dalbergia lanceolaria*, *Linn.*; Leguminosæ.
Vern.—Chapot siris, chapot, S.
- Dalbergia latifolia*, *Willd.*; Leguminosæ.
 Local,—Pandan.
Vern.—Sat sayar, S.
- Dalbergia Sissoo*, *Roxb.*; Leguminosæ.
 Local,—Sissu, shishâm; common as timber in bazar; much
 used in carpentry.
- Dalbergia volubilis*, *Roxb.*; Leguminosæ.
Vern.—Bir Munga, narisiris, S.
- Dall; Pulse; see Kesâri, Rahar, Mung.
- Damin; Banghy-stick wood; see *Grewia* and *Kydia*.
Vern.—Dhamin, K., *q. v.*
- Daru; tree, and bili; bush, in Kol.? arak, S.
- Datura Stramonium*, *Linn.*; Solanaceæ.
 Local,—Dhatura.
- Datura fastuosa*, *Linn.*; Solanaceæ.
Vern.—Dhatura, S. and H.
- Dawai-banda; *Loranthus Scurrula*, *Linn.*; Loranthaceæ.
- Dawei; *Woodfordia floribunda*, *Salisb.*; Lythraceæ.
 Local,—Dhaiphul, Dhawei, Dhowra.
Vern.—I chak, S.; *Olim* (*Grislea tomentosa*, *Roxb.*).
- Debdaru; *Polyalthia longifolia*, *Benth. & Hk. f.*; Anonaceæ.
 Local,—Deodar.
Vern.—Deodar, K. cult. Planted as Avenue—Dorunda.
- Dela Kunta (1); *Alangium Lamarckii*, *Thwaites.*; Cornaceæ.
 Local,—Dila, dila kanta.
- Dendrobium bicameratum*, *Lindl.*; Orchideæ.
Dendrobium crepidatum, *Lindl.*; Orchideæ.
Dendrobium formosum, *Roxb.*; Orchideæ.

- Dendrobium herbaceum*, *Lindl.*; Orchideæ.
Dendrobium macrostachyum, *Lindl.*; Orchideæ.
Dendrobium moschatum, *Wall.*; Orchideæ.
Dendrobium = *calceolaria*, *Carey.*; Orchideæ.
Dendrobium regium, *Prain.*; Orchideæ.
Dendrobium transparens, *Wall.*; Orchideæ.
Dendrocalamus strictus, *Nees.*; Gramineæ.
 Local,—Bans.
 Bamboo, E.
 Vern.—Buru mat, S., K.; Bans, H.
Denri; *Eriolæna Hookeriana*, *W. & A.*; Sterculiaceæ.
Deodar; see above, Debdaru.
Desmodium Cephalotes, *Wall.*; Leguminosæ.
 Vern.—Bir jhawar, S.
Desmodium gangeticum, *DC.*; Leguminosæ.
 Local,—Nakial.
 Vern.—Taudi bhedi janitet, S.
Desmodium gyrans, *DC.*; Leguminosæ.
 Vern.—Taben arak, S.
Desmodium gyroides, *DC.*; Leguminosæ.
Desmodium latifolium, *DC.*; Leguminosæ.
 Vern.—Sim matha sura, S.
Desmodium parvifolium, *DC.*; Leguminosæ.
 Vern.—Tandi chatom arak, tandi sun-suni, S.; Khet sun-suni, H.
Desmodium polycarpum, *DC.*; Leguminosæ.
 Local,—Brahmini, Karanji, Karjani.
 Vern.—Baiphool, S.
Desmodium pulchellum, *Benth.*; Leguminosæ.
 Local,—Paikh.
 Vern.—Bir Kapi, S.
Desmodium triflorum, *DC.*; Leguminosæ.
 Local,—Amat chingar.
Dhaiphul; *Woodfordia floribunda*, *Salisb.*; Lythraceæ.
 Local,—Dawai-dhawei phul, dhowra, daho, jaiphul.
 Vern.—Ichak, S.
 Olim (*Grislea tomentosa*, *Roxb.*)
Dhamin; *Grewia tiliæfolia*, *Vahl.*; Tiliacæ.
 Local—Damin.
 Vern.—Olat, tarse Kotap, S.; Dhamin gaphni, K.
 “The wood is much valued for banghy poles” Camp and Watt.

- Dhaunta ; *Anogeissus latifolia*, *Wall.* ; Var. *glabra*. *Combretaceæ*.
 Olim (*Conocarpus latifolia*, *DC.*).
 Dhawei, see Dhaiphul.
 Dhela Kanta (1) ; *Alangium Lamarckii*, *Thw.* ; *Cornaceæ*.
Vern.—Dela Kanta, S.
 Dhela Kanta (2) ; *Hygrophila spinosa*, *T. Anders.* ; *Acanthaceæ*.
 Dhori bân ; *Andropogon Gryllus*, *Linn.* ; *Gramineæ*.
 Dhowra (1) ; see Dhaiphul.
 Dhowra (2) ; *Panicum colonum*, *Linn.* ; *Gramineæ*.
 Local,—Bur'ndo ghans.
Vern.—Sama ghas, S.
 Dhub ghans ; *Cyndaon dactylon*, *Pers.* ; *Gramineæ*.
Vern.—Dhobi ghas, S. ; Dubghas, H.
 Dicteria Roxburghiana, *Nees.* ; *Acanthaceæ*.
 Digera arvensis, *Forsk.* ; *Amarantææ*.
Vern.—Kari gandhari, S.
 Dila = Dela = Dhela Kanta (1) *q.v.*
 Dillenia indica, *Linn.* ; *Dilleniaceæ*
Vern.—Korkot, S.
 Dillenia pentagyna, *Roxb.* ; *Dilleniaceæ*.
 Local.—Agôr, gulgûl, Korkot.
 Dimbu phûl ; *Ocimum gratissimum*, *Linn.* ; *Labiataæ*.
 Local.—Bân tûlsi, Kâla tûlsi.
 Dioscorea anguina, *Roxb.* ; *Dioscoreaceæ*.
 Dioscorea bulbifera, *Linn.* ; *Dioscoreaceæ*.
Vern.—Bengo nari, S.
 Local.—Ghenti ghenti kanda.
 Dioscorea dæmona, *Roxb.* ; *Dioscoreaceæ*.
 Dioscorea glabra, *Roxb.* ; *Dioscoreaceæ*.
Vern.—Ato-sang, S.
 Dioscorea Hamiltoni, *Hook. f.*
 Dioscorea oppositifolia, *Linn.* ; *Dioscoreaceæ*.
Vern.—Piska, S.
 Dioscorea pentaphylla, *Linn.* ; *Dioscoreaceæ*.
 Dioscorea sativa, *Linn.* ; *Dioscoreaceæ*.
 Dioscorea Wallichii, *Hook. f.* ; *Dioscoreaceæ*.
 Diospyros Embryopteris, *Pers.* ; *Ebenaceæ*.
Vern.—Tiril, S., K. ; Kend, H. ; Makarkenda, S.
 Diospyros melanoxyton, *Roxb.* ; *Ebenaceæ*.
 The Ebony tree.
 Local.—Khend, tiril.

- Diospyros montana*, *Roxb.*; Ebenaceæ.
 Indian Ebony.
 Local,—Gara tiril.
Vern.—Gada terel, S.
 Gara teril, *Mundari*; Chutia Nagpur.
- Dodonæa viscosa*, *Linn.*; Sapindaceæ.
 Grown as a hedge.
- Doka; *Odina Wodier*, *Roxb.*; Anacardiaceæ.
Vern.—Doka, S.; Jiyat, B.
- Dolichos biflorus*, *Linn.*; Leguminosæ.
 Local,—Kurti.
Vern.—Horec, S.; Kurthi, H.
- Dolichos Lablab*, *Linn.*; Leguminosæ.
Vern.—Malhan, S.; Sim, H.
- Dopatrium junceum*, *Roxb.*; Scrophularineæ.
- Dregea volubilis*, *Benth.*; Asclepiadaceæ.
Vern.—Marang kongat, S.
- Drosera Burmani*, *Vahl.*; Droseraceæ.
- Dudhi (1); *Holarrhena antidysenterica*, *Wall.*; Apocynaceæ.
 Local,—Koreia, bara dudhi, bär ki dudhi.
Vern.—Hat, S., K., H.
- Dudhi (2); *Gouania microcarpa*, *DC.*; Rhamnaceæ.
 Local,—Pahar ka dudhi.
- Dudhi bän; *Cephalostigma Schimperii*, *Hochst.*; Campanulaceæ.
 Local,—Ban dudhi.
- Dudri; *Gardenia turgida*, *Roxb.*; Bubiaceæ.
 Local,—Kärkär.
Vern.—Dundu kit, S.; Karhar, K.
- Dududhia; *Euphorbia pilulifera*, *Linn.*; Euphorbiaceæ.
Vern.—Pusi toa, S., Dudhi, H.
- Dümär; *Ficus hispida*, *Linn. f.*; Urticaceæ.
 Local,—Porho.
- Duranta Plumieri*, *Jacq.*; Verbenaceæ.
 Cultivated as a hedge. One variety has thorns, the other none; both have pretty blue heads of flowers and orange-yellow berries, size of *haws*.
- Dysophylla cruciata*, *Benth.*; Labiatæ.
- Dysophylla verticillata*, *Benth.*; Labiatæ.
Vern.—Pan singa baha, S.
- Ebony,—Indian; *Diospyros melanoxylon*, *Roxb.*; Ebenaceæ.
 Local,—Khend, Tiril.

Echinops echinatus, *Roxb.*; Compositæ.

Eclipta alba, *Hassk.*; Compositæ.

Vern.—Lal kesari, S.

Ehretia laevis, *Roxb.*; Boragineæ.

Vern.—Pusi pan, S. (1).

Pusi pan, S. (2) is *Heliotropium strigosum*, *Willd.*; Boragineæ.

Eksirha; *Micromelum pubescens*, *DC.*; Rutaceæ.

Elaeocarpus serratus, *Linn.*; Tiliaceæ.

Indian Olive; in Dorunda Garden.

Vern.—Julpi.

Hence, "Julpai-guri"—town; district.

Elaeodendron glaucum, *Pers.*; Celastrineæ.

Vern.—Neuri, S.; Thanki, K.

Eleocharis fistulosa, *Schultes.*; Cyperaceæ.

Elephantopus scaber, *Linn.*; Compositæ.

Loca,—Murghi chūndi, tal māli.

Vern.—Manjur juti, S.

Peacock's slippers.

Eleusine ægyptiaca, *Desf.*; Gramineæ.

Vern.—Suntu bekuic, S.

Eleusine indica, *Gærtn.*; Gramineæ.

(*coracana*, *Gærtn.*); Gramineæ.

E. coracana, "is the cultivated form of *indica*." (*Fl. Br. Ind.*)

Local,—Mārūa.

Vern.—Kode, S.; Marua, H.; Murha, B.

It is widely and largely cultivated and used as a food-grain.

Elytrophorus articulatus, *Beam.*; Gramineæ.

Embelia robusta, *Roxb.*; Myrsineæ.

Local,—Sasapora, babirung.

Emilia sonchifolia, *DC.*; Compositæ.

Entada scandens, *Benth.*; Leguminosæ.

Equisetum debile, *Roxb.*; Equisetaceæ.

Local,—Nar jori.

Vern.—Buru katkom charec, S.

Eragrostis amabilis, *W. & A.*; Gramineæ.

Vern.—Ich koch, goda lukui, S.

Eragrostis bifaria, *W. & A.*; Gramineæ.

Eragrostis brachyophylla, *Stapf.*; Gramineæ.

Eragrostis ciliaris, *Link.*; Gramineæ.

Vern.—Tor chandbol, S.

Eragrostis ciliata, *Nees.*; Gramineæ.

- Eragrostis coromandelina*, Trin. ; Gramineæ.
Eragrostis cynosuroides, Beauv. ; Gramineæ.
Eragrostis elegantula, Steud. ; Gramineæ.
Eragrostis interrupta, Beauv. ; Gramineæ.
Eragrostis major, Host ; Gramineæ.
Eragrostis nardoides, Trin. ; Gramineæ.
Eragrostis nigra, Nees. ; Gramineæ.
Eragrostis pilosa, Beauv ; Gramineæ.
Eragrostis stenophylla, Hochst.; (*E. Brownei*, Nees). Gramineæ.
 Local,—Burni.
Eragrostis tenella, Roem & Sch.; Gramineæ.
 Vern.—Ich Koic, S.
Eragrostis tremula, Hochst.; Gramineæ.
Eriobotrya japonica, Lindl.; Rosaceæ.
 The Loquat, E.
 Fruit inconsiderable ; cultivated Dorunda Garden.
Eriocaulon luzulæfolium, Mart.; Eriocaulæ.
Eriolaena Hookeriana, W. & A. ; Sterculiaceæ.
 Vern.—Bundum, oitbulung, pora, K. ; Goaguli, S.
 Local,—Denri, kuru, wawas, chota chungür.
Eriolaena spectabilis, Planch. ; Sterculiaceæ.
 Local,—Bhawat, pardawan.
Eriosema chinense, Vogel. ; Leguminosæ.
 Vern.—Konden, S.
Eruca sativa, Lamk. ; Cruciferæ.
Erycibe paniculata, Roxb. ; Convolvulaceæ.
 Local,—Huru bid, koel gumar.
 Vern.—Kari, S.
Erythraea Roxburghii, G. Don. ; Gentianaceæ.
 Vern.—Gada sigrik, S.
Erythrina indica, Roxb. ; Leguminosæ.
 Vern.—Marar baha, S.
Eucalyptus globulus, Labill. ; Myrtaceæ.
 Cultivated on Tea Estates.
Eucharis amazonica ; Amaryllideæ.
 Cultivated in pots.
Eugenia caryophyllata, Willd. ; Myrtaceæ.
 The Clove tree Eng.
Eugenia caryophyllifolia, Lamk. ; Myrtaceæ.
 Vern.—Bir Rod, S. ; Jamun, K.
Eugenia Jambolana, Lamk. ; Myrtaceæ.
 Local,—Jam, Jamun.
 Vern.—Chuduk bud, sokod, S. ; Jamun, K., H.

- Eugenia operculata*, *Roxb.* ; Myrtaceæ.
Vern.—Totonopak, S.
- Eugenia* ? sp. ; Myrtaceæ.
 Local,—Okar jam.
 Okar jam, Chutia Nagpur, may be a Jamun : not identified.
- Eulophia nuda*, *Lindl.* ; Orchideæ.
Eulophia sp. ; Orchideæ.
Vern.—Bonga taini, S.
- Euphorbia antiquorum*, *Linn.* ; Euphorbiaceæ.
Euphorbia Bojeri, *Hook.* ; Euphorbiaceæ.
 Adjutant's hedge. E.
- Euphorbia dracunculoides*, *Lamk.* ; Euphorbiaceæ.
 Local,—Chota brahmini.
Vern.—Parwa jhara, S.
- Euphorbia Chamaesyce*, *Roxb.* Euphorbiaceæ.
Vern.—Dudhia phul, S.
- Euphorbia granulata*, *Forsk.* ; Euphorbiaceæ.
Vern.—Kanta arak, S.
- Euphorbia hypericifolia*, *Linn.*
Euphorbia microphylla, *Heyne.* ; Euphorbiaceæ.
Vern.—Dudhia phul, S.
- Euphorbia pilulifera*, *Linn. f.* ; Euphorbiaceæ.
 Local,—Dududhia.
Vern.—Pusi toa, S. ; Dudhi, H.
- Euphorbia prolifera* *Ham.* ; Euphorbiaceæ.
 Local,—Hurburia (3).
- Euphorbia scabrifolia*, *Kurz.* Euphorbiaceæ.
Vern.—Janhe hirom, S.
- Euphorbia thymifolia*, *Burm.* ; Euphorbiaceæ.
Vern.—Chota dudhi, H. ; Nanha pusi toa, S. ; Swet-Kerua, B.
- Evolvulus alsinoides*, *Linn.* ; Convolvulaceæ.
 Local,—Khusia.
Vern.—Tandi Khode baha.
- Exacum petiolare*, *Griesb.* ; Gentianaceæ.
Exacum tetragonum, *Roxb.* ; Gentianaceæ.
- Feronia elephantum* *Correa* ; Rutaceæ.
Vern.—Koch bel S. ; Katbel, H.
- Ficus bengalensis*, *Linn.* ; Urticaceæ.
Vern.—Bare dare. S. ; Bar, H. Banyan, E.
- Ficus Cunia*, *Ham.* ; Urticaceæ.
 Local,—Dümbär.
Vern.—Hor podo, S.

- Ficus gibbosa*, *Blume.*; Urticaceæ.
Ficus glomerata, *Roxb.*; Urticaceæ.
 Local,—Gūlār?
Vern.—Loa, S.
- Ficus hispida*, *Linn. f.*; Urticaceæ.
 Local,—Dūmār, porho.
- Ficus indica*, *Linn.*; Urticaceæ.
 Local,—Būr.
- Ficus religiosa*, *Linn.*; Urticaceæ.
 Local,—Pipul.
Vern.—Hesak, S.; Pipar, K.
- Ficus retusa*, *Linn.*; Urticaceæ.
 Local,—Bour, buru hesa.
- Ficus Roxburghii*, *Wall.*; Urticaceæ.
- Ficus scandens*, *Roxb.*; Urticaceæ.
Vern.—Madhur lata, S.
- Fimbristylis diphylla*, *Vahl.*; Cyperaceæ.
 Local,—Chunki, khaksi ban, sisu ban.
- Fimbristylis ferruginea*, *Vahl.*; Cyperaceæ.
- Fimbristylis junciformis*, *Kunth.*; Cyperaceæ.
Vern.—Bindi muthi, S.
- Fimbristylis monostachya*, *Hassk.*; Cyperaceæ.
Vern.—Nana bindi mutha, S.
- Flacourtia Ramontchi*, *L'Her. Var.*—2 *sapida*, *Roxb.*; Bixineæ.
Vern.—Merlec, S.
- Flemingia Chapper*, *Ham.*; Leguminosæ.
- Flemingia congesta*, *Roxb.*; Leguminosæ.
Vern.—Bir but, buru ekasira nari, S.
- Flemingia stricta*, *Roxb.*; Leguminosæ.
- Flemingia strobilifera*, *R. Br. Var.*—*bracteata.*; Leguminosæ.
Vern.—Sim busak, S.
- Flueggia microcarpa*, *Blume.*; Euphorbiaceæ.
 Local,—Bakleri.
- Gadsi; *Limnophila conferta*, *Benth.*; Scrophularineæ.
- Galphuli; *Cardiospermum Halicacabum*, *Linn.*; Sapindaceæ.
Vern.—Putki malla, S.
- Gānja; *Cannabis sativa*, *Linn.*; Urticaceæ.
 Churrus, Bhāng and Hashish are made from it. Hemp, E.
 Cultivated, common.
- Gara Tiril; *Diospyros montana*, *Roxb.*; Ebenaceæ.
Vern.—Gada-terel, S.
- Gardenia gum. mifera*, *Linn.* Rubiaceæ.
 Local,—Burui.

- Gardenia latifolia*, *Roxb.*; Rubiaceæ.
Local,—Papra, Karhar.
Vern.—Popro, S.; Papro, K.
- Gardenia turgida*, *Roxb.*; Rubiaceæ.
Local,—Dudri, Karkar.
Vern.—Dundu kit, S.; Karhar, K.
- Gari sindri; *Mallotus philippinensis*, *Muell.*; (*Rottlera tinctoria*, *Roxb.*) Euphorbiaceæ.
Only found once at Rampur near Palandu.
Local,—Rori.
Vern.—Rora, S.
- Gärsül; *Carissa spinarum*, *A. DC.*; Apocynaceæ.
Local,—Karanda, etc.
“A state of *C. Carandas*, *Linn.*” *So Brandis.*
- Garuga pinnata, *Roxb.*; Burseraceæ.
Local,—Bära ginjen, kenkar.
- Geaster species; Fungi.
Local,—Rugura.
- Gelonium multiflorum, *A. Fuss.*; Euphorbiaceæ.
Geranium ocellatum, *Camb.*; Geraniaceæ.
Getia; *Spermacoce stricta*, *Linn. f.*; Rubiaceæ.
- Ghanto; undetermined: Compound leaves $3\frac{1}{2}$ " to 2". Fig-shaped fruit, in sal jungle.
- Ghenti Kanda; *Dioscorea bulbifera*, *Linn.*; Dioscoreaceæ.
Local,—Ghenti.
Vern.—Bengo nari, S.
- Ghetia kena; *Caesulia axillaris*, *Roxb.*; Compositæ.
Ghetia phül; *Vernonia Roxburghii*, *Less.*; Compositæ.
Ghora ghans; *Andropogon montanus*, *Roxb.*; Gramineæ.
Ginjen (1); *Guizotia abyssinica*, *Cass.*; Compositæ.
Local,—Sirguja, kala til, ram til. Black niger of commerce.
Ginjen (2), *Stereospermum suaveolens*, *DC.*; Bignoniaceæ. *q.v.*
- Globba orixensis, *Roxb.*; Scitamineæ.
Vern.—Sarparating, S.
- Glochidion Heyneanum, *Wight.*; Euphorbiaceæ.
Glochidion lanceolarium, *Dals.*; Euphorbiaceæ.
Local,—Chikni.
Vern.—Bania Kandhum, S.
- Gloriosa superba*, *Linn.*; Liliaceæ.
Vern.—Siric samano, S.
- Glossogyne pinnatifida*, *DC.*; Compositæ.
Vern.—Barangom, bir-barangom, S.

Gloxinia sp.; Gesneraceæ.

Glycine Soja, *Sieb. & Zucc.*; Leguminosæ.

Vern.—Hinde disom horec. S.; Ram Kurthi, H.

The black variety. The white variety is *Pond* disom horec. S.

Gmelina arborea, *Linn.*; Verbenaceæ.

Local,—Gumar, gumhar.

Vern.—Kasmar, S.; Gumher, K.; Gamhar, H.

Gnaphalium indicum, *Linn.*; Compositæ. Flowers white.

Gokura; *Barleria cristata*, *Roxb.*; Acanthaceæ.

Gondli; *Panicum proliferum*, *Lam.*; Gramineæ.

Goot; *Zizyphus xylopyrus*, *Willd.*; Rhamneæ.

Vern.—Karkat, S.; Karkatta, K.

Gorunda; *Combretum decandrum*, *Roxb.* Combretaceæ.

Local,—Gurunda.

Gossypium arboreum L., Cam. and Watt. Cultivated in fields.

Gossypium herbaceum, *Linn.*; Malvaceæ.

Cotton, E.

Local, Kapas; (cotton wool) Rui.

Vern.—Budhi kaskom, bhoga kaskom, S.; Bhoga kapas, budhia kapas, H.

Gouania leptostachya, *DC.*; Rhamneæ.

Gouania microcarpa, *DC.*; Rhamneæ.

Local,—Paharka dudhi.

Grewia asiatica, *Linn.*; Tiliaceæ.

Grewia laevigata, *Vahl.*; Tiliaceæ.

Grewia pilosa, *Lamk.*; Tiliaceæ.

Local,—Gur sikri.

Grewia polygama, *Roxb.*; Tiliaceæ.

Vern.—Seta andir, seta kata, S.; Kukur bicha, H.

Grewia salvifolia, *Heyne.*; Tiliaceæ.

Local,—Bitchra.

Grewia tiliæfolia, *Vahl.*; Tiliaceæ.

Local,—Bengadaru.

(*Grewia vestita*, *Wall.*); Tiliaceæ.

Vern.—Olat, S.

G. vestita, *Wall.*, is placed under *G. asiatica*, *Linn.*, in the Fl. Br. Ind., but Dr. Watt claims this to be a distinct species.

Vern.—Kal, S.

Grewia villosa, *Willd.*; Tiliaceæ.

Vern.—Gaphni, Tarse kotap, S.; Gaphni, dhamin, K.

(*Grislea tomentosa*) *Roxb.* = *Woodfordia floribunda*, *Salisb.* ;
Lythraceæ.

Local,—Dhaiphul, dhawai, dhowra, Jaiphul, Ichac, S.

Many places bear the aboriginal native names of plants. Thus *Ichak* is a town three miles north of Hazaribagh, Tiril a village three miles south-west of Doranda, Dumri, Hesel, Sarjom-dih, Kotanga, Sirguja State. Hindi names are Julpaiguri and Sal bari, Kasmar, Santali.

Guizotia abyssinica, *Cass.* ; Compositæ.

Local,—Ginjen (or jitingi) sirguja, sirgujia, kala til, ramtil
Black niger the seed.

Vern.—Surguja, S. H. K.

It is curious that the *plant* "Sirguja" is called "Ginjen" (or "Jitingi") and not "Sirguja" in Sirguja State (and in Jaspur State).

Olim G. oleifera DC. and *Verbesina sativa*, *Roxb.* An oil-seed.
Oil as far as I know is not used in cooking.

Gulab, gulabaha. The rose.

Gulainchi ; *Plumeria acutifolia*, *Poir, q.v.* ; Apocynaceæ.

Local,—Chämka.

Often called *chämpa* in Chutia Nagpur ; *Michelia Champaca* is champa.

Gulgul ; *Dillenia pentagyna*, *Roxb.* ; Dilleniaceæ.

Local,—Agor, Korkot.

Guma ; *Cleome viscosa*, *Linn.* ; Capparideæ.

Gungai ; *Panicum* sp. ; Gramineæ.

Gur ; *Saccharum officinarum*, *Linn.* Gramineæ ; Sugarcane.

Local,—Katari, ketari, ook.

Cult. "Gur," the crude native product, is questionably used for the plant.

Gur gur ; *Coix Lachryma Jobi*, *Linn.* ; Gramineæ.

Vern.—Jargadi.

Guria ; *Stephegyne parvifolia*, *Korthal.* ; Rubiaceæ.

Gurilerung ; *Ichnocarpus pubescens*, *R. Br.* ; Apocynaceæ.

Local,—Chota dudhi.

Gur Karanj, *Ailanthus excelsa*, *Roxb.* ; Simarubeæ.

Gur sikri ; *Grewia pilosa*, *Lamk.* Tiliaceæ.

Gurunda=Gorunda, see above.

Gute ban ; *Olax scandens*, *Roxb.* ; Olacineæ.

Guti ; *Croton olongifolius*, *Roxb.* ; Euphorbiaceæ.

Local,—Putri.

Vern.—Poter, K.

Gynandropsis pentaphylla, *DC.*; Capparidææ.

Habenaria affinis, *Wight.*; Orchidææ.

Habenaria galeandra, *Benth.*; Orchidææ.

Habenaria goodyeroides, *Don.*; Orchidææ.

Habenaria Lawii, *Hook f.*; Orchidææ.

Habenaria marginata, *Coleb.*; Orchidææ.

Habenaria platyphylla, *Spreng.*; Orchidææ.

Habenaria stenopetala, *Lindl.*; Orchidææ.

Habenaria Susannæ, *Br.*; Orchidææ.

Hamiltonia suaveolens, *Roxb.*; Rubiaceæ.

Haldi; Curcuma longa, *Linn.*; Scitamineæ.

Turmeric, cultivated.

Härhåria; Pulicaria angustifolia, *DC.*; Compositææ.

Local,—also pronounced Hürhåria, *q.v.* (1), (2) and (3).

Håri tåki; Terminalia Chebula, *Retz.*; Combretaceæ.

Håsua dühåri; Leea aspera, *Wall.*; Ampelidææ.

Local,—Hensuadowri, akori.

Hedychium coccineum, *Ham.*; Scitamineæ.

Scarlet—on Baragai Hill and Marångburu.

Hedychium coronarium, *Linn.*; Scitamineæ.

Local,—Saida.

Helicteres Isora, *Linn.*; Sterculiaceæ.

Vern.—Pechamra, S.

Collected in Dorunda garden; a shrub.

Heliotropium strigosum, *Willd.*; Boraginææ.

Vern.—Pusi pan, S. (2).

Another Pusi pan, S. (1) is Ehretia levis, *Roxb.*; Boraginææ.

Hemidesmus indicus, *R. Br.*; Asclepiadaceæ.

Hemigraphis latebrosa, *Nees*; Acanthaceæ.

Hensuadowri = Hasua duhuri, see above.

Heptapleurum venulosum, *Seem.*; Araliaceæ.

Herpestis Hamiltoniana, *Benth.*; Scrophularinææ.

Hesa; Ficus religiosa, *Linn.*; Urticaceæ

Local,—Pipål, pipår.

Vern.—Hesac, S.

Often parasitic or a climber upon ruins. Destroys palm and other trees.

Heylandia latebrosa, *DC.*; Leguminosæ.

Hibiscus cancellatus, *Roxb.*; Malvaceæ.

Local,—Bera kanda.

Vern.—Bir kaskom, S.

Hibiscus cannabinus, *Linn.*; Malvaceæ.

Vern.—Dare kudrum.

Hibiscus radiatus, *Willd.*; Malvaceæ.

Hibiscus Rosa-sinensis, *Linn.*; Malvaceæ.

Local,—Shoe flower.

Cultivated for its flowers,—said to blacken leathers, hence shoe flower.

Hibiscus Sabdariffa, *Linn.*; Malvaceæ.

Local,—Pâtûa. Arak kudrum. S.

Cultivated. Calyces made into jelly very like red-currant jelly.

Holarrhena antidysenterica, *Wall.*; Apocynaceæ.

The commonest shrub in the scrub jungles of Chutia Nagpur.

Local,—Dudhi, Koreia, kûrchi, bara dudhi, bar ki dudhl.

Vern.—Hat, S., K., H.

No wood like this for *turning*. Toys even (*e.g.*, Dinapur Toys) are made of it, and *nests* of boxes.

Holmskioldia sanguinea, *Rets.*; Verbenaceæ.

Vern.—Jhimbiriya, S.

Holoptelea integrifolia, *Planch.*; *Ulmus integrifolia* *Roxb.* urticace.

Local,—Chiryta.

Holostemma Rheedii, *Wall.*; Apocynaceæ.

Vern.—Moron Arak.

Homonoia riparia, *Lour.*; Euphorbiaceæ.

Local,—Cheur.

Hoppea dichotoma, *Willd.*; Gentianaceæ.

Local,—Sikaie.

Hundibaha; *Jasminum?* *pubescens*, *Willd.*; Oleaceæ.

(*J. hirsutum*, *Willd.*)

Hurhuria (1); *Pulicaria angustifolia*, *DC.*; Compositæ.

Hurhuria (2); *Scoparia dulcis*, *Linn.*; Scrophularineæ.

Hurhuria (3); *Euphorbia prolifera*, *Ham.*; Euphorbiaceæ.

(*E. Nepalensis*, *Bois*).

Hurritaki, see Haritaki.

Huru bid; *Ericybe paniculata*, *Roxb.*; Convolvulaceæ.

Local,—Koel gumar.

Hydrilla verticillata, *Carp.*; Hydrocharideæ.

Hydrocotyle asiatica, *Roxb.*; Umbelliferæ.

Hygrophila spinosa, *T. Anders.*; Acanthaceæ.

Local—Dhela kanta (2), Gokula janum, S.

Hygrophila salicifolia, *Nees.*; Acanthaceæ.

Vern.— Mathom arak.

- Hymenodictyon excelsum*, *Wall.*; Rubiaceæ.
Local,—Burkund.
Vern.—Bhorkond, S.
Abundant in Tundi forests. (*Camp. & Walt.*)
- Hyptianthera stricta*, *W & A.*; Rubiaceæ.
Hyptis suaveolens, *Poit.*; Labiatæ.
Vern.—Ganga tulsi, S.
- Ichnocarpus frutescens*, *R. Br.*; Apocynaceæ.
Local,—Gurilerung, chota dudhi.
Vern.—Dudhi lota, S.; dudhi, K.; dudhi lata, H.
- Ilysanthes hyssopoides*, *Bth.*; Scrophularinæ.
Imperata arundinacea, *Cyrill.*; Gramineæ.
Indarjow; *Pavetta indica*, *Linn.*; Rubiaceæ.
Local,—Chirci gora, nunda.
- Indigo; *Indigofera tinctoria*, *Linn.*; Leguminosæ.
Both plant and dye are called *Nil* or *Lil*, locally cultivated in fields. (Blue=Eng).
- Indigofera linifolia*, *Retz.*; Leguminosæ.
Vern.—Tandi khode baha, S.
- Indigofera pulchella*, *Roxb.*; Leguminosæ.
Local,—Jerool phul.
Vern.—Dare huter, S.; Jhur hur, H.; lilibichi, S.
- Indigofera tinctoria*, *Linn.*; Leguminosæ.
Local,—Nil, Lil, Indigo, E.
Cultivated in fields.
- Ionidium suffruticosum*, *Ging.*; Violaceæ.
Vern.—Bir suraj mukhi; tandi sol, S.
- Iphigenia indica*, *Kunth.*; Liliaceæ.
Vern.—Chutia chandbol, S.
- Ipomæa barlerioides*, *Benth.*; Convolvulaceæ.
Ipomæa Batatas, *Lamk.*; Convolvulaceæ.
Local,—Sakarkand.
Vern.—Sakarkenda, S. and H. Common; cultivated.
- Ipomæa Bona-nox*, *Linn.*; Convolvulaceæ.
Moon flower, E.
- Ipomæa cymosa*, *R. & S.*; Convolvulaceæ.
Ipomæa eriocarpa, *R. Br.*; Convolvulaceæ.
Local,—Kijuli.
- Ipomæa hederacea*, *Jacq.*; Convolvulaceæ.
Ipomæa muricata, *Jacq.*; Convolvulaceæ.
Ipomæa obscura, *Ker.*; Convolvulaceæ.
Ipomæa pes-tigridis, *Linn.*; Convolvulaceæ.

- Ipomæa purpurea*, *Lamk.* ; Convolvulaceæ.
Ipomæa Quamoclit, *Linn.* ; Convolvulaceæ.
Ipomæa quinata, *Br.* ; Convolvulaceæ.
Ipomæa semperflorens, Convolvulaceæ.
Ipomæa sepiaria, *König.* ; Convolvulaceæ.
Ipomæa sessiliflora, *Chois.* ; Convolvulaceæ.
Ipomæa speciosa, *R. & S.* ; Convolvulaceæ.
Vern.—Karmbi arak, S.
Ipomæa tridentata, *Roth.* ; Convolvulaceæ.
Ipomæa turpethum, *Br.* ; Convolvulaceæ.
Vern.—Bana etka, S.
Ipomæa vitifolia, *Sweet.* ; Convolvulaceæ.
Isachne australis, *Br.* ; Gramineæ.
Isachne miliacea, *Roth.* ; Gramineæ.
Isachne sp. ; Gramineæ.
Ischæmum angustifolium, *Hack.* ; Gramineæ.
Ischæmum aristatum, *Linn.* ; Gramineæ.
Ischæmum ciliare, *Retz* ; Var.—*a. genuina Hack* Gramineæ.
Ischæmum hirtum, *Hack.* ; Gramineæ.
Ischæmum rugosum, *Salisb.* ; Gramineæ.
Iseilema Wightii, *Anders.* ; Gramineæ.
(*Isolepis supina*, *Br.*) = *Scirpus supinus*, *Linn.* ; Cyperaceæ.
Iurutia ; *Cleome viscosa*, *Linn.* ; Capparidææ.
Ixora parviflora, *Vahl.* ; Rubiaceæ.
Vern.—Merom met, S., Loha jangia, H.
Ixora sp. Rubiaceæ. Cultivated in gardens.
Jaiphül ; *Woodfordia floribunda*, *Salisb.* ; Lythraceæ.
Local.—Dhæphül, which see.
Jalkari ; *Chara foetida A. Br.* ; Characeæ.
Jalkumi ; *Ottelia alismoides*, *Pers.* ; Hydrocharidææ.
Jāmūn ; *Eugenia Jambolana*, *Lamk.* ; Myrtaceæ.
Local.—Kuda, Jam.
Vern.—Chuduk bud, so Rod, S. ; jamun, K. H.
Jāmūn bili ; *Zizyphus Jujuba*, *Lamk.* ; Rhamnææ.
Local.—Bær.
Vern.—Jamun bili, K.
Jāmūn daru ; *Zizyphus rugosa*, *Lamk.* ; Rhamnææ.
Local.—Ghoot.
Vern.—Jamun daru, K.
Jar ka bariari ; *Ærua lanata*, *Fuss.* ; Amarantaceæ.
Jasminum arborescens, *Roxb.* ; Oleaceæ.
Vern.—Gada hund baha, S.

- Jasminum pubescens*, *Willd.*; Oleaceæ.
Local,—Jungli chameili.
- Jatropha Curcas*, *Linn.*; Euphorbiaceæ.
Local,—Beranda.
Vern.—Baghbarinda, B.;
Local and Vern.—Bherenda S. and H.
- Jatropha gossypifolia*, *Linn.*; Euphorbiaceæ.
A roadside weed; common.
- Jerul; *Indigofera pulchella*, *Roxb.*; Leguminosæ.
Local,—Jerul phul.
- Jharo (1); *Justicia simplex*, *D. Don.*; Acanthaceæ.
Jharo (2); *Porana paniculata*, *Roxb.*; Convolvulaceæ.
Silver creeper, Eng.
Vern.—Panjot nari, S.
- Jinjūnia; *Crotalaria prostrata*, *Roxb.*; Leguminosæ.
Vern.—Katic jhunka, nanha jhunka, S.
“*Marang* jhunkays = *C. alata* *Ham.* (? Marung=large);
hence *Marang Baru.*” Baragai. The big hill N. of Ranchi-
Jow; *Tamarix ericoides*, *Rottl.*; Tamariscineæ.
- Jungli Chameili; *Jasminum pubescens*, *Willd.*; Oleaceæ.
Jungli Piaj; ? ban piaj; *Curculigo latifolia*; *Dryand.*
- Jussiaea suffruticosa*, *Linn.*; Onagraceæ.
Vern.—Petra da, dak ichak, S.
- Justicia* (*Adhatoda*, *Linn.*)=*Adhatoda vasica*, *Nees.*; Acanthaceæ.
- Justicia Betonica*, *Linn.*; Acanthaceæ.
Vern.—Tayar baha, S.
- Justicia diffusa*, *Willd.*; Acanthaceæ.
- Justicia procumbens*, *Nees.*; Acanthaceæ.
- Justicia quinqueangularis*, *Koen.*; *J. (peplodes* *Nees.*) Acanthaceæ.
- Justicia simplex*, *D. Don.*; Acanthaceæ.
- Jute (1) *Corchorus capsularis*, *Linn.*; Tiliaceæ. Jute, Eng. and H.; Pāt, B.
- Jute (2); *Corchorus olitorius*, *Roxb.*; Tiliaceæ.
Vern.—Bunpāt, Pāt B.; Jews' Mallow, E.
- Jute (3) *Crotalaria juncea*, *Linn.*; Leguminosæ.
Local.—Sūnpāt.
Vern.—Sūn, B. Cultivated for fibre.
- Kachnal, Kāchnar; *Bauhinia purpurea*, *Linn.*; and other species, Leguminosæ.
- Kādām; *Anthocephalus Cedamba*, *Miq.*; Rubiaceæ.
Olim (*Nauclea Cadamba*, *Roxb.*)

- Kadir gach ; *Acacia Catuch*, *Willd.* ; Leguminosæ.
See Kut and *Acacia Catechu*.
- Kajuli ; *Saccharum officinarum*, *Linn.* ; Gramineæ.
Sugarcane, Eng.
Local,—Katari, Ketari, gūr.
Vern.—Ak, Ik, Ook, Kooshiar, Pūri, Kālūa, Kajuli, B ; *Roxb.*
Gunna, H.
- Kakar ; *Knoxia corymbosa*, *Willd.* Rubiaceæ.
Local,—Banjira.
- Kala tulsi ; *Ocimum gratissimum*, *Linn.* ; Labiatæ.
- Kamala ; *Mallotus philippinensis*, *Muell.* ; (*Rottlera tinctoria*,
Roxb.) Euphorbiaceæ.
Local,—Rori.
Vern.—Rora, S.
- Kambraj ; *Buettneria herbacea*, *Roxb.* ; Sterculiaceæ.
Vern.—Diku sindur, S. Kambraj, H.
- Kāmraᅅga ; *Averrhoa* ; *Carambola*,—Geraniaceæ.
- Kandri ; *Chlorophytum sp.* ; Liliaceæ.
- Kapas ; *Gossypium herbaceum*, *Linn.* ; Malvaceæ.
Cotton, cotton wool, Eng.
Local,—Rui.
Vern.—Kaskom. Budhi kaskom, bhoga kaskom, S.
- Kapur Kadam ; *Leucæna glauca*, *Bth.* ; Leguminosæ.
- Karam ; *Adina cordifolia*, *Hk. f. e. Benth.* ; Rubiaceæ.
Olim (*Nauclea cordifolia Roxb.*)
- Karani ; *Desmodium polycarpum*, *DC.* ; Leguminosæ.
Local,—Brahmani, karanji, karjani (1). Bæphol, S.
- Karanj ; *Pongamia glabra*, *Vent.* ; Leguminosæ.
Vern.—Kuruinj, S.
A popular but smoky burning-oil for lamps is got from the seeds.
- Karanji ; see Karani.
- Karhar ; *Gardenia latifolia*, *Ait.* ; Rubiaceæ.
Local,—Papra.
Vern.—Popro, S. ; Papro, K.
- Karhi, Kari ; *Bridelia retusa*, *Spreng.* ; Euphorbiaceæ.
Local,—Dorkeri, Kasai.
Vern.—Kasei, Rawj, Khaja H. ; Karika, *Bhumij*, B ; Karki
Kadrupala, S. ; Kharaka, Kaka, K.
- Karjani (1) ; see Karani.
- Karjani (2) ; *Abrus precatorius*, *Linn.* ; Leguminosæ.
Vern.—Arak kawet, pond kawet, S. ; Rati, H., the seeds.

Karka ; see Kari, Karhi ; *Bridelia retusa*, *Spreng.* ; Euphorbiaceæ.

Karmi ; *Stephegyne parvifolia*, *Korth.* ; Rubiaceæ.

Local,—Guria.

Vern.—Gore. S.

Olim (*Nauclea parvifolia*, *Roxb.*)

Kasai, see Karhi ; *Bridelia retusa*, *Spreng.* ; Euphorbiaceæ.

Kasei, see Karhi ; *Bridelia retusa*, *Spreng.* ; Euphorbiaceæ.

Kāsāri dall ; *Lathyrus sativus*, *Linn.* ; Leguminosæ.

Local,—Kesari.

A very pleasant *dall*, the too frequent use of which is said to produce dry gangrene. We have never seen or heard good evidence of this.

Kāt ; see Kut.

Kātai. (1) ; *Flacourtia Ramontchi*, *L'Herit.* ; *Var. sapida*, *Roxb.*
Bixineæ.

Vern.—Merlec, S.

Kātai (2) *Randia uliginosa*, *DC.* ; Rubiaceæ.

Vern.—Pinde, S. ; Pindar, K.

Katanga ; *Cedrela Toona*, *Roxb.* ; Meliaceæ.

Local,—Toon, tūni.

Katari ; *Saccharum officinarum*, *Linn.* ; Gramineæ.

Sugarcane, E.

Local,—Ketari, Kosiār, gūr.

Vern.—Ook, *Sans.* ganna, H., etc.

Kat kaliĵa, Kat karanĵa ; *Cæsalpinia Bonducella*, *Flem.* ; Leguminosæ.

Kawa kanda ; *Curculigo latifolia*, *Dryand.* ; Amaryllideæ.

Kawar tāmār ; *Mukia scabrella*, *Arn.* ; Cucurbitaceæ.

Kawĵ, see Karhi ; *Bridelia retusa*, *Spreng.* ; Euphorbiaceæ.

Keĵuli ; *Muckuna pruriens*, *DC.* ; Leguminosæ.

Cowhage, E.

Local,—Kijuli.

Vern.—Etkā, S. ; Alkusi, K. H.

“Keĵuli,” the itch ; name of *effect* given to *cause*.

Kela ; Banana, Plantain, E. ; *Musa sapientum*, *Linn.* ; Scitamineæ.

Cultivated in gardens and orchards. Wild on Parasnath hill, S. side.

Kena ; *Commelina benghalensis*, *Linn.* ; Commelinaceæ.

Kend ; *Diospyros Melanoxylon*, *Roxb.* ; Ebenaceæ.

Indian ebony, E.

Local,—Khend, Tiril.

Vern.—Terel, S. ; Kend, H.

- Kenkur ; *Garuga pinnata*, *Roxb.* ; Burseraceæ.
 Ketari, see Katari. Sugarcane, Eng.
 Khair ; *Acacia Catechu*, *Willd.* ; Leguminosæ.
 Local,—Kadir gach, kât, kâtch, kher.
Vern.—Khaiyar, S. · Khair, H.
- Khaksi bār ; *Fimbristylis diphylla* *Vahl.* ; Cyperaceæ.
 Local,—Chunki, Sisu bān.
- Khardara ; *Acacia pennata* *Willd.* ; Leguminosæ
 Khend, see Kend ; Indian Ebony, E.
 Kher ; see Khar ;
 Kher ghans ; *Andropogon* ? *Schoenanthus* ; Gramineæ.
 ? Bāra Kheir.
- Khet gulab ; *Ammannia pentandra*, *Roxb.* ; Lythraceæ.
 Khet kodo ; *Eragrostis unioides*, *Nees.* ; Gramineæ.
 Khet papra ; *Oldenlandia corymbosa*, *Linn.* ; Rubiaceæ.
 Khusia ; *Evolvulus alsinoides*, *Linn.* ; Convolvulaceæ.
 Kijuli (1) ; *Mucuna pruriens*, *DC.* ; Leguminosæ.
 Cowhage, E.
 Local,—Kejuli.
 Causes intense itching ; *Oil gives immediate relief* by floating
 out the needles.
- Kijuli (2) ; *Ipomæa eriocarpa*, *Br.* ; Convolvulaceæ.
 Kijuli (3) ; *Smithia sensitiva*, *Ait.* ; Leguminosæ.
 Knoxia corymbosa, *Willd.* ; Rubiaceæ.
 Local,—Kakar, banjira.
- Kodo ; *Paspalum scrobiculatum*, *Linn.* ; Gramineæ.
Vern.—Janhe, S., Kodo, H.
- Koel gumar ; *Erycibe paniculata*, *Roxb.* ; Convolvulaceæ.
 Local,—Huru bid.
- Koreia ; *Holarrhena antidysenterica*, *Wall.*, Apocynaceæ.
 Local,—Dudhi (1), Kurchi bara dudhi, bār ki dudhi.
Vern.—Hat, S., K., H.
- Korkot ; *Dillenia pentagyna*, *Roxb.* ; Dilleniaceæ.
 Local,—Agar, gūl gūl.
- Korkota ; *Vitis sp.* ; Ampelideæ.
 Kosiar, see Katari. Sugarcane.
 Local,—Ketari, Gūr, Gāna. H. ; Ook, B., etc.
- Kūchnar ; *Bauhinia retusa*, *Ham.* and other species ; Leguminosæ.
 Local,—Kutchnar ; kuinar, etc.
- Kuchli ; *Vernonia cinerea*, *Less.* ; Compositæ.
 Local,—Kūnchli.

- Kūda; *Eugenia Jambolana*, *Lamk.*; Myrtaceæ.
 Local,—Jam, jāmūn.
Vern.—Chuduk bud, sokod, S. Jāmūn, H.
- Kūdi phūl; *Wendlandia exserta*, *DC.*; Rubiaceæ.
Vern.—Hundro, pichari baha, S.
- Kūdram; *Hibiscus radiatus*, *Willd.*; Malvaceæ.
- Kūinar; see *Kuchnar* and *Bauhinia retusa*, *Roxb.*; Leguminosæ,
 also *B. purpurea*, *Linn.*; and *B. variegata*, *Linn.*
- Kāi phūl; *Butomopsis lanceolata*, *Kunth.*; Alismaceæ.
 This use of *Kui* "phūl" is specific. I know no other plant called by this name.
- Kujeri; *Celastrus paniculata*, *Willd.*; Celastrineæ.
 Local,—Kujili.
Vern.—Kujri, S. and H.
- Kukri; A fungus; Fungi.
- Kul kudari; *Thespesia Lampas*, *Dals. & Gibs.*; Malvaceæ.
 Local,—Bān kapas.
- Kumhi; undetermined.
 A tree; leaves crenate, 17 inches long.
- Kūnchli, see *Kuchli*.
- Kūndri; *Zehneria umbellata*, *Thw.*; Cucurbitaceæ
 Local,—Bān kūndri (2).
- Kūrchi; *Holarrhena, antidysenterica*, *Wall.*; Apocynaceæ.
 Local,—Dudhi, koreia, etc.
Vern.—Hat, S., K., H.
- Kūsūm (1); *Carthamus tinctorius*, *Linn.*; Compositæ.
 Safflower, Eng.
 A dye plant. Cultivated.
- Kūsūm (2); *Schleichera trijuga*, *Willd.*; Sapindaceæ.
Vern.—Baru, S., Kusum H.
 The lac insect is cultivated on the twigs of this tree in Chutia Nagpur.
- Kūt; *Acacia Catechu*, *Willd.*; Leguminosæ.
 Local,—Kadri gach, kutch, kat, khair, kher-khair, H.
 Khaiyar, S.
- Kutchnar, see *Kuchnar* & *Bauhinia sp.*; Leguminosæ.
- Kutna; *Solanum indicum*, *Linn.*; Solanaceæ.
- Kydia calycina, *Roxb.*; Malvaceæ.
 Local,—Bitchra.
Vern.—Poska olat, S.; Pata dhamin, K.
- Kyllinga monocephala, *Rottb.*; Cyperaceæ.

Lagenaria vulgaris, *Ser.*; Cucurbitaceæ. Cultivated.

Local, and Vern.—Kädu, S.

Lagerstrœmia parviflora, *Roxb.*; Lythraceæ.

Local,—Sidh.

Vern.—Sekrec, S.; Sidha, H.

I have not seen *L. Flos-Reginæ*, *Rets*, in Chutia Nagpur.

Lagerstrœmia indica, *Linn.*; Lythraceæ.

Cultivated for its pink, purple and white flowers. A common garden shrub.

Laggera flava, *DC.*; Compositæ.

Local,—Bän sirsu.

Vern.—Bir sirguja, S.

Lal Merich; *Capsicum frutescens*, *Linn.*; Solanaceæ.

Chilli, *Capsicum*, E. See also *Mircha*; *Capsicum minimum*.

Lala jan; *Peristrophe bicalyculata*, *Ness*; Acanthaceæ.

Lantana crenulata, *Otto & Dieter.*; Verbenaceæ.

Lasia heterophylla *Schott.*; Aroideæ.

Vern.—Kanta saru, S.

Lathyrus Aphaca, *Linn.*; Leguminosæ.

Local,—Chäna, Masur.

Vern.—Musoor, chüna, bura chuna, B.

Lathyrus sativus, *Linn.*; Leguminosæ.

Local,—Käsari, Kesari-dall, *q v.*

Launæa asplenifolia, *Hk. f.*; Compositæ.

Vern.—Birmalla, S.

Lawangia; *Sonerila tenera*, *Royle.*; Melastomaceæ.

Lawsonia alba, *Lamk.*; Lythraceæ.

Henna, E.

Local,—Mehndi.

Vern.—Mihndi, S. and H.

Leea aspera, *Wall.*; Ampelideæ.

Local,—Hasua duhuri, Akori, Hensuadowri.

A *sag* common in jungle; root sweet-scented.

Leea macrophylla, *Roxb.*; Ampelideæ.

Vern.—Hatkan, S.

“A rare plant, like *L. robusta*; frs. and fl.-stalk bright red.”

Leea sambucina, *Willd. Var. sanguinea*, *Wall.*; Ampelideæ.

Leersia hexandra, *Sw.*; Gramineæ.

Leonotis nepetæfolia, *Br.* (*Phlomis n.*, *Linn.*); Labiatæ.

Vern.—Dare dhompo. janum dhompo.

Lepidagathis hyalina, *Ness*; Acanthaceæ.

- Lepidagathis scariosa*, *Nees*; *Acanthaceæ*.
Vern.—Kulai lutur, S.
- Leptodesmia congesta*, *Benth.*; *Leguminosæ*.
 Local,—Sunia.
- Leringi ghaṅs*; *Andropogon montanus*. *Roxb.*; *Gramineæ*.
 Local,—Ghora ghaṅs.
- Lettsomia bella*, *Clarke*; *Convolvulaceæ*.
 Local,—Chitti.
- Lettsomia setosa*, *Roxb.*; *Convolvulaceæ*.
 Local,—Bāktchi phul.
- Leucæna glauca*, *Benth.*; *Leguminosæ*.
 Local,—Kāpūr kādam.
- Leucas aspera*, *Spreng.*; *Labiataæ*.
- Leucas Cephalotes*, *Spreng.*; *Labiataæ*.
Vern.—Andia dhurup arak. S.; Dhurpi sag, H.
- Leucas Clarkei*, *Hk. f.*; *Labiataæ*.
Vern.—Enga dhurup arak, S.; Dhurpi sag, H.
- NOTE.—*Enga* means | *Sandi Sadom*, a horse | *S sern*, a cock
 female, in Mundari, | *Enga Sadom*, a mare | *Enga sern*, a
 thus :— | hen.
- Leucas lanata*, *Benth.*; *Labiataæ*.
- Leucas mollissima*, *Wall.*; *Labiataæ*.
Vern.—Gitil arak, S.
- Leucas montana*, *Spreng.*; *Labiataæ*.
 „ *mutans*, *Spreng.*; *Labiataæ*.
 „ *pilosa*, *Benth.*; *Labiataæ*.
 „ *urticæfolia*, *R. Br.*; *Labiataæ*.
- Lil; *Indigofera tinctoria*, *Linn.*; *Leguminosæ*.
 Indigo, E.
 Local,—Nil.
 Lil or Nil (blue), both the dye and the plant.
- Lila jan; *Rungia parviflora*, *Nees.*; *Acanthaceæ*.
- Lilibaha; *Ardisia humilis*, *Vahl.*; *Myrsinææ*.
 Local,—Mormori.
- Limnanthemum cristatum*, *Griesb.*; *Gentianaceæ*.
- Limnanthemum indicum*, *Griesb.*; *Gentianaceæ*.
- Limnophila conferta*, *Benth.*; *Scrophularinææ*.
 Local,—Gadsi.
- Limnophila gratioloides*, *Br.*; *Scrophularinææ*.
- Limnophila racemosa*, *Benth.*; *Scrophularinææ*.
Vern.—Choto lutur, S.
- Limnophila sessiliflora*, *Bl.*; *Scrophularinææ*.

- Lindenbergia urticæfolia, *Lehm.*; Scrophularinæ;
 Linei; Eleocharis fistulosa, *Schult. (olim Heliocharis)*; Cyperaceæ
 Linum usitatissimum, *Linn.*; Lineæ.
Vern.—Tisi, B.
 Linum sp.; Lineæ.
 Several species of Linum cult. in gardens; Flowers crimson or
 white.
 Lipocarpa sphacelata, *Kunth.*; Cyperaceæ.
 Litsæa nitida, *Roxb.*; Laurinææ.
 Litsæa sebifera, *Pers.*; Laurinææ.
 Litsea; see Litsæa.
 Lobelia trigona, *Roxb.*; Campanulaceæ.
Vern.—Chauric arak, S.
 Lod; Ficus hispida, *Linn. f.*; Urticaceæ.
 Local,—Dūmar, Porbo.
 Lodh; Symplocos racemosa, *Roxb.*; Styraceæ.
 Local,—Son pokri. tarop.
Vern.—Lodam, S.
 Loranthus longiflorus, *Blume (L. buddleioides, Desr.)*; Loran-
 thaceæ.
 Local and Vern.—Banda, S., H.
 Loranthus Scurrula, *Linn.*; Loranthaceæ.
Vern.—Ichak banda, S.
 Lūbān; Boswellia serrata, *Roxb.*; Butseraceæ.
 Local,—Sally, salei.
 The Gum, Luban. Olibanum, E.
 Ludia bān; Pennisetum cenchroides, *Rich.*; Cyperaceæ.
 Lud ludi bān; Aristida capillacea, *Lamk.*; Cyperaceæ.
 Ludwigia parviflora, *Roxb.*; Lythraceæ.
 Luffa acutangula; *Roxb.*; Cucurbitaceæ.
 Lungora; Reinwardtia trigyna, *Dumort.*; Lineæ.
Vern.—Paror jhugia, S. ("Paror jhinga" in Santali index).
 Cultivated.
 Lygodium scandens, *Sw.*; Filices.
 Mādár; Calotropis gigantea, *Br.*; Asclepiadææ.
 Local,—Madar, phalti.
Vern.—Akauna, S.
 Mæsa indica, *Wall.*; Myrsinææ.
 Mahadeo jat; Uraria lagopoides, *DC.*; Leguminosææ.
Vern.—Lopong herak, toyo chandbol, S.

Mahua; *Bassia latifolia*, *Willd.*; Sapotaceæ.

Local,—Mowa, mādū kam.

Vern.—Matkom, S.; mandukum, K.; mahua, H.; mahul, B. The seed, Kuindi, S.; Kuchra, H. The oil, Kuinde sunum, S.; Kuchra ka tel, H.

Makar kend; *Diospyros Embryopteris*, *Pers.*; Ebenaceæ.

Local, *Vern.*—Tiril, S. K.; Kend, H.

Mak chūn; *Pterospermum acerifolium*, *Willd.*; Sterculiaceæ.

Vern.—Mach kunda, S.

Makur jalee; *Paspalum sanguinale*, *Lamk.*; Gramineæ.

Mallotus philippinensis, *Muell.*; (olim *Rottlera tinctoria*, *Roxb.*) Euphorbiaceæ.

Local,—Kamala, rori.

Vern.—Rora, S.

Mal inaria; *Eleusine indica*, *Gærtn.*; *Var. Coracana*, *Gærtn.* Gramineæ.

Local,—Mārūa.

Vern.—Kode, S.; Marua, H.; Murha B.

Used as a food grain, largely. Marua Beer made from the grain, Darjeeling, etc.

Mángār leta; *Polygonum barbatum*, *Linn.*; Polygonaceæ.

Vern.—Rani phul, S.

Mangifera indica, *Linn.*; Anacardiaceæ.

Local,—Am, awm, ool.

Vern.—Ul, S.

The Mango, E.

Mānj; *Polygonum glabrum*, *Willd.*; Polygonaceæ.

Local,—Machi or Machli ka mānj. A fish poison.

Mānjit, see Mūnjit.

Mārcheia; *Pimpinella elata*, *Dols.*, Umbelliferæ.

Margosa; *Melia Azadirachta*, *Linn. q.v.*

Marsilea quadrifolia, *Linn.*; Marsileaceæ.

Local,—Sūn sūnia.

Vern.—Chatom arak, S. Sooni shunnaka, B. “*Beng.*—Shushni shak, who eat the leaves in their curries,” *Roxb.*, *Clarke's* Ed. p. 745.

Martynia diandra, *Gloxine.*; Pedalineæ.

Devil's claw, E.

Vern.—Baglucha, S.

Not native: an American plant.

- Marua, see Mal maria. Eleusine indica, *Gärtn.* *Var.* Coracana, *Gärtn.*; Gramineæ.
- Masturia; Cassia mimosoides, *Linn.*; Leguminosæ.
- Mästr dall; Lathyrus Aphaca, *Linn.*; Leguminosæ.
Local,—Chāna.
Vern.—Chuna, bura chuna, B.
- Masuria; Utricularia bifida, *Linn.*; Lentibulariaceæ.
- Masuria; Utricularia racemosa, *Wall.* *Var.* filicaulis, Lentibulariaceæ.
Flowers of racemosa purple; of bifida yellow.
- Mätär, mutter; Pisum sativum, *Linn.*; Leguminosæ.
Cult. in gardens.
- Mätär, mutter; Pisum arvense, *Linn.*; Leguminosæ.
Cult. in fields.
- Matha; Antidesma Bunius, *Spreng.*; Euphoriaceæ.
- Mazus rugosus; *Lamk.*; Scrophularineæ.
- Mehndi; Lawsonia alba, *Linn.*; Lythraceæ.
Henna, Eng.
Vern.—Mihndi S., H.
- Melastoma malabathricum, *Linn.*; Melastomaceæ.
Indian rhododendron, Eng. (of C.B.C.)
- Melia Azedarach, *Linn.*; Meliaceæ.
Peruvian or Persian lilac or Bastard Cedar, Eng.—Campbell and Watt.
Local,—Bakain, Belati bakain.
Vern.—Bokom baha, S.
Planted, common about stations.
- Melia Azadirachta, *Linn.*; Meliaceæ.
Local,—Nim.
Vern.—Nim. S., K., H.;
Margosa Tree, Eng.
- Melochia corchorifolia, *Linn.*; Sterculiaceæ.
Vern.—Thinak arak, S.
- Menda; Pavetta indica, *Linn.*; *Var.* tomentosa. Rubiaceæ;
Vern.—Budhi tilai, hudhi ghasit, S.
Local,—Cherei gora, Indārjow.
- Methi; Trigonella Fœnum-græcum, *Linn.*; Leguminosæ.
Used as a hair wash, the whole young plant.
- Michelia Champaca, *Linn.*; Anonaceæ.
Cultivated. Another Chāmpa is Plumeria which is properly Gulainchi; local.
Local and H.—Chāmpa.

- Micromelum pubescens*, *Blume.*; Rutaceæ.
Local,—Ek sirha.
- Micromeria biflora*, *Benth.*; Labiatæ.
- Miliusa velutina*, *Hk. f. & T.*; Anonaceæ.
Vern.—Kome, Ome, S; Lal kari, K; Kari, H.
- Millettia auriculata*, *Baker*; Leguminosæ.
Local,—Ban simar.
Vern.—Hehel, S.
- Mimosa pudica*, *Linn.*; Leguminosæ.
Sensitive plant, Eng.
- Mimosa rubicaulis*, *Lamk.*; Leguminosæ.
Vern.—Sega janum, S.
- Mimosa?* sp. Leguminosæ.
Vern.—Siuri, jasmin.
Seed alone coll. Stem very prickly; fl. said to be white.
- Mirabilis Jalapa*, *Linn.* Marvel of Peru. E.; Nycatgineæ,
Cult. in gardens; common.
- Mircha*; *Capsicum minimum*, *Roxb.*; Solanaceæ.
Chilli, Eng.
Local,—Lal Mëritch.
Birds'-eye Chilli, Cayenne pepper.
- Miriri*; *Panicum antidotale*, *Retz.*; Gramineæ.
Local,—Bëndë, bërë.
Vern.—Layo gundli, S.
- Mistletoe; *Viscum, g.v.*
- Mitreola oldenlandioides*, *Wall.*; Loganiaceæ.
- Mollugo stricta*, *Linn.*; Ficoideæ.
- Momordica Charantia*, *Linn.*; Cucurbitaceæ.
Vern.—Korilla, B.
- Momordica dioica*, *Roxb.*; Cucurbitaceæ.
Vern.—Kanchan arak (leaf), Karla (fruit), S.
- Monochoria hastæfolia* *Presl.*; Pontederiaceæ.
- Monochoria vaginalis*, *Presl.*; *Var. plantaginea*, *Kunth.*; Pontederiaceæ.
Vern.—Seta pan, S.
- Morinda tinctoria* *Roxb.*; Rubiaceæ.
Vern.—Chaili, S.
- Moringa pterygosperma*, *Gaertn.*; Moringeæ.
Vern.—Munga arak, S.
Horse-radish tree, Eng.

Mormori; *Ardisia humilis*, *Vahl.* *Var.* *arborescens*, *Wall.*
Myrsineæ.

Local,—Lilibaha.

Morus atropurpurea, *Roxb.*; Urticaceæ.

Local,—Toont.

Mulberry, Eng.

Morus Indica, *Linn.*; Urticaceæ.

Local,—Toont.

Mulberry, E.

Morus laevigata, *Wall.*; Urticaceæ.

Local,—Toont.

Mulberry, Eng.

Mota gündli; *Panicum sp.*; Gramineæ.

A food grain.

Motha ghas: *Kylinga sp.*; Cyperaceæ.

Mowna; *Randia dumetorum*, *Lamk.*; Rubiaceæ.

Mozini; not determined.

Mucuna pruriens, *DC.*; Leguminosæ.

Cowitch, Cowhage, E.

Local,—Kejuli.

Vern.—Etka, S; Alkusi, K, H.

Mukia scabrella, *Arn.*; Cucurbitaceæ.

Local,—Kawa tamar.

Mükür khend; *Diospyros Embryopteris*, *Pers.*; Ebenaceæ.

Vern.—Kend, H; Tiril, S, K.

"Local,—khend" is *D. melanoxyton*.

Müng dall; *Phaseolus Mungo*, *Linn.*; Leguminosæ.

Local,—Urid.

Vern.—Mung, Birsang, Ramra, S; Urid, H.

Cultivated largely in fields as a pulse-food for beast and man in India.

Münj (Local,—*Saccharum arundinaceum*), *Rets.*; Gramineæ.

Vern.—Sar ghas, L.

Local.—Endo.

The Korwas make their arrow shaft of the stems of this plant.

Münjit; *Rubia tinctorum*, *Linn.*; Rubiaceæ.

Madder, E.

Mürghi chüнди; *Elephantopus scaber*, *Linn.*; Compositæ.

Local,—Tal muli.

Vern.—Manjur juti, S.

Mūrāt; *Butea frondosa*, *Roxb.* Leguminosæ.

Local,—Palas, paras.

Vern.—Murup, dare murup, S.; Dhak, B.

Musa sapientum, *Linn.*; Scitamineæ.

Banana, Plantain, E.

Local,—Kela.

Musa wild on Parasnath, S. side. Also cult. passim.

Mussaenda macrophylla, Rubiaceæ. *Mussaenda*.

A commonly cultivated climber. (White bracts.)

Mutter, Mātār; *Pisum sativum*, *Linn.*; Leguminosæ.

Field pea, Eng.

Vern.—Chota mutur, H. & B.

Cultivated in fields as a pulse.

Mutter sag; *Antidesma diandrum*, *Roth.*; Euphorbiaceæ.

Nagarmota! *Cyperus exaltatus*, *Retz.* (*C. alopecuroides*, *Roxb.*

Cyperaceæ.

Nakial; *Desmodium gangeticum*, *DC.*; Leguminosæ.

Local,—Nakiel.

Nar jori; *Equisetum debile*, *Roxb.*; Equisetaceæ.

Nelsonia campestris *Br. Var. vestita*; Acanthaceæ.

Nephelium Lit-chi, *Camb.*; Sapindaceæ. The Litchi of commerce.

Local—Litchi.

Litchi trees yield much fruit and good in Ranchi and Dorunda.

Nephrodium Filix-mas, *Rich. Var. d. cochleatum*, *Don.*; Filices.

Nephrodium truncatum, *Presl.*; Filices.

Nephrodium unitum, *R. Br.*; Filices.

Nephrodium variolosum, *Baker.*; Filices.

Nerium odorum, *Soland.*; Apocynaceæ.

Vern.—Pond rajbaha, rajbaha, S.

Cultivated. Flowers white or red.

Nicotiana Tabacum, *Linn.*; Salanaceæ.

Local,—Tumbaku.

Tobacco Eng. Cult.

Nim; *Melia Azadirachta*, *Linn.*; Meliaceæ.

Local,—Neem, nimi.

Nyctanthes Arbor-tristis, *Linn.*; Oleaceæ.

Vern.—Saparom, S.

Ochna squarrosa, *Linn.*; Ochnaceæ.

Vern.—Champa baha, S.

Ocimum Basilicum, *Linn. Var. thyrsoflorum*; Labiateæ.

Vern.—Bharbari, dimbu baha, mali buha, S.

- Ocimum canum*, *Sims.* ; Labiatæ.
Vern.—Bharbari, S.
- Ocimum gratissimum*, *Linn.* ; Labiatæ.
 Local,—Bântûlsi, kala tûlsi, dimbu phul.
- Ocimum sanctum*, *Willd.* ; Labiatæ.
 Local,—Tûlsi, tûlsi.
Vern.—Doka, S.
- Odina Wodier*, *Roxb.* ; Anacardiaceæ.
Vern.—Doka, S. ; Jiyal, B.
 Local,—? Doka.
- Okar Jam ; *Eugenia sp.* ; Myrtaceæ.
 Note.—*Jamb* is the generic vern. name of the Eugenias.
- Olax nana* ; *Wall.* ; Olacineæ.
Vern.—Merom met, S.
- Olax scandens*, *Roxb.* ; Olacineæ.
 Local,—Gute bân.
- Olax sp.*
Vern.—Bir athel, hund, S.
- Oldenlandia corymbosa* *Linn.* ; Rubiaceæ.
 Local & B.—Khet papra.
- Oldenlandia dichotoma*, *Koenig.* ; Rubiaceæ.
- Oldenlandia gracilis*, *Hk. f.* ; Rubiaceæ.
- Oldenlandia senegalensis*, *Ham.* ; Rubiaceæ.
Vern.—Ilinchin, turam, S.
- Oleander ; *Nerium odorum*, *Soland.* ; Apocynaceæ.
Vern.—Rajbaha, pond raj baha, S.
- Oodul ; *Cochlospermum Gossypium DC.* Bixineæ.
Vern.—Hopo, S. ; Gûlgûl, K. and H.
 Torch wood, E.
- Ook ; *Saccharum officinarum* *Linn.* ; Gramineæ.
 Sugarcane, E.
 Local,—Katari, ketari, kosiari, gûr ûk.
- Ool ; *Mangifera indica* *Linn.* ; Anacardiaceæ.
 The Mango, Eng.
 Local, B. & H.—Am, awm.
Vern.—Ûl, S.
- Ophioglossum vulgatum* *Linn.* ; Filices.
Vern.—Ot poraini, S.
- Oplismenus compositus*, *Beauv.* ; Gramineæ.
- Oplismenus undulatifolius*, *Beauv.* ; Gramin.
- Orka phûl ; *Exacum tetragonum*, *Roxb.* ; Gentianaceæ.

- Orobanche indica, *Ham.* ; Orobanchaceæ.
Vern.—Turi sim, S ; Sarsan banda, bhatua ghas, H.
- Oroxylum indicum, *Vent.* (*Bignonia indica*, *Roxb.*) Bignoniaceæ.
 Umbrella tree, Eng.
Vern.—Banahata, S. ; Bhal supti, H.
 Local,—Dak dawa, ginjen.
- Oryza sativa, *Linn.* ; Gramineæ.
 Rice, Eng.
 Local,—Dhan.
Vern.—Uri, uri horo, S. (*var.* of sp.)
 Cultivated in fields. Baba (cooked rice), Mundari.
- Osbeckia chinensis, *Linn.* ; Melastomaceæ.
 Osbeckia truncata, *D. Don.* *Var.* Kurzii ; Malastomaceæ.
 Ottelia alismoides, *Pers.* ; Hydrocharideæ.
 Local,—Jalkumi.
- Ougeinia dalbergioides, *Benth.* ; Leguminosæ.
 Local,—Pānān.
Vern.—Rot, S.
- Oxalis corniculata, *Linn.* ; Geraniaceæ.
 Local,—Barangi.
Vern.—Tandi chatom arak, S.
- Oxystelma esculentum, *Br.* ; Asclepiadææ.
 (Dooghdkika, *Sans.*, Kirni, *B.* and Doodhee and Doodh-luta.
Roxb.)
- Padar ; Stereospermum suaveolens, *DC.* ; Bignoniaceæ.
 Local,—Pandar, papre, paydar, siris (*so*), ginjen.
Vern.—Pader, S.
- Pæderia fœtida, *Linn.* ; Rubiaceæ.
 The small of the crushed leaves is stercoraceous.
- Pagula. † (Specimen lost).
 Local.—chimti ka sāg.
- Pāhār ka dudhi ; Gouania microcarpa, *DC.* ; Rhamneæ.
 Paikh ; Desmodium pulchellum, *Benth.* ; Leguminosæ.
Vern.—Bir kapi.
- Pālās ; Butea frondosa, *Roxb.* ; Leguminosæ.
 Local.—Paras, pharad, murut.
Vern.—Dare murup, murup, S. ; Dhak, B.
- Pānān ; Ougeinia dalbergioides, *Benth.* ; Leguminosæ.
Vern.—Rot, S.
- Pāndān ; Dalbergia latifolia, *Willd.* ; Leguminosæ.
Vern.—Sat sayer, S.
- Pandar, see Padar.

- Panicum antidotale*, *Rets.*; Gramineæ.
 Local,—Bende, bere, misiri.
Vern.—Layo gundli, S.
- Panicum auritum*, *Presl.*; Gramineæ.
- Panicum ciliare*, *Rets.*; = *Paspalum sanguinale*, *Lamk.*; Gramineæ.
Vern.—Makūr jalee, H.
- Panicum colonum*, *Linn.*; Gramineæ.
 Local,—Bur'ndo ghaṅs, dhowra (2).
Vern.—Sama ghas, S.; shama, B.
- Panicum Crus-galli*, *Linn.*; Gramineæ.
- Panicum distachyum*, *Linn.*; Gramineæ.
- Panicum flavidum*, *Rets.*; Gramineæ.
- Panicum (glaucum, Linn.)*; *Setaria glauca*, *Beauv.*; Gramineæ.
- Panicum humile*, *Nees.*; Gramineæ.
- Panicum indicum*, *Linn.*; Gramineæ.
- Panicum interruptum*, *Willd.*; Gramineæ.
- Panicum Isachne*, *Roth.*; Gramineæ.
- Panicum javanicum*, *Poir.*; Gramineæ.
- Panicum maximum*, *Jacq.*; Gramineæ.
- Panicum miliaceum*, *Linn.*; Gramineæ.
Vern.—Chuna, H. & B.
- Panicum miliare*, *Lamk.*; Gramineæ.
Vern.—Gündli, S.
- Panicum montanum*, *Roxb.*; Gramineæ.
 Guinea grass, E.
- Panicum myosuroides*, *Br.*; Gramineæ.
- Panicum nodosum*, *Kunth.*; Gramineæ.
- Panicum patens*, *Linn.*; Gramineæ.
 Gündli, Santali; is *Panicum miliare*, *Lamk.* (Camp & Watt.)
- Panicum (paludosum, Roxb.)*; *Panicum proliferum*, *Lamk.*; Gramineæ
 Local,—Gündli.
- Panicum proliferum*, *Lamk.*; Gramineæ.
 Local,—Gündli, gungri.
- Panicum prostratum*, *Lamk.*; Gramineæ.
- Panicum psilopodium*, *Trin.*; Gramineæ.
- Panicum, punctatum* *Burm.*; Gramineæ.
- Panicum ramosum*, *Linn.*; Gramineæ.
- Panicum repens*, *Linn.*; Gramineæ.
- Panicum setigerum*, *Rets.*; Gramineæ.
 (*Panicum sylvaticum*, *Lamk.*); *Oplismenus compositus*, *Beauv.*; Gramineæ.

- Panicum trypheron*, *Schult* ; Gramineæ.
 (*Panicum verticillatum*, *Linn.*) ; *Setaria verticillata*, *Beauv.* ; Gramineæ.
- (*Panicum vestitum*, *Nees.*) ; *P. villosum*, *Lamk.* ; Gramineæ.
Panicum villosum, *Lamk.* ; Gramineæ.
Vern.—Nari ghas, S.
- Panicum* sp. ; Gramineæ.
 Local,—Gungai.
- Panicum* sp. ; Gramineæ.
Vern.—Motha gundli.
 Growing among cultivated *F. miliare* (Camp. & Watt).
- Paper ; *Veronia cinerea*, *Less.* ; Compositæ.
 Local,—Künchli.
- Papita ; *Carica Papaya*, *Linn.* ; Passifloreæ.
 Papaw fruit, E.
- Papra ; *Gardenia latifolia*, *Ait.* Rubiaceæ.
 Local,—Karhar,
Vern.—Popro, S. ; Papro, K.
- Papre ; *Stereospermum suaveolens*, *DC.* ; Bignoniaceæ.
 Local,—Ginjen, padar pandar, siris.
Vern.—Pader, S.
- Pärás, see Pálás ; *Butea frondosa*, *Roxb.* ; Leguminosæ.
- Pardawan ; *Eriolæna spectabilis*, *Planch.* ; Sterculiaceæ.
 Local,—Bhāwāt.
- Parhi, *Cissampelos Pareira*, *Linn.* ; Menispermaceæ.
Vern.—Tejo malla, S.
- Parkinsonia aculeata*, *Linn.* ; Leguminosæ.
- Paro ; *Zingiber Cassumunar*, *Roxb.* ; Scitamineæ.
- Parola ; *Clerodendron Siphonanthus*, *Br.* ; Verbenaceæ.
- Par sati ; *Jussiaea suffruticosa*, *Linn.* ; Onagraceæ.
- Paspalum longiflorum*, *Retz.* ; Gramineæ.
- Paspalum pedicellare*, *Trin.* ; Gramineæ.
- Paspalum Royleanum*, *Nees.* ; Gramineæ.
- Paspalum Sanguinale*, *Lamk.* ; (*Panicum ciliare*, *Retz.*) Gramineæ.
Vern.—Makur jalee, H.
- Paspalum scrobiculatum*, *Linn.* ; Gramineæ.
 Local.—Kodo.
Vern.—Janhe, S. ; Kodo H. Janhe chanle, S. for the husked grain (Chanle-chāwāl=husked rice), H.

- Pātal chatta ; *Cheilanthes farinosa*, *Kaulf.* ; and *Cheilanthes tenuifolia*, *Swartz.* ; Filices.
Local,—Bhui nim.
- Pavetta indica*, *Linn.* ; *Var. tomentosa* ; Rubiaceæ.
Local,—Cherei gora, inderjow, menda.
Vern.—Budhi tilai, budhi ghasit, S.
- Pea ; *Pisum arvense* L. cultd. *P. sativum*, *Linn.* ; Leguminosæ.
Local,—Matar, *q.v.*
- Peeyar ; *Buchanania latifolia*, *Roxb.* ; Anacardiaceæ.
Local,—Beāl pūtti, Peyal, cheronji (the fruit).
Vern.—Tarop, S., Tarum, K. ; Piyar, piyal, biyala, chironji (the fruit) H. ; Piyal, B. ; Pīal, Bhumij, ; Peera, Kharwar.
- Pennisetum cenchroides*, *Rich.* ; Gramineæ.
Local,—Ludia bān.
- Pennisetum parviflorum*, *Trin.* ; (*P. imberbe*, *Edgew.*) ; Gramineæ.
- Pennisetum setosum*, *Rich.* ; Gramineæ.
- Pennisetum typhoideum*, *Rich.* ; (*Panicum spicatum*, *Roxb.*) ; Cult. Gramineæ.
Local,—Būjera or būjra.
Vern.—Kasa jouar, H. ; Bajra, S.
- Pentapetes phœnicia*, *Linn.* ; Sterculiaceæ.
Vern.—Bare baha, S.
- Perar ; *Randia uliginosa*, *DC.* ; Rubiaceæ.
Local,—Katai.
- Peristrophe bicalyculata*, *Nees.* ; Acanthaceæ.
- Perotis latifolia*, *Ait.* ; Gramineæ.
- Phalanda ; *Hemigyrosa canescens*, *Thw.* ; Sapindaceæ.
- Phalti ; *Calotropis gigantea*, *DC.*, Asclepiadeæ.
Local,—Mādār.
Vern.—Akauna, S.
- Pharad ; see Pālās. *Butea frondosa*, *Roxb.* ; Leguminosæ
- Phaseolus aconitifolius*, *Jacq.* ; Leguminosæ.
Vern.—Bir mung, bir moch, moch, S. ; Moth, H.
- Phaseolus calcaratus*, *Roxb.* ; Leguminosæ.
Vern.—Sutri, S.
- Phaseolus Mungo*, *Linn.* ; Leguminosæ.
Local,—Mūng dall.
Vern.—Mung, bir sang ramra, S. ; urid, H.
- Phaseolus vulgaris*, *Linn.* ; Leguminosæ.
Local,—Paras bean.
Haricot, Kidney bean, E.

- Phätkäl; *Artocarpus integrifolia*, *Linn.*; Urticaceæ.
 Jak-fruit tree, Eng.
 Local,—Kätäl.
Vern.—Kanthar, S.; Poros, Kol.; Kanthal, kathal, chakk, panas, H.; Kathal, B.
- Phoenix acaulis*, *Ham.*; Palmeæ.
 Local,—Bän kajür.
 Floor-mats of bungalows made of the leaves plaited.
- Phoenix sylvestris*, *Roxb.*; Palmeæ.
 Local,—Kajür, kita.
Vern.—Khijur, S.
- Phul bārhi; *Andropogon serratus*, *Thunb.*; Gramineæ.
 Brooms are made of it.
- Phyllanthus Emblica*, *Linn.*; Euphorbiaceæ.
 Local,—Aonla, amra.
Vern.—Meral, S.; Aura, K.
- (*Phyllanthus lanceolarius*, *Muell.*); *Glochidion lanceolarium*,
Dals.; Euphorbiaceæ.
 Local,—Chikni.
Vern.—Bania kandhum, S.
- Phyllanthus Niruri*, *Linn.*; Euphorbiaceæ.
 Local,—Bän aonla, bänjiran, arjuni, jiran ban.
- Phyllanthus perdulus*, *Roxb.*; Euphorbiaceæ.
- Phyllanthus simplex*, *Rets.*; Euphorbiaceæ.
Vern.—Tandi meral, S.
- Phyllanthus urinaria*, *Linn.*; Euphorbiaceæ.
- Physalis minima*, *Linn.*; Solanaceæ.
 Local,—Ranipucco.
Vern.—Handi khandi, S.
- Pimpinella elata*, *Dals.*; Umbelliferæ.
- Pipal, Pipar (1); *Ficus religiosa*, *Linn.*; Urticaceæ.
 Local,—Hesa.
Vern.—Hesak, S.; Pipar, K.
- Pipar (2); *Anisochilus carnosus*, *Wall.*; Labiataæ.
 Local,—Chota pipar.
- Piper Betle, *Linn.*; Piperaceæ. Cult.
Vern.—Pan.
 Betle pepper, E.
- Piper longum*, *Linn.*; Piperaceæ.
Vern.—Ralli, S.
- Pisum*, *sp.*; see Mätär.
- Pithour; *Zizyphus rugosa*, *Lamk.*; Rhamneæ.

Plectranthus incanus, *Link* ; Labiatæ.

Plectranthus, *sp.* ?

Vern.—Damka duri, S.

Plumbago capensis, *Thunb.* ; Plumbaginææ.

Flower blue, in branches, a com. climber in garden.

Plumbago zeylanica, *Linn.* ; Plumbaginææ.

Got on Sillee and Sandi-Mandi road, most probably *wild.*

Plumeria acutifolia, *Poir.* ; Apocynaceæ:

Sometimes somewhat rose-coloured outside.—*Kurs.*

Local,—Gûlainchi, châmpa (?)

Vern.—Gulanj baha, S.

Another *Champa* (†) is *Michelia Champaca*, *Linn.*

Pogonatherum saccharoidium, *Beauv.* ; Graminææ. (Camp & Watt.)

Pogostemon plectranthoides, *Desf.* ; Labiatæ.

(*Poinciana pulcherrima*, *Linn.*) ; *Cæsalpinia p.* *Swartz* ;

Leguminosæ.

Poinciana regia, *Bojer.* ; Leguminosæ.

Gold mohur E., Mascarene Flamboyânt, W. J.

Poinsettia pulcherrima, *R. Grak.* ; Euphorbiaceæ.

Pollia sorzogonensis, *Endl.* ; Commelineacæ.

Pollinia argentea, *Trin.* ; (*P. tristachia*, *Thw.*) ; Graminææ.

(*Pollinia eriopoda*, *Hance.*) ; *Ischæmum, angustifolium*, *Hack.* ;

Graminææ.

Vern.—Chero ghas, bachkom, S. ; Sabe, H.

The material from which the common twine of the district is made. (Camp & Watt.)

Polyalthia cerasoides, *Benth & Hk. f.* ; Anonaceæ.

Vern.—Panjon, S.

Polyalthia longifolia, *Benth & Hk. f.* ; Anonaceæ.

Local,—Deb daru, deodar.

Vern.—Deodar, K.

Planted as avenue, Doranda.

Polycarpæa corymbosa, *Lamk. Var. aurea*, *Wight.* ; Caryophylleæ.

Vern.—Janhe nanjom, S.

Polygala chinensis, *Linn.* ; Polygalææ.

Vern.—Gaighura, S.

Polygala crotalarioides, *Ham.* ; Polygalææ.

Vern.—Lil kathi.

Polygala erioptera, *DC.* ; Polygalææ.

Polygala glaucoides, *Linn.* ; Polygalææ.

Polygonum barbatum, *Linn.* ; Polygonaceæ.

- Polygonum capitatum*, *Ham.* ; Polygonaceæ.
Polygonum chinense, *Linn.* ; Polygonaceæ.
Polygonum glabrum, *Willd.* ; Polygonaceæ.
 Local,—Manj, machli ka manj.
Vern.—jioti, sauri ark, S.
Polygonum (*indicum*, *Roxb.*) ; Polygonaceæ.
Vern.—Rani phul, S.
Polygonum plebejum, *Br.* ; Polygonaceæ.
Polygonum sp. ; Polygonaceæ.
 Local.—Hara pota.
Polypodium multilaeatum, *Wall.* ; Filices.
Polypodium proliferum, *Roxb.* ; Filices.
Pongamia glabra, *Vent.* ; Leguminosæ.
 Local,—Karan
Vern.—Kurunji, S.
 The seeds produce a smoky oil much used for burning in lamps
 in Chutia Nagpur. Planted near villages, along the village
 roadsides.
Borana paniculata, *Roxb.* ; Convolvulaceæ.
 Silver creeper, Eng.
 Local,—Jharo.
Vern.—Panjot nari, S.
 Porho ; *Ficus hispida*, *Linn. f.* ; Urticaceæ.
 Local,—Dümär.
Portulaca oleracea, *Linn.* ; Portulacaceæ.
Vern.—Mota seric alung, S.
Portulaca quadrifida, *Linn.* ; Portulacaceæ.
Portulaca tuberosa, *Roxb.* ; Portulacaceæ.
Portulaca sp. ; Portulacaceæ. "A troublesome weed. Flower
 pale purple, $\frac{1}{4}$ " to $\frac{1}{2}$." (*Watt.*)
Potamogeton crispus, *Linn.* ; Naiadaceæ.
Potamogeton natans, *Linn.* ; Naiadaceæ.
 Potato ; *Solanum tuberosum*, *Linn.* ; Solanaceæ.
 Local,—Alu, ārū, which name is also applied to yams.
 Pōtē ; Root bark, used in *gōrmi*.
 Tree,—leaves 12", diamond-shaped.
Pouzolzia pentandra, *Benn.* ; Urticaceæ.
Premna herbacea, *Roxb.* ; Verbenaceæ.
Vern.—Kadamet, S.
Premna latifolia, *Roxb.* *Var. cuneata.* Verbenaceæ.
Vern.—Dangra seya, S.
Psoralea corylifolia, *Linn.* ; Leguminosæ.

Pterocarpus Marsupium, *Roxb.*; Leguminosæ.

Local,—Beāl.

Vern.—Murga, S.

Pterspermum acerifolium, *Willd.*; Sterculiaceæ.

Vern.—Mach kunda.

Pterospermum suberifolium, *Lamk.*; Sterculiaceæ.

Pueraria tuberosa, *DC.*; Leguminosæ.

Local,—Bendo.

Vern.—Jang tira, tirra, S; patal kohnda, S. & H.

Pulicaria angustifolia, *DC.*; Compositæ.

Local,—Hurhuria.

Punial, punial aombo; *Andropogon* sp.

Root bruised and rubbed into the skin.

Punnan; see Pānān.

Putranjiva Roxburghii, *Wall.*; Euphorbiaceæ.

Vern.—Pitoj, S.

Putri; *Croton oblongifolius*, *Roxb.*; Euphorbiaceæ.

Vern.—Gote, S., Poter; K.

(*Quamoclit*); *Ipomæa Quamoclit*, *Linn.*; Convolvulaceæ.

Quisqualis indica, *Linn.*; Combretaceæ.

Cultivated in gardens, com. climber.

Rahar dall; *Cajanus indicus*, *Spreng.*; Leguminosæ.

Maghi ripe in January; *Chaitali* in March and *Aghanwi* in November, are three varieties: (C. & W.)

Vern.—Raher, S.; Laher, N.; Oroha, B.

Rai datun; *Heptapleurum venulosum*, *Seem.*; Araliaceæ.

Ram dātṅ; *Smilax macrophylla*, *Roxb.*; Liliaceæ.

Local,—aru, jungli aru, ran pawan.

Ram Kurti (1); *Atylosia mollis*, *Benth.*; Leguminosæ.

Vern.—Bir malhan, S.

Ram Kurthi (2); *Glycine Soja*. *Sieb. & Zucc.*; Leguminosæ.

Vern. Pond. White *var.* Fond disom horec, S.; Black *var.*

Hende disom horec, S., Ram Kurti, H.

Randia dumetorum, *Lamk.*; Rubiaceæ.

Local,—Mowna.

Vern.—Boi hindi, loto, S.

Randia uliginosa, *DC.*; Rubiaceæ.

Local,—Perar, Katai.

Vern.—Pinde, S.; Pindar, K.

Rani pucco; *Physalis minima*, *Linn.*; Solanaceæ.

Vern.—Handi khandi, S.

- Ran pāwān ; *Smilax macrophylla*, *Roxb.* ; Liliaceæ.
Local,—Aru, jungli aru, ram datun.
- Raphanus sativus, *Linn.* ; Cruciferæ. Com. cult.
Local,—Mūli.
The Radish, E.
- Rata bān ; *Andropogon Schoenanthus*, *Linn.* ; Gramineæ.
Vern.—Nanha dhuri ghas, S.
Local,—Bara kher, bharāndo kher.
Geranium grass, Rusa oil grass, Oil of Ginger grass, Eng.
- Rātān gowra ; *Elæodendron glaucum*, *Pers.* ; Celastrineæ.
Vern.—Neuri, S., Thanki, K.
- Rati ; (seeds) *Abrus precatorius*, *Linn.* ; Leguminosæ.
- Rat kat jāñūm ; *Solanum xanthocarpum*, *Schrad & Wendl.* ;
Solanaceæ.
? Local,—Sial kanta (Jackal thorn).
Vern.—Rangaini janum, S.
- Reinwardtia trigyna, *Planch.* ; Lineæ.
Local,—Lungora.
- Reri ; *Ricinus communis*, *Linn.* ; Euphorbiaceæ.
Vern.—Eradom, S.
Castor oil plant, *Eng.*
A dwarf variety grown in fields ; seen in Singbhum.
- Rethi ; *Sapindus Mukorossi*, *Gærtn.* ; Sapindaceæ.
- Ricinus communis*, *Linn.* ; Euphorbiaceæ.
Local,—Reri.
Vern.—Eradom, S.
The Castor oil plant, *Eng.*
- Rivea hypocrateriformis, *Chois.* ; Convolvulaceæ.
- Rivea ornata, *Chois.* ; Convolvulaceæ.
- Rohina ; *Soymdia febrifuga*, *A. Fuss.* ; Sterculiaceæ.
- Rori ; *Mulilotus philippinensis*, *Muell.* ; *olim Rottlera tinctoria* ;
Euphorbiaceæ.
- Rosa involucrata, *Roxb.* ; Rosaceæ.
- Rūch mūchi ; undetermined.
- Ruellia suffruticosa, *Roxb.* ; Acanthaceæ.
Vern.—Chaulia, S.
- Rugura ; *Geaster* sp. ; Fungi.
- Rumex dentatus *Camp.* ; Polygonaceæ.
- Rumex nigricans, *Hookf.* . Polygonaceæ.

Rungia perviflora, *Nees.*; Acanthaceæ.

Local,—Lila Jān.

Russelia juncea *Zucc.*; Scrophularineæ. Cult. Exotic. Common in gardens.

Saccharum arundinaceum, *Rets.*; Gramineæ.

Local,—? Munj. Sar ghas, S.

Saccharum Narenga, *Ham.*; Gramineæ.

Local,—Munj.

Saccharum officinarum, *Linn.*; Gramineæ.

Sugarcane, E.

Cultivated in fields.—Planted, irrigated.

Local,—Kātāri, Ketari, Kosear, Ook, ? gūr.

Vern.—Gunna, H.

Gūr, the crude product, is sometimes used as the name of the plant.

Saccharum spontaneum, *Linn.*; Gramineæ

Saccopetalum tomentosum, *Hk. f. and T.*; Anonaceæ.

Local,—Kari.

Sagittaria sagittæfolio, *Linn.*; Alismaceæ.

Saida; *Hedychium coronarium*, *Koen.*; Scitamineæ.

Saki; *Adenostemma viscosum*, *Forst.*; Compositeæ.

Sakna; Sal; *Shorea robusta*, *Gærtn.*; Dipterocarpeæ.

Local,—Sākna, surjūm.

Vern.—Sarjom, S; Sakhna, Sal, H. The red resin, Sarjom lori

S.; Dammar resin, Eng. Used in varnish, incense.

Salai; *Boswellia serrata*, *Roxb.*; Melisceæ.

Local,—Sālei, sally: The gum Lubān.

Frankincense, Olibanum, Eng.

Vern.—Salga, S., K., H. The wood valuable for gunpowder-charcoal. Stakes of fences made of this wood sprout and grow.

Salix tetrasperma, *Roxb.*; Salicineæ.

Vern.—Gada sigrik, S.

Salomonias oblongifolia *DC.*; Polygaleæ.

Sān,—see Sūn; *Crotalaria juncea*, *Linn.*; Leguminosæ.

Sauromatum guttatum, *Schott*; Aroideæ.

Sansevieria Roxburghiana, *Schult.*; Hæmodoraceæ.

Sapindus Mukorossi, *Gærtn.*; Sapindaceæ.

Local,—Rethi. Trees, to 40 ft. cult. in Rajah's garden, Jaspurnagar.

Saponaria Vaccaria, *Linn.*; Caryophylleæ.

Vern.—Musna, S. Cultivated. An oil seed.

Sarnega ; *Curcuma cordata*, *Wall* ; Scitamineæ.

Vern.—Sarānga, (Sar'nga).

Sarjum ;—see Sāl.

Sarpank ; *Tephrosia purpurea*, *Pers.* ; Leguminosæ.

Sasapora ; *Embelia robusta*, *Roxb.* ; Myrsineæ.

Local,—Babirūng.

Satawar ; *Asparagus racemosus*, *Roxb.* ; Liliaceæ.

Sauromatum guttatum, *Schott.* ; Aroideæ.

Saussurea candicans, *Clarke* ; Compositæ.

Schleichera trijuga, *Willd.* ; Sapindaceæ.

Local,—Kūsūm.

Vern.—Baru, S.; Kūsūm, H. Another *Kūsūm* (L.), is *Carthamnus tinctorius*, L.

Scindapsus officinalis, *Schott.* ; Aroideæ.

Vern.—Dhara jhapak, S.

Scirpus articulatus, *Linn.* ; Cyperaceæ.

Scirpus erectus, *Poir.* ; Cyperaceæ.

Scirpus grossus, *Linn.* *Var.* Kysoor (sp.) *Roxb.* ; Cyperaceæ.

Scirpus Isolepis, *Boeck.* ; Cyperaceæ.

Scirpus Michelianus, *Linn.* ; Cyperaceæ.

Scirpus mucronatus, *Linn.* ; Cyperaceæ.

Scirpus squarrosus, *Linn.* ; Cyperaceæ.

Scirpus supinus *Linn.* ; Cyperaceæ.

Scleria caricina, *Benth.* ; Cyperaceæ.

Scleria elata, *Thw.* ; Cyperaceæ.

Scleria hebecatpa, *Nees.* ; Cyperaceæ.

Scleria oryzoides, *Presl.* ; Cyperaceæ.

Scleria pergracilis, *Kunth.* ; Cyperaceæ.

Scleria tenellata, *Willd.* ; Cyperaceæ.

Scoparia dulcis, *Linn.* ; Scrophularineæ.

Sebastiania Chamælea, *Muell. Arg.* ; Euphorbiaceæ.

Sej pāt ; ? *Euphorbia* species ; Euphorbiaceæ.

? *Vern.*—Sij, B.

Sekoie ; *Hoppea dichotoma*, *Willd.* ; Gentianaceæ.

Local,—Sekoy.

Selaginella rupestris, *Spreng.* ; Lycopodiaceæ.

Selaginella tenera, *Spr.* ; Lycopodiaceæ.

Semecarpus Anacardium, *Willd.* ; Anacardiaceæ.

Local,—Belwa soso.

Vern.—Soso, S.

Senduār ; *Vitex Negundo*, *Linn.* ; Verbenaceæ.

Vern.—Sinduari, S., K., H.; Bhadu, marak, S.

Serho ; *Iseilema Wightii*, *Anderss.* ; Gramineæ.

Sesamum indicum, *DC.* ; Pedalineæ.

Local,—Til.

Vern.—Tilmin, kat tilmin, S. "Tila Sanscrit. Gingeli *Eng.* on Coromandel Coast." *Roxb.* Grown in fields for oil-seed. "Krishna til of the Hindus."—*Roxb.*

Sesbania aculeata, *Pers.* ; Leguminosæ.

Sesbania ægyptiaca, *Pers.* ; Leguminosæ.

Setaria glauca, *Beauv.* ; Gramineæ.

Vern.—kukra, S.

Setaria italica, *Beauv.* ; Gramineæ.

Vern.—Erba, S. ; kauni, H.

Setaria verticillata, *Beauv.* ; Gramineæ.

Vern.—Bir kauni, S.

Sher, Shere ; *Smilax zeylanica*, *Linn.* ; Liliaceæ.

Shorea robusta, *Gærtn.* ; Dipterocarpeæ.

Local,—Chal, sakua, sal, sarei, sarjum.

Vern.—Sarjom, S. ; sakhua, sal, H.

Sicat ; *Oroxylum indicum*, *Vent.* ; Bignoniaceæ.

Local,—Dak dawa, ginjen.

Vern.—Banahata, S. ; Bhal supti, H.

Sida carpinifolia, *Linn.* ; Malvaceæ.

Sida humilis, *Willd.* ; Malvaceæ.

Vern.—Bir-or tandi bariar, bariar, jokha sakam, S.

Sida rhombifolia, *Linn.* ; Malvaceæ.

Siegesbeckia orientalis, *Linn.* ; Compositæ.

Local,—Bhuseri.

Siliari ; *Celosia argentea*, *Linn.* ; Amarantaceæ.

Sinapis (see *Brassica*).

Vern.—Sirsū, sirsa, rai. Mustard, *Eng. e.a.* (*Brassica campestris*, *L.*). *Vern.*—Lutni, Thadia turi, S. B. juncea, *Hk. f.* & *T.*

Local,—Sersa, sirsu. *Vern.*—Rai, S.

Sirguja ; *Guizotia abyssinica*, *Cass.* ; *olim G. oleifera*, *DC.* and *Verbesina sativa*, *Roxb.* ; Compositæ.

Local,—Jítngi (or ginjeri) (1) sirgujia, ram til, kala til.

Black niger, *Eng.* (the seed).

Vern.—Surguja, S., K., H.

Siris (1) ; *Albizzia Lebbeck*, *Benth.* ; Leguminosæ.

Siris (2) ; *Stereospermum suaveolens*, *DC.* ; Bignoniaceæ.

Local,—Ginjen (2) padar, papre.

Vern.—Pader, S.

- Sirle; Flacourtia, Ramontchi, *L'Her.*; Bixineæ.
- Sirsa, Sirsu; Brassica juncea, *Hk. f. & T.*; B. alba, *H. f. & T.* and B. nigra, *Koch.*; Cruciferæ.
- Local,—Rai.
- Vern.*—Rai, S.
- Sital hemp; "Agave Rigida sisalana"; Amaryllideæ. Cult. at Palandu.
- Sissü; Dalbergia Sissoo, *Roxb.* Leguminosæ.
- Local,—Shishām, shisham.
- Sisu-ban; Fimbristylis, diphylla *Vahl.*; Cyperaceæ.
- Local, Chunki khaksi ban.
- Siuri janum;? Mimosa species. Seed alone collected on Chutia Palughat 1,500—2,000 feet: *stem* very prickly; *flrs.* said to be *white.*
- Smilax aspera, *Linn.*; Liliaceæ.
- Smilax macrophylla, *Roxb.*; Liliaceæ.
- Smilax Roxburghiana *Wall.*; Liliaceæ.
- Smilax zeylanica, *Linn.*; Liliaceæ.
- Smithia sensitiva, *Ait.*; Leguminosæ.
- Local,—Kijuli (3).
- Solanum indicum, *Linn.*; Solanaceæ.
- Local,—Kūtūa.
- (Solanum lycopersicum, *Willd.*); Lycopersicum esculentum, *Mill.*, Solanaceæ.
- Tomato, love apple; *Eng.*
- Local,—Belati bengan.
- Solanum Melongena, *Willd.*; Solanaceæ.
- Egg plant, brinjal, *Eng.*
- Vern.* —Bengan, H. Beugun.
- Solanum nigrum, *Linn.*; Solanaceæ.
- Solanum tuberosum, *Linn.*; Solanaceæ.
- The Potato, *Eng.* Local,—Alu, aru, alua.
- Vern.*—Dahu, S., K. Cult. in gardens. The tops used as a potherb by natives and the tubers pickled.
- Solanum xanthocarpum, *Schrad. & Wendl.*; Solanaceæ.
- Local,—Rat kat janum, siäl kanta.
- Vern.*—Rangani janum, S.
- Senchus arvensis, *Linn.*; Compositæ.
- Vern.*—Bir barangon.
- Sonerila tenera, *Royle.*; Melastomaceæ.
- Local,—Lawangla.

- Son pokri, *Symplocos racemosa*, *Roxb.* ; *Styracææ*.
 Local,—Lödh, tarop.
Vern.—Lodam, S. ; Lodh, K., H.
- Sopubia delphinifolia, *G. Don.* ; *Scrophularinææ*.
Vern.—Dak kadur, S.
- Sorghum, see *Andropogon*, *Linn.* ; *Graminææ*.
 Soso ; *Semecarpus Anacardium*, *Willd.* ; *Anacardiaceææ*.
 Local,—Belwa, soso.
Vern.—soso, S.
- Soymida febrifuga, *A. Fuss.* ; *Sterculiaceææ*.
 Local,—Rohina.
Vern.—Ruhen ; S. ; Rakat rohen K., H. ; Rohia, B.
- Spatholobus Roxburghii, *Bth.* ; *Leguminosææ*.
 Local, - Bendo chandan.
Vern.—Bando (fruit), chihutlar (tree), S., H. spear grass, E.
- Spermacoce hispida, *Linn.* ; *Rubiaceææ*.
Vern.—Pitua arak, S.
- Spermacoce stricta, *Linn.* ; *Rubiaceææ*.
 Local,—Getia.
- Sphaeranthus indicus, *Linn.* ; *Compositææ*.
Vern.—Belaunja, S.
- Spilanthes Acmella, *Linn.* ; *Compositææ*.
 Local,—Barbäria.
- (*Spodiopogon obliquivalvis*, *Nees*) ; *Ischæmum ciliare*, *Rets* ; *Graminæææ*.
- (*Sponia*) *Trema orientalis*, *Blume.* ; *Sponia orientalis* ; *Planch.*
Urticaceææ.
- (*Sponia*) *Trema amboinensis*, *Blume.* ; (*Sponia velutina.* ; *Planch.*
 and *Miq.*) ; *Urticaceææ*.
- Spondias mangifera*, *Willd.* ; *Anacardiaceææ*.
 Local,—Amra.
 Hog plum, *Eng.*
- Sporobolus diander*, *Beauv.* ; *Graminæææ*.
 Local,—Bherendi.
- Stachytarpheta indica*, *Vahl.* ; *Verbenaceææ*.
Stephegyne parvifolia, *Korth.*, *Rubiaceææ*,
 Local,—Guria.
Vern.—Gore, S.
- Sterculia colorata*, *Roxb.* ; *Sterculiaceææ*.
Vern.—Sisi, K., Bollua, walena, H ; Mula, B.
- Sterculia urens*, *Roxb.* ; *Sterculiaceææ*.
Vern.—Telhec, S. ; Kaunji, K.

- Sterculia villosa*, *Roxb.* ; Sterculiaceæ.
Vern.—Ganjher, S. ; Pironja, sisi, walkom, K., Udal, H.
- Stereospermum suaveolens*, *DC.* ; Bignoniaceæ.
 Local,—Ginjen(2) Pádár, pápre, siris.
Vern.—Pader, S.
 (Stratiotes) ; *Ottelia sp.* ; Hydrocharideæ.
- Streblus asper*, *Lour.* ; Urticaceæ.
Vern.—Sahra, S.
- Strobilanthes auriculatus*, *Nees.* ; Acanthaceæ.
Vern.—Gada Kalha, harna pakor, S.
- Strobilanthes sabinianus*, *Nees.* ; Acanthaceæ.
- Strychnos Nux-vomica*, *Linn.* ; Loganiaceæ.
 Local,—Küchla. *Nux-vomica*, and *Strychnia-tree* E.
- Strychnos potatorum*, *Linn.* ; Loganiaceæ.
Vern.—Kuchla, S. & H.
- Stylidium tenellum*, *Sw.* *Var. minima* ; Stylidiæ.
- Sugarcane ; *Saccharum officinarum*, *Linn.* ; Gramineæ, *q. v.*
- Sun ; *Crotalaria juncea*, *Linn.* ; Leguminosæ.
 Local,—Sän.
Vern.—Son, S & B ; San, H.
 A good fibre for fishing-nets, said to stand water well.
- Sunia ; *Leptodesmia congesta*, *Benth.* ; Leguminosæ.
 Sün Sünia ; *Marsilea quadrifolia*, *Linn.* ; Marsileaceæ.
Vern.—Suni Shunnuka, Sanscrit.
- Symplocos racemosa*, *Roxb.* ; Styraceæ. A dye.
 Local,—Lodh, son pokri, tarop.
Vern.—Lodam, S. ; Lodh, K & H.
- Tabernaemontana coronaria*, *R. Br.* ; Apocynaceæ.
 Local,—Toaha.
- Tacca pinnatifida*, *Linn.* ; Taccaceæ.
Vern.—Dhai, S.
- Talgach ; *Borassus flabellifer*, *Linn.* ; Palmeæ.
 Fan palm, toddy palm, *Eng.*
 Local,—Tar, -tari-gach.
- Tal muli ; *Elephantopus scaber*, *Linn.* ; Compositæ, *q. v.*
- Tamarindus indica*, *Linn.* ; Leguminosæ.
 Local,—Imli.
Vern.—Jojos, S. ; Joj, K. ; Teter, H.
- Tamarix dioica*, *Roxb.* ; Tamariscineæ.
 Local,—Jow.
- Tamarix ericoides*, *Rottl.* Tamariscineæ.
 Local,—Jow.

Targach ; see Talgach.

Tea ; see Camellia.

Tecoma jasminoides, *Lindl.* ; Bignoniaceæ. Cult.

Tecoma velutina, *Lindl.* ; Bignoniaceæ. Cult.

Tectona grandis, *Linn.* ; Verbenaceæ.

Teak, *Eng.*

Vern.—Saguna, S. ; Segoon, B.

Telei ; Wendlandia tinctoria, *DC.* ; Rubiaceæ.

Local,—Tilei phul.

Tephrosia purpurea, *Pers.* ; Leguminosæ.

Local,—Sār pānk.

Terminalia Arjuna, *W. & A.* ; Combretaceæ. A *Merobolan* of commerce.

Local,—Arjūu.

Vern.—Kauha, S & K ; Matha Sura, S.

Terminalia belerica, *Roxb.* ; Combretaceæ. A *Merobolan* of commerce.

Local,—Bahera.

Vern.—Lopong, S.

Terminalia Catappa, *Linn.* ; Combretaceæ.

Local,—Bodām, desi bodām. Country almond.

Terminalia Chebula, *Rets* ; Combretaceæ.

Local,—Hāri, hari taki (the fruit).

Vern.—Rol, S. ; Harla, H.

Terminalia tomentosa, *Bedd.* ; Combretaceæ.

Local,—Asān.

Vern.—Atnak, S. ; Matnak, K.

(*Tetranthera laurifolia*, *Facq.*) ; *Litsaea*, sebifera, *Pers.* ; Laurineæ.

(*Tetranthera monopetala*, *Roxb.*) *Litsaea polyantha*, *Fuss.* ; Laurineæ.

Vern.—Pojo ; S.

Thalictrum javanicum, *Bl.* ; Ranunculaceæ.

(*Thea* ; *Camellia Thea*, *Link.*) ; *Camellia theifera*, *Griff.* ; Ternstroemiaceæ.

Tea, *Eng.* Local—Cha. Cult., in Tea gardens ; Hazaribagh, Ranchi, Netter hāt, Parasnath, etc.

Thespesia Lampas, *Dalé & Gibs.* ; Malvaceæ.

Local,—Bān kapas.

Vern.—Bon kaposi, S.

Thevetia neriifolia, *Fuss.* ; Apocynaceæ.

Vern.—Berenjo, S ; Zurd Kunel, H.

- Thunbergia alata, *Bojer.* ; Acanthaceæ.
 Thunbergia grandiflora, *Roxb.* ; Acanthaceæ.
 Thunbergia laurifolia, *Lindl.* ; Acanthaceæ. Cult.
 Thysanolaena Agrostis, *Nees.* ; Gramineæ.
 Vern.—Karsar, S.
 Til ; Sesamum indicum, *Linn.* ; Pedalineæ.
 An oilseed, widely cultivated.
 Vern.—Tilemin, S. ; Gingely, *Roxb.*
 Tirchiti ; Achyranthes aspera, *Linn.* ; Amarantaceæ.
 Local,—Chinchiri.
 Vern.—Chipchirit, S
 Tiril ; Diospyros melanoxylon, *Roxb.* ; Ebenaceæ. Tiril is *Mundari*.
 Local,—Khord.
 Tirio ; Pimpinella elata, *Dals.* ; Umbelliferæ.
 Local,—Marcheia.
 Tisi ; Linum usitatissimum, *Linn.* ; Lineæ.
 Toaha ; Tabernæmontana ; see above.
 Tobacco ; see Nicotiana.
 Toon ; Cedrela Toona, *Roxb.* ; Meliaceæ.
 Local,—Tuni.
 Vern.—Alga jari, S.
 Toont ; Mulberry, *Eng.* ; Morus *sp.* ; Urticaceæ.
 Torenia cordifolia, *Roxb.* ; Scrophularineæ.
 Torenia peduncularis, *Benth.* ; Scrophularineæ.
 Toriar ; Vallaris Heynei—*Spreng.* ; Apocynaceæ. V. dichotoma,
 Wall.
 (Tradescantia sp.) Commelina *species* ; Commelinaceæ. Tradescantia discolor. Cult.
 Tragia involucrata, *Linn.* ; Euphorbiaceæ.
 Vern.—Sengel sing, S.
 Trema amboinensis, *Bl.* ; Urticaceæ.
 Trema orientalis, *Bl.* ; Urticaceæ.
 Trichodesma indicum, *Br.* ; Boragineæ.
 Vern.—Het mudia, S.
 Trichodesma zeylanicum, *Br.* ; Boragineæ.
 Trigonella Fœnum-græcum, *Linn.* ; Leguminosæ.
 Local,—B. Methi.
 Triumphetta rhomboidea, *Jacquem.* ; Tiliaceæ.
 Tulsi ; see Ocimum *sp.* ; Labiataæ.
 Tuni ; see Toon.
 Tupistra aurantiaca, *Wall.* ; Liliaceæ.

- Turnera ulmifolia, *Linn.*; Turneraceæ. Cult.
 (*Ulmus integrifolia*, *Roxb.*) *Holoptelea iutegrifolia*, *Planch.*;
 Urticaceæ.
 Local,—Chiryta.
 Ungul; *Alysicarpus vaginalis*, *DC.*; Leguminosæ.
Uraria lagopoides, *DC.*, Leguminosæ.
 Local,—Mahadeo jät.
Vern.—Lopong herac, toyo chanadol, S.
Uraria lagopus, *DC.*; Leguminosæ.
Urena lobata, *Linn.*; Malvaceæ.
Vern.—Bidhi janitet, S.
Urena repanda, *Roxb.*; Malvaceæ.
Vern.—Sikuar, S.
Urena sinuata, *Linn.*; Malvaceæ.
 Local,—Bheri lät.
Vern.—Mota bhedi janitet, S; Lotloti, H.
Utricularia bifida, *Linn.*; Lentibularieæ.
 Local,—Masuria.
Vern.—Arak jhawar, S.
Utricularia hirta, *Klein*; Lentibulareaceæ.
 Local,—Masuria.
Vallis dichotoma, *Wall.*; Apocynaceæ.
 Local,—Toriar.
Vanda Roxburghii, *Br.*; Orchideæ.
 Local,—Banda.
Vern.—Dare banki, S.
Vandellia crustacea, *Benth*; Scrophularineæ.
Vanilla planifolia, *Andrews.*; Orchidaceæ. Cult.
Ventilago calyculata; *Tulasne*; Rhamnææ.
 Local,—Sakan.
Vern.—Bonga Sarjom, S. Raidharie, H.
Vernonia anthelmintica, *Wild.*; Compositæ.
Vernonia cinerea, *Less.*; Compositæ.
 Local.—Cüchli, kánchezli, pāpār.
Vern.—Bahu tuturi, Barangom, bir lopong arak, Durya arak,
 Jhur juri, S.
Vernonia Roxburghii, *Less.*; Compositæ.
 Local,—Ghetia phul.
Vernonia teres, *Wall.* *Var. subsessilis*. Compositæ.
Vern.—Char sira, S.
Vicia Faba, *Linn.*; Leguminosæ. Cult.
 Local,—Sem, Broad bean, E.

- Vicia hirsuta*, *Koch.* ; Leguminosæ. Cult.
Vern.—Tiririte, S.
- Vicoa auriculata*, *Cass.* ; Compositæ.
 Local,—Arguni.
- Vigna Catjang*, *Endl.* ; Leguminosæ. Cult.
Vern.—Ghangra, S ; Ramhi Kolai, B.
- Vigna vexillata*, *Benth.* ; Leguminosæ.
Vern. Serwang, birghangra (the fruit), S.
- Vinca pusilla*, *Murr.* ; Apocynaceæ.
- Vinca rosea*, *Linn.* ; Apocynaceæ. Cult. in all gardens ; flowers red and white.
- Viscum articulatum*, *Burm. f.* ; Loranthaceæ.
Vern.—Katkomp janga, S. ; Mistletoe, E.
- Viscum monoicum*, *DC.* ; Loranthaceæ.
Vern.—Pet chamra banda, S ; Mistletoe, E.
- Viscum orientale*, *Willd.*
Vern.—Banda, S, K, H ; Mistletoe, E.
- Vitex Negundo*, *Linn.* ; Verbenaceæ.
 Local,—Senduar.
Vern.—Bhadu, marak, S.
- Vitex peduncularis*, *Wall.* ; Verbenaceæ.
- Vitex trifolia*, *Linn.* ; Verbenaceæ.
- Vitis adnata*, *Roxb.* ; Ampelideæ.
Vern.—Bod lar nari, S.
- Vitis lanata*, *Roxb.* ; Ampelideæ,
Vern.—Kolo, kolo nari, S.
- Vitis latifolia*, *Roxb.* ; Ampelideæ.
Vern.—Ic ewer, ic er, S.
- Vitis tomentosa*, *Heyne.* ; Ampelideæ.
Vern.—Ghora lidi, S.
- Vitis* sp. ; ? *auriculata*, *Roxb.* ; Ampelideæ.
 Local,—Korkota.
- Vitis vinifera*, *Linn.* ; Ampelideæ.
 The grape vine, E.
 Local,—Üngür, Ängür.
- Wedelia Wallichii*, *Less.* ; Compositæ.
- Wendlandia exserta*, *DC.* ; Rubiaceæ.
 Local,—Kudi phul.
Vern.—Hundro, pichari baha, S.
- Wendlandia tinctoria*, *DC.* ; Rubiaceæ.
Vern.—Tilei, S.

Woodfordia floribunda, *Salisb*; *olim* *Grislea tomentosa*, *Roxb.*;
Lythraceæ.

Local,—Dhaiphul, dhawei, dhowra, jaiphul.

Vern.—Ichak, S.

Wrightia tomentosa, *R. & S.*; Apocynaceæ.

Vern.—Atkura, buru machkunda, S.

Xylosma longifolium, *Clos.*; Bixineæ.

Xyris pauciflora, *Willd.*; Xyrideæ.

Yucca aloifolia; Liliaceæ. Cult. in gardens.

Adam's needle, E.

Zea Mays, *Linn.*; Gramineæ.

Local,—Mākai.

Vern.—Jondra, S; Jonar, B; Makai, H.

Zehneria Hookeriana, *Arn.*; Cucurbitaceæ.

Zehneria umbellata, *Thw.*; Cucurbitaceæ.

Vern.—At, S.

Zingiber capitatum, *Roxb.*; Scitamineæ. Jungla Adruk, *Roxb.*

Zingiber Casumunar, *Roxb.*; Scitamineæ.

Local,—Paro. Bān ada, H. & B. (*Roxb.*)

Zingiber officinale, *Rosc.*; Scitamineæ.

Local,—Ādrāk.

Vern.—Adraka, Ada, H. & B. The dry root, Soontha, *Roxb.*
(*Zinnia, bidens Roxb.*) *Glosogyne pinnatifida*, *DC.*; Compositæ.

Zinnia species; Compositæ.

Zizyphus Jujuba, *Lamk.*; Rhamneæ.

Local,—Baer.

Vern.—Dedlaori jomjanum, S. Common in gradens and self-sown.

Zizyphus Oenoplia, *Mill.*; Rhamneæ.

Local,—Koir.

Zizyphus oxyphylla, *Edgw*; Rhamneæ.

Vern.—Kurit rama, S.

Zizyphus rugosa, *Lamk.*; Rhamneæ.

Local,—Pithour.

Vern.—Sekra, S.

Zizyphus xylopyrus, *Willd.*; Rhamneæ.

Local,—Ghoot.

Vern.—Karkat, S; Karkata, K.

Zornia diphylla, *Pers.*; Leguminosæ.

Vern.—Tandi jhapni, bir moch, S.

III.—Systematic List of Chutia Nagpur Plants. (*)

I—RANUNCULACEÆ.

1. *Clematis Gouriana Roxb.*

Parasnath.

2. *Clematis nutans Royle.*

Baragaon, 2—3,000 feet: (also Parasnath, 2,000 feet, *Hooker*).

Vern.—Bongo Khanti *Santal* (Campbell & Watt).

3. *Thalictrum javanicum Blume.*

Neterhat, 300 feet *Gamble*; (also Parasnath, 4,000 feet, *Hooker*).

(*Aconitum heterophyllum Wall.*)

Bazars.

Vern.—Atus-root. A bazar medicine (root only).

* In the preparation of his very valuable list of Chutia Nagpur plants, Lieutenant-Colonel Wood, as he has explained in a letter which accompanies it, has included not only every species observed or collected by himself, but every plant from the province collected by other botanists of which he has been able to see specimens or for which he has been able to find a record. In the case of one work in particular, Campbell and Watt's *Catalogue* of the plants of the Sontha Pergunnas—a very careful and reliable paper—he has cited the vernacular (*Santali*) names when such are given.

Finding from this letter that it was the author's desire to provide botanists with as complete a list as possible of Chutia Nagpur plants, the Editor has, in furtherance of this desire, attempt, to render it still more complete by including in the list *every* species obtained in Chutia Nagpur, of which there are, up to the time of going to press, any specimens in the Calcutta Herbarium.

It would not have been difficult in the case of not a few of these intercalated species to add vernacular names and economic notes like those given by the author of the list for species actually collected by him, Having regard, however, to the fact that such notes must have lacked the authority that accompanies the accurate economic references and the critical vernacular connotations made in the field by so careful and competent a Collector as Lieutenant-Colonel Wood, it has been deemed advisable only to intercalate the names of such species as are known to occur in Chutia Nagpur, although they have not been met with by Lieutenant-Colonel Wood; this, in fact, is what the author himself has done in the case of his own intercalations, except, as has already been explained, as regards the plants recorded by Campbell and Watt. As the list stands, therefore, it has the double advantage of giving as complete an enumeration as is yet possible of the plants of Chutia Nagpur, while leaving the painstaking and excellent work of the author with reference to the species collected by him untouched. In the few cases where plants collected by Lieutenant-Colonel Wood in Chutia Nagpur are not present in Herb., Calcutta, the fact is intimated in an editorial note within [] square brackets.—*Editor, Rec. Botanical Survey.*

II—DILLENiaceÆ.

4. *Dillenia indica* Linn.
Santalia, say to 2,000 feet.
Vern.—Korkot *Santal* (Campbell & Watt).
5. *Dillenia pentagyna* Roxb.
Taimaraghat, Bundir, 1,500—2,000 feet; Dhadka, Man-
bhum, 500—1,000 feet.
Vern.—Agor, Gulgul, Korkot.

III.—MAGNOLIACEÆ.

6. *Michelia Champaca* Linn.
Stations in Chutia Nagpur, to 2,000 feet.
Vern.—Châmpa. Cult. A bush in gardens; heavy jasmine
odour; fls. yellow.

IV.—ANONACEÆ.

7. *Polyalthia longifolia* Benth. & Hook. f.
Dorunda, 1,500—2,000 feet.
Vern.—Debdaru, Deodar *local*. Cult. as an avenue tree,
say 30 feet. A light wood, used for splints, idols, etc.
(*Hersog*).
8. *Polyalthia cerasoides*, Benth & Hook. f.
Santalia, say to 2,000 feet.
Vern.—Panjom *Santal*.—(Campbell & Watt).
9. *Anona squarrosa* Linn.
Ranchi, 2,000 feet.
Vern.—Sarifa, Sariphal; Custard apple. Cult. in gardens.
10. *Anona reticulata* Linn.
Ranchi, 200 feet.
Vern.—Sarifa, Sariphal; Bullock's Heart. Cult. in
gardens.
11. *Saccopetalum tomentosum* H. f. & T.
Jaspurnagar, 2,000—2,500 feet; also Saidope reserve.
Palamow (*Gamble*), say 2,000 feet.
Vern.—Kari *local*. A tree 50 feet high; common.
12. *Miliusa velutina* H. f. & T.

V.—MENISPERMACEÆ.

13. *Cocculus villosus* DC.
Kewtbar, Palamow, 1,000—1,500 feet.
A common climber.

14. *Cissampelos Pareira* Linn.

Hopwa, Hazaribagh district, 1000—1,500 feet, (var. β . *H. f. & T.*); Jaspur State, 2,000—2,500 feet, (vars. α & β .); Kotarki thana, Sirguja State, 1,500—2,000 feet, (vars. β . & δ .); Kochang, 2,000—2,500 feet, (vars. β . & δ .).

Climbing; in fruit (vars. β . & δ .), yellow or orange or green.

VI.—BERBERIDEÆ.

15. *Berberis asiatica* Roxb

Parasnath.

VII.—NYMPHÆACEÆ.

16. *Nymphæa Lotus* Linn.17. *Nymphæa stellata* Willd.18. *Nelumbium speciosum* Willd.

Common on tanks throughout Chutia Nagpur.

VIII.—PAPAVERACEÆ.

19. *Argemone mexicana* Linn.

Ranchi Plateau, 500—2,000 feet, common.

Vern.—Seyāl kanta=Jackal's tooth.

20. *Papaver somniferum* Linn.

In fields, cultivated for Opium under the Opium Department.

Vern.—Posta.

IX.—CRUCIFERÆ.

21. *Nasturtium officinale* Br.

Plains and Plateau 500—2,000 feet; cultivated water cress; "thrives well in Bengal." (*Firminger.*)

22. *Nasturtium indicum* DC.23. *Brassica oleracea* Linn.

Plains and Plateau.

Vern.—Band-kubi, Gol-kubi=Kohlrabi, Knolcole; Kubi=cabbage; Phul-kubi=cauliflower. Brusse's sprouts seen at Palamow. Cult. in Jail Garden, 1891.

24. *Brassica nigra* Koch.

Vern.—Sirsū. (*Sinapis nigra*, Linn.; *S. erysimoides*, Roxb.)

25. *Brassica campestris* Linn.

Sub. sp. 1 *Campestris* proper. Cultivated.

Vern.—Sūlgūm; Swedish Turnip.

- Sub. sp. 2. *Napus Linn.* Cultivated.
 • Ranchi, 2,000 feet.
Vern.—Latni (*Sinapis dichotoma Roxb.*) Indian Rape.
- Sub. sp. 3. *Rapa Linn.* Cultivated.
Vern.—Sūlgām; Common Turnip.
- Sub. sp. 4. *Sarson.* Cultivated.
Vern.—Sirsū; Indian Colza.
- Two races with seed-pods erect (*Natua*) or pendent (*ulti.*)
 each with 2 sub-races 2-valved and 3-4-valved.
 Erect 2-valved = *Sinapis glauca, Roxb.*; general.
 Pendent 2-valved = *Santalia* only.
 Erect 4-valved = *Brassica quadrivalvis, H. f. & T.*
 "Banks of Soane opposite Rhotas" (*Hooker*).
 Pendent 3-4-valved = *Sinapis trilocularis, Roxb.* Palanow
 (*Prain*).
26. *Brassica juncea H. f. & T.*
Vern.—Rai; Indian mustard.
27. *Brassica, alba H. f. & T.*
 Ranchi, 2,000 feet.
Vern.—Sirsū (*Sinapis alba Linn.*)
28. *Eruca sativa, Lamk.*
 Garden Rocket.
29. *Cochlearia flava Ham.*
30. *Lepidium sativum Linn.*
Vern.—Haleem *Hind*; Cress.
31. *Raphanus sativus, Linn.*
 Very common; cultivated.
Vern.—Mūli. Radish of English gardens, globe or carrot
 shaped, small and Bazar or native mūli as large as carrots.

X.—CAPPARIDEÆ.

32. *Cleome monophylla Linn.*
 Ranchi, 2,000 feet.
33. *Cleome viscosa Linn.*
 Sillee, 500—1,000 feet.
Vern.—Ban Sirsu = Wild mustard; Jurutia.
34. *Gynandropsis pentaphylla DC.*
 Jaspur, 2,000 feet.
Vern.—Guma. Astringent, flowers purple.
35. *Capparis horrida Linn. f.*
 Chorea, Balmash, Dorunda, 1,500—2,000 feet.
Vern.—Bagni, Bagnei, Baguchi. Stem very thorny; fls. and
 stamens purple; fruit eaten as a vegetable.

XI.—VIOLACEÆ.

36. *Ionidium suffruticosum* *Ging.*
Ranchi, 1,500—2,000 feet.
Vern.—Suruj mukhi (*Watt*)? Surujmuli, (Chutia Nagpur).
37. *Viola odorata* *Linn.*
Ranchi, Hazaribagh. Cult. in pots and gardens; fls. in cold weather.
38. *Viola tricolor* *Linn.*
Ranchi, Hazari bagh. Cult. in pots and gardens; fls. in cold weather.

XII.—BIXINEÆ.

39. *Cochlospermum Gossypium* *DC.*
Baragaon, 2,000—3,000 feet.
Vern.—Sisibaha, Udal. Young leaves larger than adult ones.
40. *Bixa Orellana* *Linn.*
Cult as a shrub in gardens.
Vern.—Latkan, (*Watt*); Arnotto. The testa furnishes the common colour adulteration of milk and butter.
41. *Flacourtia Ramontchi* *L'Herit.*
Tamar, 500—1,000 feet; Jaspur, 2,000—2,500 feet.
Vern.—Sirle, Katai (*Faspur*).
Var. 2 *sapida*, *H. f. & T.*
Jabra, 1,000—1,500 feet.
Small brushrood, thorny (*F. sapida* *Roxb.*).
42. *Xylosma longifolium* *Clos.*
Singhbhum, 500—1,000 feet, *Gamble, Haines.*

XIII.—POLYGALACEÆ.

43. *Salomonina oblongifolia* *DC.*
44. *Polygala chinensis* *Linn.*
Santalia, 2,000 feet.
Vern.—Gaighura *Santal.* (Campbell & Watt.)
45. *Polygala triphylla* *Ham.* *Var. glaucescens* *H. f. & T.*
46. *Polygala crotalarioides* *Ham.*
Santalia, 2,000 feet.
Vern.—Lil Kathi *Santal.* (Campbell & Watt.)
47. *Polygala erioptera* *DC.*
Santalia, 2,000 feet.
48. *Polygala leptalea* *DC.*

XIV.—CARYOPHYLLÆ.

49. *Saponaria Vaccaria* Linn.
 "Cult. An oilseed" (*Campbell & Watt*); "A weed of cultivation. Throughout India" (*F. B. I.*).
Vern.—Musna *Santal* (*Campbell & Watt*.)
50. *Spergula arvensis* Linn.
51. *Spergula pentandra* Linn.
52. *Polycarphæ corymbosa* Lamk. var. *aurea* Wight.
 Baragaon 2,000—3,000 feet; in fields. A weed.
Vern.—Janhe Nanjom *Santal* (*Campbell & Watt*.)
53. *Polycarpa Lœflingia* Bth. & Hook. f.
54. *Drymaria cordata* Willd.

XV.—PORTULACÆ.

55. *Portulaca oleracea* Linn.
Santalia.
Vern.—Mota seric (? uric) along *Santal*. (*Campbell & Watt*.)
56. *Portulaca quadrifida* Linn.
57. *Portulaca tuberosa* Roxb.
 So far only known from Monghyr.
 [Watt refers to a *Portulaca* sp.—a troublesome weed; $\frac{1}{4}$ — $\frac{1}{2}$ inch. Fls. pale purple.]

XVI.—TAMARISCINÆ.

58. *Tamarix ericoides* Rottb.
 Jilmili river, Sirguja, 1,500—2,000 feet.
Vern.—Jao; low. Common in river-beds; a bush-like broom.

XVII.—ELANTIEÆ.

59. *Bergia ammannioides* Roxb.

XVIII.—HYPERICINÆ.

60. *Hypericum japonicum* Thunb.

XIX.—GUTTIFERÆ.

61. *Garcinia Cowa* Roxb.
 Singbhum.
62. *Mesua ferrea* Linn.
 Planted only.

XX.—TERNSTROEMACEÆ.

63. *Camellia theifera Griff.*

Cultivated at 1,500—2,000 feet, *e.g.*, at Sitagarha (Hazari-bagh) and Palandu (Ranchi) the oldest Tea-Estates in Chutia Nagpur.

Vern.—Cha *Hind.* Tea. In flower Novr. Probably a hybrid, Chinese and Assam, or the China Plant.

XXI.—DIPTEROCARPEÆ.

64. *Shorea robusta Gaertn. f.*

Sillee, 300—1,000 feet and elsewhere.

Vern.—Chal-Sal, Sākua, Sarjom *Kol* (? *Mandari*); hence “Sarjom dip” = village of the Sal tree. Sal forests young and old, common throughout Chutia Nagpur. Difficult to grow from seed (*T. Peppé*) and hence not *laid down*. Timber used for all purposes; sinks in water and is floated on bamboo rafts (down the Kol river, *e.g.*, in Palamow) in the rains. A *red* wood freely attacked by white ants.

XXII.—MALVACEÆ.

65. *Althaea rosea Willd.*

Cult. in gardens.

Vern.—Gool khaira. Hollyhock.

66. *Sida mysorensis Willd.*67. *Sida carpinifolia Linn.*68. *Sida cordifolia Linn.*69. *Sida rhombifolia Linn.*70. *Sida humilis Willd.*

Ranchi, 1,500—2,000 feet; a common weed.

Vern.—Bir-bariar, Tandi-bariar, Bariar, Jokha, Sakam.

Sida spinosa Linn.

71. *Abutilon indicum G. Don.*

Ranchi, 1,500—2,000 feet; Jilmili, Sirguja 1,000—1,500, feet.

Vern.—Miru baha *Santal.* By jungle sidēs; orange yellow flowers.

72. *Abutilon polyandrum Schlecht.*73. *Pavonia odorata Willd.*74. *Urena sinuata Linn.*

Jaspurnagar, 2,000—2,500 feet.

Vern.—Beri lāt (1).

75. *Urena repanda* *Roxb.*
Jonha, 1,000—1,500 feet; Sirguja, 1,500—2,000 feet;
sometimes six feet high.
76. *Urena lobata* *Linn.*
Santalia.
Vern.—Bidhi janetet *Santal.*
77. *Hibiscus micranthus* *Linn.*
78. *Hibiscus panduræformis* *Burm.*
79. *Hibiscus furcatus* *Roxb.*
Pitorea, 2,000—2,500 feet.
80. *Hibiscus vitifolius* *Linn.*
81. *Hibiscus cancellatus* *Roxb.*
Ashpur, 2,000—2,500 feet; Keonjhur, 1,500—2,000 feet.
Vern.—Bera Kānda. Kulkudari. Root eaten. Poulticea
head. About hill-side woods.
82. *Hibiscus mutabilis* *Linn.*
83. *Hibiscus rosa-sinensis* *Linn.*
Palandu, etc.; in gardens, cultivated. Shoe-flower; native
of China.
84. *Hibiscus Sabdariffa* *Linn.*
All stations, 500—2,000 feet.
Vern.—Arak kudrum *Santal*; Patwa. Calyces make jelly,
best red-currant jelly.
85. *Hibiscus cannabinus* *Linn.*
Santalia.
Vern.—Dare kudrum *Santal.*
86. *Hibiscus esculentus* *Linn.*
87. *Thespesia Lampas* *Dalz & Gibs.*
Jaspur, 2,000—2,500 feet.
Vern.—Bān Kāpas; wild cotton. In fruit in Novr.
88. *Gossypium herbaceum* *Linn.*
Ranchi, 1,500—2,000 feet; Cult in fields.
Vern.—Kāpas; Cootton. Hand-manufactured, thread and
cloth, locally.
89. *Kydia calycina* *Roxb.*
Sillee, 500—1,000 feet; Gunia 1,500—2,000 feet; Sitonga,
Jaspur, 2,000—2,500 feet; Dorunda 1,500—2,000 feet.
Vern.—Lengra Dhamin (*Peppel*); Bichra (1).
A shrub, 15 feet, used for "Banghy-sticks." (Bichra (2)
is *Grewia salvifolia* *Heyne*).
90. *Bombax malabaricum* *Linn.*
General, 500—3,000 feet.
Vern.—Simāl; Simār; Silk-Cotton tree. Height up to
120 feet; Timber not good—loose.

XXIII.—STERCULIACEÆ.

91. *Sterculia urens Roxb.*
Tamar, 500—1,000 feet; Singbhum, 500—1,000 feet; Patratu.
Vern.—Māk chūnd; Gur-karanj, *Mundari*; Tele, *Ho*; Būr Kūnda, *Mundari*.
Causes intolerable itching if touched or handled; oil removes the hairs, and the itching, effectually.
(Another Māk chūnd is *Pterospermum acerifolium, Willd.*)
92. *Sterculia colorata Roxb.*
Tamar, 500—1,000 feet; Palandu, perhaps planted.
93. *Helicteres Isora Linn.*
94. *Pterospermum acerifolium Lamk.*
Chutia Village, near Ranchi, 1,500—2,000 feet.
Vern.—Māk chūn. (*Sterculia urens Roxb.* is also a Māk chūnd.)
95. *Eriolæna Hookeriana W. & A.*
Palamow, Kumandi Reserve Forest, say 1,000 feet; Sirguja, 1,500—2,000 feet, not uncommon.
Vern.—Chota Changoor; Wawas; Kusu (? Kuru); (Campbel & Watt): Denri (Sirguja). Bark fibrous.
96. *Eriolæna quinquelocularis Wight.*
Jaspur, 1,500—2,000 feet.
Vern.—Bhāwāt.—Poultice of root heals wounds.
97. *Pentapetes phœnicea Linn.*
Santalia.
Vern.—Bare baha, *Santal*.
98. *Melochia corchorifolia Linn.*
Santalia, about 2,000 feet.
Vern.—Thuiak arak, *Santal*.
99. *Waltheria indica Linn.*
100. *Buettneria herbacea Roxb.*
Santalia, about 2,000 feet.
Vern.—Diku; Sindur; Kambraj, *Santal*.

XXIV.—TILIACEÆ.

101. *Grewia salvifolia Heyne,*
Sirguja, 1,500—2,000 feet; Jaspur, 2,000—2,500 feet.
Vern.—Pardawan, Bichra (Sirguja).
102. *Grewia scabrophylla Roxb.*
103. *Grewia tiliæfolia Vahl.*
Baragaon, 2,000—2,500 feet.
Vern.—Benga daru. "Banghy sticks" made of the wood.

104. *Grewia excelsa* *Vahl.*
 105. *Grewia asiatica* *Linn.*
 Ranchi, 1,500—2,000 feet, perhaps cult.; Dorunda garden,
 1,500—2,000 feet, cult.
 Fruit 2-stoned, edible; bark fibrous.
 106. *Grewia sapida* *Roxb.*
 107. *Grewia pilosa* *Lamk.*
 Sirguja and Kuru ghat, Chandwa, 1,500—2,000 feet.
 Vern.—Gur-Sikri. Fruit green or orange; bark fibrous.
 108. *Grewia hirsuta* *Vahl.*
 109. *Grewia laevigata* *Vahl.*
 Jonha to Sandunandi. 1,000—1,500 feet.
 110. *Grewia vestita* *Wall.*
 111. *Grewia cinnamomea* *Gamble.*
 112. *Triumfetta rhomboidea* *Jacq.*
 Jaspur, 2,000—2,500 feet, common.
 Vern.—Bēri lāt.
 113. *Corchorus fascicularis* *Lamk.*
 114. *Corchorus acutangulus* *Linn.*
 115. *Corchorus olitorius* *Linn.*
 Ranchi, 1,500—2,000 feet.
 Vern.—Bān pāt.
 (Campbell and Watt mention a *Corchorus* n. sp.)
 Vern.—Bir Narcha *Santal.*, leaves used as a potherb.
 116. *Elæocarpus serratus* *Linn.*
 Dorunda garden 1,500—2,000 feet.
 Vern.—Jālpai; Indian Olive. Tree 40—50 feet; flowers
 white.

XXV—LINEÆ.

117. *Linum usitatissimum* *Linn.*
 Cult. in fields everywhere to 2,500 feet.
 Vern. Tisi.
 (Crimson and scarlet-flowered species, also cult. in
 gardens.)
 118. *Reinwardtia trigyna* *Planch.*
 Pitorea and Jaspur, 2,000—2,500 feet.
 Vern.—Lāngora, Flowers bright chrome-yellow.
 119. *Erythroxylon* *Coca Lamk.*
 Daladiri Tea Estate, also in Ranchi gardens.
 Difficult to raise from seeds; none have germinated but
 self-sown plants rise (*Peppé*).

XXVI.—MALPIGHIACEÆ.

120. *Hiptage Madablota Gaertn.*

XXVII.—ZYGOPHYLLÆ.

121. *Tribulus terrestris Linn.*

XXVIII.—GERANIACEÆ.

122. *Geranium ocellatum Camb.*

Santalia 1,500—2,000 feet (Campbell & Watt).

[This occurs on Parasnath, near the top of the mountain.]

123. *Oxalis corniculata Linn.*

Pitorea and Jaspur, 2,000—2,500 feet.

Vern.—Barangi (Jaspur). Flowers yellow.

124. *Biophytum sensitivum DC.*

Mahretta Tea Estate 2,000 feet.

A sensitive plant, growing in shade; flowers yellow.

125. *Biophytum Reinwardtii Walp.*

Chakardarpur, Singbhum, 500 feet.

Vern.—Tetria.

126. *Averrhoa Carambola Linn.*

Cult. in gardens, Dorunda 1,500—2,000 feet.

Vern.—Kamarānga. A small tree, the sour variety; fruit three inches long, used for pickles, jam, ect.

127. *Impatiens Balsamina Linn.*

Cult. single and double, also a garden weed (and an escape) in Chutia Nagpur.

Garden Balsam.

XXIX.—RUTACEÆ.

128. *Glycosmis pentaphylla Corr.*

129. *Micromelum pubescens Bl.*

Baragaon, 2,000—3000 feet.

Vern.—Exsirha.

130. *Limonia acidissima Linn.*

131. *Murraya exotica Linn.*

132. *Murraya Kœnigii Spreng.*

133. *Aegle Marmelos Correa.*

Baragaon, 2,000—3,000 feet.

Vern.—Bēl; Lohagasi, *Kol*; Siphul (*Watt*). Bael. A very common tree, scattered specimens in jungle or near villages; also cult.

Mach used in sherbets; a reputed cure for Dysentery.

134. *Feronia Elephantum* *Corr.*
 135. *Citrus medica* *Linn.*
 136. *Citrus aurantium* *Linn.*
 137. *Citrus decumana* *Murr.*

The three foregoing, respectively the Lime, *Vern.*—
 Limbu, Nimbu; the orange, naringi; and the Pömelo'
 or Shaddock, are cultivated in gardens, native and
 European.

XXX.—SIMARUBEÆ.

138. *Ailanthus excelsa* *Roxb.*
 Satbarua Fort, 1,000—1,500 feet.
Vern.—Gur Karanj. A moderate sized tree.

XXXI.—OCHNACEÆ.

139. *Ochna pumila* *Ham.*

XXXII.—BURSERACEÆ.

140. *Boswellia serrata* *Roxb.*
 Sirguja, 1,500—2,000 feet.
Vern.—Sälái, Sálly; Lüban=the gum: Olibanum. A
 common tree, 50—60 feet high; boughs used as fences
 take root; orange-leaved when withering; charcoal
 (*vide Lillingstone*) good for gunpowder.
141. *Garuga pinnata* *Roxb.*
 Jaspur, 1,500—2,000 feet; Sirguja.
Vern.—Büna gingeri; ken-kur. A tree, 40 feet high;
 bark of young branches used as astringent.
142. *Bursera serrata* *Roxb.*

XXXIII.—MELIACEÆ.

143. *Melia Azadirachta* *Linn.*
 Ranchi, 1,500—2,000 feet.
Vern.—Nim, *Hind*; Nimi, *Kol*. Poultices made of leaves.
144. *Melia Azedarach* *Linn.*
 Sillee, 500—1,000 feet; Dorunda, 1,500—2,000 feet; Chye-
 bassa, 500—1,000 feet; Cult. by roadsides and in com-
 pounds.
Vern.—Beläti Bäkain. Persian Lilac. Flowers purple;
 timber bad; tree soon decays. A variegated specimen,
 white and green-leaved, observed by the large tank at
 Chyebassa.

145. *Cipadessa fruticosa Bl.*
146. *Aglaia Roxburghiana W. & A.*
Pitorea, 2,000—2,500 feet.
Leaves with ferruginous stellate scales.
147. *Amoora Rohituka W. & A.*
148. *Heynea trijuga Roxb.*
Baragaon, 2,000—3,000 feet.
Vern.—Bān-Sīmar, meaning “wild silk-cotton tree.”
A large climber! given as “a tree” (*Roxburgh*).
“sometimes attaining a large size” (*Hiern* in *F. B. I.*).
149. *Soymida febrifuga A. Juss.*
Chandwa, Toree 1,000—1,500 feet ;
Tatupani, Sirguja, 1,400—2,000 feet ; abundant on Chandwa-Balumath road.
Vern.—Rōhina. A tree ; ripe fruits adherent as in *Terminalia tomentosa* (Āsān) but with open valves.
150. *Cedrela Toona Roxb.*
Palandu, etc., 1,500—2,000 feet ; common and cult.
Vern.—Tūn, Tūni ; Bastard Mahogany. Useful timber for furniture, tea-boxes, etc.

XXXIV.—OLACINEÆ.

151. *Olax scandens Roxb.*
Jabra, 1,000—1,500 feet ; Hundgunge, Baragaon, 2,000—3,000 feet.
Vern.—Gūti bān. In fruit in December.

XXXV.—CELASTRINEÆ.

152. *Gymnosporia montana Roxb.*
153. *Celastrus paniculata Willd.*
Ranchi 1,500—2,000 feet ; Jaspur 1,500—2,000 feet ; Sirguja, 1,500—2,000 feet ; Kochang, 2,000—2,500 feet.
Vern.—Kūjiri, Kudj'ri. A bush or climber.
154. *Elæodendron glaucum Pers.*
Hilghat, Jaspur, 1,500—2,000 feet.
Vern.—Ratan gowra. A tree ; root purgative ; leaves good for fever.

XXXVI.—RHAMNEÆ.

155. *Ventilago calyculata Tul.*
Ranchi, to 2,000 feet; Jaspur 2,000—2,500 feet.
Vern.—Sākān. A climber, very common in jungle.
156. *Zizyphus Jujuba Lamk.*
Palamow, 1,000—1,500 feet; common,
Vern.—Baer (pronounced Buyer). A bush-like gorse or
whin; fruit eaten.
157. *Zizyphus vulgaris Lamk.*
Santalia.
Vern.—Kurit rama *Santal.* (Campbell & Watt.)
158. *Zizyphus Cenoplia Mill.*
Pitorea, 2,000—2,500 feet; Sirguja, 1,500—2,000 feet.
Vern.—Koir (*Mundari?*). A climber; fruit eaten.
159. *Zizyphus xylopyra Willd.*
Baragaon, 2,000—3,000 feet; Jaspur, 1,500—2,000 feet;
Chutupālu, 1,500—2,000 feet.
Vern.—Ghoot (Jaspur).
160. *Zizyphus rugosa Lamk.*
Lohardugga District, 1,500—2,000 feet; Jaspur, 2,000—
2,500 feet.
Vern.—Pit-hower. Fruit eaten.
161. *Gouania leptostachya DC.*
Sonua, Kolhan, Singbhum, 500—1,000 feet, *Gamble*;
Sitonga, Jaspur, 2,000—2,500 feet.
Vern.—Pahar-ka-dudhi. A climber.
162. *Helinus lanceolatus Brand.*

XXXVII.—AMPELIDEÆ.

163. *Vitis adnata Wall.*
Santalia.
Vern.—Bod lar nari *Santal.* (Campbell & Watt.)
164. *Vitis tomentosa Heyne.*
Sirguja, Pertabpur, 1,500—2,000 feet.
Vern.—Ghora lidi, (Campbell & Watt.)
165. *Vitis lanata Roxb.*
Santalia.
Vern. Kolo nari *Santal.* (Campbell & Watt.)

166. *Vitis lanceolaria Roxb.*
167. *Vitis latifolia Roxb.*
Chutu pālu ghat, 1,500—2,000 feet.
Fruit eaten; seeds large; flavour good.
168. *Vitis vinifera Linn.*
Dorunda, 1,500—2,000 feet: Cult.
Vern.—(fruit) Āngūr; Grape-vine. Fruit fails to ripen because of the rains.
169. *Vitis auriculata Roxb.*
Mata, Manbhum, 500—1,000 feet.
Vern.—Korkōta.
170. *Leea alata Edgew.*
171. *Leea macrophylla Roxb.*
Santalia, say 500—2,000 feet.
Vern.—Hatkan *Santal*. "A rare plant, like *L. robusta*" (Campbell & Watt).
172. *Leea robusta Roxb.*
173. *Leea aspera Hall.*
Jaspur, 2,000—2,500 feet;
Common in jungle.
Vern.—Hasua dahuri; Hernua dowri; Akori. *A Sāg*, leaves eaten; root sweet-scented.
174. *Leea herbacea Ham.*
175. *Leea sambucina Willd.*
Santalia (Campbell & Watt).
176. *Ampelopsis quinquefolia Michx.* (= *Vitis hederacea Ehsh.*)
In gardens; an American plant.

XXXVIII.—SAPINDACEÆ.

177. *Cardiospermum Halicacabum Linn.*
Sillee, 500—1,000 feet; Sirguja, 1,500—2,000 feet.
Vern.—Gæphuli *local*.
178. *Schleichera trijuga Willd.*
Baragaon, 2,000—2,500 feet, S. Lohardugga District,
1,500—2,000 feet; Palandu, 1,500—2,000 feet.
Vern.—Kūsūm (2) *Hind.*; Baru *Santal*. The Lac-insect is cultivated on the twigs of this tree. The other Kūsūm (*Hind.*) is *Carthamus tinctorius*.

179. *Sapindus trifoliatus* *Linn.*
 Hazaribagh district, village Chatra, 1,500—2,000 feet.
Vern.—Phalanda. A tree, about 20 feet high, by the roadside,? planted. Appearance suggested *Mallotus philippinensis* but has green, not red fruit: only this one tree ever seen.
180. *Sapindus Mukorossi* *Gaertn.*
 Jaspurnagar, 2,000—2,500 feet; cult. in the Rajah's garden.
Vern.—Reti or Rēthi. A tree, up to 40 feet; "pulp of fruit used to wash linen" (*Roxburgh*).
181. *Nephelium Litchi* *Camb.*
 Dorunda and Ranchi, 1,500—2,000 feet; cult, but sparsely.
Vern.—Lichi; the Litchi of Commerce. The fruit ripens well.
182. *Dodonæa viscosa* *Linn.*
 Palandu, 1,500—2,000 feet; cult.
 As evergreen hedges in gardens. *Dodonia Eng.*

XXXIX —ANACARDIACEÆ.

183. *Mangifera indica* *Linn.*
 Dorunda. 1,500—2,000 feet; Cult. for the fruit.
Vern.—Ām, Ul. The Mango. A source of food; kernels also eaten raw or cooked.
184. *Buchanania latifolia* *Roxb.*
 Sillee, 500—1,000 feet.
Vern.—Piál, Piār. One of the commonest scrub jungle bushes.
185. *Odina Wodier* *Roxb.*
 Common.
Vern.—Doka *Santal.*
186. *Semecarpus Anacardium* *Linn.*
 Sillee, 500, 1,000 feet.
Vern.—Belwa, Soso. Mouths of children seem ulcerated from eating the fruit, part of which is acid and part harmless. The juice of the *tree* is acrid.
187. *Spondias mangifera* *Willd.*
 Ranchi, 1,500—2,000 feet.
 The "Amra, Hog-plum" (*F. B. I.*).

XL.—MORINGEÆ.

188. *Moringa pterygosperma* *Gaertn.*
 Cultivated, *e.g.*, as a tree in villages, common.
 The Horse-radish tree; "root pungent" (*F. B. I.*).

XLI.—LEGUMINOSÆ.

189. *Heylandia latebrosa* DC.
190. *Crotalaria prostrata* Roxb.
Jaspur, 2,000—2,500 feet.
Vern.—Jinjünia.
191. *Crotalaria sericea* Retz.
192. *Crotalaria alata* Ham.
Santalia.
Vern.—Märäng jhunka *Santal* (Campbell & Watt).
193. *Crotalaria mysorensis* Benth.
194. *Crotalaria albida* Heyne.
Sitonga, Jaspur, 2,000—2,500 feet; Chectiari Bärwa, 2,000—3,000 feet; Lohardugga village, Palamow, 1,500—2,000 feet; Sirguja, 2,000 feet.
Vern.—Ban methi. Root purgative; fls. yellow.
(Methi is *Trigonella Foenum-græcum*.)
195. *Crotalaria linifolia* Linn.
196. *Crotalaria calycina* Schrank.
Mahretta Tea Garden, 2,000—2,500 feet.
197. *Crotalaria juncea* Linn.
Sillee, Jonha jungles, 1,000—1,500 feet.
Vern.—Sün. Fishing-net fibre got from this plant.
198. *Crotalaria medicaginea* DC. *Var.* *neglecta*.
199. *Crotalaria striata* DC.
Dorunda, 1,500—2,000 feet.
A garden and road-side weed.
200. *Chotalaria quinquefolia* Linn.
201. *Trigonella Foenom-græcum* Linn.
Cult.
Vern.—Methi; Fenugreek. In Sikkin women use it as a hair-brush.
202. *Indigofera linifolia* Retz.
Sillee, 500—1,000 feet; Jabra, Hazaribagh, 1,000—1,500 feet; Manka, Palamow, 1,000—1,500 feet; common on cultivated and waste land.
Vern.—Suruj muli. Flowers bright crimson.
203. *Indigofera echinata* Willd.
204. *Indigofera enneaphylla* Linn.
205. *Indigofera tinctoria* Linn.
Manbbum District, 500 feet; cult. in fields for dye-manufacture.
Vern.—Nil, Lil.

206. *Indigofera pentaphylla* Linn.
207. *Indigofera pulchella* Roxb.
Barwa plateau, Lohardugga District, 2,500—3,000 feet ; S.
Palamow, 2,500—3,000 feet ; commonly road sides in the
ghats.
Vern.—Jerool, Jeroolphúl. A shrub, flowers pink.
208. *Indigofera trifoliata* Linn.
209. *Indigofera trita* Linn. f.
210. *Indigofera hirsuta* Linn.
211. *Indigofera cordifolia* Heyne.
212. *Psoralea corylifolia* Linn.
Satbarua, Palamaw, 1,000—1,500 feet.
213. *Cyamopsis psoraloides* DC.
214. *Millettia auriculata* Bak.
Pitorea, 2,000—2,500 feet ; Baragoon, 2,000—2,500 feet.
Vern.—Bän Simär ; Hehel *Santal*. A large climber.
215. *Tephrosia purpurea* Pers.
Sillee, 500—1,000 feet ; common on waste land.
Vern.—Särpänk.
216. *Sesbania ægyptiaca* Pers.
Ranchi, 1,500—2,000 feet.
217. *Sesbania aculeata* Pers.
Jonha, 1,000—1,500 feet.
218. *Zornia diphylla* Pers. *Var. zeylonensis* Bak.
Uparghat, Jaspur, 2,000—2,500 feet ; on rocky knolls.
Vern.—Tandijhapni ; Bir moch *Santal*.
219. *Smithia conferta* Linn.
220. *Smithia ciliata* Royle.
221. *Smithia sensitiva* Ait.
Sirguja, 1,500—2,000 feet ; near water-courses in the open.
Vern.—Kijuli local. Flowers yellow.
222. *Æschynomene indica* Linn.
223. *Æschynomene aspera* Linn.
224. *Leptodesmia congesta* Benth.
Jaspur, 2,000—2,500 feet.
Vern.—Sunia. A small trefoil.
[Not in Herb., Calcutta, from Chutia Nagpur.]
225. *Uria hamosa* Wall.
226. *Uria lagopoides* DC.
Betghat, Jaspur, 1,500—2,000 feet.
Vern.—Mahadeo Jät.

227. *Uraria alopecuroides* *Wight*.
Jabra, Hazaribagh, 1,000—1,500 feet; in jungles, common.
228. *Alysicarpus vaginalis* *DC.* *Var. nummularifolius* *Bak.*
Jaspur, 2,000—2,500 feet.
Vern.—Angül.
229. *Alysicarpus monilifer* *Edgew.*
230. *Alysicarpus rugosus* *DC.*
Tundi Hills (Campbell & Watt).
231. *Alysicarpus bupleurifolius* *DC.*
232. *Ougeinia dalbegioides* *Benth.*
Guina village, Toree, Lohardugga, 500—1,000 feet; Munka, Palamow, 500—1,000 feet.
Vern.—Pänän.
233. *Arachis hypogaea* *Linn.*
Daladiri and Bankuli Tea Estates, 1,500—2,000 feet; cult.
Vern.—Chiné bādām.
234. *Desmodium Cephalotes* *Wall.*
Pitorea, 2,000—2,500 feet. Shrub, 8—10 feet high.
235. *Desmodium pulchellum* *Benth.*
Mahretta Tea garden, Hazaribagh, 2,000—2,500 feet; Pitorea, 2,000—2,500 feet; Jaspur, 2,000—2,500 feet; Kochang, S. of Lohardugga dist., 2,000—2,500 feet; common.
Vern.—Paikh.
236. *Desmodium gangeticum* *DC.*
Jaspur, 2,000—2,500 feet; Dorunda 1,500—2,500 feet.
Vern.—Nakial, Nakiel.
237. *Desmodium latifolium* *DC.*
Pitorea, 2,000—2,500 feet.
238. *Desmodium diffusum* *DC.*
239. *Desmodium polycarpum* *DC.*
Sitonga, Jaspur, 2,000—2,500 feet; Sirguja, 1,500—2,000 feet.
Vern.—Karjani; Brahmini; Karanji (Sirguja).
240. *Desmodium brachystachyum* *Grah.*
241. *Desmodium laxiflorum* *DC.*
242. *Desmodium triflorum* *DC.*
Jaspur, 2,000—2,500 feet; Ranchi, 1,500—2,000 feet.
Vern.—Sunia. A small trefoil.
243. *Desmodium parvifolium* *DC.*
Jaspur, 2,000—2,500 feet; Santalia.
Vern.—Ämät Chingar.

244. *Desmodium gyrans* DC.
Tamar, 500—1,000 feet; Toree, 1,500—2,000 feet;
Sirguja, in shady nullahs, 2,000 feet.
245. *Desmodium gyrans* DC. *Var.* Roylei.
Tamar, 500—1,000 feet.
- 245A. *Lespedeza sericea* Miq.
246. *Arbus precatorius*—Linn.
Baragaon, 2,000—2,500 feet.
Vern.—Karjani, Rati (the seeds).
247. *Cicer arietinum* Linn.
Cult. everywhere in fields.
Vern.—Büt; Cheuna, *local*. Horses fed chiefly on this
in Chutia Nagpur.
248. *Lathyrus Aphaca* Linn.
Kewtbar, Palamow, 1,000—1,500; cult., *a field of it*.
Vern.—“Chuna” (Piddington); “Musöör-Chuna” (*Rox-*
burgh.) (*Not* Chünna Chenna (*local*), which is *Cicer*
arietinum.)
349. *Lathyrus sativus* Linn.
Barwa plateau, 2,500—3,000 feet.
Vern.—Kisäri; Kisäri-dall (*Forbes*). Mortification said
to follow its too frequent use, more particularly when
eaten raw; some natives of Chutia Nagpur limit its use
to once a week. I like it *well.* (J. J. W.)
250. *Pisum sativum* Linn.
All Stations, 500—2,000 feet.
Vern.—Mätär, *local*.
251. *Pisum arvense* Linn.
Cult. in fields, common.
Vern.—Chotä mätär, *local*.
252. *Vicia Faba* Linn.
Cult.
Vern.—Sem; Broad bean.
253. *Vicia hirsuta* Koch.
Santalia.
Vern.—Tiririti *Santal*.
254. *Dumasia villosa* DC.
255. *Glycine hispida* Maxim.
Santalia.
Vern.—Ram Kurthi, *Hind., local*; Hindi desom horec,
Santal.
256. *Teramnus labialis* Spreng.
257. *Mucuna pruriens* DC.
Ranchi, 1,600—2,000 feet.

Vern.—Khujli.

258. *Mucuna utilis* Wall.

259. *Mucuna nivea* DC.

Cult. Flowers white, velvet of pod said not to be irritant.

260. *Erythrina indica* Roxb.

Ranchi, 2,000 feet; planted.

261. *Erythrina suberosa* Roxb.

262. *Erythrina resupinata* Roxb.

263. *Spatholobus Roxburghii* Benth.

Pitorea, East Hill, 2,000—2,500 feet.

Jaspur, 1,500—2,000 feet.

Vern.—Chundan, Bendo (1) (*Jaspur*). In sal jungle.

264. *Butea frondosa* Roxb.

Palandu, 1,500—2,000 feet.

Sirguja, 1,500—2,000 feet.

Vern.—Pharad; also Palás, Paras, Dhak, *Beng.*; Murut.

265. *Butea superba* Roxb.

Ghats.

266. *Canavalia ensiformis* DC.

Ranchi, 1,500—2,000 feet.

Var.—3. *Mollis* Wall.

Dorunda garden and Ranchi, 1,000—2,000 feet.

267. *Canavalia virosa* W. & A.

268. *Pueraria tuberosa* DC.

Jaspur, 2,000—2,500 feet.

Vern.—Bendo (2). Ropes made of fibre.

269. *Gouera Grahami* Benth.

270. *Phaseolus aconitifolius* Jacq.

Santalia, about 2,000 feet.

Vern.—Bir moch, Bir mung, Moch, *Santal*; Moth, *Hind.*

271. *Phaseolus Mungo* Linn.

Chyebassa, 500—1,000 feet.

Cult. a pulse.

Vern.—Mung, Mung-dall. Seeds green, a variety.

272. *Phaseolus calcaratus* Roxb.

Santalia.

Vern.—Sutri *Santal*.

273. *Phaseolus trilobus* Ait.

274. *Phaseolus vulgaris* Linn.

All Stations, 500—2,000 feet;

Cult.

Paras bean; Haricot bean; French bean.

275. *Vigna Catjang* *Endl.*
Vern.—Burbuti (*Roxburgh*); serwang *Santal*; Bēr
ghangra (the fruit) *Santal*.
276. *Vigna vexillata* *Benth.*
277. *Pachyrhizus angulatus* *Rich.*
278. *Clitoria ternatea* *Linn.*
All Stations, 500—2,000 feet.
Mussel-shell creeper.
279. *Dolichos Lablab* *Linn.*
280. *Dolichos biflorus* *Linn.*
Lohardugga dist., 1,500—2,000 feet.
A pulse, cult. in fields.
Vern.—Kūrti; koolthee (*Roxburgh*).
281. *Atylosia crassa* *Prain.*
Sillee, 500—1,000 feet; Sirgūja, 1,500—2,000 feet.
Vern.—Ram Kūrti.
282. *Atylosia platycarpa* *Benth.*
283. *Atylosia scarabæoides* *Benth.*
Sillee, 500—1,000 feet; Jaspur, 2,000—2,500 feet;
Sitonga, Loro, Jaspur, 2,000 feet.
Vern.—Bān Kūrti. In Jaspur termed Ram Kūrti but
probably a mistake for Bān Kūrti.
284. *Cajanus indicus* *Spreng.*—*var. bicolor.*
Ranchi, 1,500—2,000 feet; cult., cold-weather pulse.
Vern.—Rāhār; Ārhār; Rāhār-dall; Ārhār-dall.
285. *Rhynchosia minima* *DC. var laxiflora.*
286. *Eriosema chinense* *Vog.*
287. *Flemingia semialata* *Roxb.*
288. *Flemingia nana* *Roxb.*
289. *Flemingia bracteata* *Roxb.*
290. *Flemingia strobilifera* *R. Br.*
Ranchi, 1,500—2,000 feet.
291. *Flemingia paniculata* *Wall.*
292. *Flemingia Chappar* *Ham.*
Jabra, Hazaribagh 1,000—1,500 feet. A low shrub, com-
mon in jungles.
293. *Flemingia stricta* *Roxb.*
Ranchi, 1,500—2,000 feet.
294. *Dalbergia Sissoo* *Roxb.*
Vern.—Sisū, Shēshām. A common timber.

295. *Dalbergia latifolia Roxb.*
Tirla nadi, Lohardugga, 2,000—2,500 feet.
Vern.—Pändän.
296. *Dalbergia lanceolaria Linn.*
Sitonga, Jaspur, 2,000—2,500 feet; S. Dāmuda Ghat,
Gamble.
Vern.—Bän Mūnga.
297. *Dalbergia volubilis Roxb.*
Tirla nadi, Lohardugga, 2,000—2,500 ft. Fls. white.
298. *Pterocarpus Marsupium Roxb.*
Tataparū, Sirguja, 1,500—2,000 feet.
Vern.—Beāl.
299. *Pongamia glabra Vent.*
Ranchi; Palandu, 1,500—2,000 feet.
Vern.—Kārānj. Planted as village avenues.
An oil bean; oil smoky, cleared with salt, much used for
burning.
300. *Derris scandens Benth.*
301. *Sophora Bakeri Clark.*
Top of Parasnath.
302. *Cæsalpinia Bonducella Flem.*
303. *Cæsalpinia Sappan Linn.*
Ranchi; Hazaribagh; planted.
304. *Cæsalpinia pulcherrima Sw.*
All stations in Chutia Nagpur; in hedges, etc.
305. *Cæsalpinia sepiaria Roxb.*
306. *Cæsalpinia digyna Rottb.*
307. *Cæsalpinia coriaria Kunth.*
Chyebassa. 500—1,000 feet; native of S. America, cult.
308. *Mezoneuron cucullatum W. & A.*
309. *Poinciana regia Boj.*
In stations, e.g., Ranchi, Dorunda, Hazaribagh.
The Mascarene Flamboyant, or Gold Mohur Tree.
310. *Parkinsonia aculeata Linn.*
Barli, Grand Trunk Road, 1,500—2,000 feet; Chyebassa,
500—1,000 feet; universally cult., and often naturalized.
311. *Cassia Fistula Linn.*
Ranchi; Dorunda; 1,500—2,000 feet; planted.
Vern.—Āmultās; Bāndār-lathi.
312. *Cassia Sophera Linn.*
313. *Cassia obtusifolia Linn.*
314. *Cassia Tora Linn.*
Ranchi, 1,500—2,000 feet; very common in waste ground.

315. *Cassia glauca* Lamk.; var. *suffruticosa* Koenig.
Ranchi, 1,500—2,000 feet.
316. *Cassia Absus* Linn.
317. *Cassia pumila* Lamk.
318. *Cassia mimosoides* Linn.
Tamar, 500—1,000 feet; Jaspur, 1,500—2,000 feet; in rice-fields.
Vern.—Masturia.
319. *Tamarindus indica* Linn.
Villages everywhere; also frequent in jungle, 500—3,000 feet.
Vern.—Imli.
320. *Bauhinia tomentosa* Linn.
Tamar, 500—1,000 feet; yellowish white flowers.
321. *Bauhinia acuminata* Linn.
Dorunda, 1,500—2,000 feet; grown as a garden hedge.
Vern.—Kaimo; flower white.
322. *Bauhinia racemosa* Lamk.
Palamow, 1,000—1,500 feet; also S. Damuda Ghat, Hazaribagh 1,500—2,000 feet, Gamble.
323. *Bauhinia malabarica* Roxb.
324. *Bauhinia retusa* Ham.
Jonha, 1,500—2,000 feet; Jaspur, 2,000—2,500 feet; Kochang, 2,000—2,500 feet.
Vern.—Kätchnär. Flowers eaten.
325. *Bauhinia VahlII* W. & A.
Baragaon, 2,000—3,000 feet; Rampur, 1,500—2,000 feet; Kochang, 2,000—2,500 feet; Singbhum, 500—2,500 feet; Sirguja, 1,500—2,000 feet.
The bark-fibre, called "Chope" is used in the rough for tying house-roof timbers, etc.
326. *Bauhinia variegata* Linn.
Palamow, 1,000—1,500 feet; Sirguja, 1,500—2,000 feet.
Vern.—Kätchnär, Kuinär. This and several other Bauhinias, apparently, called by these names.
- 326A. *Bauhinia purpurea* Linn.
327. *Entada scandens* Benth.
Baragai Hills, 2,000—3,000 feet.
328. *Leucaena glauca*, Benth.
Ranchi and Dorunda, 1,500—2,000 feet.
Vern.—Kapur-Kadam. Flowers white in terminal clusters of *mimosa*-like globes.

329. *Mimosa pudica* *Linn.*
Dorunda, roadsides ; common.
330. *Mimosa rubricaulis* *Lamk.*
331. *Acacia Farnesiana* *Willd.*
Toree, 1,000—1,500 feet ; frequent.
Vern.—Bābūl Bābūla.
332. *Acacia arabica* *Willd.*
Grand Trunk Road, apparently rare.
Vern.—Bābūl.
333. *Acacia Catechu* *Willd.*
Sillee, 500—1,000 feet.
Vern.—Kadir, Kadir-gāch, Khair, Kut, Kutch. Catechu,
Eng. Chips boiled and Kut (Catechu) obtained ; process seen at Huntergunge, Hazaribagh dist.
334. *Acacia Intsia* *Willd.*—*var.* *Caesia W. & A.*
Baragai Hill, 2,000—3,000 feet ; Jaspur, 2,000—2,500 feet.
Vern.—Arār. A shrub 10—15 feet high.
335. *Acacia pennata* *Willd.*
Jaspur, 1,500—2,000 feet ; common.
Vern.—Arai. A climber.
336. *Albizzia Lebbek* *Benth.*
Ranchi, 1,500—2,000 feet ; Mailpiri, Singbhum, 500—1,000 feet ; *Gamble.*
Vern.—Siriss. A tree 40—50 feet high ; flower-heads white.
337. *Albizzia odoratissima* *Benth.*
338. *Albizzia procera* *Benth.*
339. *Albizzia stipulata* *Boiv.*
340. *Enterolobium Saman* *Prain.*
Planted. The Rain-tree.

XLII.—ROSACEÆ.

341. *Pygeum Andersoni* *Hook. f.*
342. *Rosa involucrata* *Roxb.*
Bonai state, on river-banks ; Palamow, banks of the Kose river.
Bonai-Tributary mehal-water-shed is towards the S. and E., not Gangetic but between Ganges and Mahanadi.
343. *Rosa centifolia* *Linn.*
In gardens.
344. *Rosa indica* *Linn.*
In gardens.

345. *Eriobotrya japonica* *Lindl.*
Dorunda, 1,500—2,000 feet; cult.
Loquat. Fruit inconsiderable.
346. *Fragaria vesca* *Linn.*
All stations; cult. in gardens in the cold weather.
Strawberry.
347. *Pyrus communis* *Linn.*
Dorunda, etc., 1,500—2,000 feet; cult.
Vern.—Naspāti. The Pear. Fruit hard, barely eatable;
used cooked.

XLIII.—CRASSULACEÆ.

348. *Bryophyllum calycinum* *Salisb.*
Palandu, 1,500—2,000 feet; cult.
349. *Kalanchoe floribunda* *W. & A.*

XLIV.—DROSERACEÆ.

350. *Drosera Burmanni* *Vahl.*
Hazaribagh, Mowdoo village, 1,000—1,500 feet; Sirguja
and Jaspur, 1,500—2,000 feet; common.
Vern.—Agía. Sundew.
351. *Drosera indica* *Linn.*

XLV.—HALORAGÆÆ.

352. *Callitriche stagnalis* *Scop.*
Sirguja, 1,500—2,000 feet; in still water near a stream.
[Not in Herb., Calcutta, from Chutia Nagpur.]

XLVI.—COMBRETACEÆ.

353. *Terminalia Catappa* *Linn.*
Chyebassa, 500—1,000 feet; cult.
Vern.—Bodām. Country Almond. Fruit eaten.
354. *Terminalia belerica* *Roxb.*
Dhakda, Manbhūm, 500—1,000 feet.
Vern.—Bohora. A large tree; cattle eat the fruit.
355. *Terminalia Chebula* *Rets.*
Bankuli, 1,500—2,000 feet.
Vern.—Hāri-tāki, Rola *Mundari* and *Ho.*
356. *Terminalia Arjuna* *Bedd.*
Palamow, 1,000—1,500 feet.
Vern.—Arjān.

357. *Terminalia tomentosa* *Bedd.*
Sirguja, 1,500—2,000 feet; common in jungles.
Vern.—Äsän. Tusser silk worms fed on the leaves.
358. *Anogeissus latifolia* *Wall.*
Munka, Palamow, 1,000—1,500 feet.
Vern.—Dhaunta. Very common in all Chutia Nagpur jungles.
359. *Anogeissus acuminata* *Wall.*
360. *Combretum nanum* *Roxb.*
361. *Combretum ovalifolium* *Roxb.*
362. *Combretum extensum* *Roxb.*
363. *Combretum decandrum* *Roxb.*
Ētkooree, Hazaribagh District, 1,000—1,500 feet; Jaspur 1,500—2,000 feet.
Vern.—Güründa. or Goründa. A common climber; root used in fever.
364. *Quisqualis indica* *Linn.*
Common in gardens over trellises.
Quisqualis, *Eng.*

XLVII.—MYRTACEÆ.

365. *Psidium Guyava* *Linn.*
Dorunda, 1,500—2,000 feet; cult. in gardens.
Vern.—Ämrüt. The Guava. Fruit eaten, but strong-smelling, so that some dislike it.
366. *Eugenia operculata* *Roxb.*—*var.* *Obovata.*
367. *Eugenia Jambolana* *Linn.*
Tirli nadi, 2,000—2,500 feet; Dorunda, 1,500—2,000 feet.
Vern.—Jämüm; Chota jām. A tree 50—60 feet; sometimes cultivated; fruit eaten and made into "port wine."
368. *Eugenia Heyneana* *Wall.*
369. *Careya arborea* *Roxb.*
Sirguja, 1,500—2,000 feet.
Vern.—Kumhi.
370. *Eucalyptus globulus* *Labill.*
Bankuli Tea Estate; planted—native of Australia.
Blue Gum. Supposed to prevent malaria where planted, but of no use.
371. *Myrtus communis* *Linn.*
Dorunda, 1,500—2,000 feet; planted in gardens.
Myrtle. A thriving bush up to seven feet high.

XLVIII.—MELASTOMACEÆ.

372. *Osbeckia truncata* *Don.*—*var.* *Kurzii*.
Parasnath, 4,200 feet *Kurs*.
373. *Osbeckia chinensis* *Linn.*
Santalia (Campbell & Watt).
No *Osbeckia* found or seen by the writer in Chutia Nagpur.
374. *Melastoma malabathricum* *Linn.*
375. *Sonerila tenera* *Royle*.
Jaspur, 1,000—1,500 feet; on banks by the wayside.
Vern.—Lāwangia.

XLIX.—LYTHRACEÆ.

376. *Ammannia peploides* *Spreng.*
Ranchi, 1,500—2,000 feet.
377. *Ammannia dentelloides* *Kurs*.
378. *Ammannia pygmaea* *Kurs*.
379. *Ammannia pentendra* *Roxb.*
Pertabpur, Sirguja, 1,500—2,000 feet; moist soil near tank.
Var. *Fimbriata* *Wight*.
Jaspurnagar, 2,000—2,500 feet; in wet rice fields.
Vern.—Khet-gulab = "rose of the field."
Var. *Illecebroides* *Arn.*
Palandu, 1,500—2,000 feet.
380. *Ammannia multiflora* *Roxb.*
381. *Ammannia baccifera* *Linn.*
Chatra, 1,000—1,500 feet; flowers white.
382. *Woodfordia floribunda* *Salisb.*
Pitorea, 2,000—2,500 feet; common in jungles.
Vern.—Dhāwei, Dhai phūl.
383. *Lawsonia alba* *Lamk.*
Ranchi, 1,500—2,000 feet; cult. as a hedge.
Vern.—Mehndi. Henna.
384. *Lagerstroemia indica* *Linn.*
Ranchi and Hazaribagh; in gardens, common.
Crape Flower. Flowers white, pink or purple.
385. *Lagerstroemia parviflora* *Roxb.*
Plateau generally.
Vern.—Sid. One of the commonest bushes in scrub-jungle.
386. *Punica Granatum* *Linn.*
All stations from 500—2,000 feet; cultivated.
Vern.—Anar. Pomegranate. Fruit inferior in quality in Chutia Nagpur; flowers single or double.

L.—ONAGRACEÆ.

387. *Jussiaea repens* Linn.
 388. *Jussiaea suffruticosa* Linn.
 Guina, Pergunnah Toree 1,000—1,500 feet, Jaspur, 1,500—2,000 feet.
Vern.—Pärsāti. Grows in water; flowers yellow; root spongy; in Jaspur the root boiled and liquid drunk for fever.
 389. *Ludwigia parviflora* Linn.
 390. *Trapa bispinosa* Roxb.

LI.—SAMYDACEÆ.

391. *Casearia graveolens* Dalz.
 Jaspur, 1,500—2,000 feet.
Vern.—Rüch müti, Ruch muchi. Leaves purple-red.
 392. *Casearia tomentosa* Roxb.
 Chätra, Hazaribagh, about 1,500 feet; Ranchi, 1,500—2,000 feet.
Vern.—Bēri. This is, with *Croton oblongifolium* and *Buchanania* a very common scrub-jungle. At Chätra were seven trees together, 25—30 feet high, two feet diameter at six feet from the ground; not seen arboreal except here and one tree on Bälümäth Hill, 30 miles south of Chätra.

LII.—PASSIFLOREÆ.

393. *Carica Papaya* Linn.
 Palandu, 1,400—2,000 feet; cult. in many native and European gardens.
Vern.—Papita. The Papaw. (*Passiflora*; Passion-flower; various species cult. on porches and trellises in European stations.)

LIII.—TURNERACEÆ.

394. *Turnera ulmifolia* Linn.
 Ranchi, 1,500—2,000 feet, on roadsides, naturalized.
 A native of the West Indies.

LIV.—CUCURBITACEÆ.

395. *Trichosanthes palmata* Roxb.
 396. *Trichosanthes anguina* Wall.

397. *Gymnopetalum Cochinchinense* *Kurz.*
Plateau, 1,500—2,000 feet *Clarke.*
398. *Lagenaria vulgaris* *Ber.*
Jaspur, 1,500—2,000 feet; by roadside, probably cult.
Vern.—Kädu.
399. *Luffa graveolens* *Roxb.*
400. *Luffa acutangula* *Roxb.*
Santalia (Campbell & Watt).
Vern.—Paror jhinga *Santal.*
401. *Luffa amara* *Roxb.*
402. *Luffa echinata* *Roxb.*—*var.* *Longistylis.*
403. *Benincasa cerifera* *Savi.*
Cult. The Pumpkin (*Firminger* only); White gourd.
404. *Momordica Charantia* *Linn.*
Chättra, Hazaribagh, 1,000—1,500 feet; cult.
Vern.—Kurela (*Firminger*).
405. *Momordica dioica* *Roxb.*
406. *Cucumis trigonus* *Roxb.*
407. *Cucumis Melo* *Linn.*
Cult. The Melon.
408. *Cucumis sativus* *Linn.*
Cult. The cucumber.
409. *Citrullus vulgaris* *Schrad.*
Cult. The water-melon.
410. *Cephalandra indica* *Naud.*
411. *Cucurbita maxima* *Duch.*
Cult. The common gourd.
412. *Cucurbita moschata* *Duch.*
Cult. The Musk-melon.
413. *Cucurbita Pepo* *DC.*
Cult. Rhe Pumpkin.
414. *Bryonia laciniosa* *Linn.*
Ranchi, 1,500—2,000 feet.
415. *Mukia scabrella* *Arn.*
Jaspur, 1,500—2,000 feet; in dry sal jungle.
Vern.—Kawa-tamar. Fruit scarlet.
416. *Zehneria Hookeriana* *Arn.*
Jaspur, 1,500—2,000 feet.
Vern.—Bän-kündri (1). Root used with milk in fever
and for diarrhœa. [Not in Herb., Calcutta, from
Chutia Nagpur.]

417. *Zehneria umbellata* *Thev.*

Baragaon Hill; also Sirguja, 1,500—2,000 feet.

Vern.—Bän-kündri (2); Mül. The root is eaten; it is radish-like and hourglass shaped.

LV.—CACTEÆ.

418. *Opuntia Dillenii* *Ham.*

Cochineal Cactus; naturalized.

LVI.—FICOIDEÆ.

419. *Trianthema monogynum* *Thw.*420. *Mollugo hirta* *Thunb.*421. *Mollugo spergula* *Linn.*422. *Mollugo stricta* *Linn.*

LVII.—UMBELLIFERÆ.

423. *Hydrocotyle asiatica* *Linn.*

Sirguja, 1,500—2,000 feet; banks of the Rer river.

A ground-ivy like creeper.

424. *Bupleurum mucronatum* *W. & A.*

Sirguja 1,500—2,000 feet.

425. *Apium graveolens* *Linn.*

Ranchi, 1,500—2,000 feet; cult.

Celery.

426. *Carum Roxburghianum* *Benth.*

Caraway.

427. *Carum copticum* *Benth.*

Caraway.

428. *Pimpinella Heyneana* *Wall.*

Jaspur, Sitonga; also Jaspur, 2,000—2,500 feet.

Vern.—Tirio, Märcheia. Root used in fever.429. *Seseli indicum* *W. & A.*430. *Fœniculum vulgare* *Gaerten.*

Cult. Fennel.

431. *Peucedanum nagpurensis* *Prain.*432. *Peucedanum graveolens* *Benth.* Cult.433. *Pastinaca sativa* *Linn.*

Cult. in gardens in Chutia Nagpur.

Parsnip.

434. *Coriandrum sativum* *Linn.*435. *Daucus Carota* *Linn.*

Cult. The Carrot.

LVIII.—ARALIACEÆ.

436. *Panax fruticosum* *Linn.* Cult.
 437. *Heptapleurum venulosum* *Seem.*
 Plateau, 1,500—2,000 feet.
Vern.—Rai-datūm. Epiphytic on trees.
 438. *Heteropanax fragrans* *Seem.*

LIX.—CORNACEÆ.

439. *Alangium Lamarkii* *Thw.*

LX.—CAPRIFOLIACEÆ.

440. *Lonicera macrantha* *DC.*
 Stations of Chutia Nagpur, 500—2,000 feet; cultivated,
 very common for trellises and porches.
 Chinese Honey-Suckle.

LXI.—RUBIACEÆ.

441. *Anthocephalus Cadamba* *Miq.*
 Palandu, 1,500—2,000 feet; planted.
Vern.—Kādām.
 442. *Adina cordifolia* *Hook. f.*
 Sillee, 1,000—1,520 feet; common.
Vern.—Kārām. A large tree.
 443. *Stephegyne parvifolia* *Korth.*
 Hundrughag, 1,500—2,000 feet; Jabra, Hazaribagh dis-
 trict, 1,000—1,500 feet; Jaspurnagar, 2,000—2,500 feet,
 in a *sal* grove.
Vern.—Karmi, *local*; Guria *Kol.* A tree 30—40 feet
 high.
 444. *Hymenodictyon excelsum* *Wall.*
 Sitonga, Jaspur, 2,000—2,500 feet.
Vern.—Bürkünd.
 445. *Wendlandia exserta* *DC.*
 Hazaribagh, 1,500—2,000 feet; Jaspur, 1,500—2,000 feet.
Vern.—Kūdi phūl. A shrub.
 446. *Wendlandia tinctoria* *DC.*
 Pitorea, 2,000—2,500 feet; Palamow 500—1,000 feet.
Vern.—Telei phūl.
 447. *Dentella repens* *Forst.*
 448. *Hedyotis pinifolia* *Wall.*
 449. *Hedyotis hispida* *Retz.*

450. *Oldenlandia corymbosa*, *Linn.*
Châtra, 1,500—2,000 feet; flowers lavender, moist places
by rice-fields.
451. *Oldenlandia diffusa* *Roxb.*
452. *Oldenlandia Heynei* *R. Br.*
453. *Oldenlandia dichotoma* *Kœnig.*
Santalia.
454. *Oldenlandia gracilis* *Hook. f.*
455. *Oldenlandia nudicaulis* *Roth.*
456. *Anotis calycina* *Wall.*
457. *Mussaenda macrophylla* *Wall.*
In gardens.
458. *Randia fasciculata* *DC.*
459. *Randia uliginosa* *DC.*
Sirguja, 1,500—2,000 feet, common.
Vern.—Perar, Katai. A thorny shrub.
460. *Randia dumetorum* *Lamk.*
Ranchi, 1,500—2,000 feet; Jaspur, 2,000—2,500 feet.
Vern.—Mowna.
461. *Gardenia gummifera* *Linn. f.*
Kantnagar, Singbhum, 500—1,000 feet.
Vern.—Burui. Fruit eaten. Ashes boiled with *Sal*
(*Shorea robusta*).
462. *Gardenia latifolia* *Ait.*
Poitrea, 2,000—2,500 feet; Baragaon, 2,000—2,500 feet;
Jaspur 1,500—2,000 feet; Chyebassa, 500—1,000 feet.
Vern.—Pâpra; Kârhar (Jaspur).
463. *Gardenia turgida* *Roxb.*
Baragaon, 2,000—2,500 feet; Jaspur, 1,500—2,000 feet.
Vern.—Dudri.
464. *Hyptianthera stricta* *W. & A.*
Dorunda, 1,500—2,000 feet, in gardens cult. for flowers;
also wild in Chutia Nagpur jungles.
Vern.—Karkar.
465. *Knoxia corymbosa* *Willd.*
Aurunga, Palamow, 1,000—1,500 feet; Jaspur 2,000—2,500
feet, on rocky knolls in scrub jungle.
Vern.—Bânjira.
466. *Knoxia brachycarpa* *Br.*
467. *Canthium didymum* *Roxb.*
Sirguja, 1,500—2,000 feet; Santalia, about 2,000 feet.
Vern.—Garbha, Gojha *Santal.*

468. *Ixora parviflora Vahl.*
469. *Pavetta indica Linn.—var. tomentosa.*
 Châtra, 1,500—2,000 feet; Jaspur, 2,000—2,500 feet;
 Sirguja, 2,000—2,500 feet; in sal jungle and on hills.
Vern.—Inderjow (Chatra); Chereigora (Jaspur); Menda
 (Sirguja). A small tree 20 feet high; dry fruit adher-
 ing. (Another "Inderjow" is *Holarrhena antidysen-*
terica, = Kurchi, Dudhi, Koreia, etc.)
470. *Coffea bengalensis Linn.*
471. *Coffea arabica Linn.*
 Pitorea, 2,000 feet; Bankuli; cultivated.
472. *Morinda tinctoria Roxb.*
473. *Pæderia foetida Linn.*
 Sillee, 1,000—1,500 feet; Hill near Pitorea 2,000—2,500
 feet. Plant foetid.
474. *Hamiltonia suaveolens Roxb.*
 W. Hill, Pitorea, 2,000—2,500 feet; Jaspur, 2,000—2,500
 feet, on rocky knolls in small jungle.
Vern.—Lila jan, local; Karha, Hind. Shrubby; flowers
 white, strong jasmine smell.
475. *Spermacoce stricta Linn. f.*
 Jaspur, 2,000—2,500 feet; Sirguja, 1,500—2,000 feet, on
 dry rocks.
Vern.—Getia.
476. *Spermacoce hispida Linn.*
 Santalia about 2,000 feet.
Vern.—Pitua arak. Santal.
477. *Rubia cordifolia Linn.*

LXIII.—COMPOSITÆ.

478. *Vernonia teres Wall.—var. subsessilis.*
 Pitorea, 2,000—2,500 feet; Santalia.
Vern.—Char Sira, Santal (Campbell & Watt).
479. *Vernonia Roxburghii Less.*
 Jaspur, 2,000—2,500 feet, common in dry jungle and in
 the open.
Vern.—Ghetia phul. Flowers purple.
480. *Vernonia cinerea Less.*
 Black rocks, Ranchi, 2,000—2,500 feet; Dorunda 1,500—
 2,000 feet, in gardens, common; Hazaribagh district,
 1,500—2,000 feet; Jaspurnagar, 2,000—2,500 feet;
 Hetghat, Jaspur, 1,500—2,000 feet.

- Vern.*—Päpar; Künchli. Flowers purple; root sweet-smelling, given for dropsy.
481. *Vernonia divergens Benth.*
Parasnath, 4,000 feet (*F.B.I.*)
482. *Vernonia anthelmintica Willd.*
Sirguja, 1,500—2,000 feet; in once place only, under a *Pipal* tree; seven feet high.
483. *Elephantopus scaber Linn.*
Iruvia, near Hundrughag, 1,500—2,000 feet; Pitorea, 2,000—2,500 feet; Jaspur, 2,000—2,500 feet.
Vern.—Täl Müli; Mürgi chüdi (Jaspur).
484. *Adenostemma viscosum Fortst.*
Sirguja, 1,500—2,000 feet; in rice fields.
Vern.—Säki.
485. *Ageratum conyzoides Linn.*
Dorunda, 1,500—2,000 feet; a garden weed.
486. *Cynathocline lyrata Cass.*
Jaspur, 1,500—2,000 feet, in moist cultivated fields.
Vern.—Chickeni or Chik'ni.
487. *Grangea maderaspatana Poir.*
488. *Erigeron asteroides Roxb.*
489. *Conyza stricta Willd.*
Pitorea, 2,000—2,500 feet; Jaspur, 1,500—2,000 feet.
Vern.—Barango.
490. *Blumea Wightiana DC.*
491. *Blumea glomerata DC.*
Ranchi, 1,500—2,000 feet.
492. *Blumea lacera DC.—var. cinerascens.*
Dorunda 1,500—2,000 feet; a garden-weed.
493. *Blumea laciniata DC.*
494. *Blumea membranacea DC.*
495. *Blumea Jacquemontii Hook. f.*
Parasnath (*F.B.I.*).
496. *Blumea oxyodonta DC.*
497. *Laggera flava Benth.*
Ranchi, 1,500—2,000 feet; Jaspur 1,500—2,500 feet; very common in dry jungle.
Vern.—Bäu Sirsu. Flowers yellow.
498. *Laggera alata Sch.-Bip.*
499. *Laggera pterodonta Benth.*
500. *Laggera aurita Sch.-Bip.*
501. *Sphæranthus indicus Linn.*
Ranchi, 1,500—2,000 feet; on edges of rice-fields.

502. *Gnaphalium luteo-album* *Linn.*
503. *Gnaphalium indicum* *Linn.*
Sirguja, 1,500—2,000 feet; on dry grassy (maidan) open ground; flowers white.
504. *Gnaphalium pulvinatum* *Del.*
505. *Cæsulia axillaris* *Roxb.*
Pitorea, 2,000—2,500 feet, on the east hill, dry; granitic gneiss, rocky; Jaspurnagar, 2,000—2,500 feet; in wet rice fields.
Vern—Ghetia-kena (Jaspur); not eaten. A similar plant, if not the same, is used as a vegetable (sāg) for food, but it grows on the maidan and so is dry.
506. *Vicoa auriculata* *Cass.*
Jabra, Hezaribagh, 1,000—1,500 feet; Jaspur, 2,000—2,500 feet.
507. *Pulicaria angustifolia* *DC.*
Jaspur, 2,000—2,500 feet, on jungle ground.
Vern—Hürhürä. This plant has milky juice when on cultivated ground.
508. *Xanthium strumarium* *Linn.*
509. *Siegesbeckia orientalis* *Linn.*
Jaspur, 1,500—2,000 feet.
Vern.—Bhäseri.
510. *Eclipta alba* *Hassk.*
Jaspur.
Vern.—Bengäria. Flowers white.
511. *Wedelia Wallichii* *Less.*
Santalia (Campbell & Watt).
512. *Blainvillea latifolia* *DC.*
513. *Spilanthes Acmella* *Linn.*
Ranchi.
Vern.—Bärbäri'a.
514. *Guizotia abyssinica* *Cass.*
Bulrampur, Manbhum 500—1,000 feet; grown in fields largely, to 2,500 feet.
Vern.—Sirguja; sirguja; ram til; kala til; ginjeri: this last is the local name in the *State* of Sirguja itself.
An oil-seed—'Black Niger' of commerce.
515. *Glossocardia linearifolia* *Cass.*
516. *Cosmos sulphureus* *Cav.*
517. *Bidens pilosa* *Linn.*
Var. *bipinnata.*
Mahretta Tea State Hazaribagh, 2,000—2,500 feet.

518. *Glossogyne pinnatifida* DC.
 Jaspur-nagar, 2,000—2,500 feet; Santalia (Campbell & Watt).
Vern.—Bān Jātni (Jaspur); Barrangom, Birbarangom, Santal.
519. *Chrysanthellum indicum* DC.
 Seetagurra Tea Estate, Hazaribagh, 2,000 feet. Flower yellow.
520. *Tridax procumbens* Linn.
 Dorunda, 1,500—2,000 feet. Flowers yellow.
521. *Chrysanthemum coronarium* Linn.
 Cult. in gardens.
522. *Centipeda orbicularis* Lour.
 Santalia.
Vern.—Bedi Achim Santal.
523. *Sphæromorphæa Russelliana* DC.
524. *Artemisia parviflora* Roxb.
 Sirguja, 1,500—2,000 feet; Parasnath, 4,000 feet (*F.B.I.*).
525. *Emilia sonchifolia* DC.
 Jabra, Hundagunge, W. Hazaribagh, 1,000—1,500 feet; Sirguja, 1,500—2,000 feet. Flowers purple. According to a native (Moreed chuprassie) "the leaves bruised with arrack, good for sore eyes, the first day."
526. *Echinops echinatus* DC.
 Baragon, 2,000—2,500 feet.
527. *Cnicus arvensis* Hoff.
528. *Saussurea candicans* Clarke.
 Kolhan, Singbhum Dist., 500—1,000 feet.
529. *Voluntarella divaricata* Benth.
530. *Carthamus tinctorius* Linn.
 Palamow 500—1,000 feet; cultivated.
Vern.—Kūsūm (1). Safflower, the yellow dye plant.
 (Kūsūm (2) is *Schleichera trijuga*, a tree.)
531. *Crepis japonica* Benth.
532. *Crepis acaulis* Hook. f.
533. *Sonchus asper* Vill.
534. *Sonchus oleracens* Linn.
535. *Sonchus arvensis* Linn.
536. *Launea aspleniifolia* DC.
 Jabra, Hazaribagh dist., 1,000—1,500 feet, on waste ground; Santalia, 500—2,000 feet.
Vern.—Ber malla Santal.

537. *Launea nudicaulis* Sess.
 538. *Scorzonera divaricata* Turcz.
 Jaspur, 1,500—2,000 feet.
 Vern.—Chāti'ān. [Not in Herb. Calcutta, from Chutia Nagpur.]

LXIII.—STYLIDÆ.

539. *Stylidium tenellum* Sw.—var. *minima*.

LXIV.—CAMPANULACEÆ.

540. *Lobelia trigona* Roxb.
 Sirguja, 1,500—2,000 feet.
 Flowers blue. Plant, when growing in water, up to 15 in.;
 on dry soil only 6 inches high.
 541. *Lobelia trialata* Ham.
 542. *Lobelia affinis* Wall.
 543. *Cephalostigma Schimperii* Hochst.
 Jaspur, 2,000—2,500 feet.
 Vern.—Bān-dudhi; Dūdi-bān. Plant 9 inches high.
 544. *Cephalostigma hirsutum* Edgew.
 Parasnath (F.B.I.).
 545. *Cephalostigma Hookeri* Clarke.
 Parasnath (F.B.I.).
 546. *Wahlenbergia gracilis* DC.
 547. *Sphenoclea zeylanica* Gærtn.

LXV.—PLUMBAGINÆ.

548. *Plumbago zeylanica* Linn.
 Jonha, Sandi-mandi, 1,000—1,500 feet; here most probably wild.
 549. *Plumbago capensis* Thunb.
 All stations, 500—2,000 feet; cult. in gardens.
 Plumbago Eng. A climber.

LXVI.—PRIMULACEÆ.

550. *Anagallis arvensis* Linn.
 551. *Centunculus tenellus* Duby.

LXVII.—MYRSINÆ.

552. *Embelia robusta* Roxb.—var. *ferruginea* Wall.
 Jaspur, 2,000—2,500 feet.
 Vern.—Sāsapōra; Bābirāng.

553. *Ardisia humilis Vahl*.
 Ba ragaon, 2,000—2,500 feet.
Vern.—Lilibaha. Leaves glossy, laurel-like; flowers
 profuse, wax-plant-like.
Var. arborescens Wall.
 Dhadka, Manbhum, 500—1,000 feet.
Vern.—Mormori. A small tree or shrub.

LXVIII.—SAPOTACEÆ.

554. *Achras Sapota Linn.*
 Dorunda, 1,500—2,000 feet, cult.
 Sapota. A small tree, the fruit comes to nothing in
 Chutia Nagpur.
 555. *Bassia latifolia Roxb.*
 Everywhere abundant, 500—2,500 feet, particularly in
 Palamow.
Vern.—Máhūa, Mōwa.
 556. *Mimusops Elengi Linn.*

LXIX.—EBENACEÆ.

557. *Diospyros montana Roxb.*
 Rampur, near Palāndu, 1,500—2,000 feet.
Vern.—Gara Tiril.
 558. *Diospyros Embryopteris Pers.*
 Ranchi, 1,500—2,000 feet.
Vern.—Makar Khend.
 559. *Diospyros tomentosa Roxb.*
 Plateau, 2,000 feet *Clarke*.
 560. *Diospyros melanoxydon Roxb.*
 All districts, 500—2,500 feet; common as scrub jungle.
Vern.—Khend, *local*; Tiril, *mundari*. Imitates "Bengal
 Fire," if stirred in a bonfire.
 [Not in Herb., Calcutta, from Chutia Nagpur.]

LXX.—STYRACEÆ.

561. *Symplocos racemosa Roxb.*
 Ranchi, 1,500—2,000 feet; Jaspur 2,000,—2,500 feet;
 Sirguja, 2,000—2,500 feet; very common.
Vern.—Lodh, *general*, also Son Pokri (in Jaspur) and
 Makar Khend (in Sirguja); apparently the last name a
 mistake for *Diospyros Embryopteris*. A tree, 40 feet;
 root-bark used as a dye.

LXXI.—OLEACÆ.

562. *Jasminum Sambac Ait.*
 563. *Jasminum pubescens Willd.*
 Baragari, 2,000—3,000 feet; Jaspur 1,500—2,000 feet;
 Sirguja 1,500—2,000 feet.
Vern.—Hündi Baha; Jungli Chameile; Bärsi.
 Flowers white with sweet jasmine smell.
564. *Jasminum arborescens Roxb.*
 564. *Jasminum Roxburghianum Wall.*
 566. *Nyctanthes Arbor-tristis Linn.*
 Pitorea, 2,000—2,500 feet; Gunia, Toree Purgunnah,
 1,000—1,500 feet; Sillee; etc. A very common shrub
 throughout Chutia Nagpur.
567. *Schrebera Swietenioides Roxb.*
 568. *Linociera intermedia Wight—Var. Roxburghii.*

LXXII.—APOCYNACEÆ.

569. *Carissa Carandas Linn.*
 Palandu, cult.
 Currownda *Eng.*
570. *Carissa spinarum A.D.C.*
 Munka, Palamow, 1,000—1,500 feet; Dorunda, 1,500—
 2,000 feet.
Vern.—Korönda. Fruit eaten; probably a state of *C.*
Carandas (Brandis, Clarke).
571. *Vinca rosea Linn.*
 All stations in Chutia Nagpur; cult. in gardens.
572. *Plumeria acutifolia Poir.*
 All stations, 500—2,000 feet; cult.
 Flowers offered to idols; strong jasmine smell.
573. *Holarhena antidysenterica R. Br.*
 Munka, Palamow, 1,000—1,500 feet; Baragaon 2,000—
 3,000 feet; Jaspur, 1,500—2,000 feet; Palandu, 1,500—
 2,000 feet; the commonest shrub in the jungles; seldom
 seen as trees.
Vern.—Dudhi; Koreia; Bär-ki-Dudhi; the seeds = Inder-
 jow. A good wood for turning.
574. *Tabernæmontana coronaria R. Br.*
 Baragaon, 2,000—2,500 feet; grown in gardens.
Vern.—Toa had.
575. *Vallis Heynei Spreng.*
 Pochra, Toree pergunnah, 1,000—1,500.
Vern.—Toriar. A climber, flower white.

576. *Wrightia tomentosa* R. & S.
Baragaon, 2,000—3,000 feet.
Vern.—Kunel (Firminger).
577. *Nerium odorum* Soland.
Cultivated throughout Chutia Nagpur.
Oleander. Flowers pink or white.
578. *Beaumontia grandiflora* Wall.
Palandu, 1,500—2,000 feet; cult.
579. *Ichnocarpus frutescens* R. Br.
Palamow 500—1,000 feet; Jaspur 2,000—2,500 feet.
Vern.—Chota dudhi; Guri lerting. Root good for fever.
580. *Ichnocarpus ovalifolius* A. DC.
(*Allamanda cathartica* Linn. and *Thevetia neriifolia* Juss.)
Exotic members of this order are cult. in Chutia Nagpur.)

LXXIII.—ASCLEPIADEÆ.

581. *Hemidesmus indicus* R. Br.
Ranchi, 1,500—2,000 feet; common in jungles.
Vern.—Ānāntomūl. Indian sarsaparilla.
582. *Cryptolepis Buchanani* R. & S.
Vern.—Ulri Dudhi (Campbell & Watt).
583. *Cryptostegia grandiflora* R. Br.
Hazaribagh, 1,500—2,000 feet; cult.
584. *Calotropis gigantea* R. Br.
In jungles and open ground; frequent about villages.
Vern.—Mādār; Phalti. Flowers purple.
585. *Calotropis procera* R. Br.
586. *Daemia extensa* R. Br.
587. *Cynanchum Callialata* Ham.
Parasnath, 4,500 feet, *Hooker*.
588. *Asclepias Curassavica* Linn.
589. *Raphistemma pulchellum* Wall.
590. *Holostemma Rheedei* Wall.
591. *Gymnema hirsutum* W. & A.
592. *Sarcostemma brevistigma* Wight.
593. *Dregea volubilis* Benth.
Kudia Lotiva village, Lohardugga dist., 1,500—2,000 feet.
594. *Hoya pendula* Wight.
595. *Ceropia hirsuta* Wight.

LXXIV.—LOGANIACEÆ.

596. *Mitreola oldenlandioides* Wall.
597. *Mitrasacme alsinoides* R. Br.

598. *Buddleia asiatica* *Lour.*
 599. *Strychnos Nux-vomica* *Linn.*
 Bend, Dalbhum, 500—1,000 feet.
Vern.—*Küchlia*, *Beng.* (Roxbur gh).
 600. *Strychnos potatorum* *Linn. f.* Cleaning-nut.

LXXV.—GENTIANACEÆ.

601. *Exacum tetragonum* *Roxb.*
 Ranchi, 1,500—2,000 feet; Hundrughag, 1,500—2,000 feet; Jaspur, 1,500—2,000 feet.
Vern.—Orka phül. Common beside wet rice-fields, sometimes over 4 feet high. Root given in fever, with black pepper, as a mild bitter.
 602. *Exacum pedunculatum* *Linn.*
 603. *Exacum petiolare* *Griseb.*
 604. *Hoppea dichotoma* *Willd.*
 Jaspur, 1,500—2,000 feet; Tatapāni, Sirguja, 2,000 feet.
Vern.—Sekoi. In moist places; near hot mineral springs.
 605. *Canscora diffusa* *R. Br.*
 Guona, Torea Pergunnah, 1,500—2,000 feet; Byturnee river, towards Keonjar, 500—1,000 feet; Jaspur, 1,500—2,000 feet; common in shady moist places.
 606. *Canscora decussata* *R. & S.*
 Balunath, Torea Pergunnah, 1,000—1,500 feet; Jaspur—1,500—2,000 feet; Sirguja, 2,000 feet; common; flowers white; no local name.
 607. *Swertia pulchella* *Ham.*
 Jaruda, Singbhum, 1,000—1,500 feet.
 [Not in Herb., Calcutta, from Chutia Nagpur.]
 608. *Swertia affinis* *Clarke.*
 609. *Limnanthemum cristatum* *Griseb.*
 Sirguja, 1,500—2,000 feet.
 610. *Limnanthemum indicum* *Thev.*
 Būdū, 500—1,000 feet.

LXXVI.—POLEMONIACEÆ.

611. *Phlox Drummondi* *Hook.*
 In gardens in "cold weather."

LXXVII.—HYDROPHYLLACEÆ.

612. *Hydrolea zeylanica* *Vahl.*

LXXVIII.—BORAGINEÆ.

613. *Cordia Myxa* Linn.
Ramkūnda, Palamow 500—1,000 feet; Jilmille, Sirguja,
1,500—2,000 feet; Sirguja, 1,500—2,000 feet.
Vern.—Bahuar. A tree, 30—40 feet high.
614. *Cordia obliqua*. Willd.—var. Wallichii.
615. *Cordia Macleodii* H. f. & T.
Kuru (Chandwa) Ghat, Lohardugga, 1,500—2,000 feet;
Sirguja, 1,500—2,000 feet.
Vern.—Belwalūng. A small tree in scrub jungle.
616. *Ehretia laevis* Roxb.
Jonha, 1,000—1,500 feet. A tree, 30 feet high.
617. *Coldenia procumbens* Linn.
618. *Rhabdia lycioides* Mast.
619. *Heliotropium strigosum* Willd.
620. *Heliotropium marifolium* Retz.
621. *Heliotropium indicum* Linn.
622. *Trichodesma indicum* R. Br.
623. *Trichodesma zeylanicum* R. Br.
Hundrugghag, Lohardugga, 1,500—2,000 feet.
- 623A. *Cynoglossum denticulatum* A. DC.

LXXIX.—CONVOLVULACEÆ.

624. *Erycibe paniculata* Roxb.
Baragaon, 2,000—3,000 feet.; Sirguja, 1,500—2,000 feet.
Vern.—Hūru bid; Koel=gumār, (Sirguja). A climber;
fruit eaten.
625. *Rivea ornata* Choisy.
Jaspur, 1,500—2,000 feet.
Vern.—Bhita bhonorā. A shrub, 12 feet high.
[Not in Herb., Calcutta, from Chutia Nagpur.]
626. *Rivea hypocrateriformis* Choisy.
Tatapani, Sirguja, 1,500—2,000 feet.
Midnapore Creeper (*Firminger*). A climber.
627. *Argyreia speciosa* Sw.
628. *Argyreia Daltoni* Clarke.
Jaspur, 2,000—2,500 feet.
Vern.—Chitti. A climber, ropes made of the bark.
629. *Argyreia nervosa* Boj.
Dorunda, 1,500—2,000 feet; climber in gardens and on
porches.
"Elephant creeper," Eng.

630. *Lettsomia aggregata* Roxb.
Tainmara to Bundu, on ghat, 1,500—2,000 feet.
[Not in Herb., Calcutta, from Chutia Nagpur.]
631. *Lettsomia bella* Clarke.
Sirguja, 1,500—2,000 feet.
Calyx lined with crimson; capsule scarlet within.
632. *Lettsomia setosa* Roxb.
Jaspur, 1,500—2,000 feet.
Vern.—Bäktchi phül. A jungle climber.
633. *Ipomœa bona-nox* Linn.
Stations, etc., Cult.
Moonflower.
634. *Ipomœa muricata* Jacq.
Sirguja, 1,500—2,000 feet; among village jungle, doubtful cult.
635. *Ipomœa phœnicea* Roxb.
636. *Ipomœa Quamoclit* Linn.
Cult. in most stations, 500—2,000 feet.
637. *Ipomœa hederacea* Jacq.
Sirguja, 1,500—2,000 feet; on village fences, doubtful cult. In light-purple flower here.
638. *Ipomœa purpurea* Lamk.
Cult.; common.
Morning glory.
639. *Ipomœa barlerioides* Benth.
640. *Ipomœa calycina* Benth.
641. *Ipomœa digitata* Linn.
642. *Ipomœa Batatas* Lamk.
All stations, 500—2,000 feet.
Vern.—Säkärkänd. Sweet Potato.
643. *Ipomœa pes-tigridis* Linn.
Mahretta, Hazaribagh, 2,000—2,500 feet.
644. *Ipomœa eriocarpa* R. Br.
Mahretta, 2,000—2,500 feet; Jaspur, 2,000—2,500 feet.
Vern.—Kijuli (2). (In spite of the name; it does not cause itchiness: another kijuli is *Mucuna pruriens*, which does.)
645. *Ipomœa tridentata* Roth.
646. *Ipomœa chryseides* Ker.
647. *Ipomœa obscura* Ker.
Rudia-Lotwa Tea Estate, 1,500—2,000 feet.
648. *Ipomœa reniformis* Choisy.

649. *Ipomœa sepiaria* *Koen.*
Sirguja, 1,500—2,000 feet; near water-courses.
650. *Ipomœa aquatica* *Forsk.*
651. *Ipomœa cymosœa* *R. & S.*
Gunia, Toree Pergunnah, 1,500—2,000 feet.
652. *Ipomœa petaloidea* *Choisy.*
653. *Ipomœa Turpethum* *R. Br.*
654. *Ipomœa vitifolia* *Sw.*
Kewatbar, Palamow, 1,000—1,500 feet. Flowers bright yellow. Sometimes cult. on trellises.
655. *Ipomœa quinata* *R. Br.*
(Other species are cult. in gardens.)
656. *Convolvulus pluricaulis* *Choisy, var. macra.*
Sirguja, 1,500—2,000 feet; on paths and dry *maidāns*.
Flowers, white, size of a shilling.
657. *Evolvulus alsinoides* *Linn.*
Dorunda, 1,500—2,000 feet; Jaipur 1,500—2,000 feet;
Sirguja, 1,500—2,000 feet.
Flowers blue; common on dry *maidāns*.
658. *Jacquemontia violacea* *Choisy.*
Cultivated.
659. *Porana paniculata* *Roxb.*
Chutupalughat, 1,500—2,000 feet; Jaspur, 1,500—2,000 feet, also cult. in Ranchi; not so common in Jaipur jungles.
Vern.—Jharo (1) (Jaspur.) (Jharo (2) *Justicia simplex* (Acanthaceæ)).
660. *Cuscuta reflexa* *Roxb.*
Koru Chandwa ghat, 1,500—2,000 feet; Sirguja, 1,500—2,000 feet.
A "Dodder."

LXXX.—SOLANACEÆ.

661. *Solanum nigrum* *Linn.*
Palamow Forts, 1,000—1,500 feet; Chatrā, Hazaribagh 1,500—2,000 feet in cult. fields.
Plant about 12 in. high fruit eaten.
662. *Solanum tuberosum* *Linn.*
Villages and stations; cult. 500—2,500 or 3,000 feet.
Vern.—Alu, Aru. The Potato. Green tops also eaten as a vegetable (*sāg*).
663. *Solanum verascifolium* *Linn.*
664. *Solanum tervum* *Sw.*

665. *Solanum indicum* *Linn.*
 Chuta Pulughat, 1,500—2,000 feet ; Jaspurnagar 2,000—2,500 feet.
Vern.—Kūtūa. The fruit used as medicine in fever.
666. *Solanum Melongena* *Linn.*
 Villages ; cult. sometimes even in fields.
Vern.—Brinjal ; Beúgan ; Begūn. The Egg-Plant or Aubergine (Firminger).
667. *Solanum xanthocarpum* *Schr. & Wend.*
 Kautnagar, Singhbhām, 500—1,000 feet.
Vern.—Rāt-kāt-jānūm. The bud and flower, with salt (solution) good for watery eyes.
668. *Lycopersicum esculentum* *Mill.*
 All stations, 500—2,500 feet ; cult.
Vern.—Belāti Beúgān. The Tomato. Grows well in the open in the Chutia Nagpur.
669. *Physalis minima* *Linn.*
 Tangratola and Gerla villages, Jaspur, 2,000—2,500 feet.
Vern.—Rani-pūcco.
670. *Physalis peruviana* *Linn.*
 Stations, 500—2,500 feet ; cult., commonly, in gardens.
Vern.—Tipāri. Cape gooseberry. Good jam made of the fruit.
671. *Capsicum frutescens* *Linn.*
 Bankuli and Palandu Tea estates, 1,500—2,000 feet cult.
Vern.—Lal Miritch. The chillee.
672. *Capsicum minimum* *Roxb.*
 Cult., common.
 Bird's-eye chillee, *Eng.*
673. *Capsicum grossum* *Willd.*
 Cult.
 Bell Pepper, *Eng.*
674. *Datura fastuosa* *Linn.*
675. *Datura Stramonium* *Linn.*
 Gunia, Toree Pergunnah, 1,500—2,000 feet ; growing by the thana.
Vern.—*Datura Hind.*
 [Not in Herb., Calcutta, from Chutia Nagpur.]
676. *Nicotiana Tabacum* *Linn.*
 Palandu, 1,500—2,000 feet ; cult.
Vern.—Tāmācu. Tobacco.
677. *Nicotiana rustica* *Linn.*

LXXXI.—SCROPHULARINEÆ.

678. *Russelia juncea* *Zucc.*
Palandu, cult.; common in gardens.
679. *Maurandia Barclaiana* *Lindl.*
Stations; cult. on trellis work.
680. *Lophospermum scandens* *Don.*
Cult., most stations.
681. *Celsia coromandeliana* *Vahl.*
682. *Linaria ramosissima* *Wall.*
683. *Mazus rugosus* *Lour.*
Chatrā, Hazaribagh, 1,500—2,000 feet.
684. *Lindenbergia urticifolia* *Lehm.*
Pitorea, 2,000—2,500 feet.
685. *Stemodia viscosa* *Roxb.*
686. *Limnophila Roxburghii* *G. Don.*
687. *Limnophila conferta* *Benth.*
Jaspur, 1,500—2,000 feet, in water.
Vern.—Gadsi.
688. *Limnophila diffusa* *Benth.*
689. *Limnophila sessiliflora* *Bl.*
Sirguja, 1,500—2,000 feet, in water.
690. *Limnophila gratissima* *Bl.*
691. *Limnophila racemosa* *Benth.*
Santalia.
Vern.—Choto lutur, *Santal.* (Campbell & Watt.)
692. *Limnophila heterophylla* *Benth.*
693. *Limnophila gratioloides* *R. Br.*
Sirguja, 1,500—2,000 feet; on wet ground by a stream.
694. *Herpestis Monnieria* *H. B. K.*
Baragaou, 2,000—2,500 feet.
695. *Herpestis Hamiltoniana* *Benth.*
696. *Dopatrium junceum* *Roxb.*
Santalia (*Campbell & Watt.*)
697. *Torenia cordifolia* *Roxb.*
Parasnath, to 4,000 feet. (*F. B. I.*)
698. *Torenia pedunculata* *Benth.*
699. *Vandellia crustacea* *Benth.*
700. *Vandellia Hookeri* *Clarke.*
Parasnath (*F. B. I.*)
701. *Vandellia erecta* *Benth.*
702. *Vandellia angustifolia* *Benth.*
703. *Ilysanthes hyssopoides* *Benth.*
Sirguja, 1,500—2,000 feet; in water of small streams.
Flowers purple. [Not in Herb., Calcutta, from Chutia Nagpur.]

704. *Ilysanthes parviflora* *Benth.*
 705. *Bonnaya brachiata* *Link & Otto.*
 706. *Bonnaya veronicæfolia* *Spreng.*
 707. *Scoparia dulcis* *Linn.*
 Sitonga, Jaspur, 2,000—2,500 feet; Dorunda, 1,500—2,000 feet; a garden weed.
 Vern.—Hürhüría (Jaspur). Flowers white.
 708. *Alectra indica* *Benth.*
 Parasnath, 4 000 feet. (*F. B. I.*)
 709. *Alectra?* *Thomsoni* *Hook. f.*
 Parasnath, 3,000 feet. (*F. B. I.*), "parasitic on *Strobilanthes.*"
 710. *Buchnera hispida* *Ham.*
 Sirguja, 2,000—2,500 feet, on a dry rock ghat road.
 Stem leafless; 25 inches high.
 711. *Striga lutea* *Lour.*
 712. *Striga euphrasioides* *Benth.*
 713. *Centranthera hispida* *R. Br.*
 714. *Centranthera humifusa* *Wall.*
 Parasnath (*F. B. I.*)
 715. *Sopubia delphinifolia* *G. Don.*
 Parasnath (*F. B. I.*)

LXXXII.—OROBANCHACEÆ.

716. *Aeginetia indica* *Linn.*
 Santalia.
 Vern.—Pathu orot *Santal.*
 717. *Orobanche indica* *Ham.*
 Kotarki, Sirguja, 1,500—2,000 feet; growing plentifully on field-mustard.
 Flower purple-blue.

LXXX—LENTIBULARIÆ.

718. *Utricularia stellaris* *Linn. f.*
 719. *Utricularia flexuosa* *Vahl.*
 720. *Utricularia exoleta* *R. Br.*
 721. *Utricularia bifida* *Linn.*
 Jaspur, 2,000—2,500 feet.
 Vern.—Masuria. Flowers yellow, growing on wet soil-rice-stubble.
 722. *Utricularia racemosa* *Wall.*
 Jaspur, 2,000—2,500 feet.
 Vern.—Masuria. Flowers, purple.
 723. *Utricularia hirta* *Klein.*

LXXXIV.—GESNERACEÆ.

724. *Didyamocarpus pygmæa* *C. B. Clarke*.
Lohardugga, 1,500—2,000 feet, *Clarke*.
725. *Rhynchoglossum obliquum* *Bl.*—*var. parviflora*.
(*Achimenes* sp.; cult. in pots ; all stations, 500—2,000 feet.)

LXXXV.—BIGNONIACEÆ.

726. *Millingtonia hortensis* *Linn. f.*
Ranchi, common, 1,500—2,000 feet, planted in avenues.
(Bastard) Cork-tree. Very graceful ; upset by wind.
727. *Oroxylum indicum* *Vent.* (*Bignonia indica* *Roxb.*)
Sitonga village, Jaspur, 2,000—2,500 feet ; Hetgagh,
Jaspur, 1,500—2,000 feet ; Runka village, Palamow,
1,500—2,000 feet.
Vern.—Ginjen ; Dak-dawa ; Sicat (Palamow). A tree
up to 40 feet high ; capsule 2—3 feet long, 2—4 inches
broad ; seeds purgative.
728. *Bignonia venusta* *Ker-Gawl.*
All stations, cult ; common, 500—2,000 feet.
Vern.—Chirere. A climber, orange-scarlet flowers,
inch long, in clusters.
729. *Tecoma jasminoides* *Lindl.*
Ranchi, 1,500—2,000 feet ; cult.
A scandent shrub, very beautiful ; flowers rosy-white with
dark purple centres (Firminger).
730. *Tecoma stans* *Fuss.*
Stations, cult., 1,500—2,000 feet.
A shrub, 6—8 feet high ; flowers large, golden-yellow.
731. *Stereospermum suaveolens* *DC.*
Dorunda 1,500—2,000 feet, roadside tree ; Sirguja 1,500—
2,000 feet.
Vern.—Papré, Siriss, Padar (Chutia Nagpur proper).
The name *Siriss*, given as well as Papré, in Sirguja, is
possibly by mistake for some other tree, say *Albizzia*
Lebbe, which is also *Siriss*.

LXXXVI.—PEDALINEÆ.

732. *Martynia diandra* *Glox.*
Ranchi, 1,500—2,000 feet.
Tiger-claw, Devil's-claw ; an American weed.

733. *Sesamum indicum* DC.
Villages, frequent by middens; also cult. in fields for oil-seeds, 500—2,000 feet.
Vern.—Krishna-til; Til.

LXXXVII.—ACANTHACEÆ.

734. *Thunbergia fragrans* Roxb. var. *lævis*.
735. *Thunbergia tomentosa* Wall.
736. *Thunbergia alata* Boj.
Cult., common about Ranchi; ? naturalized.
737. *Thunbergia grandiflora* Roxb.
Dorunda, 1,500—2,000 feet, cult., on trees.
738. *Thunbergia laurifolia* Lindl.
Ranchi, 1,500—2,000 feet, cult.
738A. *Elytraria crenata* Vahl.
739. *Nelsonia campestris* R. Br.
739A. *Hygrophila polysperma* T. And.
740. *Hygrophila salicifolia* Nees.
741. *Hygrophila quadrivalvis* Nees.
742. *Hygrophila spinosa* T. And.
Jaspur, 2,000—2,500 feet.
Vern.—Dhela Kanta. Flowers blue, common in moist places.
743. *Ruellia prostrata* Lamk.
Common; flowers purple.
744. *Ruellia cernua* Roxb.
745. *Ruellia suffruticosa* Roxb.
746. *Petalidium barlerioides* Nees.
747. *Phayloopsis parviflora* Willd.
748. *Dædalacanthus nervosus* T. And.
Bandgaon, 2,000—2,500 feet.
Flowers blue.
749. *Dædalacanthus purpurascens* T. And.
Bandgaon, 2,000—2,500 feet; Pertabpur, Sirguja, 1,500—2,000 feet; in scrub jungle.
Flowers blue.
750. *Hemigraphis latebrosa* Nees.
Tamar, 500—1,000 feet.
751. *Strobilanthes auriculatus* Nees.
Jaspur, 1,500—2,000 feet; on rocky hill-tops.
Vern.—Bainsa phul. Said to flower every three years.
752. *Strobilanthes sabinianus* Nees.
Palandu, 1,500—2,000 feet, cult. in garden.

753. *Blepharis boerhaavifolia Pers.*
 754. *Blepharis molluginifolia Pers.*
 755. *Barleria Prionitis Linn.*
 Santalia (Campbell & Watt).
 Vern.—Kanta phul, *Santal.*
 756. *Barleria strigosa Willd.*
 Tamar ghat, 1,500—2,000 feet ; also cult. in gardens.
 757. *Barleria cristata Linn*
 Pitorea, East hill, 2,000—2,500 feet ; Jaspur, 2,000—2,500
 feet ; Sirguja 1,500—2,000 feet ; and elsewhere on ghats
 and in dry jungle.
 Vern.—Gokhura (in Jaspur, where the Zemindar insists
 that this is very *local* plant).
 758. *Andrographis paniculata Nees.*
 Pitorea, East hill, 2,000—2,500 feet ; Sirguja 1,500—2,000
 feet.
 Vern.—Kalmeg, Charayta. The Great *Eng.* ; used as a
 medicine ; one of the *Chirettas.*
 759. *Andrographis echioides Nees.*
 760. *Lepidagathis Hamiltoniana Wall.*
 761. *Lepidagathis trinervis Nees.*
 762. *Lepidagathis hyalina Nees.*
 763. *Lepidagathis purpuricaulis Nees.*
 764. *Lepidagathis fasciculata Nees.*
 765. *Justicia Betonica Linn.*
 Ramandag reserve, Palamow, 1,000—1,500 feet, *Gamble* ;
 Jaspurnagar 2,000—2,500 feet.
 Vern.—Chitowr.
 766. *Justicia Gendarussa Linn.*
 767. *Justicia quinqueangularis Nees.*
 Ranchi, 1,500—2,000 feet.
 768. *Justicia diffusa Willd.*
 Sirguja, 1,500—2000, common.
 Flowers purple.
 769. *Justicia simplex Don.*
 Jaspur, 2,000—2,500 feet.
 Vern.—Jharo.
 770. *Justicia procumbens Linn.*
 Jonha to Sandimandi,* 1,000—1,500 feet. (Not in Herb.,
 Calcutta, from Chutia Nagpur.)

* Sandimandi (Mundari) = "Adam and Eve." A waterfall, south of Jonha Police Station and Dak Bungalow ; a romantic glen and 100 feet fall, very beautiful—*J. J. W.*

771. *Adhatoda Vasica* Nees.
Pitorea, East hill, 2,000—2,500 feet.
772. *Rhinacanthus communis* Nees.
Palandul 1,500—2,000 feet, *A. Cooke*.
773. *Rungia parviflora* Nees—*var. pectinata*.
Jabra, S. of Chatra, Hazaribagh, 1,000—1,500 feet, very thickly distributed on the ground under Bur (*Ficus bengalensis*) trees; Pitorea, East Hill, * 2,000—2,500 feet; Jaspur, 2,000—2,500 feet, on dry rocky knolls; Sirguja, on dry rocks.
Vern.—Lila-jān (Jaspur). Flowers blue and elastic seed (? fruit).
774. *Dicliptera micrantha* Nees.
775. *Dicliptera Roxburghiana* Nees.
Pitorea, East Hill, 2,000—2,500 feet.
776. *Peristrophe bicalyculata* Nees.
Toree pergunnah, 1,000—1,500 feet on waste land.
Flowers white, purple blotch on upper limb of bipartite corolla.

LXXXVIII.—VERBENACEÆ.

777. *Lantana indica* Roxb.
778. *Lantana Camara* Linn.
Dournda, 1,500—2,000 feet; cult. and wild.
A Brazilian plant, makes a straggling hedge.
779. *Lippia nodiflora* Rich.
780. *Lippia geminata* H. B. K.
781. *Aloysia citriodora* Orteg.
All stations, cult. in gardens and pots.
Lemon-scented Verbena, *Eng.*
782. *Stachytarpheta indica* Vahl.
Ranchi, 1,500—2,000 feet.
Flowers blue, or pink.
783. *Verbena officinalis* Linn.
784. *Duranta Plumieri* Jacq.
Bankuli Tea-Estate, 1,500—2,000 feet; common, cult. as hedges.
Duranta Eng.; American; flower blue, berries orange; dull green leaf. One variety has spines, this has none.

* This hill is granitic gneiss, much broken up, but not large rocks, and jungle covered.—*J. J. W.*

785. *Callicarpa arborea Roxb.*
 Dhadka, Manbhum, 500—1,000 feet; Jaigri, Palamow,
 1,500—2,000 feet. *Gamble.*
Vern.—Harula. Birds eat the fruit.
786. *Callicarpa macrophylla Vahl.*
 Barasand, Palamow. *Gamble.*
787. *Tectona grandis Linn.*
 Ranchi and Dorunda, 1,500—2,000 feet; cult. but does
 not thrive; the trees are about 20 feet or so.
Teak Eng.
788. *Premna latifolia Roxb.*
789. *Premna herbacea Roxb.*
790. *Gmelina arborea Linn.*
 Palandu Tea-Estate, 1,500—2,000 feet. *A. Cooke.*
Vern.—Gumhár.
791. *Vitex Negundo Linn.*
 Jaspur, 2,000—2,500 feet, common as hedges near villages.
Vern.—Senduár. A shrub, to 15 feet and upwards.
792. *Vitex peduncularis Wall.*
 Bandgaon, 2,000—2,500 feet.
- 792A. *Clerodendron phlomoides Linn.*
793. *Clerodendron serratum Spreng.*
 Hundrughag, 1,500—2,000 feet; Mahretta Tea Estate,
 2,000—2,500 feet.
794. *Clerodendron infortunatum Gærtn.*
 Jingi, Lohardagga, 1,500—2,000 feet; Dorunda.
 A roadside weed (scrub jungle) in Dorunda.
795. *Clerodendron Siphonanthus R. Br.*
 Ranchi, 1,500—2,000 feet; Jaspur, 1,500—2,000 feet; Sir-
 guja 1,500—2,000 feet.
Vern.—Parola (Jaspur). Flowers September or earlier.
796. *Clerodendron Thomsoni Balf.*
 Ranchi, cult. in gardens.
 (Other species of *Clerodendron* are cultivated in stations.)
797. *Holmskioldia sanguinea Retz.*
 Pitorea, East hill, 2,000—2,500 feet.
798. *Petraea volubilis Linn.*
 Cult. in gardens and on trellises.
 A red-stemmed, blue-flowered climber.
799. *Symphorema polyandrum Wight.*

LXXXIX.—LABIATÆ.

800. *Ocimum canum Sims.*
801. *Ocimum Basilicum Linn.*
Santalia (Campbell & Watt).
Vern.—Dimbu Baha, Mali Baha, *Santal.*
802. *Ocimum gratissimum Linn.*
 Sillee, 500—1,000 feet; Jaspur, 2,000—2,500 feet.
Vern.—Kāla tūsi; Dimbu phūl, Ban tūsi.
803. *Ocimum sanctum Linn.*
 Tamar, 500—1,000 feet; Tantanagar, Singbhum, 500—
 1,000 feet.
Vern.—Tūlūsi, Tulsi, Atchamba. Used in hæmaturia.
804. *Acrocephalus capitatus Benth.*
Santalia (Campbell & Watt).
805. *Orthosiphon pallidus Royle.*
806. *Orthosiphon rubicundus Benth.*
807. *Orthosiphon stamineus Benth.*
808. *Plectranthus ternifolius Don.*
809. *Plectranthus incanus Link.*
 Sirguja, 1,500—2,000 feet, among dry rocks in open pas-
 ture land.
810. *Coleus barbatus Benth.*
 Parasnath, 4,500 feet, *Thomson.*
811. *Coleus aromaticus Benth.*
 In gardens, cult most stations.
812. *Coleus scutellarioides Benth.*
 In gardens, cult.
813. *Anisochilus carnosus Wall.*
 Jaspur, 2,000—2,500 feet; Sirguja, 1,500—2,000 feet; on
 rocky knolls.
Vern.—Chota pipar.
814. *Hyptis suaveolens Poit.*
Vern.—Gunga tūsi (Campbell & Watt).
815. *Lavandula Burmanni Benth.*
816. *Pogostemon plectranthoides Desf.*
 Hazaribagh, 1,500—2,000 feet; also top of Parasnath,
Hooker.
817. *Dysophylla cruciata Benth.*
 Sirguja, 1 500—2,000 feet.
 Head of flowers purple; grows in or near water.
818. *Dysophylla verticillata Benth.*
819. *Dysophylla pentagona C. B. Clarke.*
 Singbhuni, 2,000 feet.

820. *Colebrookia oppositifolia Sw.*
Pitorea, East Hill, 2,000—2,500 feet.
821. *Micromeria capitellata Benth.*
822. *Micromeria biflora Benth.*
Chama, Lobardugga dist., 1,500—2,000 feet.
Flowers small, light purple.
823. *Calamintha umbrosa Benth.*
824. *Salvia plebeja R. Br.*
825. *Nepeta ruderalis Ham.*
826. *Anisomeles ovata R. Br.*
827. *Leucas lanata Benth.—var. nagpurensis.*
828. *Leucas montana Spreng.*
829. *Leucas mollissima Wall.*
Mahretta Tea Estate, 2,000—2,500 feet.
Var. scaberula.
Jaspur, 2,000—2,500.
Vern.—Bibi gora.
830. *Leucas Clarkei Hook f.*
831. *Leucas nutans Spreng.*
832. *Leucas Cephalotes Spreng.*
Santalia (Cambell & Watt).
Vern.—Dhurpi sag Hind. Andia durap arak, Santal.
833. *Leucas martinicensis R. Br.*
834. *Leucas hyssopifolia Benth.*
835. *Leucas aspera Spreng.*
836. *Leucas linifolia Spreng.*
837. *Leonotis nepetæfolia R. Br.*
Chatra, 1000—1,500 feet.
Reaches six feet in height.
838. *Ajuga macrosperma Wall.—var. breviflora.*

XC.—NYCTAGINEÆ.

839. *Mirabilis Jalapa Linn.*
Stations, 500—2,000 feet, cult.
Marvel of Peru.
840. *Boerhaavia repens Linn.*
Kewatbar, Palamow, 1,000—1,500 feet.
841. *Bougainvillea glabra Choisy.*
Bankuli Tea Estate, etc., 1,500—2,000 feet, in gardens cult.

XCI.—AMARANTACEÆ.

842. *Deeringia celosioides* R. Br.
 843. *Celosia argentea* Linn.
 Jaspur, 1,500—2,000 feet, common.
 Vern.—Siliari. Leaves eaten as a *sāg* (vegetable).
 844. *Celosia cristata* Linn.
 845. *Allmania nodiflora* R. Br.
 846. *Digera arvensis* Forsk.
 847. *Amarantus spinosus* Linn.
 848. *Amarantus paniculatus* Linn.
 849. *Amarantus caudatus* Linn.
 850. *Amarantus gangeticus* Linn.
 851. *Amarantus margostanus* Linn.
 852. *Amarantus viridis* Linn.
 853. *Amarantus Blitum* Linn. *Var.* oleraceus.
 (Species of *Amarantus* are largely cultivated in stations
 and villages by natives as potherbs.
 Vern.—*Sāg*, Lal *Sāg*, etc.)
 854. *Pupalia atropurpurea* Moq.
 855. *Ærua scandens* Wall.
 856. *Ærua lanata* Fuss.
 Chatra, 1,000—1,500 feet; Sirguja, 1,500—2,000 feet, by
 roadsides and in cultivated and waste ground.
 Vern.—*Jārka bariāri*.
 857. *Ærua Monsonia* Mart.
 858. *Achyranthes aspera* Linn.
 Chatra, 1,000—1,500 feet; Jaspur, 1,500—2,000 feet;
 very common (and annoying) in waste places.
 Vern.—Chinchiri; Tirchiti.
 Var. porphyristachya.
 Parasnath.
 859. *Achyranthes bidentata* Bl.
 860. *Alternanthera sessilis* R. Br.
 Pochra, Toree Pergunnah, 500—1,000 feet; Jaspur 2,000
 —2,500 feet.
 861. *Gomphrena globosa* Linn.

XCII.—CHENOPODIACEÆ.

862. *Chenopodium album* Linn.
 863. *Beta, vulgaris* Linn.
 All stations, 500—2,000 feet, cult. in gardens.
 Beet, Eng.

864. *Spinacia oleracea* Linn.

All stations, 500—2,000 feet, cult. in gardens.

Spinach, *Eng.*

865. *Basella rubra* Linn.

Sillee, 500—1,000 feet, common, cult. on village garden fences.

Vern.—Chota Pūi Sāg.

XCIII.—POLYGONACEÆ.

866. *Polygonum plebejum* R. Br.

Etkuri, 1,000—1,500 feet.

867. *Polygonum limbatum* Meisn.868. *Polygonum glabrum* Willd.

Gunia, Toree Pergunnah, in running water, 1,000—1,500 feet; Tirla-nadi, 2,000—2,500 feet; Lohardugga dist., 1,500—2,000 feet.

Vern.—Hūrā pota; Manj; Mächli-ka-manj. A water-plant; used as a fish-poison.

869. *Polygonum stagninum* Ham.870. *Polygonum barbatum* Linn.

Gunia, Toree Pergunnah, common in running water, 1,000—1,500 feet; Bandgaon, 2,000—2,500 feet; Jaspur, 2,000—2,500 feet, in a stream-bed.

Vern.—Mangar leta (Jaspur). A water or marsh-plant.

871. *Polygonum hydropiper* Linn.872. *Polygonum alatum* Ham.

Parasnath.

873. *Polygonum capitatum* Ham.

Parasnath.

874. *Polygonum chinense* Linn.

Parasnath.

875. *Rumex dentatus* Linn.

Kewätbar, 1,000—1,500 feet.

876. *Antigonon leptopus* Endl.

Most stations, 500—2,000 feet; cult. in gardens.

XCIV.—ARISTOLOCHIACEÆ.

877. *Aristolochia bracteata* Retz.

(*Aristolochia labiosa*, cult. in gardens, Ranchi.)

XCV.—PIPERACEÆ.

878. *Piper longum* Linn.

Palandu Tea Estate, 1,500—2,000 feet cult. *Cooke.*

879. *Piper Betle* Linn.
Cult.
Vern.—Pān.
880. *Peperomia reflexa* Dietr.
Parasnath.

XCVI.—LAURINEÆ.

881. *Litsæa sebifera* Pers.
Dorunda, 1,500—2,000 feet.
882. *Litsæa polyantha* Fuss.
883. *Litsæa nitida* Roxb.
Chyebassa, 500 feet, Haines.
884. *Cassytha filiformis* Linn.
Santalia (Campbell & Watt).
Vern.—Alag jāri Santal. (Another *Alag jāri* is *Cuscuta chinensis* Lamk.)

XCVII.—LORANTHACEÆ.

885. *Loranthus scurrula* Linn.
Ranchi, 1,500—2,000 feet, not so common as *L. longiflorus*;
Jaspur, 1,500—2,000 feet; Kochang, 2,000—2,500 feet
growing on *Woodfordia floribunda* Salisb.
Vern.—Dawai banda (Banda = parasite = slave).
886. *Loranthus cordifolius* Wall.
887. *Loranthus longiflorus* Desrouss.
Pitorea, West hill, 2,000—2,500 feet; Ranchi, 1,500—2,000
feet.
Vern.—Banda. Very common on Mango-trees through-
out Chutia Nagpur; has handsome clusters of orange
flowers. (Banda is a general term for Loranthaceous
plants.)
888. *Loranthus globosus* Roxb.
889. *Viscum monoicum* Roxb.
Pitorea, East bill 2,000—2,500 feet.
Vern.—Pet chamra banda Santal. A mistletoe.
890. *Viscum orientale* Willd.
Lunkta, Hazaribagh, 1,000—1,500 feet.
Vern.—Banda Santal, Kol, Hind. A mistletoe.
891. *Viscum articulatum* Burm.
Kurwāndi Res., Palamow, 1,000—1,500 feet, Gamble;
Rāke 500—1,000 feet. A mistletoe, flowers white.

XCVIII.—SANTALACEÆ.

892. *Santalum album* *Linn.*

XCIX.—EUPHORBIACEÆ.

893. *Euphorbia hypericifolia* *Linn.*

894. *Euphorbia pilulifera* *Linn.*

Jasurnagar, 2,000—2,500 feet; Sirguja, 1,500—2,000 feet; in open pasture land; Dorunda, 1,500—2,000 feet; a garden weed.

Vern.—Du-dudhia.

895. *Euphorbia thymifolia* *Burm.*

Ranchi, 1,500—2,000 feet.

896. *Euphorbia microphylla* *Heyne.*

Santalia.

Vern.—Dudhia phul

897. *Euphorbia Tirucalli* *Linn.*

898. *Euphorbia neriifolia* *Linn.*

899. *Euphorbia Nivulia* *Ham.*

900. *Euphorbia antiquorum* *Linn.*

901. *Euphorbia dracunculoides* *Lamh.*

Jaspur, 2,000—2,500 feet.

Vern.—Chota Brahmini.

902. *Euphorbia prolifera* *Ham.*

Jaspur, 2,000—2,500 feet, on cultivated ground.

Vern.—Hürhüría. Juice milky.

[Not in herb., Calcutta from Chutia Nagpur.]

903. *Euphorbia pulcherrima* *Willd.*

Stations, 500—2,500 feet cult.

Adjutant's Hedge, *Eng.*

904. *Bridelia retusa* *Spreng.*

Tirla nadi, 2,000—2,500 feet; Pitorea East hill, 2,000—2,500 feet; Jaspur, 1,500—2,000 feet; Thanakatarki, Sirguja, 1,500—2,000 feet.

Vern.—Kawj, kāsāi or kasei,? kari. A tree, 30—40 feet high; berries white. Root astringent.

905. *Bridelia montana* *Willd.*

Parasnath.

906. *Bridelia stipularis* *Bl.*

907. *Bridelia tomentosa* *Bl.*

Ranchi, 1,500—2,000 feet; Dorunda, 1,500—2,000 feet; cult.; fruit eaten.

908. *Cleistanthus collinus Benth.*
Vern.—Kargalli *Santal*.
909. *Sauropus quadrangularis Muell.-Arg.*
910. *Phyllanthus reticulatus Poir.*
911. *Phyllanthus Emblica Linn.*
 Palamow, 1,000—1,500 feet; Jaspur, 2,000—2,500 feet;
 Dorunda, 1,500—2,000 feet. Cult. also common in jungle.
Vern.—Amla, āmra or aonla. The Embelic merobalan of
 commerce. Fruit, size of a gooseberry, pickled, and
 used in tanning.
912. *Phyllanthus Lawii Grah.*
913. *Phyllanthus urinaria Linn.*
 Jabra, Hazaribagh, 1,500—2,000 feet, in moist places by
 rice fields.
914. *Phyllanthus simplex Retz.*
915. *Phyllanthus pendulus Roxb.*
 Ranchi, 1,500—2,000 feet.
 [There is no specimen of this in Herb., Calcutta.]
916. *Phyllanthus Niruri Linn.*
 Jaspur, 2,000—2,500 feet; common.
Vern.—Bān-jiran or jiran-bān or Arjuni (possibly Ar-
 guni).—*Ḷ. Ḷ. W.*
917. *Phyllanthus debilis Ham.*
918. *Glochidion multiloculare Muell.-Arg.*
919. *Glochidion lanceolarium Dals.*
 Ranch, 1,500—2000ft. ; Jaspur, 2,000—2,500 feet.
Vern.—Chikni. A shrub, 10—15 feet high. Used by
 potters (kūmār) in pottery (in what way is doubtful).—
Ḷ. Ḷ. W.
920. *Glochidion velutinum Wight.*
921. *Flueggia microcarpa Bl.*
 Baragaon, 2,000—2,500 feet; Dorunda garden, 1,500—
 2,000 feet.
Vern.—Bakleri. A straggling shrub.
922. *Breynia rhamnoides Muell.-Arg.*
Vern.—Kadrupala, karki *Santal*.
923. *Putranjiva Roxburghii Wall.*
Vern.—Pitaj *Santal*
924. *Bischofia javanica Bl.*
925. *Antidesma Ghæsembilla Gærtn.*
Vern.—Umtoa (Hazaribagh), Mata sure *Kol.* (Watt.)

926. *Antidesma Bunius Spreng.*
Jaspur, 2,000—2,500 feet; on low hills in scrub jungle.
Vern.—Matha.
927. *Antidesma diandrum Roth.*
Bāragāon, 2,000—2,500 feet; at the base of Marang Būrū
or Bāragai Hill.
Vern.—Müttūr Sāg.
928. *Antidesma acuminatum Wall.*
929. *Jatropha gossypifolia Linn.*
Ranchi, 1,500—2,000 feet. A roadside weed, common.
930. *Jatropha multifida Linn.*
Ranchi, etc., 1,500—2,000 feet, cult.
931. *Jatropha Curcas Linn.*
Stations, etc., 500—2,000 feet, common, cult. in gardens.
Vern.—Berenda. Poison-Physic or Purging-nut, *Eng.*
932. *Croton oblongifolius Roxb.*
Latéhar, Palamow, 1,000—1,500 feet; the commonest
shrub in the jungles.
Vern.—Pūtri,
933. *Croton caudatus Geisel.*
- 933A. *Croton Tigilium Linn.*
934. *Codiaeum variegatum Bl.*
Stations, 500—2,000 feet; cult. as foliage plants.
935. *Chrozophora plicata A. Fuss.*
Santalia (Campbell & Watt).
Vern.—Pangs nari *Santal.*
936. *Mallotus repanda Muell.-Arg.*
937. *Mallotus philippinensis Muell.-Arg.*
Pitorea, East Hill, 2,000—2,500 feet; Sirguja.
Vern.—Rori,
938. *Ricinus communis Linn.*
Cult. in fields throughout Chutia Nagpur as an oil seed.
Vern.—Rēri, (=Rhendi).
Castor-oil plant, *Eng.*
939. *Homonoia riparia Lour.*
Tirla nadi, 2,000—2,500 feet; Jaspur.
Vern.—Cheūr. A shrub-like a willow, frequent in water-
courses.
940. *Gelonium multiflorum A. Fuss.*
941. *Baliospermum axillare Bl.*
Mumka-Palamow road, 1,500—2,000 feet.
942. *Tragia involucrata Linn.*
943. *Sebastiania Chamælea Muell.-Arg.*

C.—URTICACEÆ.

944. *Holoptelea integrifolia* *Planch.*
Hupwa outpost and elsewhere in Hazaribagh district,
1,500—2,000 feet.
Vern.—Chiryta. A large tree very like a beech; leaves
wavy, entire; seed two-winged.
945. *Trema orientalis* *Bl.*
Jonha 1,500—2,000 feet; Jaspur, 1,500—2,000 feet.
Leaves used to polish wood.
946. *Trema amboinensis* *Bl.*
Ranchi, 1,500—2,000 feet.
947. *Trema politoria* *Planch.*
948. *Cannabis sativa* *Linn.*
Villages, up to 2,000 feet; Cult. (? frequently) in fields.
Dried plant sold in bazars. Bang—the form used, also
Churrus.
Vern.—Ganja.
Hemp, *Eng.*
949. *Streblus asper* *Lour.*
Santalia (Campbell & Watt).
Vern.—Sahra *Santal.*
950. *Morus lævigata* *Wall.*
Dorunda Garden, 1,500—2,000 feet; Palandu, 1,500—2,000
feet; *Cooke*; cult.
Vern.—Toont. Fruit purple, cylindrical, eaten.
951. *Ficus gibbosa* *Bl.*—*var.* *parasitica.*
952. *Ficus bengalensis* *Linn.*
Here and there throughout Chutia Nagpur.
Vern.—Bar (Burr).
953. *Ficus tomentosa* *Roxb.*
954. *Ficus Benjaminia* *Linn.*—*var.* *comosa.*
955. *Ficus retusa* *Linn.*—*var.* *nitida.*
Pitorea, East Hill, 2,000—2,500 feet; Chyebassa 500—
1,000 feet.
Vern.—Buru hesa *Ho*; Bowr.
956. *Ficus nervosa* *Roth.*
957. *Ficus Rumphii* *Bl.*
958. *Ficus religiosa* *Linn.*
959. *Ficus Arnottiana* *Miq.*
960. *Ficus infectoria* *Roxb.*—*var.* *Lambertiana.*

961. *Ficus hispida* *Linn. f.*
Old garden, Pitorea, 2,000—2,500 feet.
Vern.—Dümär, Porho.
962. *Ficus Cunia* *Ham.*
Kurughat, Ranchi, probably planted.
Vern.—Dümbär.
963. *Ficus scandens.* *Roxb.*
Santalia (Campbell & Watt); Parasnath (Hooker).
Vern.—Madhur lata *Santal.*
964. *Ficus Roxburghii* *Wall.*
Kochang, Singbhum district, 2,000—2,500 feet.
965. *Ficus glomerata* *Roxb.*
Santalia (Campbell & Watt).
Vern.—Loa *Santal.*
966. *Artocarpus integrifolia* *Linn. f.*
Stations and villages, cult. common.
Vern.—Kätäl. The Jack-fruit tree.
967. *Artocarpus Lakoocha* *Roxb.*
968. *Girardinia zeylanica* *Dcne.*
969. *Bœhmeria platyphylla* *Don.*—*var* *scabrella.*
970. *Pouzolzia indica* *Gaud.*
971. *Pouzolzia auriculata* *Wight.*
972. *Pouzolzia pentandra* *Burm.*
Sirguja, Bisrampur coal field, 1,500—2,000 feet.
973. *Pouzolzia hirta* *Hassk.*

CI.—SALICINEÆ.

974. *Salix tetrasperma* *Roxb.*
Kudia Lotwa Tea Estate, 1,500—2,000 feet; Singbhum,
500—1,000 feet.

CII.—CERATOPHYLLÆ.

975. *Ceratophyllum demersum* *Linn.*

CIII.—CONIFERÆ.

976. *Pinus longifolia* *Roxb.*
Dorunda, 1,500—2,000 feet, cult.
A tree; reaches 40 feet or so in height in Dorunda.

CIV.—HYDROCHARIDEÆ.

977. *Hydrilla verticillata* *Casp.*
Sirguja, 1,500—2,000 feet, in water.

978. *Lagarosiphon Roxburghii* *Benth.*
 979. *Vallisneria spiralis* *Linn.*
 980. *Blyxa Roxburghii* *Rich.*
 981. *Blyxa oryzetorum* *Hook. f.*
 982. *Ottelia alismoides* *Pers.*
 Sirguja, 2,000—2,500 feet; Pertabpur, 1,500—2000 feet
 in tanks.
Vern.—Jälkumi.

CV.—BURMANNIACEÆ.

983. *Burmannia cœlestis* *Don.*

CVI.—ORCHIDEÆ.

984. *Microstylis congesta* *Reichb. f.*
 985. *Oberonia iridifolia* *Lindl.?* [Not yet seen in flower.]
 986. *Oberonia Falconeri* *Hook. f.*
 987. *Dendrobium herbaceum* *Lindl.*
 988. *Dendrobium formosum* *Roxb.*
 989. *Dendrobium bicameratam* *Lindl.*
 990. *Dendrobium crepidatum* *Lindl.*
 991. *Dendrobium macrostachyum* *Lindl.*
 Sillee, 1,000 feet.
 992. *Dendrobium calceolaria* *Corey.*
 993. *Dendrobium transparens* *Wall.*
 994. *Dendrobium regium* *Prain.*
 995. *Bulbophyllum triste* *Reichb. f.*
 996. *Eria flava* *Hook.*
 997. *Pachystoma senile* *Reichb. f.*
 998. *Phajus Wallichii* *Lindl.*
 999. *Pholidota imbricata* *Lindl.*
 1000. *Eulophia nuda* *Lindl.*
 1001. *Geodorum dilatatum* *R. Br.*
 1002. *Luisia trichorhiza* *Bl.*
 1003. *Rhynchostylis retusa* *Bl.*
 1004. *Ærides multiflorum* *Roxb.*
 Hindibili, Sandi-mandi waterfall, 1,000—1,500 feet.
 1005. *Ærides odoratum* *Lindl.*
 1006. *Vanda parviflora* *Lindl.*
 1007. *Vanda Roxburghii* *R. Br.*
 Sirguja, 1,500—2,000 feet; Palandu, 1,500—2,000 feet.
Vern.—Banda.
 1008. *Saccolabium præmorsum* *Hook. f.*
 1009. *Sarcanthus insectifer* *Reichb. f.*

1010. *Vanilla planifolia* *Andr.*
Palandu Teà Estate, 1,500—2,000 feet; cult. *Cooke.*
(Mr. Cooke says that it develops pods.)
1011. *Zeuxine sulcata* *Lindl.*
1012. *Acanthephippium* sp. [flowers not yet seen].
1013. *Goodyera procera* *R. Br.*
1014. *Habenaria stenopetala* *Lindl.*
1015. *Habenaria plantaginea* *Lindl.*
1016. *Habenaria triflora* *Don.*
1017. *Habenaria Susannæ* *R. Br.*
Chandua-mandu Road, Tooree, 1,000—1,500 feet.
Vern.—? Saida.
1018. *Habenaria commelinifolia* *Wall.*
1019. *Habenaria platyphylla* *Spreng.*
Jonha, 1,000—1,500 feet.
[Not in Herb., Calcutta, from Chutia Nagpur.]
1020. *Habenaria affinis* *Wight.*
1021. *Habenaria marginata* *Colebr.*
1022. *Habenaria diphylla* *Dals.*
1023. *Habenaria goodyerioides* *Don.*
1024. *Habenaria Lawii* *Hook. f.*
1025. *Habenaria Galeandra* *Benth.*

CVII.—SCITAMINEÆ.

1026. *Globba orixensis* *Roxb.*
Banda-Tantar, 500—1,000 feet.
1027. *Globba ophioglossa* *Wight.*
Parasnath, 2,500 feet.
1028. *Globba bulbifera* *Roxb.*
1029. *Kæmpferia rotunda* *Linn.*
1030. *Gastrochilus longiflora* *Wall.*
1831. *Hedychium coronarium* *Kæn.*
Jonha, 1,000—1,500 feet.
Vern.—Saida. Flowers white, sweet-scented.
1032. *Hedychium coccineum* *Hom.*
Mārang-buru, or Bāragai hill, 4,000 feet.
Flowers, scarlet-crimson. Not elsewhere met with.—
J. J. W.
[Not in Herb., Calcutta, from Chuttia Nagpur].*

*[Mārang-Buru, (the Great mountain) is also the Santal national deity, propitiated, according to Sir W. W. Hunter, by sacrifices involving bloodshed or by offerings of red flowers. Is the unexpected existence of *H. coccineum* in Chuttia Nagpur, and its apparent restriction to Bāragai, to be explained by deliberate introduction by Santhals?—*Ed. Records.*]

1033. *Curcuma aromatica* *Salisb.*
 1034. *Curcuma Zedoaria* *Roscoe.*
 1035. *Curcuma cæsia* *Roxb.*
 1036. *Curcuma Amada* *Roxb.*
 1037. *Curcuma longa* *Linn.*
 Parasnath, 4,000—5,000 feet.
 Vern.—Haldi.
 Turmeric, *Eng.*
1038. *Curcuma reclinata* *Roxb.*
 1039. *Curcuma petiolata* *Roxb.*
 Jaspur, 2,000—2,500 feet.
 Vern.—Saru'ga.
 [Not in Herb., Calcutta, from Chutia Nagpur.]
1040. *Amomum dealbatum* *Roxb.*
 1041. *Zingiber rubens* *Roxb.*
 1042. *Zingiber officinale* *Roscoe.*
 Bankuli Tea Estate, 1,500—2,000 feet ; cult,
 1042A. *Zingiber Zerumbet* *Sm.*
 1043. *Zingiber Casumunar* *Roxb.*
 Sirguja, 1,500—2,000 feet, banks of Govind river.
 Vern.—Paro.
1044. *Zingiber capitatum* *Roxb.*
 Ranchi, 1,500—2,000 feet.
 1045. *Costus speciosus* *Linn.*
 Jaspur.
1046. *Alpinia Galanga* *Sw.*
 1047. *Phrynum capitatum* *Willd.*
 1048. *Maranta arundinacea* *Linn.*
 Most stations, 5,00—2,000 feet ; cult.
 Arrowroot, *Eng.* (Eleven varieties cult. at Palandu
 Tea Estste, *Cooke.*)
1049. *Canna indica* *Linn.* var. *orientalis.*
 1050. *Musa ornata* *Roxb.*
 Singbhum, *Haines.*
 1051. *Musa sapientum* *Linn.*
 Parasnath, wild. Cult. occasionally.

CVIII.—HÆMODORACEÆ.

1052. *Sansevieria Roxburghiana* *Schult.*
 Palandu, 1,500—2,000 feet ; cult.

CIX.—IRIDEÆ.

1053. *Belamcanda chinensis* *Leman.*

CX.—AMARYLLIDÆ.

1054. *Hypoxis aurea* *Lour.*
Baragaon, 2,000—3,000 feet.
1055. *Curculigo orchioides* *Gærtn.*
Baragaon, 2,000—3,000 feet.
1056. *Curculigo recurvata* *Dryand.*
Jaspur, 2,000—2,500 feet; Sirguja, 1,500—2,000 feet.
Vern.—Kawa Kandu (=Crow Root); Ban Pij (=Wild onion).
1057. *Zephyranthes tubispatha* *Herb.*
Palandu. Cult.
1058. *Crinum defixum* *Ker.*
1059. *Crinum latifolium* *Linn.*
1060. *Pancratium biflorum* *Roxb.*
1061. *Agave Cantula* *Roxb.*
Cult. for fibre at Hazaribagh Jail and elsewhere.
1062. *Agave rigida* *Linn.*—*var.* *Sisalana.*
Cult. Palandu. Plants poled in 11th year, one plant had over 3,000 bulbils, sold at 2 annas each. *Cooke.*

CXI.—TACCACEÆ.

1063. *Tacca pinnatifida* *Forst.*

CXII.—DIOSCOREACEÆ.

1064. *Dioscorea dæmona* *Roxb.*
1065. *Dioscorea pentaphylla* *Roxb.*
1066. *Dioscorea anguina* *Roxb.*
1067. *Dioscorea glabra* *Roxb.*
Jaspur, 1,500—2,000 feet; Kochang, 2,000—2,500 feet.
Vern.—Bān-āru (=wild potato); Āru. A yam. Root eaten.
1068. *Dioscorea belophylla* *Voigt.*
1069. *Dioscorea globosa* *Roxb.*
Cult. generally; three varieties.
1070. *Dioscorea Wallichii* *Hook f.*
1071. *Dioscorea Hookeri* *Prain.*
1072. *Dioscorea Hamiltonii* *Hook f.*
1073. *Dioscorea sativa* *Linn.* (*D.* *bulbifera.*)
Jaspur, 2,000—2,500 feet; Sirguja, 1,500—2,500 feet.
Vern.—Ghenti kandu, Ghenti. Root eaten.
Var. *crispata.*
Jonha, 1,000—1,500 feet.
1074. *Dioscorea alata* *Linn.*

CXIII.—LILIACEÆ.

1075. *Smilax zeylanica* *Linn.*
 Sirguja, 1,500—2,000 feet.
Vern.—Sher or shere.
 [Not in Herb., Calcutta from Chutia Nagpur.]
1076. *Smilax macrophylla* *Roxb.*
 Baragaon, 2,000—2,500 feet ; Jaspur, 2,000—2,500 feet.
Vern.—Rām dātun ; Jungli āru, Ran puwan. Root eaten.
1077. *Smilax Roxburghiana* *Wall.*
1078. *Smilax prolifera* *Roxb.*
1079. *Asparagus racemosus* *Willd.*
 Jaspur, 2,000—2,500 feet.
Vern.—Sātwar. Wild asparagus. A cooling medicine.
1080. *Tupistra aurantiaca* *Wall.*
 Sirguja, 1,500—2,000 feet.
 [Not in Herb., Calcutta ; from Chutia Nagpur.]
1081. *Hemerocallis fulva* *Linn.*
 Cult.
1082. *Cordyline terminalis* *Kunth.*
 In gardens, cult.
1083. *Asphodelus tenuifolius* *Cav.*
1084. *Chlorophytum arundinaceum* *Bak.*
 Jaspur, 2,000—2,500 feet ; Sirguja, 1,500—2,000 feet.
Vern.—Kāndri.
1085. *Allium Cepa* *Linn.*
 Cult.
Vern.—Piāj.
 Onion, *Eng.*
1086. *Scilla indica* *Bak.*
1087. *Iphigenia indica* *Kunth.*
Vern.—Chutia Chandbol *Santal.*
1088. *Gloriosa superba* *Linn.*
 Baragaon ; Dorunda, 2,000—3,000 feet.
1089. *Yucca aloifolia* *Linn.*
 Ranchi, cult.
1090. *Disporum pullum* *Salisb.*

CXIV.—PONTEDERiaceÆ.

1091. *Monochoria hastæfolia* *Presl.*
 Seetagarha Tea Estate, 2,000 feet ; growing in water
 flowing from rice-fields.
1092. *Monochoria vaginalis* *Presl.*—*var.* *plantaginea.*

CXV.—XYRIDEÆ.

1093. *Xyris pauciflora Willd.*

CXVI.—COMMELINACEÆ.

1094. *Commelina nudiflora Linn.*
 1095. *Commelina salicifolia Roxb.*
 Ranchi, 1,500—2,000 feet.
 1096. *Commelina Hasskarlii Clarke.*
 1097. *Commelina bengalensis Linn.*
 Jaspur, 2,000—2,500 feet.
 Vern.—Kena.
 1098. *Commelina attenuata Kæn.*
 1099. *Commelina obliqua Ham.*
 1100. *Commelina suffruticosa Bl.*
 1101. *Aneilema scapiflorum Wight.*
 1102. *Aneilema lineolatum Kunth.*
 1103. *Aneilema spiratum R. Br.*
 1104. *Aneilema nudiflorum R. Br.*
 Sillee, 500—1,000 feet.
 1105. *Aneilema Hamiltonianum Wall.*
 1106. *Aneilema vaginatum R. Br.*
 1107. *Cyanotis cristata Schult. f.*
 Pitorea, 2,000—2,500 feet; Kochang, 2,000—2,500 feet.
 1108. *Cyanotis tuberosa Schult. f. var. adscendens.*
 1109. *Cyanotis axillaris Ræm. & Schult.*
 Jonha-Sandi-mandi road, 1,000—1,500 feet; Pertabpur.
 Sirguja, 1,500—2,000 feet; on banks of a tank.
 Flowers blue.
 1110. *Floscopa scandens Lour.*
 Sirguja, 1,500—2,000 feet; roots in water.

CXVII.—PALMEÆ.

1111. *Areca Catechu Linn.*
 Cult. 500 feet and upwards; not common on the plateau
 level, 2,000 feet and upwards.
 Vern.—Sopari.
 1112. *Phœnix sylvestris Roxb.*
 Palamow, 1,000—2,000 feet.
 Vern.—Kājūr. Sometimes tapped for sugar, etc.

1113. *Phoenix acaulis* *Ham.*
 Jaspur, 2,000—2,500 feet; common in jungles.
Vern.—Bān Kājūr. Coarse floor mats commonly made of the leaves. [This species is very common along the eastern edge of the Chutia Nagpur plateau and is, we believe, the *only* dwarf *Prænix* that occurs in the province.—*Ed. Records*].
1114. *Phoenix humilis* *Royle.* *Var. typica.*
 "At Chota Nagpore, *Cal. Ouseley*" (F. B. I.). (? cult. in the Commissioner's compound where, *vide* Peppé, a Sago-Palm and other palms occur, planted. *Cal.* (? *Col*) Ouseley was Commissioner of Chutia Nagpur before Dalton.—(*F. F. W.*) [*Phoenix Ouseleyana* *Griff.*, which is this plant, was described by Griffith *from an Assam specimen.*]
1115. *Phoenix robusta* *Hook f.*
 Parasnath.
1116. *Calamus viminalis* *Willd.*
1117. *Metroxylon Sagus* *Willd.*
 Cult. in Commissioner's compound, Ranchi.
 [No specimen in Herb., Calcutta from Chutia Nagpur.]
1118. *Borassus flabellifer* *Linn.*
 Ranchi, 1,500—2,000 feet; frequent by villages and in lapsed jungle. Not *here* tapped for Toddy.
Vern.—Tāl, Tār. Toddy Palm; Fan Palm.
 Palmyra Palm. *Eng.*
1119. *Cocos nucifera* *Linn.*
 Cult; *not* frequent; grown, perhaps as a curiosity, not for its fruit.
 Coconut Palm.

CXVIII.—PANDANÆ.

1120. *Pandanus fascicularis* *Linn.*
 Ranchi lake, 1,500—2,200 feet.
Vern.—Keora.

EXIX.—AROIDEÆ.

1121. *Cryptocoryne ciliata* *Fisch.*
 1122. *Cryptocoryne retrospiralis* *Kunth.*
 1123. *Cryptocoryne spiralis* *Fisch.*
 1124. *Pistia stratiotes* *Linn.*
 1125. *Arisæma tortuosum* *Schott.*

1126. *Sauromotum guttatum* Schott.
Palandu Tea Estate, 1,500—2,000 feet.
1127. *Typhonium trilobatum* Schott.
1128. *Amorphophallus campanulatus* Bl.
1129. *Amorphophallus bulbifer* Bl.
1130. *Plesmonium margaritifera* Schott.
1131. *Remusatia vivipara* Schott.
Parasnath.
1132. *Colocasia antiquorum* Schott.
1133. *Colocasia nymphaeifolia* Kunth.
1134. *Alocasia indica* Schott.
Cult.
Vern.—Man Kutchu.
1135. *Alocasia macrorrhiza*, Schott.
1136. *Alocasia fornicata* Schott.
1137. *Scindapsus officinalis* Schott.
1138. *Lasia heterophylla* Schott.
Santalia (Campbell & Watt.)

CXX.—LEMNACEÆ.

1139. *Lemna paucicostata* Hegelm.
1140. *Wulfia arhiza* Wimm.

CXXI.—ALISMACEÆ.

1141. *Alisma reniforme* Don.
Sirguja.
1142. *Sagittaria sagittifolia* Linn.
Sirguja, banks of the Rer river.
1143. *Butomopsis lanceolata* Kunth.
Jaspur, in moist places. Flowers white.

CXXII.—NAIADACEÆ.

1144. *Aponogeton monostachyum* Linn. f.
1145. *Potamogeton indicus* Roxb.
Pochra, Toree pergunnah 1,000—1,500 feet; in a tank.
Chyebassa, 500—1,000 feet; abundant in tanks.
1146. *Potamogeton crispus* Linn.
Sirguja, 1,500—2,000 feet; in running water, in a small tributary of the Rer river.
1147. *Potamogeton mucronatus* Presl.
Chyebassa tank.
[Not in Herb., Calcutta from Chutia Nagpur].

1148. *Naias graminea* *Del.*

1149. *Naias minor* *All.*

CXXIII.—ERIOCAULEÆ.

1150. *Eriocaulon Sieboldianum* *Zucc.*

1151. *Eriocaulon truncatum* *Ham.*

1152. *Eriocaulon oryzetorum* *Mart.*

1153. *Eriocaulon luzulæfolium* *Mart.*

Jabra, Hazaribagh, 1,500—2,000 feet; common in rice-fields and moist places.

1154. *Eriocaulon quinqueangulare* *Linn.*

1155. *Eriocaulon trilobum* *Ham.*

1156. *Eriocaulon xeranthemum* *Mart.*

CXXIV.—CYPERACEÆ.

1157. *Kyllinga triceps* *Rottb.*

1158. *Kyllinga monocephala* *Rottb.*

Jaspur 1,500—2,000 feet.

Vern.—Mosha ghas.

1159. *Kyllinga brevifolia* *Rottb.*

Dorunda, 1,500—2,000 feet.

1160. *Kyllinga cylindrica* *Nees.*

Parasnath.

1161. *Pycnus latespicatus* *C. B. Clarke.*

1162. *Pycnus nitens* *Nees.*

1163. *Pycnus capillaris* *Nees.*

1164. *Juncellus pygmæus* *C. B. Clarke.*

1165. *Juncellus lævigatus* *C. B. Clarke.*

Jaspur, 1,500—2,000 feet.

[Not in Herb., Calcutta, from Chutiá Nagpur.]

1166. *Cyperus amabilis* *Vahl.*

1167. *Cyperus cuspidatus* *H. B. K.*

1168. *Cyperus difformis* *Linn.*

1169. *Cyperus flavidus* *Retz.*

1170. *Cyperus compressus* *Linn.*

1171. *Cyperus aristatus* *Rottb.*

1172. *Cyperus Iria* *Linn.*

1173. *Cyperus nutans* *Vahl.*

1174. *Cyperus pilosus* *Vahl.*

1175. *Cyperus tegetum* *Roxb.*

1176. *Cyperus rotundus* *Linn.*

1177. *Cyperus exaltatus* *Reta*.
 Jaspur, 2,000—2,500 feet ; in wet places near streams.
Vern.—Nägär Mota.
1178. *Mariscus microcephalus* *Presl*.
1179. *Courtoisia cyperoides* *Nees*.
1180. *Eleocharis plantaginea* *R. Br.*
1181. *Eleocharis fistulosa* *Schult.*
 Pertabpur, Sirguja, 1,500—2,000 feet ; in a tank.
Vern.—Linei.
1182. *Eleocharis congesta* *Don.*
1183. *Fimbristylis tetragona* *R. Br.*
1184. *Fimbristylis schœnoides* *Vahl.*
1185. *Fimbristylis dipsacea* *Benth.*
1186. *Fimbristylis squarrosa* *Vahl.*
1187. *Fimbristylis dichotoma* *Vahl.*
1188. *Fimbristylis diphylla* *Vahl.*
 Jaspurnagar, 2,000—2,500 feet ; Sitonga, Jaspur, 2,000—
 2,500 feet ; Sirguja, 1,500—2,000 feet ; on wet ground
 and in moist jungle.
Vern.—Khäksi ban = Ban khäksi ; Sísuban, Chänki.
1189. *Fimbristylis æstivalis* *Vahl.*
1190. *Fimbristylis podocarpa* *Nees*.
1091. *Fimbristylis ferruginea* *Vahl.*
 Jaspur, 1,500—1,200 feet ; in wet fields.
Vern.—Bhainsa ban.
1192. *Fimbristylis Hookeriana* *Bæck.*
1193. *Fimbristylis quinqueangularis* *Kunth.*
1194. *Fimbristylis miliacea* *Vahl.*
1195. *Fimbristylis Thomsonii* *Bæck.*
1196. *Fimbristylis monostachya* *Hassk.*
1197. *Bulbostylis barbata* *Kunth.*
1198. *Scirpus supinus* *Linn.*
 Palamow, 1,000—1,500 feet.
1199. *Scirpus erectus* *Poir.*
1120. *Scirpus articulatus* *Linn.*
1201. *Scirpus mucronatus* *Linn.*
1202. *Scirpus grossus* *Linn. f.*
 Sirguja, 1,500—2,000 feet ; a rush, on moist ground.
 Var. Kysoor.
 Manbhūm, 1,500—2,000 feet.
1203. *Scirpus kyllingioides* *Bæck.*

1204. *Scirpus Michelianus* Linn.
 1205. *Scirpus Isolepis* Bock.
 1206. *Scirpus squarrosus* Linn.
 1207. *Fuirena glomerata* Lamk.
 1208. *Fuirena umbellata* Rottb.
 1209. *Lipocarpa argentea* R. Br.
 1210. *Lipocarpa sphacelata* Kunth.
 Sirguja, 1,500—2,000 feet.
 1211. *Scleria pergracilis* Kunth.
 1212. *Scleria lithosperma* Sw.
 1213. *Scleria tessellata* Willd.
 1214. *Scleria hebecarpa* Nees.
 1215. *Carex cruciata* Wahl. *Var. nagpurensis*.
 1216. *Carex stramentitia* Boott.
 1217. *Carex plebeja* C. B. Clarke.
 1218. *Carex speciosa* Kunth.

CXXV.—GRAMINEÆ.

1219. *Paspalum scrobiculatum* Linn.
 Sirguja, 2,000—2,500 feet; a wayside grass.
 Vern.—Kodo; used as a food-grain.
 1220. *Digitaria sanguinalis* Lamk *var. ciliare*.
 Ranchi, 1,500—2,000 feet.
 1221. *Digitaria longiflora* Retz.
 1222. *Digitaria Royleana* Nees.
 1223. *Digitaria pedicilliaris* Trin.
 1224. *Eriochloa polystachya* H. B. K.
 1225. *Isachne australis* R. Br.
 1226. *Panicum Isachne* Roth.
 1227. *Panicum flavidum* Retz.
 1228. *Panicum punctatum* Burm.
 1229. *Panicum Crus-Galli* Linn.
 1230. *Panicum colonum* Linn.
 Ranchi, 1,500—2,000 feet; Jaspurnagar, 2,000—2,500 feet;
 Sirguja in wet rice fields.
 Vern.—Bur'ndo ghas, Dhowra. A food-grain.
 1231. *Panicum prostratum* Lamk.
 1232. *Panicum ramosum* Linn.
 Vern.—Diota Gundli Santal.
 1233. *Panicum distachyum* Linn.
 Nari ghas Santal.
 1234. *Panicum myurus* H. B. K.

1235. *Panicum indicum* *Linn.*
Kachang, Singbhum, 2,000—2,500 feet.
1236. *Panicum myosuroides* *R. Br.*
1237. *Panicum miliaceum* *Linn.*
Mahretta Tea Estate, Hazaribagh, 2,000—2,500 feet.
1238. *Panicum miliare* *Lamk.*
Cult.
Vern.—Gundli *Santal.*
1239. *Panicum psilopodium* *Trin.*
1240. *Panicum trypheron* *Schult.*
1241. *Panicum humile* *Nees.*
1242. *Panicum maximum* *Jacq.*
Daladili Tea Estate, west of Ranchi, 1,500—2,500 feet;
cult. as a fodder-grass.
Guinea grass *Eng.*
1243. *Panicum repens* *Linn.*
1244. *Panicum proliferum* *Linn.*
1245. *Panicum antidotale* *Rets.*
Ranchi plateau, 2,000 feet; Sitonga, Jaspur, 2,000—2,500
feet; Sirguja, 1,500—2,000 feet; in fields, cult.
Vern.—Bendi (= Benri); Bērē; Misiri. A food-grain.
[Not in Herb., Calcutta from Chutia-Nagpur.]
1246. *Panicum montanum* *Roxb.*
Hill near Pitorea, 2,000—2,500 feet.
1247. *Panicum plicatum* *Lamk.*
1248. *Panicum rhachitrichum.*
A species of *Panicum*, a food-grain.
Vern.—Gūngai, was collected at Chyebassa, 500—1,000
feet.
1249. *Thysanolaena agrostis* *Nees.*
1250. *Axonopus semialatus* *Hook. f.*
1251. *Axonopus cimicinus* *Beauv.*
1252. *Oplismenus compositus* *Beauv.*
East Hill, Pitorea.
1253. *Oplismenus Burmanni* *Beauv.*
1254. *Setaria italica* *Beauv.*
1255. *Setaria glauca* *Beauv.*
Baragaon, 2,000—2,500 feet.
1256. *Setaria intermedia* *Ræm. & Schult.*
1257. *Setaria verticillata* *Beauv.*
Chatra, Hazaribagh, 1,000—1,500 feet; Mahretta Tea
Estate, 2,000—2,500 feet.

1258. *Arundinella setosa* Trin.
Santalia.
Vern.—Bur lukui ghas *Santal*.
1259. *Arundinella tenella* Nees.
1260. *Arundinella Wallichii* Nees.
1261. *Pennisetum typhoideum* Rich.
1262. *Pennisetum parviflorum* Trin.
Hazaribagh 1,500—2,000 feet.
1263. *Pennisetum orientale* Rich.
Parasnath.
1264. *Pennisetum pedicellatum* Trin.
Biras, Hazaribagh.
1265. *Pennisetum cenchroides* Rich.
Black Rocks, Ranchi, 1,500—2,000 feet; Loro, Jaspur
1,500—2,000—feet (Loro village below Hetghat = below
the ghat; the top of the ghat is 2,000—2,500 feet).
Vern.—Ludia bän.
1266. *Oryza sativa* Linn.
1267. *Oryza granulata* Nees.
1268. *Leersia hexandra* Sw.
1269. *Perotis latifolia* Ait.
1270. *Coix Lachryma-Jobi* Linn.
Nawa tand, 1,500—2,000 feet.
Var. *gigantea* Stapf.
Sitonga, Jaspur, 2,000—2,500.
Vern.—Gür-gür.
Job's Tears Eng.
1271. *Polytoca barbata* Stapf.
1272. *Zea Mays* Linn.
Most cultivated in Toree Pergunnah, Lohardugga.
Vern.—Mākai, Bhūta.
1273. *Hygrophiza aristata* Nees.
1274. *Leersia hexandra* Sw.
1275. *Garnotia stricta* Brogn.
Parasnath.
1276. *Imperata cylindrica* Cyrill.
1277. *Saccharum spontaneum* Linn.
1278. *Saccharum arundinaceum* Retz.
1279. *Saccharum Narenga* Ham.
Jaspur, 1,500—2,000 feet.
Arrow-shafts of the Korwas made of this grass. (Korwas
= Korewah of V. Ball.

1280. *Saccharum officinarum* *Linn.*
Cult. frequently.
1281. *Erianthus fastigiatus* *Nees.*
1282. *Pollinia articulata* *Trin.*
1283. *Pollinia argentea* *Trin.*
1284. *Pollinia ciliata* *Trin.*
1285. *Dimeria ornithopoda* *Trin.*
1286. *Dimeria connivens* *Hack.*
1287. *Pogonatherum saccharoideum* *Beauv.*
Chama, Lohardugga dist., 1,000—1,500 feet.
1288. *Apocopis Wightii* *Nees.*
Hazaribagh, 2,000 feet *Clarke.*
1289. *Arthraxon lanceolatus* *Hochst.*
Parasnath, 4,000 feet.
1290. *Arthraxon ciliaris* *Beauv.*
1291. *Arthraxon microphyllum* *Hochst.*
1292. *Rottbœllia compressa* *Linn. f.*
1293. *Rottbœllia Clarkei* *Hack.*
1294. *Rottbœllia exaltata* *Linn. f.*
1295. *Mnesithea lævis* *Kunth* (*Rottbœllia perforata* *Roxb.*)
1296. *Manisuris granularis* *Linn. f.*
1297. *Ischæmum rugosum* *Salisb.*
1298. *Ischæmum angustifolium* *Hack.*
1299. *Ischæmum ciliare* *Rets.*
Jaspurnagar, 2,000—2,500 feet ; in wet rice fields.
Vern.—Bhüründi bân.
1300. *Ischæmum hirtum* *Hack.*
1301. *Ischæmum laxum* *R. Br.*
1302. *Andropogon brevifolius* *Sw.*
1303. *Andropogon exilis* *Hochst.*
1304. *Andropogon fastigiatus* *Sw.*
1305. *Andropogon foveolatus* *Del.*
1306. *Andropogon pertusus* *Willd.*
1307. *Andropogon intermedius* *R. Br.*
1308. *Andropogon fascicularis* *Roxb.*
1309. *Andropogon micranthus* *Kunth.* *Var. villosula.*
Parasnath.
1310. *Andropogon assimilis* *Steud.*
Parasnath, 4,000 feet.
1311. *Andropogon halepensis* *Brot.*
1312. *Andropogon Sorghum* *Brot.*
1313. *Andropogon serratus* *Thunb.*

- Jaspur, 1,500—2,000 feet.
Vern.—Phül-bārhi. Brooms are made of it.
1314. *Andropogon aciculatus Retz.*
1315. *Andropogon lancearius Hook. f.*
 Ramghar ghat, 1,750 feet *Clarke.*
1316. *Andropogon monticola Schult. var Trinii.*
 Jaspurnagar, 2,000—2,500 feet.
Vern.—Ghora ghans. It is said 'not to flower.'
1317. *Andropogon polyphyllus Hack.*
1318. *Andropogon squarrosus Linn. f.*
Vern.—Sirom *Santal.* Khus-Khus.
1319. *Andropogon Gryllus Linn.*
 Sitonga, Jaspur, 2,000—2,500 feet.
Vern.—Dhori-bān.
 [Not in Herb., Calcutta, from Chutia Nagpur.]
1320. *Andropogon caricosus Linn.*
1321. *Andropogon annulatus Sw.*
1322. *Andropogon Clarkei Hack.*
1323. *Andropogon contortus Linn.*
1324. *Andropogon Schœnanthus Linn. Var. versicolor.*
 Jaspur, 1,500—2,000 feet.
Vern.—Rātā-ban; Nundia Dushi ghas *Santal.* Geranium
 grass. Rusa oil grass.
1325. *Andropogon citriodorus DC. (? Schœnanthus Linn.) J.J.W.*
 Jaspur, 2,000—2,500 feet.
Vern.—Barando Kher, Bāra Kher ghas, Lemon Grass.
1326. *Iseilema Wightii Anders.*
 Sirguja 1,500—2,000 feet Leaves with a blue purple
 bloom.
1327. *Anthistiria imberbis Retz.*
1328. *Anthistiria ciliata Linn. f.*
1329. *Anthistiria gigantea Cav. Var. caudata.*
1330. *Apluda varia Hack. subsp. aristata.*
 Gunia, 1,000—1,500 feet; by side of nulla in sal jungle.
1331. *Aristida Cumingiana Trin & Rupr.*
 Jaspur, 2,000—2,500 feet.
Vern.—Lūd Lūdi bān.
1332. *Aristida adscensionis Linn.*
1333. *Aristida setacea Retz.*
1334. *Aristida redacta Stapf.*
1335. *Sporbolus diander Beauv.*
 Ranchi, 1,500—2,000 feet; Jaspur; Dorunda.
Vern.—Bherendi.

1336. *Sporobolus indicus* *R. Br.*
 1337. *Coelachne pulchella* *R. Br. Var. spicata.*
 1338. *Polypogon monspeliensis* *Desf.*
 1339. *Avena sativa* *Linn.*
 Little if at all cultivated by natives.
 1340. *Microchloa setacea* *R. Br.*
 1341. *Cynodon dactylon* *Pers.*
Jaspur, Baghicha village, 1,500—2,000 feet.
Vern.—Dhüb ghas. Found near villages only.
 1342. *Chloris pallida* *Hook. f.*
 1343. *Chloris delicatula* *Clarke.*
Mandu, Hazaribagh, 1,500—2,000 feet Clarke
 1344. *Chloris virgata* *Sw.*
 1345. *Chloris barbata* *Sw.*
 1346. *Tripogon capillatus* *Faub. & Spach.*
Parasnath.
 1347. *Eleusine indica* *Gærtn.*
Jaspur, 1,500—2,000 feet.
Vern.—Mäl mārēa.
 1348. *Eleusine coracana* *Gærtn.*
Commonly cult. throughout Chutia Nagpur.
Vern.—Mārūa.
 1349. *Eleusine ægyptiaca* *Desf.*
 1350. *Leptochloa filiformis* *Roem & Schult.*
 1351. *Leptochloa chinensis* *Nees.*
 1352. *Arundo donax* *Linn.*
Sirguja, 1,500—2,000 feet.
A tall grass, 7—8 feet high ; in a secluded valley.
 1353. *Phragmites* *Karka Trin.*
 1354. *Elytrophorus articulatus* *Beauv.*
Palamow 1,000—1,500 feet ; Jaspurnagar, 2,000—2,500
feet ; in wet rice-fields.
Vern.—Bhāro Pōchi.
 1355. *Eragrostis ciliata* *Nees.*
 1356. *Eragrostis coarctata* *Staff.*
Dorunda garden, 1,500—2,000 feet ; a weed.
 1357. *Eragrostis tenelia* *Roem & Schult.*
Sirguja, 1,500—2,000 feet.
 1358. *Eragrostis interrupta* *Beauv.*
 1359. *Eragrostis amabilis* *W. & A.*
Jonha Road, 1,500—2,000 feet ; Jaspurnagar, 2,000—2,500
feet ; Sirguja, 1,500—2,000 feet.
Vern.—Khet kodo.

1360. *Eragrostis major* *Host.*
Chyebassa, 500 feet.
1361. *Eragrostis stenophylla* *Hochst.*
Hunterganj, Hazaribagh, 500—1,000 feet; Chakradarpur,
Singbhum, 500—1,000 feet.
Vern.—Bürni.
1362. *Eragrostis gangetica* *Stend.*
1363. *Eragrostis elongata* *Jacq.*
1364. *Eragrostis tremula* *Hochst.*
Chyebassa.
1365. *Eragrostis minor* *Host.*
1366. *Eragrostis tenuifolia* *Hochst.*
1367. *Eragrostis pilosa* *Beauv.*
1368. *Eragrostis cynosuroides* *Beauv.*
1369. *Eragrostis nardoides* *Trin.*
1370. *Eragrostis coromandeliana* *Trin.*
1371. *Triticum vulgare* *Vill.*
Not much cultivated in Chutia Nagpur.
Vern.—Géhun. Wheat.
1372. *Hordeum vulgare* *Linn.*
Cultivated.
Vern.—Jow. Barley.
1373. *Bambusa vulgaris* *Schrad.*
1374. *Bambusa arundinacea* *Willd.*
1375. *Dendrocalamus strictus* *Nees.*
Baragaon, 2,000—3,000 feet; Palamow, 1,000 feet;
Rhotas Garh.
Vern.—Bans. Bamboo.
1376. *Dendrocalamus sericeus* *Munro.*
Parasnath.
1377. *Cephalostachyum pergracile* *Munro.*

CXXVI—FILICES.

1378. *Gleichenia dichotoma* *Willd.*
1379. *Alsophila glabra* *Hook.*
1380. *Davallia immersa* *Wall.*
1381. *Davallia pulchra* *Don.*
1382. *Adiantum lunulatum* *Burm.*
Jaspur, 2,000—2,500 feet; by rocky streams in moist
places.
Vern.—Bhūi nim (1).
1383. *Adiantum caudatum* *Linn.*

1384. *Cheilanthes tenuifolia Sw.*
Jaspur, 1,500—2,500 feet; in *Sāl* jungle.
Vern.—Pätäl chalta (1); Bhūi nim (2).
1385. *Cheilanthes farinosa Kaulf.*
Jaspur.
Vern.—Pätäl chalta (2).
Silver Fern. *Eng.*
1386. *Pteris longifolia Linn.*
1387. *Pteris pellucida Presl.*
1388. *Pteris biaurita Linn.*
1389. *Ceratopteris thalictroides Brogn.*
Pertabpur, Sirguja, 1,500—2,000 feet; in moist soil near tanks.
1390. *Blechnum orientale Linn.*
1391. *Asplenium laciniatum Don. Var. depauperata.*
1392. *Asplenium drepanophyllum Bak.*
Sitonga, Jaspur, 2,000—2,500 feet.
Vern.—Chūnki.
1393. *Asplenium Filix-fœmina Bernh.*
1394. *Asplenium esculentum Presl.*
1395. *Actinopteris radiata Link.*
1396. *Nephrodium falcilobum Hook.*
1397. *Nephrodium cochleatum Don.*
Sirguja, 2,000—2,500 feet.
1398. *Nephrodium odoratum Bak.*
1399. *Nephrodium unitum R. Br.*
Sirguja, 1,500—2,000 feet.
1400. *Nephrodium truncatum Presl.*
Sirguja, 1,500—2,000 feet.
1401. *Nephrodium aridum Hook. & Bak.*
1402. *Nephrodium molle Desv.*
1403. *Nephrodium variolosum Hook. & Bak.*
Sirguja, 2,000—2,500 feet.
1404. *Nephrodium cicutarium Hook. & Bak.*
1405. *Polypodium proliferum Roxb.*
Sirguja, 1,500—2,000 feet; Palandu, near Ranchi, 1,500—2,000 feet.
1406. *Polypodium multilineatum Wall.*
1407. *Polypodium adnascens Sw.*
1408. *Polypodium stigmatosum Sw.*
1409. *Polypodium simplex Sw.*
1410. *Polypodium membranaceum Don.*
1411. *Hemionitis cordata Roxb.*

1412. *Lygodium flexuosum Sw.*
Jaspur, 2,000—2,500 feet.
1413. *Angioptetis evecta Hoffm.*
1414. *Ophioglossum vulgatum Linn.*
Sirguja.
1415. *Ophioglossum reticulatum Linn.*

CXXVII.—EQUISETACEÆ.

1416. *Equisetum debile Roxb.*
Jaspur, 1,500—2,000 feet; in rice-fields.
Vern.—När jōri.

CXXVIII.—LYCOPODIACEÆ.

1417. *Lycopodium Hamiltonii Spreng.*
1418. *Selaginella proniflora Bak.*
Sirguja, 1,500—2,000 feet.
1419. *Selaginella pentagona Spreng.*
1420. *Selaginella rupestris Spreng.*
Jaspur, 1,500—2,000 feet; common.
Vern.—Chāpka.

CXXIX.—SALVINIACEÆ.

1421. *Salvinia cucullata Roxb.*
1422. *Azolla pinnata R. Br.*

CXXX.—MARSILIACEÆ.

1423. *Marsilea quadrifoliata Linn.*
Jaspurnagar, 2,000—2,500 feet; in rice-fields, moist-ground.
Vern.—Sūn Sūnia.
1424. *Marsilea minnta Linn.*
Balomatti, Toree Pergunnah, 10,00—1,500 feet; in rice-fields, after crop is cut. Leaves eaten as a sāg or vegetable, *not* the roots.

CXXXI.—MUSCI.

- (One or more undetermined species of mosses in Sirguja 1,500—2,000 feet; on banks near small streams.)

CXXXII.—LICHENES.

- (An undetermined species found in Sirguja or Jaspur, 1,000—1,500 feet, along with fungus on a decayed branch.)

CXXXIII.—FUNGI.

1425. *Geaster sp.*

Sirguja, 1,500—2,000 feet; on or immediately beneath surface of soil in open scrub jungle: pretty plentiful in places.

Vern.—Rügūra.

1426. *Polyporus sp.*

Sirguja, 1,500—2,000 feet.

1427. *Dædalea sp.*

Sirguja, 1,500—2,000 feet.

(Another species of Fungi was collected in Sirguja, 1,500—2,000 feet, along with Lichen on a decayed branch; still another (*vern.* Kūkri) was obtained at Loro village, Jaspur, 1,500—2,000 feet, growing on old timber.)

CXXXIV.—CHARACEÆ.

• 1428. *Chara foetida A. Br.*

Sirguja, 1,500—2,000 feet, in a small stream.

1429. *Chara sp.* (much broader leaf than *C. foetida*).

Sirguja, 1,500—2,000 feet.

Vern.—Jhal khari.

CXXXV.—ALGÆ.

1430. *Cosmerium Logiense Biss.*

Santalia.

1431. *Tabellaria flocculosa Kuets.*

Santalia.

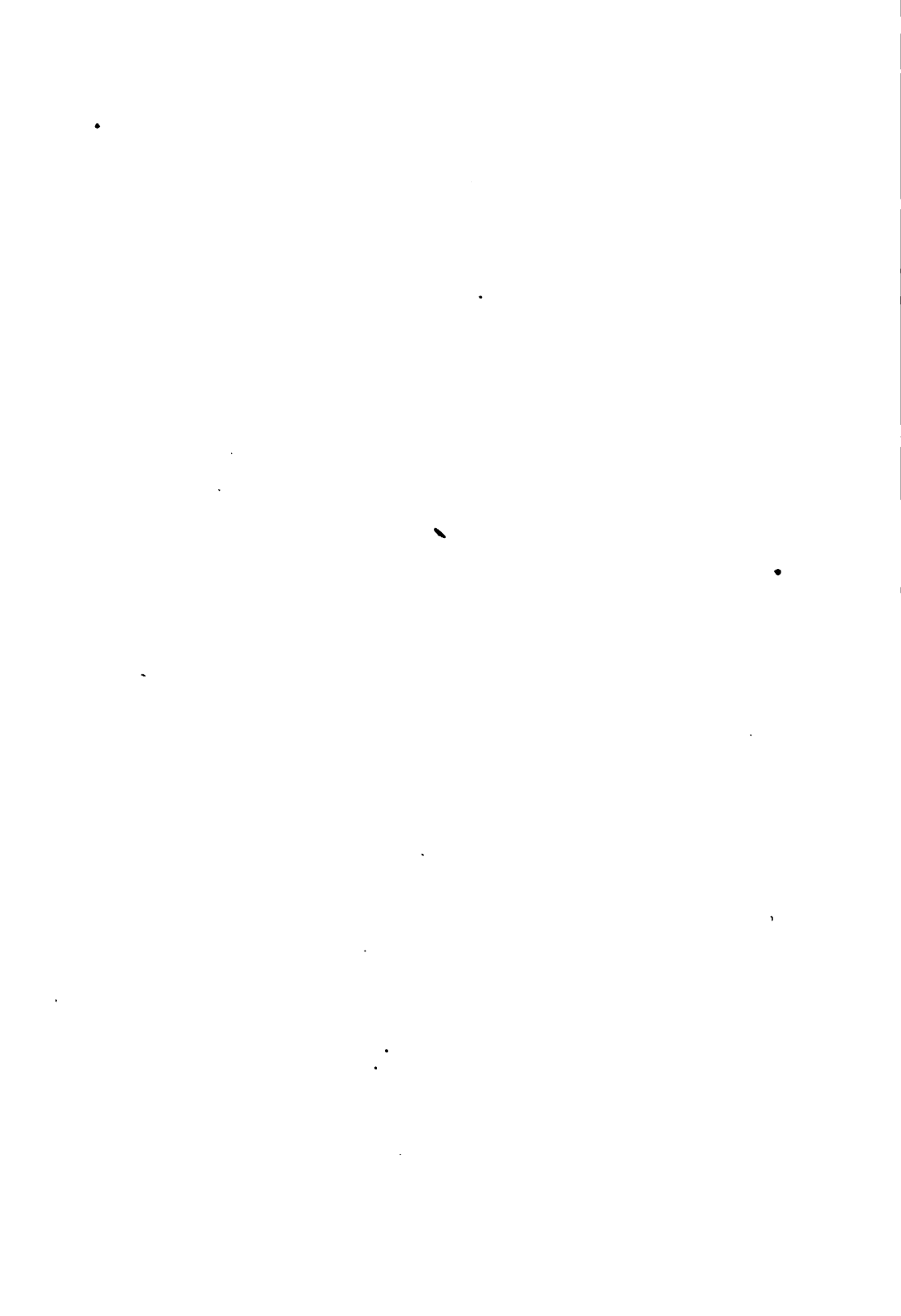
1432. *Cymbella cymbiformis van Heurck. Var. parva.*

Santalia.

1433. *Mougeotia immersa West.*

Santalia.

(An undetermined species of Alga was collected in a small stream in Sirguja.)



APPENDIX TO PLANTS OF CHUTIA NAGPUR.

INDEX OF SANTALI NAMES.

From Campbell and Watt's Catalogue.

Akauna	Calotropis gigantea <i>Br.</i>
Alag jari	Cassytha filiformis <i>Linn.</i>
Alag jari	Cuscuta chinensis <i>Lamk.</i>
Andia dhurup arak	Leucas Cephalotes <i>Spreng.</i>
Arak jhawar	Utricularia bifida <i>Linn.</i>
Arak kawet	Abrus precatorius <i>Linn.</i>
Arak kudrum	Hibiscus Sabdariffa <i>Linn.</i>
Armū	Bursera serrata <i>Colebr.</i>
At	Zehneria umbellata <i>Thw.</i>
Aten	Combretum decandrum <i>Roxb.</i>
Atkir	Smilax ovalifolia <i>Roxb.</i>
Atkuli janum	Argemone mexicana <i>Linn.</i>
Atkura	Wrightia tomentosa <i>R. & S.</i>
Atuak	Terminalia tomentosa <i>Roxb.</i>
Ato saug	Dioscorea glabra <i>Roxb.</i>
Bachkom	Ischæmum angustifolium <i>Hack.</i>
Bæphol	Desmodium polycarpum <i>DC.</i>
Baglucha	Martynia diandra <i>Gloxine.</i>
Bahu tuturi	Vernonia cinerea <i>Less</i>
Bajra	Pennisetum typhoideum <i>Roxb.</i>
Bana etka	Ipomæa turpethum <i>Br.</i>
Bana hatak	Oroxylum indicum <i>Vent.</i>
Banda	Loranthus longiflorus <i>Desv.</i>
Banda	Vanda <i>sp.</i> (<i>Roxburghii Br.</i>)
Banda	Viscum orientale <i>Linn.</i>
Bando	Spatholobus Roxburghii <i>Benth.</i>
Bang sing	Artemis parvifolia <i>Roxb.</i>
Bania kandhum	Phyllanthus lanceolarius <i>Muell.</i>
Barangom	Glossogyne pinnatifida <i>DC.</i>
Barangom	Vernonia cinerea <i>Less.</i>
Bhar bhari	Ocimum canum <i>Sims.</i>
Bare baha	Pentapetes phœnicia <i>Linn.</i>
Bare dare	Ficus bengalensis <i>Linn.</i>
Barge kode baha	Peristrophe bicalyculata <i>Nees.</i>
Bariar	Sida humilis <i>Willd.</i>
Barni	Clerodendron infortunatum <i>Linn.</i>
Barsa pakor	Colebrookia oppositifolia <i>Linn.</i>
Baru	Scleichera trijuga <i>Willd.</i>
Belaunja	Sphæranthus indicus <i>Linn.</i>
Bengo nari	Dioscorea bulbifera <i>Linn.</i>

Bereng phul	Pogonatherum saccharoideum Beauv.
Berenjo	Thevetia nerifolia Fuss.
Bhadu	Vitex Negundo Linn.
Bhainsa	Colebrookia oppositifolia Sm.
Bharbari	Ocimum Basilicum Linn.
Bharbhari	Ocimum canum Sims.
Bhatua arak	Chenopodium album Moq.
Bhedi achim	Centipeda orbicularis Lour.
Bherenda	Jatropha Curcas Linn.
Bhoga kaskom	Gossypium (arboreum) herbaceum Linn.
Bhorkond	Hymenodictyon excelsum Wall.
Bindi muthi	Fimbristylis junciformis Kunth.
Bir athel	Olax sp.
Bir barangom	Glossogyne pinnatifida DC.
Bir barangom	Sonchus arvensis Linn.
Bir baria	Sida humilis Willd.
Bir but	Flemingia congesta Roxb.
Bir horec	Atylosia scarabaeoides Benth
Bir jhawar	Desmodium Cephalotes DC.
Bir Rana arak	Commelina salicifolia Linn.
Bir kaskom	Hibiscus cancellatus Roxb.
Bir kauni	Setaria verticillata Beauv.
Bir kod	Eugenia caryophyllifolia Lamk.
Bir kubet	Andropogon echioides Nees.
Bir lopong arak	Rungia pectinata Nees.
	Vernonia cinerea Less.
Bir malkan	Atylosia mollis Benth.
Bir malla	Launaea asplenifolia HK. f.
Bir moch	Phaseolus aconitifolius Jacq.
Bir moch	Zornia diphylla Pers.
Bir mung	Phaseolus aconitifolius Jacq.
Bir munga	Dalbergia volubilis Roxb.
Bir mutha	Cyperus niveus Retz.
Bir narcha	Corchorus nov. sp. Watt.
Birnju	Bauhinia sp.
Bir saug	Phaseolus Mungo Linn.
Bir sasaug	Curcuma sp.
Bir suraj mukhi	Ionidium suffruticosum Ging.
Bir surguja	Laggera flava Benth.
Bod lar nari	Vitis adnata Roxb.
Boi bindi	Randia dumetorum Lamk.
Bokom baha	Melia Azedarach Linn.
Bonga khanti	Clematis nutans Royle.
Bonga sarjom	Ventilago calyculata Tul.
Bonga taini	Eulophia sp.
Bon kapsi	Thespesia Lampas Dals. & Gibs.
Buch	Cordia Myxa Linn.
Budhi ghasit	Pavetta indica Linn.; Var. tomentosa
Budhi ghasit	Callicarpa macrophylla Vahl.
Budhi kaskom	Gossypium (arboreum) herbaceum Linn.

Budhitilai	Pavetta indica <i>Linn.</i> ; <i>Var. tomentosa.</i>
Buru asaria	Capparis horrida <i>Linn.</i>
Buru ekasira nari	Flemingia congesta <i>Roxb.</i>
Buru kalikom charee	Equisetum debile <i>Roxb.</i>
Buru lukni ghas	Arundinella <i>Sp.</i>
Buru mach kunda	Wrightia tomentosa <i>R. & S.</i>
Buru mat	Dendrocalamus strictus <i>DC.</i>
Buru raher	Cymopsis psoralioides <i>DC.</i>
Bat	Cicer arietinum <i>Linn.</i>
Chaili	Morinda tinctoria <i>Roxb.</i>
Chakaoda arak	Cassia Tora <i>Linn.</i>
Champa baha	Ochna squarrosa <i>Linn.</i>
Chapot	} Dalbergia lanceolaria <i>Linn.</i>
Chapot siris	
Char sira	Vernonia teres <i>DC. Var. subsessilis.</i>
Chatni	Alstonia scholaris <i>Br.</i>
Chatom arak	Marsilea quadrifolia <i>Linn.</i>
Chaulia	Ruellia suffruticosa <i>Roxb.</i>
Chauric arak	Lobelia trigona <i>Roxb.</i>
Chero ghas	Ischæmum augustifolium <i>Hack.</i>
Chihut lan	Spatholobus Roxburghii <i>Benth.</i>
Chip Chirit	Achyranthes aspera <i>Linn.</i>
Chorcho	Casearea tomentosa <i>Roxb.</i>
Choto lutur	Limnophila racemosa <i>Benth.</i>
Chuduk bud	Eugenia Jambolana <i>Lamk.</i>
Chutia chandbol	Iphigenia indica <i>Kunth.</i>
Dahu	Artocarpus Lakoocha <i>Roxb.</i>
Dak ichak	Jussiaea suffruticosa <i>Linn.</i>
Dak kadur	Sopubia delphinifolia <i>G. Don.</i>
Damka duri	Plectranthus <i>Sp.</i>
Dangra seya	Premna latifolia <i>Roxb.</i>
Dare banki (1)	Vanda Roxburghii <i>Br.</i>
Dare banki (2)	Vanda <i>sp.</i> ; probably Roxburghii <i>Br.</i>
Dare dhompo	Leonotis nepetæfolia <i>Br.</i>
Dare huter	Indigofera pulchella <i>Roxb.</i>
Dare jhapak	Scindapsus officinalis <i>Schott.</i>
Dare kudrum	Hibiscus cannabinus <i>Linn.</i>
Dare murup	Butea frondosa <i>Linn.</i>
Dare orsa	Commelina suffruticosa <i>Bl.</i>
Dedhaori janum	Zizyphus Jujuba <i>Lamk.</i>
Dhai	Tacca pinnatifida <i>Forst.</i>
Dhatura	Datura fastuosa <i>Linn.</i>
Dhela	Alangium Lamarckii <i>Thw.</i>
Dhiri jhapak	Begonia picta <i>Sm.</i>
Dhobe ghas	Cynodon dactylon <i>Pers.</i>
Dhurighas	Apluda varia <i>Hack. Sub. sp. aristata Linn.</i>
Diku sindur	Buettneria herbacea <i>Roxb.</i>
Dimbu baha	Ocimum Basilicum <i>Linn.</i>
Dodhari (1)	Adiantum lunulatum <i>Burm. Var. thyrsoflor</i>

Dodhari (2)	. . . . .	<i>Cheilanthes tenuifolia Sw.</i>
Doka	. . . . .	<i>Odina Wodier Roxb.</i>
Dudhi lota	. . . . .	<i>Ichnocarpus frutescens Br.</i>
Dudhia phul	. . . . .	<i>Euphorbia Chamæsyce Linn.</i>
Dundu kit	. . . . .	<i>Gardenia turgida Roxb.</i>
Durya arak	. . . . .	<i>Vernonia cinerea Less.</i>
Edel	. . . . .	<i>Bombax malabaricum DC.</i>
Enga dhurup arak	. . . . .	<i>Leucas Clarkei Hk. f.</i>
Eradom	. . . . .	<i>Ricinus communis Linn.</i>
Erba	. . . . .	<i>Setaria italica Kunth.</i>
Etka	. . . . .	<i>Mucuna pruriens DC.</i>
Etkes	. . . . .	<i>Euphorbia antiquorum Linn.</i>
Gabur	. . . . .	<i>Acacia Farnesiana Willd.</i>
Gada hund baba	. . . . .	<i>Jasminum arborescens Roxb.</i>
Gada kalha	. . . . .	<i>Strobilanthes auriculatus Nees.</i>
Gada pachwani	. . . . .	<i>Blumea lacera DC.</i>
Gada sigrik (1)	. . . . .	<i>Erythraea Roxburghii G. Don.</i>
Gada sigrik (2)	. . . . .	<i>Salix tetrasperma Roxb.</i>
Gada terel	. . . . .	<i>Diospyros montana Roxb.</i>
Gaighura	. . . . .	<i>Polygala chinensis Linn.</i>
Gandhari arak	. . . . .	<i>Amarantus gangeticus Linn.</i>
Ganga tului	. . . . .	<i>Hyptis suaveolens Poit.</i>
Ganjher	. . . . .	<i>Sterculia villosa Roxb.</i>
Garbha gojha	. . . . .	<i>Canthium didymum Roxb.</i>
Garundi arak	. . . . .	<i>Alternanthera sessilis Br.</i>
Ghangra	. . . . .	<i>Vigna Catjang Endl.</i>
Ghora lidi	. . . . .	<i>Vitis tomentosa Heyne.</i>
Gitil arak	. . . . .	<i>Leucas mollissima Bth.</i>
Gitil ran	. . . . .	<i>Anisochilus carnosus Wall.</i>
Goaguli	. . . . .	<i>Eriolæna Hookeriana W. & A.</i>
Gokhula janum	. . . . .	} <i>Hygrophila spinosa T. Anders.</i>
Gokhula kanta	
Gom	. . . . .	<i>Anona reticulata Linn.</i>
Gore	. . . . .	<i>Stephegyne parvifolia Korth.</i>
Gote	. . . . .	<i>Croton oblongifolium Roxb.</i>
Gulanj baha	. . . . .	<i>Plameria acutifolia Poit.</i>
Gundli (1)	. . . . .	<i>Panicum miliare Lamk.</i>
Gundli (2)	. . . . .	<i>Panicum psilopodium Trin.</i>
Handi khandi	. . . . .	<i>Physalis minima Linn.</i>
Haranda	. . . . .	<i>Leea robusta Roxb.</i>
Harna pakor	. . . . .	<i>Strobilanthes auriculatus Nees.</i>
Hat	. . . . .	<i>Holarrhena antidysenterica Wall.</i>
Hatkan	. . . . .	<i>Leea macrophylla Roxb.</i>
Hatkan	. . . . .	<i>Leea robusta Roxb.</i>
Hehel	. . . . .	<i>Millettia auriculata Baker</i>
Hende disom horec	. . . . .	<i>Glycine Soja Sieb. & Zucc</i>
Hesac	. . . . .	<i>Ficus religiosa Linn.</i>
Hesel	. . . . .	<i>Anogeissus latifolia Wall.</i>

Hetmundia	Trichodesma indicum <i>Br.</i>
Hinjor	Barringtonia acutangula <i>Gaertn.</i>
Hodo jereng arak	Cyanotis tuberosa <i>Roem. & Sch.</i>
Hopo	Cochlospermum Gossypium <i>DC.</i>
Hor podo	Ficus Cunia <i>Buch.</i>
Horec	Dolichos biflorus <i>Linn.</i>
Hund	Olax scandens <i>Roxb.</i>
Hundro	Wendlandia exserta <i>DC.</i>
Hurhura	Cleome monophylla <i>Linn.</i>
Icer	Vitis latifolia <i>Roxb.</i>
Icewer	Vitis latifolia <i>Roxb.</i>
Ich koie	Eragrostis tenella <i>Nees.</i>
Ichak	Woodfordia floribunda <i>Salisb.</i>
Ichak banda	Loranthus Scurrula <i>Linn.</i>
Ichkoch	Eragrostis unioides <i>R. & S.</i>
Ilinchin	Oldenlandia senegalensis <i>Hiern.</i>
Jang olak	Grewia asiatica <i>Linn.</i>
Jang siris	Albizzia odorata <i>Beath.</i>
Jang tira	Pueraria tuberosa <i>DC.</i>
Janhe	Paspalum scrobiculatum <i>Linn.</i>
Janhe hirom	Euphorbia scabrifolia <i>Kurs.</i>
Janhe nanjom	Polycarpæa corymbosa <i>Lamk.</i>
Jargadi	Coix Lachryma-Jobi <i>Linn.</i>
Janum arak	Amarantus spinosus <i>Linn.</i>
Janum dhompo	Leonotis nepetifolia <i>Br.</i>
Jhawa khandra	Phyllanthus Lawii <i>J. Grah.</i>
Jhavar	Trema amboinensis <i>Bl.</i>
Jhimbriya	Holmskioldia sanguinea <i>Retz.</i>
Jhurjhuri	Vernonia cinerea <i>Less.</i>
Jinjit	Bauhinia variegata <i>Linn.</i>
Jinjit	Bauhinia retusa <i>Ham.</i>
Jioti	Polygonum glabrum <i>Willd.</i>
Jojo	Tamarindus indica <i>Linn.</i>
Jokha sakam	Sida humilis <i>Willd.</i>
Jom janum	Zizyphus Jujuba <i>Lamk.</i>
Jondra	Zea Mays. <i>Linn.</i>
Jugia	Cordia Macleodii <i>Hk. f. & T.</i>
Kada chandi ghas	Andropogon pertusus <i>Willd.</i>
Kada met	Premna herbacea <i>Roxb.</i>
Kadam	Anthocephalus Cadamba <i>Miq.</i>
Kadrupala	Bridelia retusa <i>Spreng.</i>
Kadu	Lagenaria vulgaris <i>Seringe.</i>
Kahu buthki	Bryonia laciniosa <i>Linn.</i>
Kalmeg	Andrographis paniculata <i>Nees.</i>
Kanchan arak	Momordica dioica <i>Roxb.</i>
Kanta phul	Barleria Prionitis. <i>Linn.</i>
Kanta saru	Lasia heterophylla <i>Schott.</i>
Kanta siris	Albizzia myriophylla <i>Benth.</i>
Kantha arak	Euphorbia granulata <i>Forsh.</i>

Karam	Adina cordifolia <i>Hk. f.</i>
Karanj jhonok ghas	Aristida <i>Sp.</i>
Kargalli	Lepidicropsis orbicularis <i>Muell.</i>
Kari	Ericybe paniculata <i>Roxb.</i>
Karkat	Zizyphus Xylopyrus <i>Willd.</i>
Karke	Bridelia retusa <i>Spreng</i>
Karmbi arak	Ipomaea speciosa <i>R. & S.</i>
Karsar	Thysolæna Agrostis <i>Nees.</i>
Karwak janum	Cariasa Carandas <i>Linn.</i>
Kasmar	Gmelina arborea <i>Roxb.</i>
Kat tilsinia	Sesamum indicum <i>DC.</i>
Katik jhunka	Crotalaria prostrata <i>Roxb.</i>
Katkom junga	Viscum attenuatum <i>DC.</i>
Kauha	Terminalia Arjuna <i>Bedd.</i>
Kedar jhawar	Cleome monophylla <i>Linn.</i>
Kedar nari	Asparagus <i>sp.</i>
Kedok arak	Argyrea speciosa <i>Sweet</i>
Kesari	Lathyrus sativus <i>Linn.</i>
Khaiyar	Acacia Catechu <i>Willd.</i>
Kharbari	Clerodendron infortunatum <i>Linn.</i>
Khijur	Phoenix sylvestris <i>Roxb.</i>
Koch Bel	Feronia elephantum <i>Correa.</i>
Kode	Eleusine coracana <i>Gartn.</i>
Kolo	Vitis lanata <i>Roxb.</i>
Kolo nari	Vitis lanata <i>Roxb.</i>
Kome	Miliusa betulina <i>H. R. F. & T.</i>
Konden	Eriosema chinense <i>Vogel.</i>
Kondro janum	Acacia Intsia <i>Willd.</i>
Korkot	Dillenia indica <i>Linn.</i>
Kuchla	Strychnos potatorum <i>Linn.</i>
Kujri	Celastrus paniculatus <i>Willd.</i>
Kukra	Setaria glauca <i>Beauv.</i>
Kulai lutur	Lepidagathis scariosa <i>Nees.</i>
Kumbir	Careya arborea <i>Roxb.</i>
Kuri gandhara	Digera arvensis <i>Forsk.</i>
Kurit rama	Zizyphus oxyphylla <i>Edgew.</i>
Kuruinj	Pongamia glabra <i>Vent.</i>
Lal kesari	Eclipta alba <i>Hassk.</i>
Larka baha	Amarantus paniculatus <i>Miq.</i>
Layo gundli	Panicum antidotale <i>Retz.</i>
Lenaha	Pennisetum typhoideum <i>Rich.</i>
Lil kathi	Polygala crotalarioides <i>Ham.</i>
Lili bichi	Indigofera pulchella <i>Roxb.</i>
Loa	Ficus glomerata <i>Roxb.</i>
Lodam	Symplocos racemosa <i>Roxb.</i>
Lopong	Terminalia belerica <i>Roxb.</i>
Lopong arak	Aerua lanata <i>Linn.</i>
Lopong herak	Uraria lagopoides <i>DC.</i>
Loto	Randia dumetorum <i>Lamk.</i>
Lutni	Brassica campestris <i>Linn.</i>

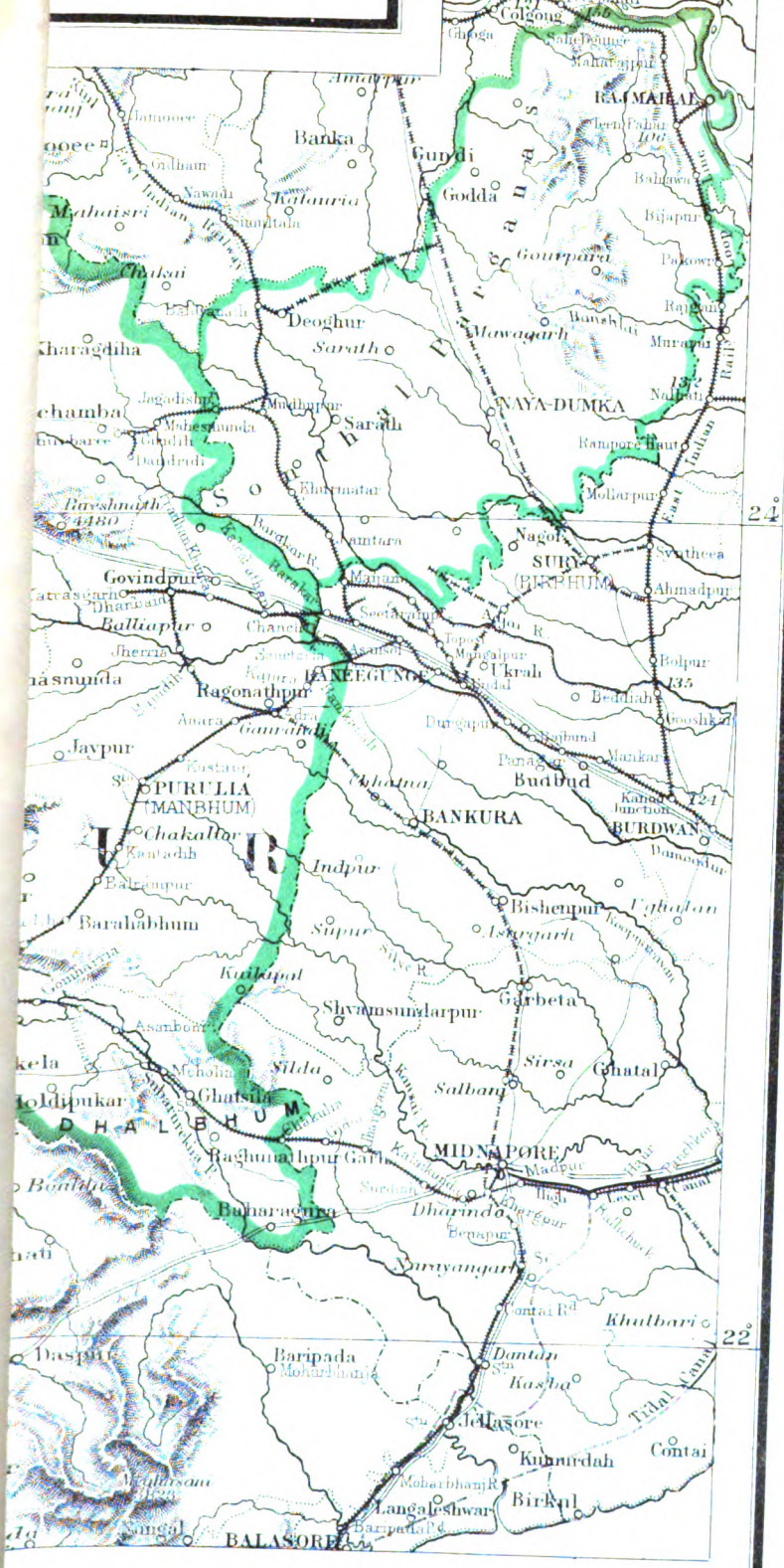
Machkunda	<i>Pterospermum acerifolium Willd.</i>
Madhur lata	<i>Ficus scandens Roxb.</i>
Makar kenda	<i>Diospyros Embryopteris Pers.</i>
Malhan	<i>Dolichos Lablab Linn.</i>
Mali buha	<i>Ocimum Basilicum L. Var. thyrsoflora.</i>
Mandargom	<i>Anona squamosa Linn.</i>
Marang jhunka	<i>Crotalaria alata Roxb.</i>
Marang kongah	<i>Dregia volubilis Bth.</i>
Marabha	<i>Vitex peduncularis Wall. Var. Roxburg- hiana C. B. Clarke</i>
Marak	<i>Erythrina indica Roxb.</i>
Motha arak	<i>Antidesma diandra Tulas.</i>
Motha sura	<i>Terminalia Arjuna W. & A.</i>
Mathom arac	<i>Hygrophila salicifolia Nees.</i>
Matkom	<i>Bassia latifolia Roxb.</i>
Meral	<i>Phyllanthus Emblica Linn.</i>
Merlec	<i>Flacourtia Ramontchi L'Herit.</i>
Merom chundri	<i>Cyanotis tuberosa R. & S.</i>
Merom met	<i>Ixora parviflora Vahl.</i>
Merom met	<i>Olax nana Wall.</i>
Mihndi	<i>Lawsonia alba Linn.</i>
Miru baha	<i>Abutilon indicum Don.</i>
Moch	<i>Phaseolus aconitifolius Jacq.</i>
Moron arak	<i>Holostemma Rheedii Wall.</i>
Mota bhedi janetel	<i>Urena sinuata Linn.</i>
Mota bir jhunka	<i>Crotalaria calycina Shrank.</i>
Mota gundli	<i>Panicum sp.</i>
Mota uric alang	<i>Portulaca oleracea Linn.</i>
Mung	<i>Phaseolus Mungo L., var. maxima Roxb.</i>
Munga arak	<i>Moringa pterpyosperma Gaertn.</i>
Munjur juti	<i>Elephantopus scaber Linn.</i>
Murga	<i>Pterocarpus Marsupium Roxb.</i>
Murup	<i>Butea frondosa Linn.</i>
Mutha	<i>Cyperus rotundus Linn</i>
(Mutha ghas)	<i>Kyllinga monocephala Rottb.</i>
Nanha	<i>Cheilanthes tenuifolia Sw.</i>
Nanhabindi mutha	<i>Thunbergia monostachya Hassk.</i>
Nanha bonga charee	<i>Panicum sp.</i>
Nanha durhi ghas	<i>Andropogon Schœnanthus Linn.</i>
Nanha jhunka	<i>Crotalaria prostrata Roxb.</i>
Nanha pusi toa	<i>Euphorbia thymifolia Burm.</i>
Nari ghas	<i>Panicum vestitum Nees.</i>
Nari murup	<i>Butea (superba R.) frondosa Roxb.</i>
Nari siris	<i>Dalbergia volubilis Roxb.</i>
Nuri	<i>Elaeodendron Roxburghii W. & A.</i>
Nurnic	<i>Cassia Fistula Linn.</i>
Ochohic	<i>Boerhaavia diffusa Roxb.</i>
OI	<i>Amorphophallus campanulatus Blum. .</i>
Olat	<i>Grewia tilizefolia Vahl.</i>

Olat	<i>Grewia vestita</i> Wall.
Ome	<i>Miliusa velutina</i> Hf. & T.
Oponom	<i>Angelica glauca</i> Edgew.
Orop	<i>Costus speciosus</i> Sm.
Orsorin	<i>Curcuma</i> sp.
Ot kondro	<i>Cassia mimosoides</i> Linn.
Ot poraini	<i>Ophioglossum vulgatum</i> Linn.
Pader	<i>Stereospermum suaveolens</i> DC.
Pango nari	<i>Chrozophora plicata</i> A. Juss.
Panjon	<i>Polyalthia cerasoides</i> Benth & Hk.f.
Panjot	<i>Clerodendron phlomoides</i> Linn.f.
Panjot nari	<i>Porana paniculata</i> Roxb.
Pansinga baha	<i>Dysophylla verticillata</i> Benth.
Paror jhinga	<i>Luffa acutangula</i> Roxb.
Parwa cetchirip	<i>Cynoglossum denticulatum</i> A.DC.
Parwa jhara	<i>Euphorbia dracunculoides</i> Lamk.
Parwa lata	<i>Cynoglossum denticulatum</i> A.DC.
Patal kohnda	<i>Pueraria tuberosa</i> DC.
Pathu orot	<i>Æginetia indica</i> Linn.
Patwa ghas	<i>Cassia mimosoides</i> Linn.
Pet chamra	<i>Helicteres Isora</i> Linn.
Pet chamra banda	<i>Viscum monoicum</i> Roxb.
Petrada	<i>Jussiaea suffruticosa</i> Linn.
Pichari baha	<i>Wendlandia exserta</i> DC.
Pinde	<i>Randia uliginosa</i> DC.
Piska	<i>Dioscorea oppositifolia</i> Linn.
Pitoj	<i>Putranjiva Roxburghii</i> Wall.
Pitua arak	<i>Spermacoce stricta</i> Linn.
Pojò	<i>Tetranthera monopetala</i> Roxb.
Pond disom horec	<i>Glycine Soja</i> Sieb & Zucc.
Pond gandhari arak	<i>Amarantus tristis</i> Linn.
Pond kawet	<i>Abrus precatorius</i> Linn.
Pond raj baha	<i>Nerium odorum</i> Solan.
Popro	<i>Gardenia latifolia</i> Ait.
Poska olat	<i>Kydia calycina</i> Roxb.
Pusi pan	<i>Ehretia levis</i> Roxb.
Pusi pan	<i>Heliotropium strigosum</i> Willd.
Pusi toa	<i>Euphorbia pilulifera</i> Linn.
Putki malli	<i>Cardiospermum Halicacabum</i> Linn.
Raher	<i>Cajanus indicus</i> Spreng.
Rai	<i>Brassica juncea</i> Hk.f. & T.
Rai dhani	<i>Ventilago calyculata</i> Tul.
Raila baha	<i>Barleria</i> sp.
Raj baha	<i>Nerium odorum</i> Soland.
Ralli	<i>Piper longum</i> Linn.
Ramra	<i>Phaseolus Mungo</i> Linn. <i>Var. radiata</i> .
Rangaini janum	<i>Solanum xanthocarpum</i> Schrad & Wendl.
Rani phul	<i>Polygonum indicum</i> Heyne.
Ride	<i>Casearia tomentosa</i> Roxb.

Rol	<i>Terminalia Chebula Rets.</i>
Rondoc,	<i>Blumea Wightiana DC.</i>
Rora	<i>Mallotus philippinensis Muell.</i>
Rot	<i>Ougeinia dalbergioides Benth.</i>
Ruhen	<i>Soymida febrifuga A. Juss.</i>
Saguna	<i>Tectona grandis Linn.</i>
Sahra	<i>Streblus asper Lour.</i>
Sakarkenda	<i>Ipomæa Batatas Lamk.</i>
Salga	<i>Boswellia serrata Roxb.</i>
Sama ghas	<i>Panicum colonum Linn.</i>
Sapuirom	<i>Nyctanthes Arbor-tristis Linn.</i>
Saram lutur	<i>Clerodendron serratum Spreng.</i>
Sar ghas	<i>Saccharum arundinaceum Rets.</i>
Sarjom	<i>Shorea robusta Gartn.</i>
Sarparating	<i>Globba orixensis Roxb.</i>
Satsayar	<i>Dalbergia latifolia Roxb.</i>
Sauri arak	<i>Polygonum glabrum Willd.</i>
Sauri ghas	<i>Andropogon contortus Linn.</i>
(Secra) sekra	<i>Zizyphus rugosus Lamk.</i>
Sega janum	<i>Mimosa rubicaulis Lamk.</i>
Sehrec	<i>Lagerstrœmia parviflora Roxb.</i>
Sengel sing	<i>Tragia involucrata Linn.</i>
Serwang	<i>Vigna vexillata Benth.</i>
Seta andir	<i>Grewia polygama Roxb.</i>
Seta kata	<i>Grewia polygama Roxb.</i>
Seta kata arak	<i>Gynandropsis pentaphylla Linn.</i>
Seta pan	<i>Monochorea sp.</i>
Seta pan	<i>Monochorea plantaginea Kunth.</i>
Siknar	<i>Urena repanda Roxb.</i>
Sikyom baha	<i>Crinum nov. sp. G. Watt.</i>
Sim basak	<i>Flemingia strobilifera R. Br.</i>
Sim dôehok	<i>Cyanotis tuberosa R. & S.</i>
Sim mutha sura	<i>Desmodium latifolium DC.</i>
Sindnari	<i>Vitex Negundo Linn.</i>
Sing arak	<i>Bauhinia purpurea Linn.</i>
Sinjo	<i>Ægle Marmelos Correa.</i>
Sirgit arak	<i>Celosia argentea Linn.</i>
Siric samand	<i>Gloriosa superba Linn.</i>
Siris	<i>Albizzia Lebbek Benth.</i>
Sirom	<i>Andropogon muricatus Rets.</i>
So kod	<i>Eugenia Jambolana Lamk.</i>
Son	<i>Crotalaria juncea Linn.</i>
Son jhunka	<i>striata DC.</i>
Soso	<i>Semecarpus Anacardium Linn.</i>
Sunta bukni	<i>Eleusine ægyptiaca Desf.</i>
Sunum jor	<i>Ficus cordifolia Roxb.</i>
Sura	<i>Cyperus tegetum Roxb.</i>
Surgi baha	<i>Anisomeles ovata R.Br.</i>
Surguja	<i>Guizotia abyssinica Cass.</i>
Sutri	<i>Phaseolus calcaratus Roxb.</i>

Taben arak	Desmodium gyrans DC.
Tandi bhedi janetel	Desmodium gangeticum DC.
Tandi chatom arak	Desmodium parvifolium DC.
Tandi chatmarak	Oxalis corniculatus Linn.
Tandi jhapni	Zornia diphylla Pers.
Tandi khode baha	Evolvulus alsinoides Linn.
Tandi khode baha	Indigofera linifolia Retz.
Tan li meral	Phyllanthus simplex Retz.
Tandi sol	Ionidium suffruticosum Ging.
Tandi sunsuni	Desmodium parvifolium DC.
Tandi sura	Cyperus rotundus Linn.
Tarbuji	Cucumis Melo Linn.
Tarse kotap	Grewia villosa Willd.
Tayar baha	Justicia Betonica Linn.
Tejo malla	Cissampelos Pareira Linn.
Telhec	Sterculia urens Roxb.
Terel	Diospyros (tomentosa Roxb.) Embryopteris Pers.
Thadia turi	Brassica campestris var. Toria Linn.
Thuiak arak	Melochia corchorifolia Linn.
Tihon	Canavalia ensiformis DC.
Tilai	Wendlandia tinctoria DC.
Tilmin	Sesamum indicum Linn.
Tiririte	Vicia hirsuta Koch.
Tirra	Pueraria tuberosa DC.
Torchandbol	Eragrostis ciliaris Linn.
Totonopak	Eugenia operculata Roxb.
Turam	Oldenlandia senegalensis Hierw.
Turi sim	Orobanche indica Ham.
Udal	Sterculia sp. (G. Watt.)
Ul	Mangifera indica Linn.
Uri	} Oryza sativa Linn.
Uri horo	
Utri dudhi	Cryptolepis Buchanani R. & S.
Varni	Clerodendron infortunatum Linn.

(W : -X : -Y : -Z. No words beginning.)



21

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Banka
Gyda
Goddā
Katauria
Deoghur
Savatho
Sarathā

Govindpur
Balliapur
Ragonathpur
Chakaltar
Kantadh
Barahabhum

SPURULIA
(MANBHUM)
Chakaltar
Kantadh
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DHALBHUM
Ghatsula
Rashmalpur
Buharagunia

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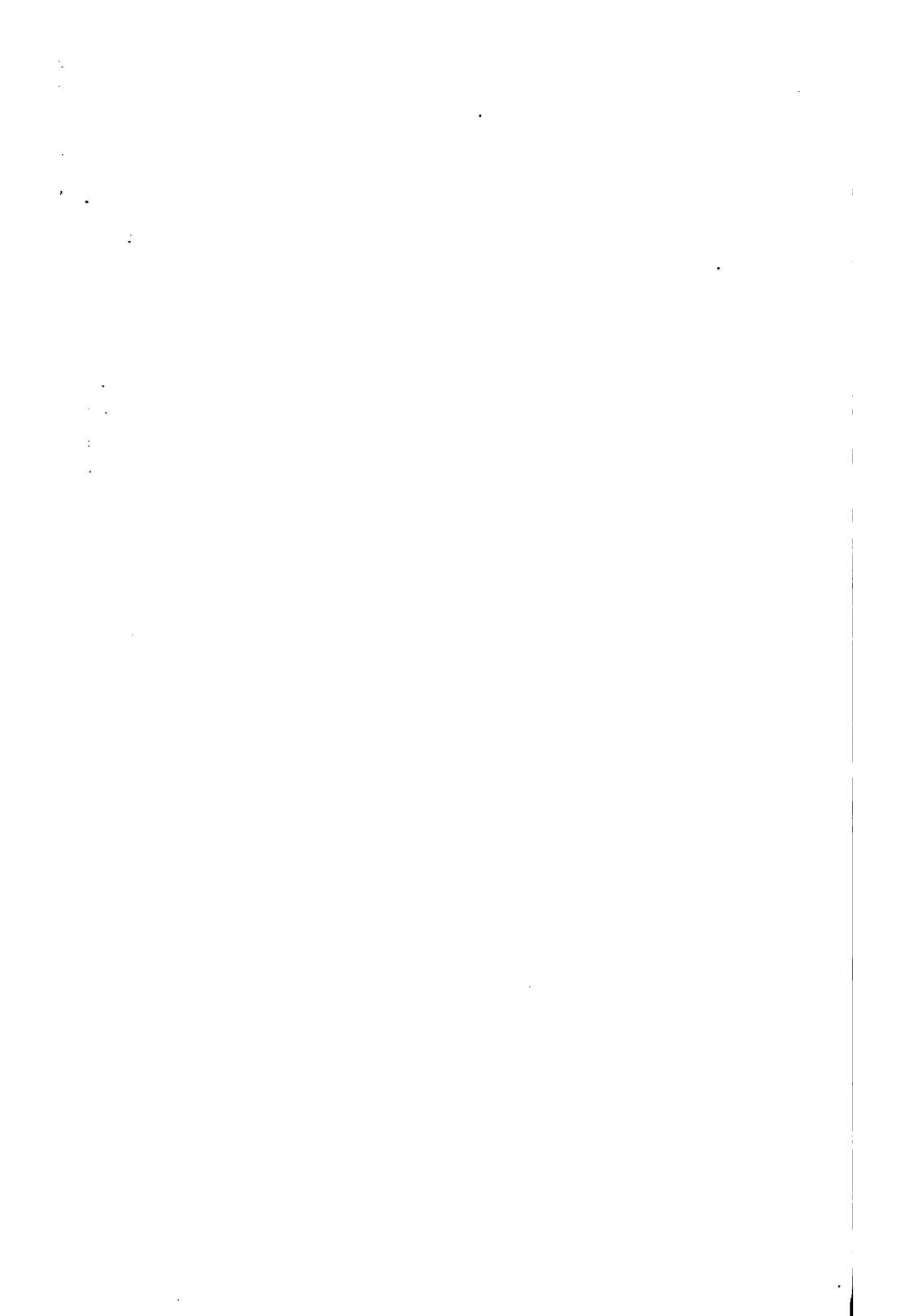
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A NOTE ON PLANTS
USED DURING FAMINES AND SEASONS OF SCARCITY
IN THE BOMBAY PRESIDENCY.

—◆—
By G. A. GAMMIE.
—◆—

BY Government of Bombay Resolution No. 5214, dated 25th July 1901, I was instructed to place myself in communication with the Collectors of affected districts in order to procure complete information regarding the plants used for food during times of scarcity and famine. A list is appended of the Collectors and their subordinate officers who generously assisted in the enquiry and to whom my thanks are due.

In many cases the samples submitted were very inadequate and were only to be identified after minute investigation ; but, still, the valuable remarks attached to many compensated for the trouble in effecting their determination. The vernacular names are collected with extreme care and as they, in almost all cases, refer to common plants, sufficiently familiar to be selected for food, they can be accepted as correct. The names are localized in the list to illustrate the differences of usage in the various districts. In a few instances and probably by inadvertence, vernacular names and specimens were transposed. There was no difficulty found in correcting mistakes of this description ; but, in fewer instances, happily, vernacular names were applied indiscriminately. These, of course, were deleted and are ignored in the list. It must be borne in mind that few of these plants are or could be used exclusively for food. The customary method is to mix them with cereal grains to eke out a scanty stock of the latter and the poorer classes habitually resort to such expedients.

Dr. J. C. Lisboa (Gazetteer, Bombay Presidency, Volume XXV, pp. 190-209) (1886) mentioned "that it is curious to find in many reports written on the subject that plants and vegetables that are eaten all the year round in ordinary times are sometimes included in the lists of famine foods." He also states, with forcible truth, "that it is a difficult task for a single man, however long he may have resided in the country, to obtain an accurate list of all the food grains and vegetables eaten by the natives of India during ordinary seasons and those of scarcity. It is also a fact that even well-to-do natives eat some of the wild herbs found in or about their villages, either as a change or as an addition to the meals or when a supply of good cultivated vegetables is not procurable, and many of them make a point to use, at least once a year, made into *shak baji*, herbs and tubers usually eaten by the humbler classes, whether cultivated or uncultivated, under the belief that such a proceeding assists in warding off various causes of disease."

In my own opinion it is neither politic nor desirable to obtain a complete list of all the plants used in times of stress, as any plant, not absolutely poisonous or repugnant to the taste, will serve, and besides, the self-respecting attitude of the very poor protects them from minute research into the details of their poverty. Another point must also be remembered, and, that is, in an enquiry of this description, the people, from an intense dread of ridicule, will often withhold information regarding even their ordinary articles of diet. A cursory examination of the list will prove that, with very few exceptions, the plants named are palpable makeshifts for more wholesome food and that, even were they subjected to rigid selection under long-continued cultivation, the result would not repay the labour and anxiety entailed.

The Special Civil Officer in charge of famine relief works at Khamgaon Tank, Poona District, remarks: "The poorer classes make use of the grass seeds and green vegetation when they have not sufficient food, but some of the seeds and vegetation being injurious to human health, the workers are not allowed to make use of them. Besides, the price of the common staple food grain, *bajri* not being very heavy during this famine, no necessity compelled them to make use of the seeds, etc. If these latter are not properly cooked and are eaten in too great quantity they tend to produce diarrhœa and dysentery and are, therefore, strictly prohibited from use on this work. The entire use of these and other

grasses and vegetables would not keep human life for a considerable period with safety and health."

The Mamletdar of Sangamner Taluka, Ahmednagar, writes: "In other seasons the poorer classes collect the seeds of *Ichaka*, *Godsdi* and *Kena*, *Kaotha nut* and *Umbar*. The fruits of Prickly Pear too are used by the poorer classes."

Dr. Lisboa remarks (*op. cit.*): "It is a fact that many of the plants in the list given below contain less of nutritive principles and more of woody tissue, gummy and resinous substances and various extractive matters which are neither digestible nor nourishing; they may be palatable to the taste and temporarily appease the cravings of hunger, but their exclusive use for a lengthened period brings on decay and emaciation and renders the constitution an easy prey to disease. This assertion is not based on theory alone. Numerous facts observed during the famines in Orissa, Behar, Madras, and the Southern Mahratha Country, prove that the protracted use of such herbs alone, even "of *taclu*, *muchur*, etc., which are used in ordinary seasons in small quantities along with other food, was followed by emaciation and other symptoms of slow starvation such as *anæmia*, *scurvy*, etc., often proving fatal by inducing diarrhœa, dysentery, dropsy of the whole body, or of the abdomen alone . . . besides the plants below mentioned, there are many others which famine-stricken people make use of, in fact, it would appear that they devour whatever more or less tender vegetable substances they come across, provided they are not either very acrid or bitter."

My thanks are due to the Collectors and other duly mentioned officers of the districts from which information was sent to me.

Ahmednagar District—

The Collector.

The Mamletdar of Akola.

- „ of Ahmednagar.
- „ of Karjat.
- „ of Kopergaon.
- „ of Newasa.
- „ of Parner.
- „ of Rahuri.
- „ of Sangamner.
- „ of Shevgaon.
- „ of Shrigonda.

Bijapur District—

The Collector.

The Mamletdar of Badami.

" of Bilgi.

" of Indi.

" of Sindgi.

Broach District—

The Collector.

The Mamletdar of Amod.

" of Anklesvar.

" of Jambusar.

" of Wagra.

Ahmedabad District—

The Collector.

The Mamletdar of Ahmedabad.

" of Gogha.

" of Modasa.

" of Prantij.

" of Viramgaon.

Kaira District—

The District Deputy Collector, Kaira.

The Mamletdar of Anand.

" of Borsad.

" of Kapadvanj.

" of Matar.

" of Mehamadabad.

" of Nariad.

" of Thasra.

Khandesh District—

The Collector.

The Mahalkari of Nawapur.

The Mamletdar of Pimpulner.

" of Shahada.

" of Shirpur.

" of Taloda.

Nasik District—

The Collector.

The Mamletdar of Baglan.

" of Chandor.

" of Dindori.

" of Igatpuri.

" of Kalwan.

" of Malegaon.

" of Nandgaon.

" of Nasik.

" of Niphad.

" of Peint.

" of Sinnar.

" of Yeola.

Panch Mahals—

The Collector.

The Assistant Collector, Godhra.

The District Deputy Collector, Panch Mahals.

Poona District—

The Collector.

The Mamletdar of Junnar.

Special Civil Officer, Khamgaon Tank.

The Mahalkari of Mulshi.

The Mamletdar of Purandhar.

Special Civil Officer, Walha Parincha Road.

Satara District—

The Collector.

Sholapur District—

The Divisional Forest Officer, Sholapur.

Surat District—

The Collector.

The Mamletdar of Bardoli.

The Range Forest Officer, Mandvi.

The Mamletdar of Mandvi.

" of Olpad.

The Range Forest Officer, Dangs.

The Divisional Forest Officer, Surat.

The Mamletdar of Pardi.

The Mahalkari of Valod.

DILLENACEÆ.

Dillenia pentagyna, Roxb. *Karaola* (Dang, Surat). The flowers and fruits are eaten. This tree flourishes only in the moister parts of the Presidency and its habitats are remote from most areas liable to famine.

ANONACEÆ.

Anona squamosa, Linn. *Sitaphal*. Although this plant has run wild round Deccan villages and maintains its existence on dry rocky soil, its fruit is probably worthless in seasons of a drought.

MENISPERMACEÆ.

Cocculus villosus, DC. *Vasu vel* (Taloda, Khandesh). *Dagadi* (Badami, Bijapur). "The leaves are made into *bhaji*." "The root is said to be medicinal."

NYPHÆACEÆ.

The roots and seeds of *Nymphæa Lotus*, Linn. and *Nymphæa stellata*, Willd. and *Nelumbium speciosum*, Willd. are said to be eaten during periods of scarcity.

CRUCIFERÆ.

Members of this order are rare in the Bombay Presidency, and not one of its species would survive in the absence of rainfall.

CAPPARIDÆ.

Cleome viscosa, Linn. *Tilwani*. (Poona and Ahmednagar Districts.) *Tilvan* (Yeola, Nasik). Leaves are eaten.

POLYGALÆ.

Polygala chinensis, Hooker. *Negli*. Leaves eaten. (J. C. Lisboa.)

PORTULACACEÆ.

Portulaca Oleracea, Linn. *Ghol* (Ahmednagar and Nasik Districts). *Gholu* (Sangamner, Ahmednagar). *Gkola* (Satara). *Goli* (Badami, Bijapur). A plentiful weed on waste and cultivated ground. Leaves eaten.

Portulaca quadrifida, Linn. *Chil* (Rahuri, Ahmednagar) *Gholu* (Khamgaon, Tank, Poona). *Chul ghul* (Walha Parincha Road, Poona). *Chighal* (Ahmednagar). *Ghol* (Ahmednagar). *Nacha goli* (Indi, Bijapur). Very common

in waste and cultivated ground. "This is a vegetable, the leaves of which are used in preparing bread by mixing with *Bajri* or *Fowari* flour, after being boiled."

Portulaca suffruticosa, Wight. *Morad* (Ahmedabad). Leaves eaten. Plant received from this locality only.

MALVACEÆ.

Abutilon indicum, G. Don. *Kachnia* (Ahmednagar). Seeds eaten.

Abutilon muticum G. Don. *Chakrabenda*. Seeds eaten. (J. C. Lisboa.)

Hibiscus panduræformis, Burms. *Kasli* (Khamgaon Tank, Poona). "Seeds mixed with *Bajri* or *Fowari* grains and made into flour."

Hibiscus tiliacerus, Linn. *Belapata*. Mucilage eaten. (J. C. Lisboa.)

Bombax malabaricum, DC. *Sawar* (Shahada, Khandesh). *Shimla* (Godhra, Panch Mahals). *Savri*. (Taloda, Khandesh). "Young roots from this tree, like *Nim* tree, cut into thin pieces and when mixed with spices and salt, form a good food." "The gum, tender leaves, and flowers are eaten. The root is first roasted over the fire and then the skin is taken off and the contents which are similar to that of sweet potato (*ratali*) are eaten. The leaves are eaten after boiling with condiments. The flowers are first dried and then pounded. The flower is then prepared into bread, either with or without corn."

Eriodendron anfractuosum, DC. *Shameula*, *Pandhari Savar*. Seeds eaten. (J. C. Lisboa.)

STERCULIACEÆ.

Sterculia urens, Roxb. *Kadhái* (Shahada, Khandesh). "This grows as large as a *Nim* or *Babhúl* tree. Its tender roots are edible. They are first cut into small pieces, then boiled and mixed with either spices or sugar. The tree further yields a good outturn of seeds of a black colour and as large as gram. It is dried and turned into pulse. Its taste is similar to that of *Masúr*."

Buettneria herbacca, Roxb. Leaves eaten. (J. C. Lisboa.)

TILIACEÆ.

- Grewia populifolia**, Vahl. *Tapadi* (Sholapur). Leaves eaten.
Grewia tillæfolia, Vahl. *Dhaman* (Taloda, Khandesh).
Dhamni (Dang, Surat). *Rodaga* (Sholapur). "The tender
leaves only of this tree are eaten."
Grewia pilosa, Lamk. *Karmati* (Sholapur). Leaves eaten.
Corchorus sp. Rajan (Panch Mahals). Leaves eaten.

ZYGOPHYLLÆ.

- Tribulus terrestris**, Linn. *Sarata* (Universally.) *Gokharu*
(Nasik). "Leaves boiled with water and mixed with salt
and chillies if available." An abundant and troublesome
weed on waste, sandy soils. The fruits are also said to be
eaten.

GERANIACEÆ.

- Oxali Scorniculata**, Linn. *Ambusi*. Leaves eaten. A common
almost ineradicable weed in moist soils.

RUTACEÆ.

- Feronia elephantum**, Correa. *Kothi* (Jâmbusar). Fruits eaten.
Egle marmelos, Correa. *Bila* (Mandvi, Surat). Fruits eaten.

.BURSERACEÆ.

- Garuga pinnata**, Roxb. *Kaked* (Mandvi, Surat). Leaves and
fruits eaten.

MELIACEÆ.

- Melia azadirachta**, Linn. *Nim* (Mandvi, Surat). Fruits.

RHAMNEÆ.

- Zizyphus jujuba**, Lamk. *Bordi* (Dang, Surat). *Bor* (Shola-
pur). Fruits.

SAPINDACEÆ.

- Cardiospermum Halicacabum**, Linn. *Naphatki*. (J. C.
Lisboa.) Leaves and young shoots eaten.

ANACARDIACEÆ.

- Rhus mysorensis**, Heyne. *Ambonia* (Rahuri, Ahmednagar).
Ambaoni (Ahmednagar). *Amoni* (Sholapur). Leaves and
fruits eaten. "The fruits are used after cooking or roast-
ing on an iron pan."

MORINGEÆ.

Moringa pterygosperma, Gærtn. *Shekta* (Surat). Roots, leaves, flowers and fruits eaten. "Cooked in water and mixed with salt and chillies."

LEGUMINOSÆ.

Rothia trifoliata, Pers. (J. C. Lisboa.) Leaves and pods eaten.

Crotalaria orixensis, Rottb. *Lagad* (Newasa, Ahmednagar)

"This plant bears pods which contain red seeds as large as *Bajri*. It is used for bread."

Indigofera linifolia, Retz. *Barbada* (Newasa, Ahmednagar).

"The plant is threshed and gives seeds like Italian millet (*Rala*). It is turned into flour for making bread."

Indigofera cordifolia, Heyne. *Godadi* (Universally). *Potre*

(Malegaon, Nasik). "Seeds mixed with *Bajri* or *Fowari* grains and made into flour. The plant is removed and threshed. It yields a white seed like opium and it is used for making bread. It thrives on light mûrûm soil and on lands lying fallow for a considerable time. It grows with grass at the commencement of the monsoon and is ripe in the month of November. It, also, is threshed like *Vichka* (*Cyanotis axillaris*) and bread is made of it. It has not a bad taste when it is mixed with *Fowari*; otherwise, it is not palatable. When it is used without mixture of grain, such as *Fowari* or *Bajri*, the body of the eater swells and he is likely to succumb. When it is used after mixing with grain it does not produce any bad effect on one's health. Like *Vichka* it has not the quality of keeping off hunger."

Indigofera glandulosa, Willd. *Divali* (Newasa, Ahmednagar).

Ranmetha (Kopargaon, Ahmednagar). *Borbada* (Purandhar, Poona). *Pahudi* (Anklesvar, Broach). *Fronju* (Nawapur, Khandesh). *Barbada* (Nandgaon, Nasik). *Peodi* (Mandvi, Surat). *Defri* (Wagra, Broach). "Plants when threshed give reddish seed like Italian millet. It is either boiled as rice or is used for making bread after converting it into flour."

Indigofera linifolia, is common on poor grass lands. The other species mentioned come up in thick beds along river banks and on low lying lands liable to be inundated during heavy showers in the rainy season. Towards the end of September

they stand laden with fruits and the yield of seeds in favourable situations must be very large. From the number of specimens received, it is to be presumed that these *Indigoferas* are of considerable value as food.

- Sesbania ægyptiaca**, Pers. *Shevri* (J. C. Lisboa). Seeds eaten. A very quickly growing, short lived shrub, also useful for fodder. It will not thrive, however, without water.
- Sesbania grandiflora**, Pers. *Aghio* (Dang, Surat). Leaves, flowers and young pods are eaten. This is also a quickly growing shrub, much used in *Pan baris*.
- Smithia sensitiva**, Ait. *Kawale*. (Akola, Ahmednagar). *Kawala*. (Igatpuri, Nasik). Leaves eaten. This and other species of this genus are superabundant on flat low lying lands in the moister parts, and their bright green leaves and sparkling flowers literally carpet large areas.
- Alysicarpus rugosus**, DC. Seeds eaten. (J.C. Lisboa.) Common in pastures.
- Butea frondosa**, Roxb. *Khakhar* (Dang, Surat). "Roots toasted and eaten."
- Phaseolus trilobus**, Ait. *Ranmatki* (Walha Parincha Road, Poona). *Mathan* (Yeola, Nasik). *Mataki* (Sangamner, Ahmednagar). Seeds eaten.
- Phaseolus trinervius**, Heyne. *Chamdadi* (Walha Parincha Road, Poona) Seeds eaten. Specimens were only received from this locality, but Dr. Lisboa says: "The seeds, said to be rich in nitrogenous principles, were largely used by the famine-stricken people."
- Canavalia ensiformis**, DC. *Mavi* (Mandvi, Surat). Pods eaten. This cultivated plant often runs wild on village hedge-rows.
- Vigna vexillata**, Benth. *Chaoli* (Shirpur, Khandesh). *Halgia* (Chandor, Nasik). Tubers eaten. An abundant plant over areas of heavy rainfall, but absent from the drier districts.
- Dolichos biflorus**, Linn. *Papadi* (Nawapur, Khandesh). "Fruits used as vegetables."
- Cassia Fistula**, Linn. *Germara* (Mandvi, Surat). No information was supplied regarding the parts eaten.
- Cassia occidentalis**, Linn. *Thorla tacala*. Leaves eaten. (J. C. Lisboa.)
- Cassia Sophera**, Linn. *Kashawada* (Poona District). Leaves eaten.

Cassia Tora, Linn. *Tarota* (Universally). *Kasoda* (Rahuri, Ahmednagar). *Takla* (Satara). *Sekto* (Olpad, Surat). "The leaves are used in preparing bread by mixing *Bajri* or *Fowari* flour, after being boiled with water." This plant, in spite of its nauseous odour, is used as a vegetable at ordinary times and, judging from the number of specimens received from many districts, it must form a valuable food adjunct in times of scarcity.

Cassia auriculata, Linn. *Tarwar*; *Aral*. Leaves eaten. (J. C. Lisboa.) A superabundant plant on dry soils, in flower more or less all the year round. The bark is largely used by native tanners.

Tamarindus indica, Linn. *Chinch*; *Amlī* (Universally). *Han-shi* (Bilgi, Bijapur). Leaves and seeds eaten. "Amlī is used to mix with Dhúdhda (*Arisæma*) whilst cooking."

Bauhinia racemosa, Linn. *Asitranaparda* (Bardoli, Surat) *Asintro* (Dang, Surat). *Asitra* (Mandvi, Surat). *Apta* (Generally in Marathi). Seeds eaten. "Dry, grind, and make loaves."

Acacia arabica, Willd. *Babhúl*. Seeds eaten and said to be very deleterious. It is commonly said that only seeds voided by goats when eating the pods germinate readily.

Acacia leucophlæa, Willd. Bark and pods eaten. (J. C. Lisboa.) This tree is common on dry, *múrúm* soils and its branches are usually enlarged and distorted by disease.

CACTEÆ.

Opuntia nigricans Hw. *Nivandga* (Satara). *Hathia Thor* (Jambusar). Fruits eaten. The common prickly pear of Western India and an ineradicable pest in too many localities. It, of course, survives throughout the severest drought, but its phylloclades become very shrivelled, so that its value as a fodder would not be so great as is generally assumed.

COMBRETACEÆ.

Terminalia Belerica, Roxb. *Behedo* (Mandvi, Surat). Fruits eaten.

Terminalia Arjuna, Bedd. *Sadad* (Panch Mahals). Fruits eaten.

MYRTACEÆ.

Eugenia Jambolana, Lamk. *Jambuds* (Dang, Surat). Fruits eaten (probably to a greater extent than in ordinary seasons).

CUCURBITACEÆ.

Cucumis trigonus, Roxb. *Kachla* (Panch Mahals.) Fruits eaten.

Momordica dioica, Roxb. *Kankodan*; *kantola* (Panch Mahals). Fruits eaten.

Cephalandia indica, Naud. *Tongli* (Malegaon, Nasik). Ripe fruits eaten.

Rhynocarpa fœtida, Schrad. Fruits and leaves eaten. (J. C. Lisboa.)

FICOIDEÆ.

Trianthea decandra, Linn. *Ghetuli* (Sangamner, Ahmednagar). Leaves eaten.

Trianthea monogyna, Linn. *Ghetuli* (Poona and Ahmednagar). *Vasu* (Ahmednagar). "Leaves boiled with water and mixed with salt and chillies."

Orygia decumbens, Forsk. Leaves eaten. (J. C. Lisboa.)

Gisekia pharnacioides, Linn. Leaves eaten. (J. C. Lisboa.)

UMBELLIFERÆ.

Hydrocotyle asiatica, Linn. *Khoburwali* (Ahmednagar). Leaves eaten. This is the only member of the order received.

CORNACEÆ.

Alangium lamareckii, Thw. *Ankol* (Dang, Surat). No note regarding parts eaten was received.

RUBIACEÆ.

Randia uliginosa, DC. *Gengdi* (Bardoli, Surat). *Gengada* (Panch Mahals). "Fruits cooked in water and mixed with salt and chillies."

Randia dumetorum, Lamk. *Gengua* (Surat). Fruits eaten.

Canthium parviflorum, Roxb. *Kar* (Sholapur). Fruits eaten.

COMPOSITÆ.

Eclipta alba, Hassak. *Tandala* (Igatpuri, Nasik). Leaves eaten.

Guizotia abyssinica, Cass. *Khurasni* (Akola, Ahmednagar).
Leaves eaten.

Glossocardia linearifolia, Cass. Leaves eaten. (J. C. Lisboa.)

Goniocaulon glabrum, Cass. *Kasmud* (Universally). *Kat kasmad* (Khamgaon Tank, Poona). "Leaves boiled with water and mixed with salt and chillies, if available." This common plant appeared to be one of the most esteemed as famine food.

Sonchus oleraceus, Linn. *Pathari* (Ahmednagar). Leaves eaten. This, although an exceedingly common plant, was only received from one locality.

Launæa pinnatifida, Cass. *Pathuri* (Universally). *Hattarki* (Badami, Bijapur). Leaves eaten. This plant seems to have been extensively used.

Launæa nudicaulis, Less. *Patri* (Walha Parincha Road, Poona). Leaves eaten. Received from one locality only.

CAMPANULACEÆ.

Lobelia trigona, Roxb. *Karakholi* (Igatpuri, Nasik). Leave eaten. Received from this locality alone.

MYRSINEÆ.

Embelia robusta, Gært. *Ingali* (Pimpalner, Khandesh). *Ambat ingali* (Igatpuri, Nasik). A common plant in hilly tracts enjoying abundant rainfall. The leaves are probably extensively used.

SAPOTACEÆ.

Bassia latifolia, Roxb. Flowers and fruits. (J. C. Lisboa.)

Bassia longifolia, Linn. Flowers and fruits. (J. C. Lisboa.)

"During the famine of 1873-74 at Behar they are said to have kept thousands of people from starvation" (J. C. Lisboa.)

EBENACEÆ.

Diospyros Tupru, Ham. *Timarva* (Panch Mahals). "The pounded bark and fruits eaten."

OLEACEÆ.

Schrebera swietenoides, Roxb. *Mokha* (Surat, Khandesh, and Panch Mahals). "A tree as large as the Mango, the leaves

are made into a *bhaji*, *i.e.*, they are boiled and eaten, mixed with salt and chillies. The fruit is useless as food."

APOCYNACEÆ.

Carissa Carandas, Linn. *Karwand* (Ahmednagar). Fruits eaten. Specimens from this locality alone; but probably most people look upon it as a shrub providing ordinary diet at its proper season.

ASCLEPIADEÆ.

Dregea volubilis, Benth. *Dodi* (Godhra, Panch Mahals). *Chiri* (Talda, Khandesh), *Phundi* (Ahmednagar). Roots and leaves eaten. "The leaves are eaten as they are or sometimes only boiled before eating. The fruit is also sweet and serves as a good repast. The whole of it is eaten, and it is said to be very nourishing. The flowers are eaten as they are or prepared into a *bhaji*."

Leptadenia reticulata, W. & A. *Harandodi* (Generally). *Dodi* (Ahmednagar). "The leaves are used in preparing bread by mixing *Bajri* or *Jowari* flour, after being boiled with water." This climber, common in hedge rows, was largely utilized.

Ceropegia Bulbosa, Roxb. *Dúdha malida kand* (Shahada, Khandesh). *Malode* (Chandor, Nasik). Tubers and leaves eaten. "The very name, meaning milk and sweetmeat indicates that is a very nutritious food. It is even consumed quite raw. When boiled, it is either mixed with milk and sugar or salt and spices."

Caralluma fimbriata, Wall. *Ranshabar* (Rahuri Taluka, Ahmednagar). *Makad shenguli* (Poona and Satara). *Shindala mukadi* (Nasik and Ahmednagar). "Whole plant boiled with water and mixed with salt and chillies, if available." A tufted, leafless plant, common amongst rocks on barren hills. I have found it very abundant also around some Deccan villages, growing amidst small prickly pear bushes, and altogether absent in the open, so that it is probably browsed upon by cattle.

GENTIANACEÆ.

Limnanthemum cristatum, Griesb. *Khatara*; *Kumu*
Stems and fruits eaten. (J. C. Lisboa).

BORAGINEÆ.

- Cordia Myxa**, Linn. *Bhokri* or *Shelti* (Taloda, Khandesh). *Wadganda* (Dang, Surat). "The leaves are prepared into a *bhaji*. The fruits are sweet and their contents are sticky. These are also commonly eaten."
- Cordia Rothii**, Roem. & Sch. *Gandi* (Mandvi, Surat). No information received regarding parts eaten.
- Ehretia laevis**, Roxb. *Tamboli* (Akola, Ahmednagar). "The pounded bark is eaten."

CONVOLVULACEÆ.

- Rivea hypocrateriformis**, Choisy. *Phang*, *Phangi*, *Phanji*, and *Phandi* (Universally). *Matli* (Indi, Bijapur). *Mastiganto* (Sindgi, Bijapur). "The leaves are used in preparing bread by mixing *Bajri* or *Fowari* flour, after being boiled with water, or they are boiled with condiments, *i.e.*, prepared into a *bhaji*. The fruit is bitter to the taste and not eaten." This is an exceedingly common climber, usually covering Euphorbias and such like small shrubs. Judging from the great number of specimens received it must have been very largely utilized as food.
- Ipomœa Batatas**, Lamk. *Ratala* (Ahmednagar and Satara). "The leaves are used in preparing bread by mixing with *Bajri* or *Fowari* flour, after being boiled with water."
- Ipomœa aquatica**, Forsk. *Narini bhaji* (Olpad, Surat). *Nala* (Panch Mahals). Young shoots and leaves eaten.
- Ipomœa reniformis**, Choisy. *Adki* (Indi, Bijapur). No information received regarding parts used.
- Ipomœa eriocarpa**, Br. *Halaganaki* (Indi, Bijapur). No information received regarding parts used.
- Ipomœa sepiara**, Koen. *Aumti*. Leaves eaten. (J. C. Lisboa.)

SOLANACEÆ.

- Solanum nigrum**, Linn. *Kangwani* (Ahmednagar). Leaves and fruits eaten.
- Solanum xanthocarpum**, Schrad. & Wendl. *Bhui ringni*. Unripe fruits eaten. (J. C. Lisboa.)
- Solanum torvum**, Sw. (J. C. Lisboa.)

PEDALINEÆ.

- Martynia diandra**, Glox. *Khata amba* (Pimpalner, Khandesh). Leaves eaten.

ACANTHACEÆ.

- Hygrophila spinosa**, T. Anders. *Kolasana* (Igatpuri, Nasik).
Leaves eaten.
- Hygrophila serphyllum**, T. Anders. *Godadi* (Ahmednagar).
Leaves eaten.

VERBENACEÆ.

- Lantana Camara**, Linn. *Tuntani*. Fruits eaten. A common plant near villages and on waste ground almost everywhere.
- Premna latifolia**, Roxb. *Chambari*. Leaves eaten. (J. C. Lisboa.)
- Clerodendron serratum**, Spreng. *Bharangi* (Ahmednagar and Satara). Leaves eaten.

LABIATÆ.

- Ocimum canum**, Sims. *Manki* or *Bateria* (Matar, Kaira).
Bavchi (Kaira and Panch Mahals). "Mixed with grains of Sama." (*Panicum colonum*.) "The seeds are generally mixed with other grains and not eaten by themselves. It is of the same genus as *tulsi*." (Basil.)
- Leucas aspera**, Spreng. *Tamba*. Leaves eaten. (J. C. Lisboa.)

NYCTAGINEÆ.

- Boerhavia repens**, Linn. *Cheduli* (Walha Parincha Road, Poona). *Ghetivali* (Yeola, Nasik). Leaves eaten.
- Boerhaavia repanda**, Willd. *Pemarnara*. Leaves eaten (J. C. Lisboa.)

AMARANTACEÆ.

- Celosia argentea**, Linn. *Kurdu* (Universally). *Kundru* (Malegaon, Nasik). *Kunjru* (Pimpalner, Khandesh). *Limdi* (Mandvi, Surat). *Hani* (Badami and Sindgi, Bijapur) *Tambadi* (Modesa, Ahmedabad). "Leaves boiled with water and mixed with salt and chillies." This is a particularly valuable plant as it thrives on high lying *múrám* soils. In dry districts I have observed it growing so thickly in *bajri* fields as to leave no doubt in my mind that it was really relied upon as a subsidiary crop. By selection it could probably be rapidly improved and stripping the plants of their leaves for *bhaji* does not appear to affect the out-turn of seed, which ought also to be valuable for food. A great number of samples of this useful plant was received.

- Celosia cristata*, Linn. *Garka* (Panch Mahals). Leaves eaten.
- Digera arvensis*, Forsk. *Kunjur*; *Kunjari*; *Kunjira*; *Kunjra* (Universally). *Kundru* (Malegaon, Nasik). "Plant boiled with water and mixed with salt and chillies if available." This plant was sent from almost every part. It is abundant everywhere during the rainy season and for some time after.
- Amarantus spinosus*, Linn. *Katla Matla* (Pimpalner, Khandesh). Leaves eaten.
- Amarantus paniculatus*, Linn. *Rajgira*. Leaves and seeds eaten. Generally cultivated.
- Amarantus gangeticus*, Linn. *Math* or *Mathla* (Baglan, Nasik). *Gotala matala* (Pimpalner, Khandesh). *Ran math* (Sangamner, Ahmednagar). *Harawi* (Indi, Bijapur). "Boiled in water and mixed with salt and powder of chillies."
- Amarantus polygamus*, Linn. *Tandulja*, *Tandali* (Generally). *Pandi* (Indi, Bijapur). "Leaves boiled with water and mixed with salt and chillies." *Amarantus* spp. *Lal matala* (Pimpalner, Khandesh). *Pandhra matala* (Pimpalner, Khandesh) *Tandulja* (Sangamner, Ahmednagar). *Kunjursa* (Sangamner, Ahmednagar). These probably belong to one or other of the species already mentioned, but were not in a fit condition to be identified. In ordinary seasons all these species of *Amarantus* are largely collected for food and in times of scarcity they must prove of the utmost value as they grow everywhere.
- Ærua lanata*, Juss. Leaves used. (J. C. Lisboa).
- Achyranthes aspera*, Linn. *Aghuda* (Baglan, Nasik). *Aghadia* (Akola, Ahmednagar). *Agarda* (Pimpalner, Khandesh). *Fanjeta*, (Mandvi, Surat). "Leaves boiled and eaten, mixed with salt and chillies."
- Alternanthera sessilis*, Br. Leaves eaten. (J. C. Lisboa.)

CHEN OPODIACEÆ.

- Chenopodium album*, Linn. *Chil* (Poona and Ahmednagar). *Chili* (Sangamner, Ahmednagar). Leaves eaten.
- Suaeda fruticosa*, Forsk. *Moras* (Olpad, Surat). Leaves eaten.

SANTALACEÆ.

- Santalum album*, Linn. *Chandan*. Seeds eaten.

EUPHARBIACEÆ.

- Euphorbia pilulifera**, Linn. Leaves eaten. (J. C. Lisboa.) This is a very common weed on waste and cultivated ground, and it flourishes throughout the year. I have no records of its being eaten.
- Bridelia retusa**, Spreng. *Asan* (Dang, Surat). A characteristic tree of the forests in the areas of heavy rainfall. The fruits are probably used, but no information was received regarding the parts eaten.
- Flueggia leucopyrus**, *Pithrani* (Ahmednagar). *Pandhra phali* (Sholapur). I believe that the leaves are eaten.
- Acalypha indica**, Linn. *Khokati*. Leaves eaten. (J. C. Lisboa.) An abundant weed everywhere in the rains. I received no specimens.

URTICACEÆ.

- Ficus bengalensis**, Linn. *Vad* (Universally). *Vadla* (Panch Mahals). Fruits eaten.
- Ficus religiosa**, Linn. *Pipardi* (Dang, Surat). Young leaves are eaten.
- Ficus tsiela**, Roxb. *Pipedi* (Mandvi, Surat). Young leaves are probably eaten.
- Ficus infectoria**, Roxb. *Pipla* (Mandvi, Surat). Young leaves are probably eaten.
- Ficus glomerata**, Roxb. *Ambar* (Universally). *Umerda* (Burdoli, Surat). *Guler* (Panch Mahals). "Fruits dried and ground and used for preparing bread with *Bajri* or *Jowari* flour." I believe it is the unripe fruits that are thus made use of. The tree is very abundant in the areas of heavy rainfalls and as it is always more or less loaded with fruit, it is used in ordinary times. It is, however, almost impossible to find any ripe fruit without myriads of little black flies in its interior.

ORCHIDACEÆ.

- Enliphia**, *sp.* *Kakud Kaud* (Shahada, Khandesh). "This is a very nutritious tuber, but it is generally used as a medicinal tonic."

SCITAMINEÆ.

- Musa superba**, Roxb. *Kardai* (Kalwan, Nasik). *Rankete* (Khandesh). *Kawdari* (Nasik and Poona Districts).

"Rhizomes and shoots eaten." "Roots of wild plantains are dried and pounded and then used for bread."

Musa rosacea, Jacq. Rhizomes and shoots eaten. (J. C. Lisboa.)

Musa sapientum, Linn. *Kawadar* (Peint, Nasik and Akola, Ahmednagar). "The stem of the tree which afterwards bears plantains. This is eaten just as it is (raw)."

AMARYLLIDÆ.

Curculigo orchidioides, Gærtn. *Dholi*; *Masli*; *Kalli* (Panch Mahals). No information received as to parts eaten. *Crinum spp.* Several bulbs, apparently of this genus, were received, but I could not identify them. They are common in rivers everywhere.

Agave americana, Linn. (J. C. Lisboa.)

Agave lantula, Roxb. (J. C. Lisboa.) No samples were sent to me.

DIOSCOREACEÆ.

Dioscorea pentaphylla, Linn. *Chai*; *Chavi* (Commonly). *Alshi* (Baglan, Nasik). *Kala kand* (Shahada, Khandesh). *Faglia che kand* (Shirpur, Khandesh). *Vaj no kand* (Mandvi, Surat). *Kadu kand* (Halwan, Nasik). Leaves and tubers eaten. "This is a rather small, poisonous tuber. After being dug from the ground, its outer covering (rind) is removed, then cut and boiled. This being done, the pulp is immersed or dipped into a running stream for one night. It is again boiled and used as food, when mixed with spices and salt"... "has potato-like roots which are first boiled and then the root fibres are removed and thrown away and slices are made of the potato which are put into a gently running stream for the whole night and eaten the next morning just as they are." "The tuber is first plunged into water for one day and night, then it is boiled for some five or six times and then its cover is taken off and divided into two parts, subsequently salt is mixed with it." "The leaves of this plant are boiled and eaten."

Dioscorea sativa, Linn. *Kadia kand* (Generally). *Mano kando* (Walore, Surat). *Vaj kand* (Dang, Surat). *Kadawa kand* (Taloda, Khandesh). *Kedvo Kand* (Mandvi, Surat). "Is naturally bitter in taste. The essential juice must be taken away before it can be eaten. The tubers are boiled

as they are and then cut into pieces and kept for a sufficiently long time in flowing water, or they are boiled again and again—the process continuing for one night—fresh water being put in several times. Then the refuse is mixed with *konda* or some flour and eaten (the root matter deprived of the bitter juice is only used). The same remarks regarding preparation apply to the tubers of *Dioscorea pentaphylla* (*chai kand*) and the corms of *Sauromatum guttatum* (*Diva kand*).” “A bitter root; it is used for vegetable.” “Toast and eat with whey.” “Cut into pieces, washed with water about ten times and then seethed. They are eaten as they are or are pounded into flour and made into bread.”

Dioscorea, *sp. Vaja kand* (Taloda, Khandesh). The species is doubtful owing to the absence of leaves. The tubers were planted and will, perhaps, shoot during the rains. The leaves, the stem, and the root of this creeper are whiter than those of the *Kadawa kand* (*Dioscorea sativa*). The root is highly poisonous. The poison causes great intoxication. It is sweet to the taste. The poison is got rid of by the process employed in preparing *Kadawa kand* for food. It is said that the root is so poisonous that it is resorted to in killing tigers. When tigers kill animals in their neighbourhood, the villagers insert a quantity of the flour from the pounded roots into the body of the killed animal. The poison permeates throughout the body and when the tiger returning eats it, he becomes infatuated and mad and unable to move from the place. He scarcely knows where he is, and then the villagers make short work of the animal eater.”

LILIACEÆ.

Smilax, macrophylla, Roxb. *Tamboli* (Poona District). The roots and leaves are eaten. This is a common plant on the Ghats.

Asparagus racemosus, Willd. (Dict. of Econ. Prod.)

Chlorophytum tuberosum, Bak. *Safed mosali* (Shirpur, Khandesh). *Kolu* (Nasik and Ahmednagar Districts). *Sevni* (Walore, Surat). The bulbs and leaves are eaten. “It is dried up and converted into flour and made into loaves.”

COMMELINACEÆ.

- Commelina nudiflora**, Linn. *Kena* (Poona and Ahmednagar Districts). "Leaves boiled and mixed with salt and chillies."
- Commelina benghalensis**, Linn. *Kena* (Nasik and Ahmednagar Districts). *Bokna* (Panch Mahals). "By threshing the creeping branches a black seed as large as *Vari* (millet) obtained and this is used for making bread after being converted into flour." "The leaves are boiled with water and mixed with salt and chillies, if available, and are used as vegetables constituting the principal part of the poor people's meal."
- Commelina obliqua**, Ham. *Kena* (Sangamner, Ahmednagar) *Keni* (Pimpalner, Khandesh). *Gawati kena* (Walha Parincha Road, Poona). Leaves and seeds eaten.
- Cyanotis tuberosa**, Schultes. *Ichaka* (Walha Parincha Road, Poona). No information received regarding parts used.
- Cyanotis axillaris**, Roem. & Sch. *Vichaka* (Nasik and Ahmednagar Districts). *Narido* (Wagra, Broach). *Damro* (Ahmedabad). Seeds used. "It thrives on light *múrúm* soil and on lands lying fallow for a considerable time. It grows with grass at the commencement of the monsoon and is ripe in the month of November. The plants are pulled up and then they are threshed with a flail in order to separate the grains from the husk. It requires to be ground twice and is then made into bread. Sometimes, it is prepared as *Kanja* (boiled seeds) which is not fully ground. It is sweet to the taste when mixed with *Fowari*. Without the mixture it has no good taste. It keeps off hunger and does not deteriorate health but, on the contrary, it helps towards improving the health of those, if reduced, on account of starvation." "The seeds are ground and flour prepared. *Bhadku* is then prepared. Water is boiled with the flour and a little salt. This is called *Bhadku* when properly boiled." All these spider worts are well-known agricultural pests and towards November, fields especially on poor land, are gay every morning with the bright blue flowers. The seeds of *Cyanotis axillaris* seem to be used on a large scale, but there can be little of real nutriment in them. I have seen fields smothered with this plant, in a healthy state when

the *Bajri* has dried out on account of drought, so it must be absolutely reliable as a food product in times of dearth.

PALMEÆ.

- Phoenix sylvestris*, Roxb. *Kajuri*. Leaf buds and inner stems eaten. (J. C. Lisboa.)
Borassus flabellifer, Linn. *Tad*; *Tad-mar*. Roots eaten. (J. C. Lisboa.)

PANDANÆ.

- Pandanus fascicularis*, Lamk. *Kenr*. "The tender floral leaves are eaten raw or cooked with various condiments and the pulp contained in the lower part of the drupes of the compound fruit is sucked." (J. C. Lisboa, *op cit.*)

AROIDEÆ.

- Arisœma tortuosum*, Schott. } *Dhûdhda*; *Diwa* (Poonâ and
 Ahmednagar Districts).
Arisœma Murrayi, Hook. } *Baddha* (Junnar, Poonâ). Corms
 "cooked in water and mixed with salt and chillies." These
 are plants of the highlands with heavy rainfall.
Sauromatum guttatum, Schott. *Divakand* (Kalwan, Nasik).
 Remarks regarding preparation are given under *Dioscorea
 sativa*. Corms used.
Typhonium trilobatum, Dalz. (J. C. Lisboa.)
Typhonium divaricatum, Dcne. (J. C. Lisboa.)
Theriophorum Dalzellii, Schott. (J. C. Lisboa.)
Amorphophallus campanulatus, Bl. *Suran* (Generally). Also
 commonly cultivated.
Amorphophallus bulbifer, Bl. *Lotha*. (Igatpuri, Nasik). No
 information received regarding parts used.
Synantherias sylvatica, Schott. *Vaja* (Bardoli, Surat).
Vagaria, (Panch Mahals.) "Cooked in water and mixed with
 salt and chillies."
Remusatia vivipara, Schott. *Teri* (Dang, Surat). *Asdia*; *Alvi*.
 (Panch Mahals.) No information received regarding parts
 used. This is a common plant in the moist hilly districts
 and usual grows in the forks of trees. It produces its
 spathes in March and April and leaves at the beginning of
 the monsoon. The bulbiferous shoots emerge with the leaves
 and persist till the following hot weather.

CYPERACEÆ.

Cyperus bulbos, Vahl. *Theg* (Ahmedabad). *Bid* (Viramgam)
 "It grows in a river near Viramgam. Its bulbs are dried and powdered and used with *Fowari*, *Bajri* or wheat flour. It is not very nutritious, therefore it is mixed with the above flours. It grows wild and its effects are that people who use it as food become night blind."

Scripus grossus, Linn. Var. *Kysoor*; *Kachera*. Bulbs used. (J. C. Lisboa.) It is also in general use during ordinary times, being sold in markets.

Scirpus maritimus, Linn. *Chid* (Wagra, Broach). *Dils* (Ahmedabad). The seeds are used and the plant produces them abundantly.

GRAMINEÆ.

Paspalum scrobiculatum, Linn. *Kodra* (Walha Parincha Road Poona). Grains used. This plant is also largely cultivated but it possesses poisonous properties which have to be eliminated before the grain can be safely eaten.

Panicum flavidum, Retz. *Gorin* (Wagra, Broach). Grains used.

Panicum Crus Galli, Linn. *God*; *Tan* (Kalwan Taluka, Nasik). *Ziro* (Bardoli, Surat). "The seed is threshed out and used for the preparation of bread as in the common food grains. In these days the grass is dried on fire, or the grass with the seed is turned on fire for some time and then the seed taken off and eaten as such, *i.e.*, not turned into bread."

Panicum colonum, Linn. *Tan* (Shirpur, Khandesh). *Zari* (Bardoli, Surat). *Samo* (Anklesvar, Broach). *Sama* (Matar, Kaira).- "Grows in abundance on uncultivated lands. The plants bear grains in the monsoon season. When the plants are dried, the grains being ripe, people generally thresh them or gather them when they fall down of their own accord, cleanse them and grind them before using in bread or broth." This grass proved to be the most valuable resource of the starving people during the late famine in Gujarat. It prefers to grow on lands which are apt to become swamp in the rains, and it is common on the verges of sluggish streams.

Panicum prostratum, Lamk. *Pavdu* (Wagra, Broach).

Pahatu, (Ahmedabad). Grains used.

Panicum javanicum, Poir. *Barpha* (Kalwan, Nasik). *Tan* (Dindori, Nasik). *Khal kudu* (Modasa, Ahmedabad). Preparation similar to that detailed under *P. Crus Galli*.

Panicum trypheron, Schult. *Gogorat* (Newasa, Ahmednagar). "The heads when threshed give seeds like white Italian millet. It is used for bread."

Setaria glauca, Beauv. *Kolhu* (Kalwan, Nasik). *Kolvi* (Bardoli, Surat). Preparation similar to that described for *Panicum Crus Galli*. This grass is also cultivated as a field crop in some places.

Setaria intermedia, Roem. & Sch. *Pharesi* (Kaira). Grains used.

Pennisetum typhoideum, Rich. *Bajri*. Included as a famine plant in Dr. Lisboa's list.

Oryza sativa, Linn. *Niar* (Dang, Surat). *Nimar*; *Sathi* (Godhra, Panch Mahals). Wild rice. The Director of Agriculture has favoured me with the following note received from the Mamlatdar of Godhra :—

"*Nimar* grows in muddy beds of tanks only, and *Sathi* in rice fields. Private lands make no difference in the growth of the latter. *Nimar* is collected in baskets by means of beating with sticks, while *sathi* is reaped with a scythe like other kinds of paddy. Both are ready in September. Half a maund only of *Nimar* can be collected in half a day in about four hours, the muddy soil preventing the reapers staying longer; but about five maunds of *Sathi* can be gathered during a day of eight hours. An acre of land can yield twelve maunds of *Nimar* and thirty maunds of *Sathi*. *Nimar* is gathered by Kolis and is ordinarily used by all poor classes; and *Sathi* by all the agricultural classes, Kolis, Gandhis, Musalmans, etc. Both are used as boiled rice and are sufficiently nourishing and readily consumed by low caste people.

"*Nimar* dries up in the mud and its straw is not therefore used by cattle; on the other hand *Sathi* leaves its straw as food for cattle."

My examination of the specimens only proved that they were forms of long awned rice, and I could detect no tangible characters whereby to distinguish the two varieties. I have been informed that wild rice is largely eaten in Gujarat on fast days. So far as I have been able to ascertain wild rice

is unknown in the Deccan. Probably its introduction into swampy tracts would eventually prove to be a blessing to the people who inhabit the areas more or less liable to the recurrence of scarcity and famine. Wild rice must be common in Gujarat, the Panch Mahals and possibly other northern districts. It is surprising therefore that so little has been placed on record regarding its existence in the Bombay Presidency.

Coix lachryma-jobi, Linn. *Kaher* (Ahmedabad). Very common everywhere in swamps.

Zea mays, Linn. *Maka*. "The cobs of maize, *jowari* and *bajri* are ground and mixed with meal or flour of rice to make bread. They are a little sweet and at any rate will help to fill the empty stomach." (J. C. Lisboa.)

Andropogon sorghum, Brot. *Fowar*. (J. C. Lisboa.) For remarks see under *Zea Mays*.

Sporobolus minutiflorus, Link. *Chimanchara* (Khamgaon Tank, Poona). "Seeds mixed with *Bajri* or *Jowari* grains and made into flour."

Cynodon dactylon, Pers. *Durva*, *Hariali*. (J. C. Lisboa.)

Eleusine ægyptiaca, Desf. *Anchi-Manchi* (Matar, Kaira). *Anchi-Banchi* (Wagra, Broach). *Manki* (Kaira, Ahmedabad and Godhra, Panch Mahals). *Manchi* (Ahmedabad). *Manachhobi* (Ahmedabad). *Dhaphlu* (Ankleswar, Broach). "Mixed with grains of *Samo*" (*Panicum colonum*). "Cakes as well as *Bhadku* are prepared from the grains." In Gujarat this plant apparently ranked second to *Samo* alone as a food product. It is a humble plant bearing grain very profusely, and I have seen it thriving happily in November in many localities where a thin sprinkling of wretched soil scarcely hid the continuously rocky surface beneath.

Dinebra arabica, Jacq. *Kharin* (Ahmedabad). No information was received with the samples.

Eragrostis interrupta, Beauv. *Dhudi* (Wagra, Broach). No information was received with the samples.

Eluopus villosus, Trin. *Del* (Wagra, Broach). *Kharin* (Jambusar). No information was received.

Triticum vulgare, Vill. *Khapli, Gahu*. The chaff of these is mentioned as being used by Dr. Lisboa. The first vernacular name applies to the spelt wheat, which is an irrigated crop. The second denotes indifferently any wheat.

Arundinaria Wightiana, Nees. *Chivari*. (J. C. Lisboa.) "In the scarcity of 1864 in Kanara, this (bamboo) rice formed the principal article of the food of the poor population; hence perhaps the belief entertained by some Government officials that the bamboo only flowers in seasons of general scarcity."

Bambusa arundinacea, Willd. } *Kaste* (Peint, Nasik),
 } *Wans* (Dang, Surat),
Dendrocalamus strictus, Nees. } *Vansuta* (Panch Mahals).

"The young sprouts of the bamboo tree which shoot out from under the ground. The wrappings are first removed and the stems cut into slices, boiled and then eaten. Some apply spices and salt as in preparing vegetables." The samples sent were too inadequate for certain identification, but probably both species are used.

SYSTEMATIC ENUMERATION OF THE SPECIES
OF *CALAMUS* AND *DÆMONOROPS*,
WITH DIAGNOSES OF THE NEW ONES.

—◆—
By O. BECCARI.

—◆—
CALAMUS Linn.

GROUP I.—*Leaves* with many, more or less equidistant leaflets, and with rachis not cirriferous (not produced into a flagellum). *Primary spathes* elongate-tubular, dilated and lacerated above. *Spadix* with the partial inflorescences and spikelets provided with a pedicellar portion included in their respective spathes. *Fruiting perianth* explanate. *Spathellule* of fem. fl. short, not pedicelliform. *Albumen* ruminant. *Embryo* basilar or nearly so.

A.—*Stem* erect. *Leaf-sheaths* not flagelliferous.

1. CALAMUS ERECTUS Roxb.—*C. macrocarpus* Griff.—*C. collinus* Griff. N.-E. India.
C. ERECTUS v. BIRMANICUS Becc. Burma.

2(?) CALAMUS SCHIZOPATHUS Griff.—*C. erectus* v. Roxb.?
—Sikkim Himalaya.

B.—*Scandent*. *Leaf-sheaths* flagelliferous.

3. CALAMUS FLAGELLUM Griff.—*C. polygamus* Roxb.
—N. E. India ; Burma.

GROUP II.—*Leaves* with many, more or less equidistant leaflets, and with rachis not cirriferous. *Primary spathes* elongate-tubular, more or less lacerate above ; *secondary* often inflated and lacerate. *Leaf-sheaths* not flagelliferous. *Spadix* with the partial inflorescences and often the spikelets with a pedicellar portion included in their respective spathes. *Fruiting perianth* explanate. *Spathellule*

of fem. fl. short, not pedicelliform. *Albumen* (where known) equable. *Embryo* basilar.

A.—*Stem* erect. *Spadix* not produced into a flagellum.

4. *CALAMUS ARBORESCENS* Griff.—*C. hostilis* Hort. Calc. Burma.

5. *Calamus dongnaiensis* Pierre MS. (nomen tantum).—Caespitosus, subacaulis, frondibus magnis segmentis elongato-lanceolatis, 40-60 cent. longis, 8 cent. latis, supra viridibus et nitentibus, subtus vix pallidioribus, spadicibus ♂ valde elongatis, spathis primariis tubulosis apici dilaceratis, spathis secundariis apice subinflato lanceolato-auriculaeformi inermi spicis flexuosis 10-15 cent. longis, floribus (♂) majusculis 8-10 mill. longis, 3 mill. latis.—*C. arborescenti* valde affinis foliorum segmentis utrinque viridibus differt.

Lower Cochinchina (Pierre No. 4829).

6. *Calamus dilaceratus* Becc. sp. n.—Caespitosus? caudice erecto? spadices erecti late paniculati non flagelliferi, ramis (in flor. partialibus) erecto-patulis 25-35 cent. longis, spicis utrinque 8-10; spathae primariae breves laxae apice exsuccae et dilaceratae, spiculis rectis nigris armatae; spathae secundariae tubuloso-infundibuliformes lacero-fissae fuscescentes inermes; spicae 4-7 cent. longae parte pedicellari gracili inclusa 1-1.5 cent. longa praeditae; perianthium fructiferum in lobos 6 aequales partitum; fructus parvi late ovati, abrupte apiculati, 12 mill. longi, 9 mill. lati, squamis parvis pallide stramineis apice minute fimbriato-fuscescenti; seminibus ovatis utrinque rotundatis dorso convexis, ventre planiusculis, superficie aequabili, albumine homogeneo, embryone basilari.

Nicobar Islands (E. H. Man).

7. *CALAMUS CASTANEUS* Griff. Malayan Peninsula.

8. *CALAMUS GRIFFITHIANUS* Mart.—*C. castaneus* v. *a* Griff.

—Malayan Peninsula.

9. *Calamus Burekianus* Becc. sp. n.—Caespitosus; frondium petiolus subteres compressiusculus elongatus inermis; segmenta aequidistantia alterna numerosa lineari-ensiformia, majora 28-30 cent. longa, 12-13 mill. lata, utrinque viridia, supra distincte 3-nervia; inflorescentiae partiales spadicis ♀ circiter 50 cent. longae, apici caudiculo inermi terminatae, spathis secundariis tubuloso-infundibuliformibus inermibus, spicis basi parte pedicelliformi inclusa praeditis, vermicularibus, flexuosis, 12-15 cent. longis; fructibus globosis abrupte apiculatis 9-10 mill. diam., seminibus laevibus late ovatis compressiusculis, dorso convexis, ventre umbilicatis, albumine aequabili, embryone subbasilari.

Java (Teijsmann in Herb. St. Pet.)

B.—Scandent. *Spadix* produced into a flagellum. (*Leaf-sheaths* sometimes flagelliferous?).

10. CALAMUS LONGISETUS Griff.—*C. tigrinus* Kurz.
—Burma; Andaman Islands.
11. CALAMUS THWAITESII Becc.—*C. longisetus* (not of Gr.)
Thw. Ceylon.
12. Calamus Zollingerii Becc. sp. n. Celebes.
13. CALAMUS RUDENTUM Lour. (Pierre Nos. 4845, 4846).
—Cochinchina.

GROUP III.—*Leaves* with many more or less equidistant leaflets; rachis not cirriferous. *Leaf-sheaths* flagelliferous. *Spathes* (primary and secondary) elongate-tubular strictly sheathing. *Spadix* with the partial inflorescences and often the spikelets with a pedicellar portion included in their respective spathes. *Fruiting perianth* explanate. *Spathellule* of the fem. fl. short, not pedicelliform. *Albumen* equable. *Embryo* basilar.

A.—Asiatic.

14. CALAMUS LEPTOSPADIX Griff. N.-E. India.

15. Calamus Henryanus Becc. sp. n.—Gracilis, scandens; frondium segmenta inaequidistantia, anguste ensiformia basi attenuata apici acuminatissima, utrinque in sicco pallide viridia, subtiliter longitudinaliter nervoso-striata, nervis 5 tenuibus percursa utrinque minute spinulosis, 35-40 cent. longa, 14-17 mill. lata; spadix foemineus strictus, spica elongata terminatus; spicis erectis sparsis (nec disticis) parte pedicellari inclusa praeditis, basilaribus elongatis; floribus numerosis erectis; spathae secundariae inermes; spathellae spathaceo-auriculaeformes; involucrophorum ad basin spathellae insertum; flos sterilis pedicello elongato persistenti suffultus, fructus parvi obovati abrupte rostrati, 12 mill. longi; perianthium fructiferum in lobos 6 subaequales usque ad basin partitum.

Yunnan; Szemao Mounts. (A. Henry, No. 12,239 in Herb. Calc.).

16. CALAMUS RIVALIS Thw. Ceylon.
- B.—African.

17. CALAMUS DEERRATUS Mann & Wendl.
—Western Tropical Africa.

18. Calamus Barterii Becc. sp. n. (Barter No. 110 in Hort. Kew.)
Western Tropical Africa.

19. Calamus Heudelotii Becc. sp. n.—Gracilis, caudice 2-3 met. longo; vaginae flagelliferae 1 cent. diam., spinis rectis brevibus semiconicis sparse armatae, in ore ligula oppositifolia triangulari 2

cent. longa spinulis brevibus seriatis in medio longitudinaliter armata, marginibus integris laevibus, praeditae; frondes 60-70 cent. longae, petiolo breviusculo subtus in medio spinis paucis solitariis rectis subreversis armato, rachi redunco-aculeata, segmentis non numerosis irregulariter fasciculatis, apicalibus basi disjunctis, basilaribus, majoribus, 25-28 cent. longis, 12-16 mill. latis, lanceolato-linearibus, subulato-acuminatis, in sicco viridibus, subtus pallidioribus, tenuiter longitudinaliter nervosis et costa media sparse spinulosa, in facie superiore costulis tenuibus 3 spinulosis et nervulis minoribus percursis, marginibus minute spinuloso-serratis; spadix ♀ inflorescentiae partiales parte pedicellari praeditae, spicis non pedicellatis, brevibus 2-3 cent. longis, recurvis; spathae secundariae laeves; fructus ovati, basi rotundati, apice conico-rostrati, 13-15 mill. longi, 9 mill. lati, semine elongato-ovoideo, superficie fere aequabili, non ruminato, embryo basilari.

Senegambia (Heudelot No. 372 in Herb. Webb. et Herb. Kew.)
Gambia (Ingram in Herb. Kew.)

20. *Calamus Leprieurii* Becc. sp. n.—Scandens? Frondium petiolus furfurascens subtus et ad margines, et rachis tantum in medio, spinis validiusculis sparsis solitariis rectis horizontalibus armatus; segmenta aequidistantia opposita, lineari-lanceolata acuminata, 15-17 cent. longa, 15 mill. lata, subtus pallidula, ad basin superne lateraliter spinula substipulaeformi praedita, utrinque in nervo primario solitario tantum spinulosa; spicae 8-9 cent. longae, floribus erecto-patulis disticis utrinque 9-10; spathellis obconico-campanulatis apiculatis nudis, involucrophoro in fundo spathellae inserto; perianthium fructiferum usque ad basin in 6 lobos subaequales partitum; fructus squamis basi stramineis, late brunneo-marginatis et apice scarioso fimbriato denticulato.

Senegal (Leprieur in Herb. Leyd.)

21. *Calamus Perrotetii* Becc. sp. n.—*Calamo Leprieurii* similis differt spicarum spathellis amplioribus flores amplectentibus.

Senegal; on the River Casamanza (Perrotet, 10th April 1829, No. 761 in Herb. Delessert.).

22. *CALAMUS SCHWEINFURTHII* Becc.—*C. secundiflorus* (not of P. de B.) Schw. Centra Africa.

GROUP IV.—*Leaves* not produced into a cirrus, with very few, usually radiating or digitate, leaflets. *Primary* and *secondary spathes* very elongate-tubular and strictly sheathing. *Leaf-sheaths* flagelliferous. *Spadix* ♂ and ♀ simply decomposed; partial inflorescences and spikelets not pedicellate and inserted at the

mouth of their respective spathe. *Fruiting perianth* explanate. *Spathellule* of the ♀ flower never pedicelliform. *Albumen* equable. *Embryo* basilar.

23. CALAMUS PACHYSTEMONUS Thw. Ceylon.

24. CALAMUS DIGITATUS Becc.—*C. pachystemonus* (partly) Thw.
—Ceylon.

25. CALAMUS RADIATUS Thw. Ceylon.

GROUP V.—*Leaves* not produced into a cirrus. *Leaf-sheaths* flagelliferous. *Primary* and *secondary spathes* very elongate-tubular, strictly sheathing and entire at the mouth. *Spikelets* inserted at the mouth of their respective spathe. *Seed* not ruminant, dorsally alveolate. *Embryo* basilar.

A.—*Leaves with few leaflets usually broad, lanceolate or elliptic, more rarely elongate-lanceolate, the two terminals confluent or connate in the lower portion. Secondary spathes, spathels and spathellules not or scarcely scabrous.*

⊙ *Spathellule* of the ♀ flower not pedicelliform. *Fruiting perianth* hardly callous at the base, not or slightly pedicelliform.

26. CALAMUS JAVENSIS Bl. (type) Java; Sumatra.

C. JAVENSIS v. PENINSULARIS Becc. Malayan Peninsula.

Subvar. *PURPURASCENS* Becc. Penang.

Subvar. *PINANGIANUS* Becc. Penang.

C. JAVENSIS v. POLYPHYLLUS Becc. Malayan Peninsula.

C. JAVENSIS v. INTERMEDIUS Becc. Malayan Peninsula.

C. JAVENSIS v. TENUISSIMUS Becc. Malayan Peninsula.

C. JAVENSIS v. TETRASTICHUS Bl.—*C. tetrastichus* Bl.—

C. borneensis Miq.—*C. amplexens* Bl. Borneo.

27. CALAMUS FILIFORMIS Becc. Borneo.

28. *Calamus corrugatus* Becc. sp. n.—*Gracilis, caudice valde elongato tenuissimo; frondes breves, 30-35 cent. longae, vagina inermis sed transverse crebreque costulis prominulis notata, petiolo brevi, segmentis paucis remote oppositis lanceolato-ellipticis costulis 3 utrinque nudis percursis, majoribus 12-13 cent. longis, 2.5 cent. latis, apicalibus usque ad medium connatis.—C. javensi proximus.*

Borneo; Sarawak (Beccari P. B. No. 1910).

29. CALAMUS SCHISTOACANTHUS Bl. Sumatra.

30. CALAMUS DIOICUS Lour. (Pierre No. 4834). Cochinchina.

31. CALAMUS PAPUANUS Becc. New Guinea.

32. CALAMUS FLABELLATUS Becc. Borneo.

33. *Calamus spinilifolius* Becc. sp. n.—Gracilis; frondium segmenta inaequidistantia, 2 apicalia basi breviter connata lateralia saepe geminata, omnia convexa, oblonga vel oblanceolata, 10-12 cent. longa, 2.5-3.5 cent. lata, basi attenuata, apici abrupte acuminata, glabra, utrinque viridia subconcolora, costulis 5 subtus nudis, supra spinulis acicularibus remotis rigidis erectis, 4-8 mill. longis, conspicue armata.

Philippines (Vidal No. 3954).

34. *CALAMUS FILIPENDULUS* Becc. Malay Peninsula.

35. *Calamus gonospermus* Becc. sp. n.—Scandens; caudices digiti crassitiae, vaginis flagelliferis, spinis rectis breviusculis armatis; frondes breves (circ. 50 cent. long.) petiolo breviusculo redunco-aculeato, segmentis perpauca (6) duobus apicalibus alte connatis, oblongo-lanceolatis vel oblanceolatis, concaviusculis 20-22 cent. longis, 4.5-5.5 latis; basi attenuatis, apici abrupte in caudiculum linearem ciliato-spinulosum 2 cent. longum attenuatis, utrinque viridibus, costulis 5 utrinque nudis percursis, marginibus quoque nec ciliatis nec spinulosis; spadiciis ♀ spathae primariae arcte tubulosae, aculeatae, ore truncato integro; spicae paucae abbreviatae scorpioideae, floribus unilateralibus congestis; fructibus majusculis late ovato-ventricosis, basi attenuatis apice conico acuto, squamis convexis latis, basi stramineis margine et apice atro-castaneo apicalibus nigrescentibus; seminibus irregulariter globosis et acute angulosis; albumine aequabili.

Borneo; Sarawak (Beccari P. B. No. 23).

36. *CALAMUS MUELLERII* H. Wendl. Australia.

37. *CALAMUS CARYOTOIDES* H. Wendl. Australia.

⊙ ⊙ *Spathellule* shortly pedicelliform. Fruiting calyx pedicelliform.

38. *CALAMUS CUTHBERTSONII* Becc. New Guinea.

B.—Leaves usually with few inequidistant elongate leaflets, the two terminals shortly connate at the base. Fruiting calyx spreading, not callous at the base or pedicelliform. Secondary spathes, spathels and spathellules conspicuously scabrid.

39. *Calamus ruvidus* Becc. sp. n.—Scandens; vaginae spinis validis brevibus (majoribus 4.5 mill. long.) ad basin inflatis subtus concavis armatae adjectis costulis transversalibus prope apicem crebrioribus. Frondium (circ. 50 cent. long.) petiolus breviusculus subtus aculeis reduncis armatus; segmenta perpauca (3 in utroque latere) irregulariter alterna, 2 apicalia breviter basi connata, lanceolato-elliptica abrupte apiculata 24-25 cent. longa, 4-5 cent. lata,

3-4-costulata, lateralia angustioria et longiora, anguste oblanceolata, supra acute 3-costata, utrinque viridia, nitida et nuda; spadix breviusculus (60 cent.) apice breviter caudatus; spathae primariae tubulosae, apici exsuccae et lacerae in dorso aculeatae, inflorescentiae partiales patentes, majora 20 cent. longa, spicis utrinque numerosis alternatim distice horizontalibus vermicularibus; spathis secundariis elongatis tubuloso-infundibuliformibus tuberculato-scabridis; spathellis brevissimis scaberrimis; fructibus parvis, sphaericis (immaturis 7 mill. diam.)

Borneo; Sarawak (Lobb in Herb. Kew).

40. *Calamus scabridulus* Becc. sp. n.—Fronidium rachis supra acutissima bifacialis, subtus aculeis validis reduncis solitariis apice nigris armata; segmenta numerosa subaequidistantia remotiuscula, anguste lanceolato-ensiformia acuminata, basi attenuata utrinque viridia et subnitentia, supra in costulis 3 acutis spinosula, subtus secus nervos primarios 3 tenues parce spinulosa, marginibus fere nudis, majora 40-45 cent. longa, 2-2.5 cent. lata, 2 apicalia paulo latiora sed breviora et basi breviter connata; spadicis infl. partiales valde elongatae; spathis secundariis scabrido-aculeatis; spicis reflexis, spathellis brevissimis tuberculoso-hispidulis.—*C. ruvido* affinis.

Billiton (Riedel) and probably also in Borneo (Motley in Herb. Kew).

41. CALAMUS MURICATUS Becc. Borneo.
 42. CALAMUS ZONATUS Becc. Borneo.

C.—As in *B.*, but leaflets numerous, equidistant; spathes, spathels and spathellules conspicuously scabrid.

43. CALAMUS RADULOSUS Becc. Malayan Peninsula.
 44. CALAMUS RUGOSUS Becc. Malayan Peninsula.

D.—Leaflets many, narrow, often fascicled; spathes, spathels and spathellules smooth or more or less aculeate but never scabrid. Fruiting calyx explanate.

45. CALAMUS VIMINALIS Willd. (type)—*C. buroënsis* (partly) Mart.—*C. litoralis* Bl.—*Palmajuncus viminalis* Rumph. —Java.

C. VIMINALIS v. *FASCICULATUS* Becc.—*C. fasciculatus* Roxb.—*C. extensus* (not of Roxb.) Mart.—*C. pseudo-Rotang* Mart.

—Bengal; Burma; Tenasserim; Pinang; Andaman Islands.

46. *Calamus siamensis* Becc. sp. n.—Caudex scandens digiti crassitie, vaginis spinis longiusculis solitariis vel confluentibus

et oblique seriatis armatis; frondium petiulus brevissimus spinis rectis longis horizontalibus armatus, rachi in dorso spinis rectis longis solitariis deflexis, aculeis reduncis intermixtis, armata; segmenta numerosa approximata aequidistantia anguste lanceolata, supra in costa media, subtus in nervis 3 spinulosa, marginibus patule crebreque serrulato-spinulosis; spadiceis ♀ spathae primariae elongato-tubulosae, aculeatae, in ore oblique truncatae; inflorescentiae partiales 12-15 cent. longae, spicis disticis utrinque 5-6, 8-9 cent. longis; floribus 4-seriatis.—*C. viminali* valde affinis differt segmentis aequidistantibus et floribus ante anthesin 4-seriatis.

Siam (Schomburgh in Herb. Kew).

47. *CALAMUS CONCINNUS* Mart. Mergui.
 48. *CALAMUS FLORIBUNDUS* Griff.—*C. mishmeensis* Griff.—*C. multiflorus* Mart. N.-E. India.
 49. *CALAMUS MOLLIS* Blanco—*C. Hankeanus* Mart.—*C. usitatus* (not of Blanco) Vidal Philippines.
 50. *CALAMUS BLANCOI* Kunth—*C. gracilis* (not of Roxb.) Blanco —*C. brevifrons* Mart.—*C. parvifolius* (not of Roxb.) Vidal —*C. usitatus* (not of Blanco) Mart. Philippines.
 51. *CALAMUS PSEUDO-TENUIS* Becc.—*C. tenuis* (not of Roxb.) Thw. S. India; Ceylon.
 52. *CALAMUS RADICALIS* H. Wendl. Australia.
 53. *CALAMUS ZEBRINUS* Becc. New Guinea.
 54. *CALAMUS BARBATUS* Bl. New Guinea.
 55. *CALAMUS INTERRUPTUS* Becc. New Guinea.
 56. *CALAMUS DOCILIS* Becc.—*C. interruptus* v. *docilis* Becc. —New Guinea.
 57. *CALAMUS SERRULATUS* Becc. New Guinea.

E.—Leaflets as in *D.*, but more numerous, usually narrow (lanceolate in *C. salicifolius*). Fruiting perianth slightly callous at the base and subpedicelliform.

58. *Calamus nematospadix* Becc. sp. n.—Scandens, caudice digiti crassitiae, vaginis dense spinis laminaribus lanceolatis parvis armatis; frondium (80-90 cent. long.) petiulus elongatus marginibus aculeatis segmenta 15-30 in utroque latere aequidistantia, lineari-ensiformia, 20-30 cent. longa, 1-2 cent. lata, basi attenuata, apici acuminata, supra substriato-multinervia, costulis majoribus 3 percursa, quarum costula media nuda et costulis lateralibus spinulosis, subtus costa media superficiali spinulosa, et nervis lateralibus nudis; marginibus prope apicem tantum inconspicue spinulosis; spadices longissimi (ultra 3-metrales) gracillimi filiformes, apici

flagello tenuissimo aculeato terminati; spathae primariae angustissimae, tubulosae, parcissime aculeatae; inflorescentiae partiales paucae remotissimae et valde elongatae, floribus ♂ minutissimis; fructus parvi, inter minores, sphaeroidei pisi magnitudine, semine globoso 4·5 mill. diam., albumine aequabili.

Borneo; Sarawak (Beccari P. B. Nos. 1000, 2760, 2927).

59. *CALAMUS PYGMÆUS* Becc. Borneo.

60. *Calamus borneensis* Becc. sp. n.—*Mediocris*, scandens; frondium rachis subtus prope apicem subregulariter aculeis reversis solitariis armata; segmenta numerosa aequidistantia remotiuscula, anguste lineari-ensiformia, basi breviter attenuata, apici sensim attenuato-acuminata, supra costulis 3 acutis setosis percursa, subtus pallidiora, nervis tenuibus, costa media superficiali interdum prope apicem parce setosa, marginibus minute et inconspicue spinuloso-ciliolatis, majora 30 cent. longa, 13 mill. lata, 2 apicalia minora e basi libera; spadices ♀ longissimi filiformes; spathae primariae et secundariae valde elongatae angustissimae, arcte tubulosae; inflorescentiae partiales valde elongatae, spicis numerosis distice paullo supra spatharum faucem horizontaliter callo insertis, filiformibus 10-15 cent. longis utrinque floribus 10-19 distice onustis. Fructus (immaturi) parvi subgloboso-ovati, rostrati, perianthio basi callosobipedicelliformi suffulti.

Borneo; Sarawak? (Lobb. in Herb. Calc.).

61. *CALAMUS REINWARDTII* Mart. Java.

C. REINWARDTII v. *AMPLUS* Mart. Java.

C. REINWARDTII subsp. *HETEROIDEUS* Becc.—*C. heteroideus* Bl. with the vars. β *procerus*, γ *refractus*, δ *conjugatus*, ϵ *spissus* Java.

C. REINWARDTII v. *PALLENS* Becc.—*C. pallens* Bl. Java.

62. *CALAMUS OPACUS* Bl. Sumatra.

63. *CALAMUS DENSIFLORUS* Becc. Malayan Peninsula.

64. *Calamus Bidleyanus* Becc. sp. n.—Scandens; frondium rachis subtus aculeis reduncis validis sparsis apice nigris armata; segmenta numerosa aequidistantia, lineari-lanceolata, basi attenuata, apici acuminata, majora 45 cent. longa, 2·5 cent. lata, superiora sensim minora, apicalia parva, utrinque viridia et subnitentia, supra costulis prominentibus 3 nudis, subtus nervis tenuibus et apice versus setulosis percursa, marginibus nudis; spadix ♀ valde elongatus, 3-metralis et ultra, flagello aculeato elongato terminatus; spathae primariae arcte tubulosae in ore truncatae, dense spinulis parvis armatae; inflorescentiae partiales paucae valde elongatae (usque 75 cent.

longae) spicis numerosis disticis crassiusculis 7-8 cent. longis curvulis onustae, spathis secundariis tubulosis apici parum ampliatis dense aculeolatis, spathellis brevissimis concavo-cochleariformibus integris truncatis vix acutis, decidue furfuraceis.—*C. densifloro* valde affinis, differt praecipue inflorescentiis valde elongatis et spathis primariis et secundariis dense spinulosis.

Singapore (Ridley).

65. *CALAMUS LURIDUS* Becc. Malayan Peninsula.
 66. *CALAMUS DELICATULUS* Thw. Ceylon.
 67. *CALAMUS HELFERIANUS* Kurz. Tenasserim?; Andamans?
 68. *CALAMUS NICOBARICUS* Becc. Nicobars.

69. *Calamus salicifolius* Becc. sp. n.—Caespitosus, 1-3 metr. altus, caudice gracili 6-7 mill. diam., vaginis flagelliferis nudis vel sparse spinis parvis rectis armatis; frondes paripinnatae breves, 20-30 cent. longae, segmentis paucis remote fasciculatis, lanceolatis, parvis, rigidis, utrinque pallide viridibus, 5-9 cent. longis, 8-15 mill. latis, costa media in pagina superiore spinulis acicularibus 1-3 erectis praedita, in pagina inferiora minute puberulo-papillosis, marginibus remote et patule spinuloso-ciliatis, segmentis apicalibus minoribus e basi omnino liberis; spadices ♀ erecti, parvi, 25-35 cent. longi, spicis parvis brevibus (1-2 cent. longis) curvulis, fructibus parvis globosis abrupte rostratis, perianthio basi calloso breviter pedicelliformi suffultis, semine irregulariter globoso, superficie inaequali, albumine aequabili.

Lower Cochinchina (Pierre No. 4853).

F.—Leaflets narrow or rather large. Fruiting perianth distinctly pedicelliform.

70. *CALAMUS TENUIS* Roxb.—*C. Royleanus* Griff.—*C. amarus* Lour.—*C. Heliotropium* Ham. N. India.
 71. *CALAMUS HORRENS* Bl. Java.
 72. *CALAMUS TETRADACTYLUS* Hance China.
 73. *CALAMUS DIFFUSUS* Becc. Singapore.
 74. *CALAMUS WALKERII* Hance China.
 75. *CALAMUS BACULARIS* Becc. Borneo.
 76. *CALAMUS ROTANG* Linn.—*C. Roxburghii* Griff.—*C. monoi-cus* Roxb.—*C. Scipionum* (partly) Lamk S. India; Ceylon.
 77. *CALAMUS BRANDISII* Becc. S. India.
 78. *CALAMUS FEANUS* Becc. Tenasserim.
 79. *CALAMUS ACANTHOSPETHUS* Griff.—*C. montanus* T. And.—N. E. India.

GROUP VI.—*Rachis* of leaves not produced into a cirrus. *Leaf-sheaths* flagelliferous or not. *Primary spathes* very long, at first

tubular closed, at length longitudinally split open, loriform, laminar or foliaceous. *Seed* not superficially alveolate; albumen equable.

80. CALAMUS GURUBA Ham.—*C. Mastersianus* Griff.—*Daemonorops Guruba* v. *Hamiltonianus*, and v. β *Mastersianus* Mart. N. E. India.
81. CALAMUS PLATYSPATHUS Mart.—*Daemonorops platyspathus* Mart. Tenasserim.
82. CALAMUS PASPALANTHUS Becc. Malayan Peninsula; Borneo.
83. CALAMUS RAMOSISSIMUS Griff.—*Daemonorops ramosissimus* Mart. Malayan Peninsula.
84. CALAMUS PERAKENSIS Becc. Malayan Peninsula.
85. CALAMUS HYPOLEUCUS Becc.—*Daemonorops hypoleucus* Kurz. Burma.
86. CALAMUS MYRIANTHUS Becc. Mergui.

GROUP VII.—*Rachis* of leaves not produced into a cirrus. *Leaf-sheaths* flagelliferous. *Primary* spathes at first tubular-elongate, at length longitudinally more or less split and partly laminar. *Fruiting perianth* more or less pedicelliform. *Spathellule* distinctly pedicellate. *Seed* dorsally alveolate; albumen subruminate.

87. CALAMUS TRAVANCORICUS Bedd.—*Tsjeru-Tsjurel* Rheede —S. India.
88. CALAMUS RHEEDEI Griff.—*Daemonorops Rheedii* Mart.—*Katu-Tsjurel* Rheede. S. India.

GROUP VIII.—*Rachis* of leaves not produced into a cirrus. *Leaf-sheaths* flagelliferous. *Primary* spathes tubular, strictly sheathing, not split or lacerate. *Spathellule* of fem. fl. pedicelliform, *i.e.*, exerted beyond the spathe and as it were supported on a pedicel. *Fruiting perianth* pedicelliform. *Seed* furrowed on its surface; albumen ruminant; embryo basilar.

89. CALAMUS HUEGELIANUS Mart.—*C. Wightii* Griff.—*C. melanolepis* H. Wendl.—*C. dioicus* (not of Roxb.) Mart. —S. India.
90. CALAMUS GAMBLEI Becc. S. India.
C. GAMBLEI v. *SPHAEROCARPUS* Becc. S. India.

GROUP IX.—*Rachis* of leaves not produced into a cirrus. *Leaf-sheaths* flagelliferous. *Primary* spathes strictly sheathing. *Spathellule* not pedicelliform. *Fruiting perianth* pedicelliform. *Albumen* deeply ruminant.

A.—Embryo lateral.

91. *CALAMUS GRACILIS* Roxb. N. E. India.
 92. *CALAMUS MELANACANTHUS* Mart. Tenasserim.

B.—Embryo basilar (where known).

93. *CALAMUS DIEPENHORSTII* Miq. Malayan Peninsula; Sumatra.
 94. *CALAMUS MARGINATUS* Mart.—*Dæmonorops? marginatus*
 Bl. Borneo.
 95. *CALAMUS SINGAPORENSIS* Becc. Singapore.

GROUP X.—*Leaves* not produced into a cirrus. *Leaf-sheaths* flagelliferous. *Primary spathes* strictly sheathing. *Spathellule* distinctly pedicelliform. *Fruiting perianth* pedicelliform. *Seed* ruminant (with many plaits radiating from the centre to one face); *embryo* lateral.

96. *CALAMUS CILIARIS* Bl. Java; Sumatra.
 97. *CALAMUS EXILIS* Griff. Malayan Peninsula.

98. *Calamus pilosellus* Becc. sp. n.—*Gracilis*, vaginis 1 cent. diam. vix spinosis sub lente minutissime tuberculatis; frondium (60 cent. long.) petiolus brevis; rachis furfuracea et pilis basi bulbosis induta; segmenta numerosa (in quovis latere circiter 35) approximata et regulariter aequidistantia, anguste lanceolata utrinque aequaliter et sensim attenuata, majora 10 cent. longa, 10-11 mill. lata, in facie superiore subnitentia, costa media nervis primariis 2 setis longis obsitis percursa, nervis secundariis quoque pilosis in facie inferiore scabrida spinulis minutissimis causa, secus nervos (circiter 50) tenuissimos, seriatis; spadix ♂ elongatus apici flagelliferus, spathis tubulosis parce aculeatis laevibus nec scabridis.

Borneo (Lobb in Herb. Kew).

99. *Calamus sarawakensis* Becc. sp. n.—*Gracilis*, vaginis flagelliferis 7-10 mill. diam, sub lente minutissime tuberculato-scabridulis, spinis paucis brevibus horizontalibus vix armatis; frondium (60-65 cent. long.,) petiolus longiusculus subtus et in margine spinulosus; segmenta utrinque 16-18 inaequidistantia, lineari-ensiformia, majora 20-22 cent. longa, 15-16 mill. lata, basi longiuscule attenuata, apici acuminata, nervis primariis in facie superiore 5-7 spinuloso-ciliatis percursa, nervis minoribus interdum quoque indistincte spinulosus intermixtis, subtus nervis tenuibus numerosissimis et minute ciliolatis.—*C. ciliari* proximus.

Borneo; Sarawak (Beccari P. B. No. 1920).

100. *Calamus hispidulus* Becc. sp. n.—Gracilis, vaginis circ. 18 mill. diam., novellis dense setoso-pilosis, demum tuberculato-scabridis; frondium petiolus brevis scabridus; segmenta non numerosa (in utroque latere 11-13) aequidistantia angustissime lanceolata, basi attenuata, apici acuminata, majora 10-20 cent. longa, 10-15 mill. lata, supra in costa media et secus nervos 6-8 (subtus 26-28) minutissime spinuloso-hispidula; spadiceis spathae minutae papilloso-scabridulae; fructus elongato-elliptici, utrinque acuti.—*C. exili* affinis, differt segmentis paucioribus et vaginis novellis pilis fulvescentibus dense indutis.

Borneo; Sarawak (Beccari P. B. No. 2821).

GROUP XI.—*Leaf-sheaths* flagelliferous. *Leaflets* broad, many-nerved, two terminals completely free, often with a very short or rudimentary cirrus interposed. *Spathes* tubular, strictly sheathing. *Spathellule* not pedicelliform. *Fruiting perianth* subpedicelliform. *Seed* (where known) with albumen superficially ruminant and basilar embryo.

101. CALAMUS RHOMBOIDEUS Bl. Java.

102. CALAMUS SPECTABILIS Bl. Sumatra.

103. *Calamus Bousigonii* Pierre MS. (nomen).—Scandens, gracilis, caudicibus vaginatis 10-12 mill. diam., vaginis spinis parvis rectis sparsis basi tuberculoso-dilatatis armatis; frondes breviusculae (75-85 cent. longae) paripinnatae, segmentis paucis irregulariter alternis 10-20 cent. longis, 3-8 cent. latis, apicalibus omnino liberis ovatis vel obovatis vel subrhomboideo-ovatis, basi attenuatis, viridibus, subtus vix pallidioribus, glabris, nerviis 5-7 e basi radiatim divergentibus setis aut spinulis omnino destitutis percursis, marginibus prope apicem setoso-ciliatis; spadices breves erecti, spathis primariis arcte tubulosis et dense spinosis, inflorescentiis partialibus brevibus; fructibus subgloboso-ovoideis, abrupte apiculatis, 18 mill. longis, 14 mill. latis, perianthio basi calloso et breviter pedicelliformi suffultis; semine ovoideo-oblongo dorso alveolato, albumine aequabili.—*C. rhomboideo* affinis.

Lower Cochinchina (Pierre No. 4836).

104. CALAMUS BLUMEI Becc.—*C. rhomboideus* v. *rigida* Bl.
—Borneo.

105. CALAMUS TOMENTOSUS Becc. Malayan Peninsula.

C. TOMENTOSUS v. *KORTHALSIAEFOLIUS* Becc.

—Malayan Peninsula.

GROUP XII.—*Leaves* produced into a cirrus. *Leaf-sheaths* not flagelliferous. *Leaflets* often more or less narrowly lanceolate.

Spathellule of fem. fl. distinctly pedicelliform. *Seed* (where known) not runcate.

106. *CALAMUS HETERACANTHUS* Zipp. New Guinea.
107. *CALAMUS SYMPHYSIPUS* Mart. Celebes.

108. *Calamus Cumingianus* Becc. sp. n.—Fronidium rachis subtus in medio et ad margines aculeis reduncis solitariis validiusculis apice nigris armata et supra ad latera spinulosa; segmenta inaequidistantia irregulariter 2-4 aggregata, spathulata, basi attenuata, 20-24 cent. longa, 5-5.5 cent. lata, apici abruptissime apiculata, utrinque glabra, viridia subtus pallidioria, plicato-multinervia, costa media supra remote spinulosa, subtus nuda, nervis secundariis utrinque nudis, marginibus crebre serrulato-spinulosis; spadiceis ♀ spathae primariae tubulosae, laxiuscule vaginantes et saepe longitudinaliter fissae, aculeolatae; inflorescentiae partiales breves arcuatae, spicis laxifloris, floribus involucrophoro elongato suffultis et distincte pedicellatis.—*C. symphysis* et *C. heteracantho* ut videtur affinis.

Philippines (Cuming No. 762 in Herb. Kew).

109. *Calamus kandariensis* Becc. sp. n.—Scandens, gracilis, vaginis 8-10 mill. diametro indumento griseo-furfuraceo detergibili indutis subinermibus vel spinis brevissimis parce armatis; frondes cirriferae, petiolo brevi, segmentis paucis patentibus in utroque latere remote approximatis, anguste lanceolato-ellipticis, basi attenuatis, apici acuminatis utrinque subconcoloribus, nervis omnibus tenuibus una cum marginibus et apice omnino setis vel spinulis destitutis, majoribus 20-22 cent. longis, 2-2.5 cent. latis; spadices breviusculi, non flagelliferi, spathis primariis laxe tubulosis, vix dorso aculeolatis, indumento griseo-furfuraceo detergibili obtectis.

Var. *glabratus*: vaginis glabris et petiolis spinis longioribus armatis.

Celebes; Lepo-Lepo in Kandari (Beccari 1874).

110. *CALAMUS ADSPERSUS* Bl. Java.
111. *CALAMUS PLICATUS* Bl. Celebes.

GROUP XIII.—*Leaves* produced into a long-clawed cirrus. *Leaf-sheaths* not flagelliferous. *Primary spathes* elongate-tubular. *Spathellule* of fem. fl. not pedicelliform. *Fruiting perianth* pedicelliform. *Seed* (where known) with albumen runcate and basilar embryo.

112. *CALAMUS ZEYLANICUS* Becc.—*C. rudentum* (not of Lour.)
Thw. Ceylon.

113. CALAMUS LATIFOLIUS Roxb.—*C. inermis* T. And.
— N.-E. India.
C. LATIFOLIUS subsp. *MACRACANTHUS* Becc. — *C. macracanthus* T. And. N. E. India.
114. CALAMUS DORIAEI Becc. Burma.
115. CALAMUS MANAAN Miq. Sumatra.
116. CALAMUS SIMPLEX Becc. Malayan Peninsula.
117. CALAMUS CAESIUS Bl.—*C. glaucescens* Bl.
—Borneo; Malayan Peninsula.
118. CALAMUS OPTIMUS Becc. Borneo.
119. CALAMUS AXILLARIS Becc. Malayan Peninsula.
120. CALAMUS PALLIDULUS Becc. Malayan Peninsula.

GROUP XIV.—*Leaves* produced into a long-clawed cirrus. *Leaf-sheaths* not flagelliferous. *Primary spathes* elongate-tubular. *Fruiting perianth* (where known) not pedicelliform. *Spathellule* of fem. fl. not pedicelliform. *Seed* dorsally alveolate, not ruminant; *embryo* basilar.

A.—Scandent.

121. CALAMUS OVOIDEUS Thw. Ceylon.
122. CALAMUS ANDAMANICUS Kurz Andaman Islands.
C. ANDAMANICUS v. *NICOBARICUS* Becc. Nicobar Islands.
123. CALAMUS PALUSTRIS Griff.—*C. latifolius* (not of Roxb.)
Kurz. Mergui; Andamans; Tenasserim.
C. PALUSTRIS v. *COCHINCHINENSIS* Becc. (Pierre No. 4847).
—Cochinchina.

124. *Calamus formosanus* Becc. sp. n.—Caudicis vagina 3-3.5 cent. diam. apici valde gibbosa et nuda, caeterum spinis laminaribus subulatis 1-2 cent. longis armata; frondium petiolus brevissimus; rachis supra in parte basilari spinosa, subtus apicem versus aculeis reduncis simplicibus armata; segmenta valde irregulariter distributa, solitaria vel saepius in quovis latere geminatim vel ternatim remote aggregata, lanceolato-oblonga, costulis 5 nudis percurta.—*C. palustris* v. *cochinchinensi* valde affinis, differt praecipue frondium petiolo subnullo.

Formosa (Oldham in Herb. Kew).

125. *Calamus Moseleyanus* Becc. sp. n.—Frondium rachis prope basin trigona, in parte apicali subtetragona, subtus aculeis reduncis validis solitariis remote armata; segmenta non numerosa,

remota, inaequidistantia nec aggregata, elongato-lanceolata, 25-32 cent. longa, 3-4.5 cent. lata, utrinque aequaliter attenuata, acuminata, apice setoso-penicillata, supra opaca, subtus subconcolora, costulis 5 percurta, quarum medialis supra valdiuscula nuda, lateralibus minoribus et spinuloso-ciliatis, subtus nervis omnibus inconspicuis et nudis; spadicis spathae primariae elongato-tubulosae aculeolatae; spathae secundariae tubuloso-infundibuliformes inermes; spicae erecto-patulae, curvulae 4.5-6 cent. longae, floribus 10-12 distice utrinque praeditae: fructus parvi globosi 8-9 mill. diam. apiculati, perianthio pedicelliformi suffulti, squamis laxè imbricatis, semine subgloboso, superficie inaequali, albumine aequabili.

Philippines; Malanipa, (Moseley in Herb. Kew).

126. *Calamus Vidallianus* Becc. sp. n.—Fronidium rachis in parte basilari subtus convexa et nuda, longitudinaliter ad latera sulcata, aculeis vix reduncis dense armata, in facie superiore convexiuscula dense spinosa; segmenta aequidistantia, angustissime lanceolata, basi attenuata, apici acuminata, 30-32 cent. longa, 15-20 mill. lata, glabra, utrinque subconcolora, supra costulis 3 spinulosis percurta, subtus nuda, marginibus ciliato-spinulosis; spadicis ♀ spathae primariae tubuloso-cylindratae, in parte superiore aliquantum ampliatae, sparse aculeatae; spathae secundariae elongato-infundibuliformes inermes; spicae ad faucem spatharum callo insertae, patentia, arcuata, 5-7 cent. longa, floribus subdisticis utrinque paucis.—*C. horrens* (not of Bl.) Vidal.

Philippines (Vidal No. 933 in Herb. Kew).

127. *CALAMUS PISICARPUS* Bl.—*C. oblongus* β. Bl.—*C. verus* (not of Lour.) Mart. Moluccas
 128. *CALAMUS ARUENSIS* Becc. Aru Islands.
 129. *CALAMUS HOLLRUNGII* Becc. New Guinea.
 130. *CALAMUS UNIFARIUS* H. Wendl. Borneo.
 C. UNIFARIUS v. *PENTONG* Becc. Nicobar Islands.

131. *Calamus subinermis* H. Wendl. (nomen nudum in Herb. Kew.)—Scandens, robustus, vaginis 4 cent. diam. crases lignosis, apici saccatis, inermibus, indumento tenui cinereo-furfuraceo detergibili tectis, in ore nudis et oblique truncatis; frondes magnae cirro validissimo crebre aculeis reduncis semiverticillatis armato terminatae, petiolo brevi subtus inermi; segmentis magnis 50-60 cent. longis, 5.5-5 cent. latis, non numerosis, subaequidistantibus, elongato-lanceolatis, basi longe attenuatis, apici acuminatis, utrinque sub-

concoloribus, supra costulis 5 spinuloso-setulosis percursis, subtus nudis, marginibus ciliolato-spinulosis.

Borneo (Low in Herb. Kew)

132. *CALAMUS ALBUS* Pers. Moluccas.
 133. *CALAMUS GRAMINOSUS* Bl. Amboina.
 134. *CALAMUS NEGLECTUS* Becc. Malayan Peninsula.
 135. *CALAMUS ASPERRIMUS* Bl. Java.
 136. *CALAMUS EQUESTRIS* Willd. Moluccas.
 137. *CALAMUS CAWA* Bl. Moluccas.

138. *Calamus mucronatus* Becc. sp. n.—Scandens, gracillimus, vaginis 4-6 mill. diam. non flagelliferis inermibus vel spinis brevissimis tuberculiformibus armatis; frondes breves cirro aculeato gracillimo terminatae, petiolo subnullo; segmenta parva perpauca remote inequidistantia alterna vel subopposita, oblanceolata, abrupte acuminato-mucronata, nerves 5 tenuibus percursa, utrinque subconcoloria et in nervis nec non in margine omnino nuda; majora 6-12 cent. longa, 12-16 mill. lata, basilaria basi callosa et reflexa; spadices breves folio breviores non flagelliferi, spathis primariis tubulosis laxè vaginantibus et sursum versus ampliatis, inermibus, spicis parvis scorpioideis.

Borneo; Sarawak (Beccari P. B. Nos. 829, 1904).

139. *CALAMUS MELANOLOMA* Mart.—*C. anceps* Bl.—*C. calolepis* Miq. Java.
 140. *CALAMUS VIRIDISPINUS* Becc. Malayan Peninsula.
 141. *CALAMUS ERIOACANTHUS* Becc. Borneo.
 142. *CALAMUS SIPHONOSPETHUS* Mart.—*C. discolor* Mart.

—Philippines.

143. *Calamus microcarpus* Becc. sp. n.—Scandens; frondes cirriferae, rachi subtus aculeis reduncis armata supra bifaciali et in medio argute spinulosa; segmenta numerosa inaequidistantia, 3-7 approximata, lineari-lanceolata, acuminatissima, 20-23 cent. longa, 12-15 mill. lata, utrinque subconcolora, supra costa media acuta et in utroque latere nervis 1-2, setis paucis rigidis obsitis, percursa, subtus et tantum costa media prope apicem setulosa, marginibus crebre et patule ciliato-spinulosis; spadices partialiter ultra decompositi, spathis tubulosis laxè vaginantibus, basi attenuatis, apici ampliatis, vix spinulosis; inflorescentiis partialibus brevibus, spicis paucis gracilibus zig-zag dispositis ferentibus; fructibus minimis (5 mill. diam.) sphaericis mucronatis, squamis nitidis profunde sulcatis et apice gibbosis.

Philippines (Vidal No. 3952).

144. *Calamus dimorphacanthus* Becc. sp. n.—Gracilis, scandens, vaginis 7-8 mill. diam., spinis inaequalibus gracilibus acicularibus pallide-stramineis densissime armatis; frondes graciles, cirro gracili aculeato terminatae, petiolo brevissimo, rachi sub-biconvexa subtus aculeis reduncis, supra spinis gracilibus acicularibus elongatis, armata; segmenta numerosa subaequidistantia vel interrupte aequidistantia, herbacea, subconcoloria, glabra, lineari-lanceolata, parva (majora 10 cent. longa 4-7 mill. lata) superiora sensim minora, supra in costa media solitaria acuta parcissime spinulosa subtus nuda, ad margines spinulis remotis majusculis ciliata.

Philippines (Vidal No. 3956).

B.—Not scandent.

145. *CALAMUS OXLEYANUS* Teijsm. & Binn.—*C. Fernandesii* H. Wendl.—*Rotang Pajare* Griff.—*Daemonorops fasciculatus* Mart. . Malayan Peninsula; Bangka; Singapore.

GROUP XV.—*Leaves* of young plant not produced into a cirrus; of the adult shortly cirriferous. *Leaflets* lanceolate or elliptic or in any case with more than 3 primary nerves. *Leaf-sheaths* flagelliferous. *Primary spathes* elongate-tubular, narrow. *Spathellule* of fem. fl. not or very shortly pedicelliform. *Fruiting perianth* pedicelliform. *Seed* not ruminant.

146. *CALAMUS MARTIANUS* Becc.—*C. penicillatus* (not of Roxb.) Mart. Penang.

147. *Calamus myriacanthus* Becc. sp. n.—Scandens, robustus; vaginae circ. 4 cent. diam. apici crasse sublignosae, non saccatae, sensim in petiolum validum attenuatae, densissime spinis brevibus acicularibus sparsis, in dorso majoribus et subseriatis, in parte ventrali prope margines longioribus, armatae; frondes amplae, petiolo valido elongato margine aculeis reduncis subregulariter validissime armato, segmentis paucis in parte basilari subaequidistanter remote oppositis, oblanceolatis amplissimis, 40 cent. longis, 7-7.5 cent. latis, subtus cinerascentibus sed glabris nervis 7-8 in pagina inferiore prominulis et contra supra tenuibus percursis, utrinque pilis, setis aut spinulis destitutis; segmentis superioribus alternis, minoribus, apicalibus basi subdecurrentibus, 18-20 cent. longis, 2 cent. latis; spadices ♀ longissimi, spathis primariis arcte tubulosis sparse spinulosis et squamulis ferrugineis obsitis; inflorescentiis partialibus valde elongatis, spathis secundariis tubuloso-infundibuliformibus 2-3 cent. longis, dense spinulosis; spicis alternis gracilibus filiformibus usque ad 15 cent. longis; spathellis brevissime tubulosis; involucrophoro

brevissimo una cum cupula florali discoidea axi lateraliter adnato.—Ut videtur *C. asperrimo* Bl. proximus.

Borneo ; Bintulu in Sarawak (Beccari P. B. No. 3698).

148. *CALAMUS SPATHULATUS* Becc. Malayan Peninsula.
C. SPATHULATUS v. ROBUSTUS Becc. Malayan Peninsula.
 149. *CALAMUS INSIGNIS* Griff Malayan Peninsula.
 150. *CALAMUS QUINQUENERVIUS* Roxb. N. E. India.
 151. *CALAMUS ORNATUS* Bl. (type).—*C. aureus* Mart.—*C. ovatus*
 Reinw. Java.
C. ORNATUS v. HORRIDUS Becc. Malayan Peninsula.
C. ORNATUS v. MITIS Becc. Borneo.
C. ORNATUS v. SUMATRANUS Becc. Sumatra.
 152. *CALAMUS GIGANTEUS* Becc. Malayan Peninsula,
 153. *CALAMUS SCIPIONUM* Lour.—*C. micranthus* (partly) Bl.—*C.*
fissus (partly) Bl.
 —Malayan Peninsula ; Borneo ; Billiton ; Sumatra.

GROUP XVI.—*Leaves* imparipinnate, subcirriferous. *Leaf-sheaths* flagelliferous. *Spadix* contracted. *Primary spathes* tubular at the base ; open, dilated and auriculiform above. *Spathellule* of fem. fl. not pedicelliform. *Fruiting calyx* not callous at the base and not pedicelliform. *Seed* with albumen deeply ruminant ; *embryo* basilar, excentric.

154. *CALAMUS CONIROSTRIS* Becc. Malayan Peninsula.
 155. *CALAMUS LOBBIANUS* Becc.—*C. melanolepis* Ridley.
 —Malayan Peninsula ; Singapore.

156. *Calamus brachystachys* Becc. sp. n.—*Spadice* abbreviato densifloro, *spathis* primariis basi tubulosis apici auriculato-ampliatas, spinosis, spicis valde approximatis scorpioides, fructibus in racemo ovato-elliptico congestis inter majoribus, 3·5 cent. longis, 1·5 cent. latis, basi attenuatis, apici conico-rostratis, squamis aterrimis nitentibus, apici rotundato non fimbriato et margine vix erosulo-denticulato, convexis nec medio sulcatis, semine ovato utrinque attenuato-alveolato, albumine profunde ruminato, embryo basilari.—*C. conirostri* proximus.

Borneo ; Sarawak (Beccari).

Species of Doubtful Affinities.

157. *CALAMUS MANILLENSIS* H. Wendl.—*C. maximus* Blanco ?—*Daemonorops manillensis* Mart. Philippines.

158. *Calamus Harmandi* Pierre MS. (nomen nudum).—Caespitosus? frondium vagina in ventre aperta spinis longis basi confluentibus et irregulariter verticillatis armata; petiolus supra profunde canaliculatus, subtus rotundatus ad margines spinis rectis horizontalibus armatus; segmenta numerosa aequidistantia approximata lineari-ensiformia utrinque subconcolora, tricostulata in pagina superiore costa media validiuscula remote setosa et costulis secundariis minute remoteque spinulosis, subtus nervis omnibus nudis, majora 30-40 cent. longa, 10-15 mill. lata, 2 apicalibus basi liberis brevioribus angustissimis; spadix erectus rigidus, spicis paucis rigidis crassis cylindraceis erectis, 10 cent. longis, undique (per series 6?) floriferis, fructibus (immaturis) parvis obovatis et apici rostratis-densissime congestis.—Species anomala floribus in spica multiseriatis insignia.

Cochinchina (Pierre No. 3359 et 1198).

159. *CALAMUS THYSANOLEPIS* Hance . . . Hong-Kong.

160. *Calamus ferrugineus* Becc. sp. n.—Caespitosus? vaginae spinis solitariis vel aggregato-subseriatis, elongato-laminaribus armatae; frondes (non cirriferae?) rachi subtus plana et aculeis brevibus in medio armata, supra acute bifaciali; segmenta aequidistantia numerosa linearia acuminatissima 27-28 cent. longa, 12-15 mill. lata, acuminatissima, apice filiformi, subtus pallidiora, supra costa media nuda, nervo laterali tenui (in utroque latere) setis nigris sparso, subtus in nervis 5 tenuibus minute setoso-spinulosa, marginibus ciliato-spinulosis; spadix (♀) rigidus breviusculus non flagelliferus undique indumento furfuraceo atro-rubiginoso indutus, spathis primariis tubulosis apicem versus parum ampliatis, dorso carinatis et aculeatis, in ore barbato-ciliatis; inflor. partialibus brevibus spicis paucis ascendentibus subscorpioideis, floribus approximatis 4-seriatis; spathis secundariis infundibuliformibus truncatis et margine ciliato-barbatis.—E congerie *C. Reinwardtii*?

Borneo (Lobb in Herb. Calc.); Sarawak (Beccari P. B. No. 563).

161. *Calamus mattanensis* Becc. sp. n.—Scandens, caudicis vaginae 12-17 mill. diam. (non flagelliferae?) spissis, sublignosis, spinis linearibus anguste lanceolatis, 10-15 mill. longis, horizontalibus, basi supra tumescentibus, subtus concavis et ad latera subdecurrentibus, spinulis minoribus intermixtis, armatae; frondes majusculae cirro elongato flagelliformi aculeato terminatae, petiolo elongato subbiconvexo vel plano-convexo marginibus et subtus aculeis reduncis robustis armato; segmenta pauca (17-18) valde inaequidistantia saepe 2-3 approximata, utrinque subnitentia, rigide et spisse char-

tacea, viridi-lutescentia in sicco, lineari-ensiformia, subabrupte acuminata, majora 32-38 cent. longa 2-3 cent. lata, striato-plicato-subquinquenervia, costa media acuta, nervis lateralibus utrinque tenuibus et nudis, marginibus remote et minute tuberculato-spinulosis.

Borneo; Sarawak (Beccari P. B. Nos. 1909, 1930).

162. *CALAMUS RALUMENSIS* Warb. Bismarck Archipelago.
 163. *CALAMUS LONGEPINNA* Lauterbach . . . New Guinea.
 164. *CALAMUS WARBURGII* K. Schum. . . . New Guinea.

Of the three last recently described species I have seen no specimens.

Doubtful, Imperfectly Known or Unrecognized Species.

- C. HUMILIS* Roxb. = *C. latifolius* Roxb? . . . Chittagong.
C. EXTENSUS Roxb. Silhet.
C. PENICILLATUS Roxb. = *C. javensis* Bl? . . . Penang.
C. POLYGAMUS Roxb. = *C. flagellum* Griff.? . . . Chittagong.
C. GRAMINOSUS Bl. Amboina.
C. EPETIOLARIS Mart. Java.
C. DISCOLOR Mart. = *C. siphonospathus* Mart.? Philippines.
C. CURAG Blanco Philippines.
C. MARITIMUS Bl. Java.
C. VIMINALIS v. *REPENS* Bl. Buru.
C. MEYENIANUS Schauer = *C. mollis* Blanco? Philippines.
C. AMARUS Lour. = *C. tenuis* Roxb.? . . . Cochinchina.
C. METZIANUS Schl. = *C. rivalis* Thw.? . . . S. India.
C. VERUS Lour. = *Daemonorops* sp.? . . . Cochinchina.
C. PULCHER Miq. Borneo.

Horticultural Names of Calamus or Excluded Species.

- C. AMERICANUS* = *Desmoncus americanus* Steud. nom.
C. ASPERRIMUS (not of Bl.) Hort.
C. BUROENSIS Mart.
C. COCHINCHINENSIS Hort.
C. CUSPIDATUS Mann & Wendl. = *Eremospatha*.
C. CINNAMOMEUS Hort.
C. DEALBATUS Hort. = *Acantophoenix rubra* Wendl.
C. FARINOSUS Hort.
C. GRANDIFLORUS Pal. de Beauv. (Steud. nom.) = *Ancistrophyllum secundiflorum*?
C. HOOKERII Mann & Wendl. = *Eremospatha*.

- C. IMPERATRICE-MARIE Hort.
 C. KENTIAEFORMIS Hort.
 C. LATISPINUS Hort.
 C. LATISPINUS Teijsm. & Binn. in Cat. Hort. Bog. 1866 (name only).
 C. LINDENII ? Rodigas.
 C. LAEVIS Mann & Wendl. = *Ancistrophyllum*.
 C. MAXIMUS (not of Blanco) Reinw. = *Plectocomia elongata* Bl.
 C. MACROCARPUS (not of Griff.) Mann & Wendl. = *Eremospatha*.
 C. MANNII H. Wendl. = *Oncocalamus*.
 C. MICRANTHUS Bl.—Species formed with the leaves of *C. Scipionum* and the spadix of another species.
 C. NITIDUS (not of Mart.) Hort.
 C. NEWMANNII Hort.
 C. NICOLAI Hort.
 C. OPACUS (not of Bl.) Mann & Wendl. = *Laccosperma*.
 C. PARVIFOLIUS Roxb.—Roxburgh never described a *Calamus* with this name, used by Vidal (Pl. Cum.) = *C. Blancoi* Kunth.
 C. PATANENSIS Hort.
 C. STOLONIFERUS Teijsm. & Binn. in Cat. Hort. Bog. 1866 (name only) = *C. horrens* Bl. ?
 C. REGIS Hort.
 C. SECUNDIFLORUS Pal. de Beauv. = *Ancistrophyllum*
 C. SECUNDIFLORUS (not of Pal. de Beauv.) Schweinf. = *Calamus Schweinfurthii* Becc.
 C. VERSCHAFFELTII Hort. = *Acanthophoenix crinita* Wendl.
 C. TRINERVIS Hort. = *Calamus javensis* Bl.
 C. ZEYLANICUS (not of Becc.) Hort.
 C. ZALACCA Willd. = *Zalacca* sp.
 C. ZALACCA Roxb. = *Zalacca* sp.

DAEMONOROPS BL.

SECTION I.—CYMOSPATHAE.—*Spadix* fusiform before flowering, then densely paniculate. *Spathes* thin, broad, cymbiform, one or two outer beaked, completely enveloping the inner.

⊙ Stem scandent.

1. DAEMONOROPS JENKINSIANUS (*Calamus* Griff.) Mart.—*Calamus nutantiflorus* Griff.—*Daemonorops nutantiflorus* Mart.
—N.-E. India ; Tenasserim.

2. *DAEMONOROPS MANII* Becc Andaman Islands.
3. *DAEMONOROPS MELANOCHAETES* Bl.—*Calamus melanochaetes* Miq. Java; Sumatra.
D. MELANOCHAETES v. MACROCYMBUS Becc. Java.
D. MELANOCHAETES v. MACROCARPUS Becc. Sumatra.
D. MELANOCHAETES v. DEPRESSO-GLOBOSUS Teijsm. & Binn. Java?
D. MELANOCHAETES v. MICROCARPUS Teijsm. & Binn. Java?
4. *DAEMONOROPS PALEMBANICUS* Bl. Sumatra.
5. *Daemonorops singalanus* Becc. sp. n.—Caudex scandens 2½ cent. diam.; vaginae indumento atro-furfuraceo pro maxima parte obtectae, infra petiolum vix gibbosae et ad latera area nuda notatae in ore antice spinis elongatis erectis, in reliqua parte et ad petioli basin reversis aciculato-laminaribus, saepe basi confluentibus et transverse irregulariter seriatis armatae; petiolus brevis supra planus, subtus rotundatus et in medio nec non ad margines acutos spinosus; rachis in cirrum redunco-aculeatum producta, supra acute bifacialis vix remotissime vel non spinosa; segmenta valde numerosa aequidistantia lineari-ensiformia in caudiculum setosum acuminata, tenuiter chartacea rigidula, majora 25-27 cent. longa, 12-14 mill. lata, supra in costulis 3 acutis setosa, subtus costa media minuta crebreque spinuloso-setosa, marginibus subpatule crebreque ciliatis; spadices ante anthesin elongato-fusifformes longiuscule pedicellati, nutantes, spatha extima in rostrum inerme circiter tertiam ejusdem partem metiens producta, basi longe tubulosa ibique dense spinis erectis, in dorso, superficialiter bicarinato, spinis gracilibus acicularibus filamentoso-complanatis sparsis patulis vel reversis armata; spathae interiores saepe diu persistentes; fructus globoso-subturbinata, basi paullo attenuati apice depressiusculo minute umbonato, squamis luride stramineis linea marginali fuscescente angusta notatis, in medio profunde sulcatis; semine globoso-compresso.
Sumatra; Mount Singalang (Beccari P. S. No. 291).
6. *DAEMONOROPS KURZIANUS* Becc.—*Daemonorops grandis* (not of Mart.) Kurz Andaman Islands.
7. *DAEMONOROPS GRANDIS* (*Calamus* Griff.) Mart.
—Malayan Peninsula.
8. *DAEMONOROPS TRICHOUS* Miq.—*Calamus trichrous* Miq.
—Sumatra; Bangka.
9. *DAEMONOROPS ANGUSTIFOLIUS* (*Calamus* Griff.) Mart.
—Malayan Peninsula.
10. *DAEMONOROPS FISSUS* Bl.—*Calamus fissus* Miq. Borneo.
D. FISSUS v. CINNAMOMEUS Becc. Borneo.

11. *Daemonorops stenophyllus* Becc. sp. n.—Scandens; caudices vaginati, 2-3 cent. diam.; vaginae infra petiolum vix gibbosae, in ore nuda; caeterum undique spinis complanatis laminaribus e basi lata subulatis, majoribus 1-2 cent. longis, solitariis vel basi confluentibus et subseriatis armatae; petiolus brevissimus vel subnullus; rachis longe cirriferam in dorso aculeis solitariis prope apicem ternis et semiverticillatis armata; segmenta numerosissima. aequidistantia angustissima acuminatissima, majora 35 cent. longa, 1 cent. lata, chartacea, supra in costulis 3 tenuibus remote spinulosa, subtus nuda vel costa media spinulis raris obsita, marginibus fere nudis vel remottissime et adpresse spinulosis; spadix ♀ inapertus ventricosofusiformis erectus subsessilis; spatharum rostrum nudum et inerme corpus aequans, spatha extima superficialiter bicarinata spinis pollicaribus complanato-laminaribus et e basi lata subulatis saepe pectinato-laciniatis, sparsis, vel interdum basi confluentibus et subseriatis; fructus sphaerici umbonati, 15-16 mill. diam., squamis nitidis luride stramineis, linea intramarginali vix discolore, semine globoso-subdepresso.

Sumatra; Sungei bulu near Padang (Beccari P. S. No. 909).

12. *DAEMONOROPS INTERMEDIUS* (*Calamus* Griff.) Mart.

—Malayan Peninsula.

D. INTERMEDIUS v. *NUDINERVIS* Becc. . . Singapore.

13. *DAEMONOROPS SEPAL* Becc. . . Malayan Peninsula.

D. SEPAL v. *SPHAEROCARPUS* Becc. . . Malayan Peninsula.

14. *DAEMONOROPS PSEUDO-SEPAL* Becc. Malay an Peninsula.

15. *Daemonorops imbellis* Becc. sp. n.—Caudex . . ; vaginae . . ; frondes non cirriferae (semper?) rhachi subtus rotundata, supra acute bifaciali utrinque omnino inermi; segmenta numerosa concinna aequidistantia anguste ensiformia, majora 35-38 cent. longa, 16-17 mill. lata, acuminatissima, supra in costulis 3 acutis et in nervis 2 secundariis tenuibus, subtus tantum in costa media setosospinulosa, marginibus adpresse spinulosis; spadix fructifer pendulus laxo ramosus pedunculo longiusculo (6 cent.), breviter sed argute spinoso, suffultus; fructi majusculi exacte ovoidei abrupte mucronati circiter 3 cent. longi, 2 cent. crassi, squamis nitidis cinnamomeis linea fusca marginatis, in dorso profunde sulcatis; semine globoso 18 mill. longo, 15 mill. crasso.—*D. Sepal* Becc. affinis.

District of Perak, Malayan Peninsula (Scortechini).

16. *DAEMONOROPS MARGARITHAE* Hance . . Hong-Kong.

17. *Daemonorops Pierreanus* Becc. sp. n.—Caudex erectus 15-20 mill. diam. (?); vaginae fusciscenti-furfuraceae, spinis

nigrescentibus rectis acicularibus et complanato-laminaribus oblique seriatis armatae: frondes bimetrales et ultra non cirriferæ (semper?), petiolo subtereti basi spinis seriato-pectinatis armato; rachi in parte media utrinque inermi; segmentis numerosis aequidistantibus lineari-ensiformibus, majoribus 45-50 cent. longis, 2 cent. latis, subulato-acuminatis, supra in costa media acuta et in nervis 2 tenuibus sparse remoteque setosis, subtus tantum in costa media prope apicem spinulosis; spadices inaperti fusiformes erecti, pedicello brevissimo suffulti; spatha extima . . ., secunda ovato lanceolata in rostrum tertiam ejusdem partem metiens attenuata, in carinis 2 superficialibus parce spinulosa; fructus sphaerici vel sphaerico-subovati abrupte umbonato-mucronati, 20 mill. longi, 16-17 crassi, squamis per orthostichas 18 dispositis, in medio sulcatis, pallide cinnamomeis, linea intramarginali vix discolore notatis, in margine anguste scariosis et crenulato-erosulis; semine globoso.—*D. petiolaris* ut videtur affinis.

Cochinchina; Kuang-Repen Mountains (Pierre No. 4899).

18. *DAEMONOROPS LEWISIANUS* (*Calamus* Griff.) Mart. Penang.

⊙ ⊙ Stem erect or subscandent.

19. *DAEMONOROPS MONTICOLUS* (*Calamus* Griff.) Mart. (type).

—Mount Ophir (Malayan Peninsula).

D. MONTICOLUS v. β Becc. Penang.

20. *DAEMONOROPS PETIOLARIS* (*Calamus* Griff.) Mart. (type)

—Malayan Peninsula.

D. PETIOLARIS v. *NUDIPES* Becc.—*C. petiolaris* β Griff.

—Malayan Peninsula.

21. *Daemonorops microthamnus* Becc. sp. n.—Erectus, caespitosus, parvus; caudices vaginati 1 cent. crassi; vaginae breves tenuiter rubiginoso-fuscescenti-furfuraceae, spinis paucis gracillimis sparsis obsitae, in ore nudae et exacte horizontaliter truncatae; frondes parvulae (15-18 cent. longae) petiolo brevi depresso-ancipite basi vix tumescente inermi; rachi breviter vel abortive cirriferæ, subtus in medio aculeis validis semiconicis fere horizontalibus dense et conspicue armata; segmentis utrinque 18-20 concinnis aequidistantibus, linearibus, acuminatissimis, majoribus 5 cent. longis, 3 mill. latis, margine et supra in carina setis paucis obsitis, subtus in costa media ciliato-spinulosis; spadices (♀) folio paullo breviores, erecti, pedicelle brevi suffulti, inaperti ventricosus-fusifformes, rostro inermi corpus $\frac{1}{2}$ aequante, spatha extima tantum ad basin acute bicarinata, spinulis gracilibus filamentoso-acicularibus sparsa; fructus

ovoideo-globosi, vertice conico-acuti 15 mill. longi, 12 mill. lati, squamis cinnamomeis apice fuscidulo in margine pallidioribus, in mediosulcatis.—An *D. petiolaris* forma diminuta?

Malayan Peninsula; Perak (Scortechini).

22. *DAEMONOROPS TABACINUS* Becc. Malayan Peninsula.
 23. *DAEMONOROPS CALICARPUS* (*Calamus* Griff.) Mart.
 —Malayan Peninsula.
 24. *DAEMONOROPS MALACCENSIS* Mart.—*Calamus acanthopis*
 (*Rotang Kertong*) Griff. Malayan Peninsula.

⊙ ⊙ ⊙ Anomalous Species.

25. *Daemonorops ursinus* Becc. sp. n.—Scandens; caudices vaginati 15-18 cent. crassi; vaginae infra petiolum vix gibbosae, in ore ocrea in appendicibus longissimis (20-25 cent. long.) angustissimis loriformibus dense crinigeris producta ornatae, caeterum undique spiculis rigidis criniformibus nigris basi in membranulam confluentibus crebreque seriatis indutae; petiolus longiusculus subteres aculeis sparsis brevibus saepe digitatis armatus, adjectis setis criniformibus et una cum rachi, in filamentum vel segmenta diminuta abeunte, indumento furfuraceo-fuscescenti obtectus; segmenta valde numerosa creberrima subhorizontalia aequidistantia angustissima acuminatissima membranacea, 10-15 cent. longa, 6-10 mill. lata, supra costulis 3 conspicue crebreque ciliato setosis percursa, subtus costa media setosa, nervis lateralibus tenuibus nudis, marginibus patule ciliato-setosis; spadix parvus petiolo subdimidio brevior, elongato-fusiformis, spatha extima in rostrum tenue attenuata, sparse crinigera, in dorso rotundata nec bicarinata.—Species multis notis insignis.

Borneo; Mount Mattang (Beccari P. B. No. 2925).

26. *Daemonorops (?) intumescens* Becc. sp. n.—Gracilis, scandens; vaginae 10-12 mill. crassae in sicco nigrescentes et minute scabridulae, ochrea elongata (3-4 cent.) tenuiter membranacea inermi marcescente praeditae, spinis sparsis paucis rectis laminaribus 1-2 cent. longis praeditae, apice conspicue gibboso-tumescens; frondium rachis non cirrifera indumento floccoso-barbato nigrescente oblecta; segmenta valde numerosa herbacea creberrima aequidistantia, angustissima, acuminatissima, majora 10-16 cent. longa, 5-8 mill. lata, utrinque in nervis tribus, supra acutioribus, et in marginibus crebre ciliata; petiolus supra profundus canaliculatus ad margines basique spinis rectis armatus, in dorso

vix aculeatus et apicem versus omnino inermis.—Species insignis inter *Cymbospathas* defectu spadicis dubia, vagina in sicco atra, ochrea marcescente elongata et intumescentiis vaginae intus spongiosis inter species mihi cognitae facile discriminanda.

Malayan Peninsula ; Perak (Scortechini).

SECTION II. PIPTOSPATHAE.—*Spadix* narrow-cylindrical or elongate before flowering, then more or less diffusely branched. *Outer spathes* not completely enclosing the inner.

A.—Spathes coriaceous, tubular before flowering, the outer hardly shorter than the inner.

27. *DAEMONOROPS MACROPTERUS* (*Calamus* Miq.) Becc.

—Celebes.

28. *Daemonorops lamprolepis* Becc. sp. n.—Scandens, caudicibus vaginatis circ. 2 cent. diam ; vaginae apice conspicue saccatae, spinis gracilibus numerosissimis fusco-castaneis acicularibus vel tenuiter laminaribus, majoribus 1.5 cent. longis armatae ; frondium petiolus cito biconvexus supra spinis rectis armatus ; rachis cirro elongato gracili et verticillatim redunco-aculeato terminata ; segmenta numerosa aequidistantia anguste ensiformia apice in acumen tenuissimum filiforme vix ciliolatum attenuata, majora circ. 30 cent. longa, 17-18 mill. lata, supra in costa media acuta, marginibus acutis minutissime et adpresse spinulosis, margine inferiore in pagina superiore linea angustissima nitida notato, remote setosa et nervis duobus tenuibus setis brunneis obsitis percursa, subtus nervo medio tantum setoso ; spadicis fructiferi erecti, ante anthesin refracti pedunculus gracilis densissime apicem versus spinis fuscis sparsis laminaribus 1-2 cent. longis armatus ; spathae cylindraceae coriaceae deciduae apice densissime setoso-spinulosae, exterior spinulis tenuissimis rigidis acicularibus inordinate obsita ; panicula fructifera ovata 20 cent. longa, fructibus ovoideis obtuse umbonatis, 14-16 mill. longis, 11 mill. latis, squamis pallide stramineis, nitentibus.—*D. macroptero* Miq. affinis.

Celebes ; Kandari (Beccari).

29. *DAEMONOROPS NIGER* (*Calamus* Willd.) Bl. . Amboina.

B.—Spathes coriaceous, deep-concave, cymbiform or spoon-shaped, the outer hardly shorter than the inner. Spadix densely paniculate.

30. *DAEMONOROPS COCHLEATUS* (*Calamus* Miq.) Teijsm. & Binn. Singapore.

C.—Spadix narrow-elongate before flowering, then paniculate. Spathes at first tubular, then open, all deciduous, or the outer one

alone persistent and more or less armed with short, stout spines. Leaf-sheaths armed with scattered or serriate spines, never confluent in an annular spinulose crest.

‡ Mouth of leaf-sheaths naked or armed with scattered spines pointing variously.

⊕ Fruit resiniferous.

31. *DAEMONOROPS DRACO* (*Calamus* Willd.) Bl. (partly.)—*D. ruber* (not of Reinw.) Mart. Sumatra.

32. *DAEMONOROPS DRACONCELLUS* Becc. Borneo.

33. *DAEMONOROPS MICRANTHUS* (*Calamus* Griff.) Becc.
—Malayan Peninsula.

34. *DAEMONOROPS PROPINQUUS* Becc.—*Calamus Draco* (not of Griff.) Willd. Malayan Peninsula; Penang; Sumatra.

35. *DAEMONOROPS RUBER* (*Calamus* Reinw.) Bl.—*D. accedens* Bl. (excl. var. *brevispatha*) Java.

36. *DAEMONOROPS MATTANENSIS* Becc. Borneo.

37. *Daemonorops Motleyi* Becc. sp. n.—Scandens, mediocris; frondium vaginae spinis laminaribus complanatis sparsis armatae, segmenta anguste lanceolata conspicue et remote aggregata, saepius gemina; spadices erecti breviter pedunculati; spathae exteriores vix interioribus breviores, elongato-fusiformes, spinis brevibus fuscentibus ad margines fimbriato-filamentosis per series parvas secus carinas 2 superficiales aggregatis; fructus (immaturi) e basi lata ovati abunde resina rubra induti.

Borneo (Motley No. 1103 in Herb. Kew).

38. *DAEMONOROPS DIDYMOPHYLLUS* Becc. Malayan Peninsula.

39. *Daemonorops sparsiflorus* Becc. sp. n.—Caudices scandentes vaginati 2-2.5 cent. diam., vaginis apice saccatis, spinis valde inaequalibus laminaribus, majoribus 2-3 cent. longis, saepe ad margines fimbriatis basi non vel vix confluentibus saepe oblique subseriatis; frondium petiolus elongatus supra inermis, subtus in medio aculeis 3-nis reduncis et ad margines spinis digitatis armatus; segmenta numerosa crebre aequidistantia linearia vix basi attenuata, superne in acumen tenuissimum attenuato-caudata, majora 24-25 cent. longa, 12 mill. lata, subtus tantum in costa media, supra in costa media et secus nervis duobus fere marginantibus ciliato-spinulosa; spadices sub anthesi paniculati, 40-50 cent. longi, petiolo breve (2-4 cent.) clavato inermi; spathae (post anthesin omnes deciduae) coriaceae, clavato-oblongae, exterior interioribus brevior, 11-14 cent. longa, spinis gracilibus acicularibus barbatis sparsis in carinis confluentibus

armata; spicae 6-7 cent. longae, floribus numerosis spiraliter dispositis, spathellula elongata pedicelliformi suffultis.

Borneo; Labuan (Lobb in Herb. Kew).

⊕ ⊕ Fruit not resiniferous.

40. *DAEMONOROPS GRACILIPES* (*Calamus* Miq.) Becc.—*Dæm. longipes* (not of Mart.) Miq.—*Calamus accedens* v. *brevispatha* Bl. Sumatra.

41. *DAEMONOROPS LEPTOPUS* (*Calamus* Griff). Mart.

—Malayan Peninsula.

42. *Daemonorops erinaceus* Becc.—Caudices scandentes, vaginati 2.5 cent. diam.; vaginae apice conspicue saccatae ibique et in ore spiculis brunneis criniformibus dense vestitae, adjectis spinis nonnullis acicularibus longissimis (5-8 cent.), caeterum spinis elongatis angustissimis inaequalibus saepe setiformibus fuscescentibus basi in membranulis cristaeformibus aggregatis et per series appropinquatas obliquas dispositis, armatae, et indumento cincrescente indutae; frondium petiolus breviusculus (25 cent. long.) supra late canaliculatus subtus rotundatus et in medio inermis ad margines spinis validis et longis, minoribus immixtis, inordinate armatus; rachis griseofurfuracea apice cirro elongato semiverticillatim aculeato terminata; segmenta numerosa crebre aequidistantia angusta 20-30 cent. longa, 13-15 mill. lata, basi valde attenuata, apice longe acuminata, supra in costa media acuta dense spinulosa, subtus nervis 3 tenuissimis dense ciliato spinulosis percursa, et paleolis brunneis minutissimis conspersa, marginibus crebre et acute spinulosis.

Borneo; Sarawak (Beccari).

43. *DAEMONOROPS OXYCARPUS* Becc. Borneo.

⊕ ⊕ Mouth of leaf-sheaths armed with long, flat, erect spines; fruit not resiniferous.

44. *Daemonorops microstachys* Becc. sp. n.—Humilis, erectus, metralis; frondium vagina spinis complanatis subhorizontaliter seriatis armata, in petiolum longiusculum supra nudum subtus in medio aculeatum, ad margines praecipue prope basin spinis rectis 2-3 cent. longis patentibus armatum attenuata; rachis non cirrifera; segmenta satis numerosa aequidistanter remotiuscula, anguste lanceolato-ensiformia, supra costa media nuda et nervis duobus setulosis percursa, subtus tantum in costa media ciliolata; spadix gracillimus (± 20 cent. longus) pedicello gracili compresso ad margines spinoso, paucula densa inflorescentiis partialibus paucis, spathis circiter 5, quarum exterior persistens concavo-auriculiformis elongata, extus

in dorso et ad margines spinis nonnullis armata; interiores planae cito deciduae inermes.

Borneo; Brunei (Iobb in Herb. Kew).

45. DAEMONOROPS HYSTRIX (*Calamus* Griff.) Mart.—*D. hirsutus* Bl.—*Calamus hirsutus* Miq.
—Malayan Peninsula; Sumatra.
46. DAEMONOROPS KORTHALSII Bl.—*Calamus Korthalsii* Miq.
—Borneo.
47. DAEMONOROPS OBLONGUS (*Calamus* Reinw.) Mart —
Calamus platyacanthus Mart.—*Daem. platyacanthus*
Mart. Java; Sumatra.
48. DAEMONOROPS ELONGATUS Bl.—*Calamus elongatus* Miq.
—Borneo.
49. DAEMONOROPS DEPRESSIUSCULUS (*Calamus* Teijsm. &
Binn.) Becc. Sumatra.
50. DAEMONOROPS RUMPHII Mart.—*Calamus Rumphii* Bl.
—*Palmijuncus verus augustifolius* Rumph . Amboina.
51. DAEMONOROPS CALAPPARIUS Bl.—*D. amboinensis* Miq.—
Calamus calapparius Mart.—*C. amboinensis* Miq.
Amboina.
52. DAEMONOROPS FUSCUS Mart. Philippines.
53. DAEMONOROPS GAUDICHAUDII Mart.—*Calamus Gaudi-*
chaudii H. Wendl.—*C. usitatus* Blanco.—*C. mollis* (not
of Blanco) Vidal Philippines.
54. DAEMONOROPS RIEDELIANUS (*Calamus* Miq.) Becc. Celebes.
55. DAEMONOROPS KUNSTLERII Becc. Malayan Peninsula.
56. DAEMONOROPS VAGANS Becc. Malayan Peninsula.

D.—Spadix narrow-elongate before flowering, then paniculate. Outer spathes at first tubular, then open, all deciduous or the outer more persistent, not or hardly spinous, but more or less covered with rigid, bristly or needle-like spiculae. Leaf-sheaths with spinulose membranous collars or rings. Fruit not resiniferous.

57. DAEMONOROPS CRINITUS Bl.—*Calamus crinitus* Miq.—*C. manicatus* Teijsm. & Binn. Borneo; Sumatra.
58. DAEMONOROPS FORMICARIUS Becc. Borneo.
59. DAEMONOROPS MIRABILIS Mart.—*Calamus?* *mirabilis*
Mart. Borneo?; Sumatra?

60. *Daemonorops pseudo-mirabilis* Becc. sp. n.—Caudicis vaginae 2 cent. diam., annulis membranosis conspicue longissimeque setigeris per paria invicem obversis arcte appropinquatis

praeditae (quorum solummodo paria 1-2 apicalia cuniculum completum formantia) adjectis annulis 1-2 minoribus, horizontaliter setigeris, inter copulatos solitariis; frondium petiolus brevis biconvexus angulis obtusis et aculeis reduncis brevibus armatus; segmenta lata, pauca (10-15) per acervulos 3-5 approximatae, in facie superiore nervis 3 vix spinulosis percursa, subtus nudae.—*D. mirabili* proximus.

Cultivated at Buitenzorg, from Palembang in Sumatra.

61. *Daemonorops Forbesii* Becc. sp. n.—Caudices vaginati 12 mill. diam.; vaginae prope apicem annulis 1-2 completis reversis, caeterum annulis minoribus incompletis prope basin interruptis et obliquis ornatae; frondium petiolus biconvexus, angulis obtusis aculeis reversis brevibus armatis; segmenta lanceolato-elongata non numerosa (27) in 3 acervulos appropinquata, in facie superiore nervis 5 setulosis percursa, subtus tantum in costa media setosa; spadix axillaris nutans subpendulus, 60 cent. longus, parte pedicellari aculeata gracili 25 cent. longa, fructibus globoso-ovoideis abrupte umbonata-mucronatis, 2 cent. longis, 18 mill. latis, semine globoso-subcompressio.

Sumatra (Forbes in Herb. Calc.)

62. *Daemonorops annulatus* Becc. sp. n.—Caudices vaginati 15 mill. diam.; vaginae annulis reversis completis late membranosis (6-7) ornatae; quorum 1-2 superioribus annulis sursum versis appropinquatis et cuniculum clausum (formicarium?) formantibus, praeterea usque ad basin annulis transversis solitariis horizontalibus praeditae; frondium petiolus biconvexus, aculeis reduncis brevibus radis ad margines obtusissimos necnon in dorso armatus; segmenta non numerosa in acervulos 3 valde remotos appropinquata, elongato-oblancoolata, supra 3-costulata, utrinque pilis, setis aut spinulis destituta.

N. E. Borneo; Lawas River (Burbidge in Herb. Kew).

- | | |
|---|--------------------|
| 63. <i>DAEMONOROPS SABUT</i> Becc. | Malayan Peninsula. |
| 64. <i>DAEMONOROPS OLIGOPHYLLUS</i> Becc. | Malayan Peninsula. |
| 65. <i>DAEMONOROPS MACROPHYLLUS</i> Becc. | Malayan Peninsula. |

66. *Daemonorops collariferus* Becc. sp. n.—Caudices vaginati 15-22 mill. diam.; vaginae breves, apice non gibbosae, ibique in ore et seriatim ad petioli basin spinis rectis pallidis longissimis (5-9 cent.) armatae, praeterea annulis setuligeris tantum reversis (4-5), quorum 2 superioribus inter eos valde appropinquatis et late membranosis, ornatae, annulis inferioribus minoribus et saepe

incompletis; frondium petiolus elongatus ad margines spinis rectis binis vel ternis divergentibus armatus; segmenta satis numerosa valde inaequalidistantia et irregulariter appropinquata, angustissima (35-40 cent. longa, 10-15 mill. lata) acuminatissima supra in costa media acuta et in nervis lateralibus tenuibus nuda; subtus in nervis 5 spinulosa.

Borneo; Sarawak (Beccari P. B. No. 1923).

67. **DAEMONOROPS VERTICILLARIS** (*Calamus* Griff.) Mart.
—Malayan Peninsula.

E.—Outer spathe *acutely 2-keeled, keel alone setose*. Leaf-sheaths *armed with flat spines confluent in an annular spinulose crest*.

68. **DAEMONOROPS GENICULATUS** (*Calamus* Griff.) Mart.
—Malayan Peninsula; Penang.

D. **GENICULATUS** v. **SPHAEROCARPUS** Becc. . . . Sumatra.

F.—Spathes *membranous, quite smooth*; leaf-sheaths *armed with spinulose crests*.

69. **DAEMONOROPS CRISTATUS** Becc. Borneo.

G.—Spathes *more or less coriaceous*. Leaf-sheaths *armed with incomplete annular spinulose crests*.

70. **Daemonorops acanthobolus** Becc. sp. n.—Caudex brevis erectus; vaginae indumento tenuiter furfuraceo-ferrugineo obtectae, lamellis plurimis cristato setigeris (summis quoque spinuli feris), valde obliquis non complete annulariformibus ornatae, apice non saccatae, ibique et in petioli basi ad margines spinis longissimis (10-12 et ultra cent.) armatae; frondium petiolus longissimus supra planus subtus valde convexus; rachis subcirrifera vel in segmentum abortivum dimidiatum terminata; segmenta numerosissima aequidistantia ensiformia basi attenuata in apicem tenuissimum setulosum acuminata majora 30-35 cent. longa, 2 cent. lata, supra nuda vel in costa media prope apicem parce spinulosa, costulis lateralibus tenuibus nudis, subtus in costa media tenui creberrime, in nervis duobus remotiuscule ciliolato-spinulosa, marginibus tantum prope apicem remote ciliolatis; parte pedicellari ancipiti inermi, apice non incrassata; spadix circiter metralis decompositus amplus ovato-cupressiformis laxiusculus, decidue fusco-squamuloso-furfuraceus; inflorescentiis primariis plurimis, spicis elongatis (6-8 cent.) disticis onustus, fructibus immaturis globosis umbonato-rostratis.

Borneo; Sarawak (Beccari P. B. No. 22.).

71. **Daemonorops scapigerus** Becc. sp. n.—Caudex brevis erectus; vaginae indumento ferrugineo-furfuraceo obtectae, lamellis

crystato-setigeris valde obliquis non complete annulariformibus ornatae, apice non saccatae, ibique et in petioli basin ad margines spinis longissimis (8-11 cent.) armatae; rachi cirro aculeato gracili terminata; segmenta numerosa aequidistantia, ensiformia, basi attenuata in apicem tenuissimum setulosum acuminata, majora usque 40-42 cent. longa, 2.5 cent. lata, supra nuda vel in costa media acuta prope apicem parce spinulosa, costulis lateralibus tenuibus nudis, subtus in costa media tenui et in nervis duobus inconspicuis minute remoteque ciliato-spinulosa, marginibus nudis vel remotissime, praecipue prope apicem, adpresse minuteque spinulosis; spadice panícula brevis furfuraceo-pauciramea, pedunculus longissimus (40-115 cent. long.) basi ancipiti ad margines spinis elongatis, apice sensim incrassatus et spinis creberrimis saepe seriatis et verticillatis, armatus; spathis primariis chartaceis deciduis inermibus, fructibus immaturis ovatis rostratis.

Borneo; Sarawak (Beccari P. B. No. 22^{bis}).

D. scapigerus v. minor: humilis, spadice gracillimo pedunculo parcissime spinoso, spicis 2-3, fructibus bene evolutis sphaericis late umbonato-rostratis, 17 mill. diam.

Borneo; Sarawak (Lobb in Herb. Kew).

H.—Spadix *elongate*; outer spathe *lanceolate, slenderly 2-keeled, wholly deciduous after flowering*. Leaf-sheaths *armed with isolated or confluent spines not annular crests*.

72. **DAEMONOROPS diversispinus** Becc. sp. n.—Alte scandens; frondium rachi cirrifera; segmenta aequidistantia opposita ensiformia vel anguste lanceolata apice acuminato-caudata, basi ad insertionem fere callosa ibique subtus aculeo incurvo sursum verso praedita; subtus in nervis nuda, supra in costa media sparse setosa; spadice pedunculus elongatus subtriqueter ad latera spinulosus; spatha exterior membranacea exsucca, nuda persistens lanceolata, spathae interiores deciduae; floris ♀ cupula floralis valde obliqua conspicue lateraliter in pedicellum floris sterilis producta.

Borneo (Lobb in Herb. Calc.).

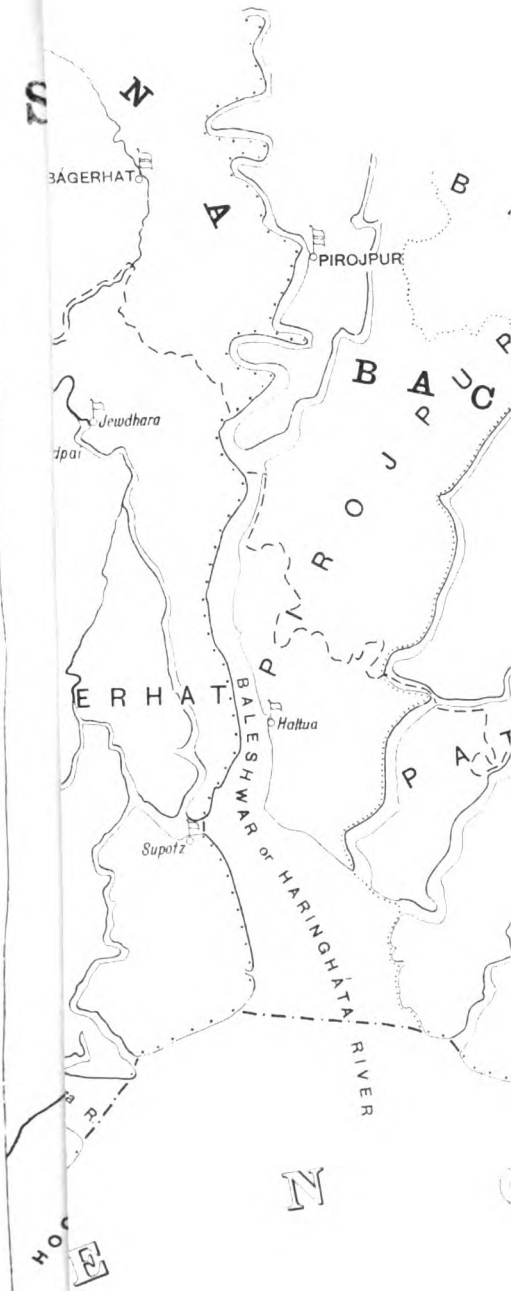
73. **DAEMONOROPS DISSITOPHYLLUS** Becc. . . . Borneo.
 74. **DAEMONOROPS PERIACANTHUS** Miq.—*Calamus periacanthus*
 Miq. Sumatra.
 75. **DAEMONOROPS LONGIPES** (*Calamus* Griff.) Mart.—*D. strictus*
 Bl.—*Calamus strictus* Miq.
 —Malayan Peninsula; Sumatra; Bangka; Billiton.

76. *Daemonorops longispathus* Becc. sp. n.—Caudices vaginati 3-4 cent. diam.; vaginae annulis membranosis destitutae, spinis magnis laminaribus solitariis vel basi confluentibus et per series \pm transversas \pm interruptas ordinatis armatae; frondium segmenta latiuscula aequidistantia; spadices magni diffusi; spathae cinnamomeae tenuiter coriaceae vel subchartaceae fragiles undique indumento furfuraceo-rubiginoso obtectae, exterior rigida elongato-lanceolata fere plana in dorso carinis 2 valde acutis et spinulosis percursa, post anthesin una cum interioribus minoribus nudis nec carinatis decidua; flores δ in spicis disticis laxiusculi, erecto-patuli.

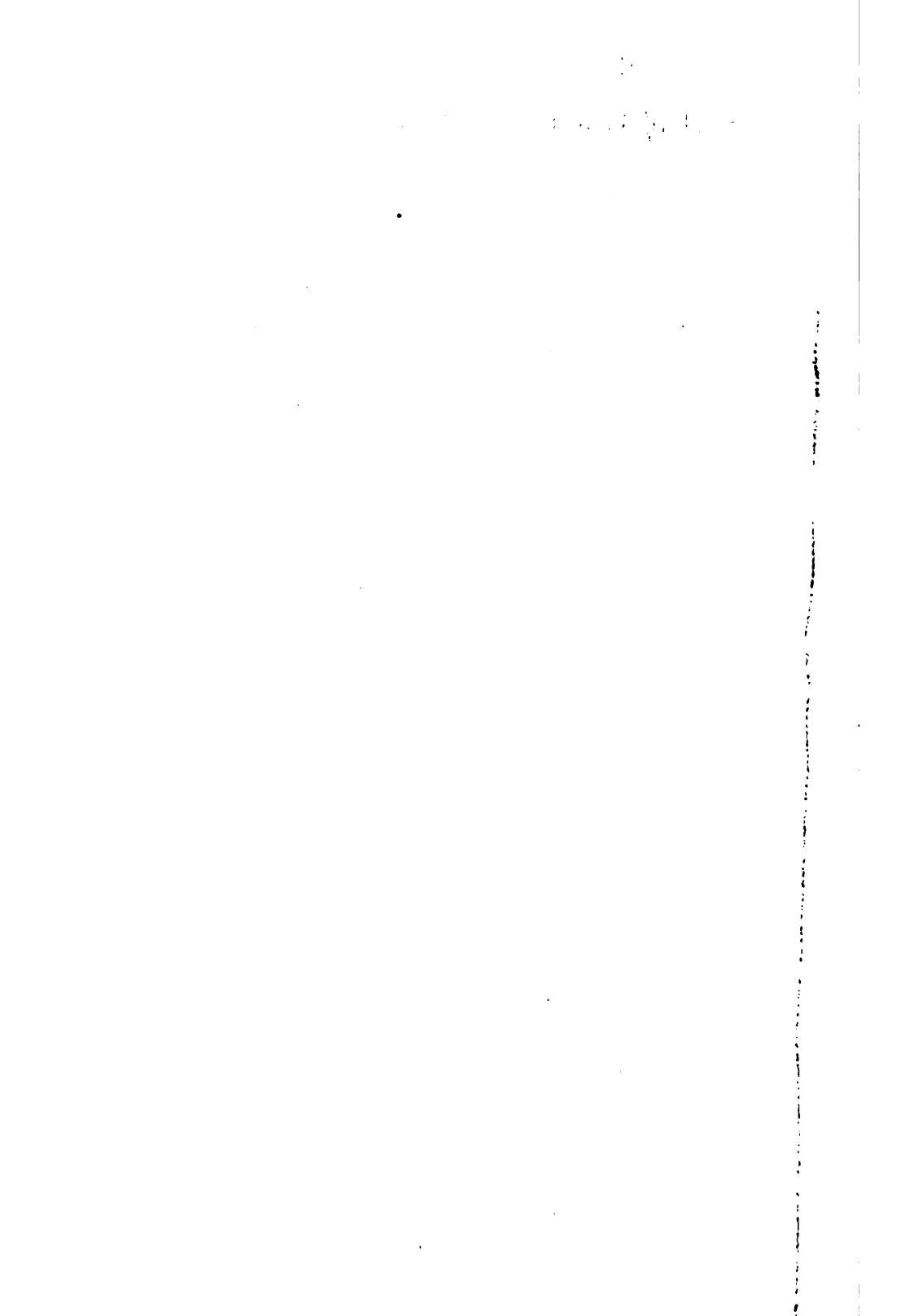
Borneo (Beccari P. B. Nos. 2193, 3697).

77. *Daemonorops ruptilis* Becc.—*Calamus ruptilis* H. Wendl. (nomen nudum in Herb. Kew.)—Robustus; caudicis vaginae ad faucem spinis laminaribus erectis horridae, quarum nonnullis longissimis et latissimis (usque ad 25 cent. long. et 5 mill. lat.); frondium segmenta ensiformia usque ad 60 cent. longa et 3 cent. lata, in apicem filamentosum et setoso-spinulosum sensim attenuata, costa media supra acuta et nuda, subtus superficialis et prope apicem paucis setis longis praedita, nervis secundariis utrinque tenuibus et nudis, marginibus tantum prope apicem spinulosis; spadix robustus, ramis brevibus crassis et ad insertionem subcalloso-tumescens, inferioribus divisis, superioribus in spicam elongatam abeuntibus, spathis secundariis et spathellis amplis exsucco-membranaceis castaneis dilaceratis; fructibus in spica 2-4-seriatis oblongis (immaturis) in rostrum attenuatis et stigmatibus magnis crassis reflexis coronatis.—Species insignis *D. longispatho* affinis.

Borneo (Low in Herb. Kew).



5 4 3 2 1 0 5 1



*
FLORA OF THE SUNDRIBUNS.

By D. PRAIN.

I.—INTRODUCTION.

The investigation of the flora of the Sundribuns has occupied the attention of the officers in charge of the Royal Botanic Garden since 1796, when Dr. Roxburgh,* through his friends Dr. William Carey of Serampur and Dr. Buchanan-Hamilton,† received from this region a number of very interesting plants. The assiduity and success with which the investigation of the Sundribuns was conducted by Roxburgh may be gathered from an examination of the *Hortus Bengalensis* published in 1814; one finds there recorded from the Sundribuns several species, such as *Flemingia congesta*, *Mesoneuron cucullatum*, *Bruguiera parviflora*, *Arthrocnemum indicum*, *Salicornia brachiata*, *Dendrobium Pierardi*, *Pteris vittata*, that have not been collected in the area since his day. The indiscriminate liberality with which the specimens collected during the first half-century of the garden's history were distributed by Dr. Wallich‡ has deprived the Calcutta collection of Roxburgh's specimens, so that all of the species enumerated have to be looked for anew in order that Roxburgh's records may be confirmed. Wallich does not himself appear to have given particular attention to the Sundribun flora though among the Wallichian specimens are examples of an interesting plant§ obtained by him from this area in 1817 that no one has found there again. Dr. Griffith, who

* Superintendent, 1793—1814.

† Superintendent, 1814—1816.

‡ Superintendent, 1817—1845.

§ *Hibiscus tortuosus* Wall. (not *H. tortuosus* Roxb., which is only *H. tiliaceus* Linn.), of which original examples are present in the Calcutta Herbarium; there are also living plants, introduced by Wallich, in cultivation still in the Calcutta Garden.

acted as Superintendent during the absence of Wallich, himself collected in the Sundribuns, and a few of his specimens from the region are present at Calcutta. Dr. Falconer, * who succeeded Wallich, next took the matter up and the collections obtained from the Sundribuns during his incumbency include *Cyamopsis psoraloides*, *Acacia Intsia*, *Asphodelus tenuifolius*, which have not been recorded since. Dr. Thomson † who followed Falconer, also made extensive Sundribun collections which include, among plants not recorded before or since his time, *Allophylus Cobbe*, *Acacia tomentosa*, *A. concinna*, *Vitex trifolia*. Dr. Anderson, ‡ the next Superintendent, did not himself collect in the Sundribuns but Mr. Kurz, § during Anderson's incumbency, made several collections in the area; the only species obtained by him that has not been collected since is *Aldrovanda vesiculosa*, a species already known to Roxburgh and to Thomson as a native of the Bengal plain immediately to the north of the Sundribuns. Mr. Clarke, || who followed Anderson, has given particular attention to the Sundribun flora, his collections include the following species not obtained since his visits to the region:—*Merremia hederacea*, *Coldenia procumbens*, *Teramnus flexilis*, *Lantana triflora*, *Scirpus triqueter* var. *segregata*, *Cladium riparium* var. *crassa*. Sir G. King ¶ kept up the traditional interest of the Calcutta Garden in the flora of the Sundribuns and with the assistance of various friends, but more especially of Mr. Gamble, added considerably to the list of Sundribun species; first, and in two cases only, records dating from the period 1871—1878 include *Mallotus repanda*, *Petunga Roxburghii*, *Bridelia stipularis*, *Desmodium umbellatum*.

Shortly after 1880, Mr. Ellis, then Deputy Conservator of the Sundribun Forests, sent to Calcutta some collections of Sundribun plants, the most interesting of these being *Oryza coarctata*, regarding which, in spite of Roxburgh's very definite account of its appearance and habitat, some misconception had arisen, and *Kleinhovia hospita* which had never been obtained in the Sundribuns before and has not been again reported. These Sundribun plants sent by Ellis were added by Mr. Brace** to a special local Sundribun collection already formed by King between 1871—1880. The knowledge of the Sundribun flora afforded by the material thus accumulated was considerable, but it was recognised that it must be far from complete. How incomplete it was

* Superintendent, 1845—1855.

† Superintendent, 1855—1861.

‡ Superintendent, 1861—1870.

§ Curator of the Herbarium, 1864—1878.

|| Officiating Superintendent, 1869—1871.

¶ Superintendent, 1871—1897.

** Curator of the Herbarium, 1881—1886.

became apparent when Mr. Heinig was posted to the Sundribuns as Deputy Conservator of Forests ten years later. His duties included the preparation of a working-plan of the Sundribun Forest Reserves; in connection with this duty Heinig sent collections of the important Sundribun species to the Calcutta Herbarium for identification by Sir G. King and by the writer, then Curator of the Herbarium. These collections, though formed with a special and technical object, proved so interesting from the scientific point of view that we begged Heinig to continue his investigations. With this request Heinig complied, and to his collections, carefully made during four or five seasons from 1891 to 1894, is largely due the fact that our knowledge of the Sundribun flora is now perhaps as complete as our knowledge of the Bengal rice-plain itself. During one of Heinig's tours he was accompanied by Mr. G. A. Gammie,* whose enthusiasm as a collector is well-known.

Heinig's interest in the Flora of the Sundribun forests led to his preparing an account of the topography of the Sundribuns and a sketch of the vegetation of their forests; these were incorporated in the working-plan alluded to above. To this Heinig added, as an appendix, based partly on the specimens of his earlier collections, depending partly on collation, a "List of the Trees, Shrubs and Large Climbers" of the Reserved and the Protected Sundribun Forests. The topographical and descriptive portions of Heinig's account have been largely drawn upon in the chapters that follow. The list appended to the working-plan, though important as a contribution to applied Botany, is less valuable from a scientific point of view. Having regard to the purpose of his report as a whole, Heinig's attention was of necessity chiefly given to such species as are of importance from the Forest Officer's stand-point. Its greatest drawback is, however, its inaccessibility. Heinig has also published an interesting account of the root-system of various species characteristic of the Sundri-forests, as apart from the Mangrove-forests, to which allusion will be made in a subsequent chapter.

A few years later Mr. C. B. Clarke, whose personal knowledge of the Sundribuns is also very intimate, provided an excellent account of the topography and vegetation of the Sundribuns. Clarke's sketch of the region took the form of a Presidential address, delivered at the Anniversary meeting of the Linnean Society of London in 1895, and subsequently published in the Society's Proceedings. This second

* Professor of Botany, College of Science, Poona, then officiating as Curator of the Calcutta Herbarium.

account of the Sundribun flora possesses a double advantage over that of Heinig. In the first place it deals not only with the western and central Sundribuns which are under swamp-forest, but with the savannah-swamps of the eastern Sundribuns, a region regarding which we owe to Clarke practically all the knowledge that we possess. Moreover, Clarke's account of the region is readily accessible; that of Heinig forms part of an unprocurable official document. Clarke's paper, however, shares with Heinig's the disadvantage of presenting a list that, though with a different object and in a different manner, is also a selective list. Its purpose cannot be better put than it has been by Clarke himself, who writes:—"This list, containing 69 species, is of course only a portion, perhaps not one-sixth, of the plants which may be collected wild in the Soondrebun. I draw up this list to include those species which I can collect in the Soondrebun, but cannot collect in the Bengal Plain for 100 miles outside the Soondrebun." Clarke's selective list serves the purpose for which it is intended as admirably as does that of Heinig. Both, however,—indeed the two taken together,—fail to provide a complete census of Sundribun plants.

The present paper is the immediate outcome of a visit that the writer, thanks to the kindness of Mr. Lacey, Conservator of Forests, Bengal, was able to pay to the Sundribuns during August 1902. An endeavour is here made to convey some idea of the topography of the region, of the nature of the vegetation, and of the origin of the characteristic flora. At the same time the opportunity is taken to provide a census, as complete as the material hitherto available will permit, of Sundribun species. Having regard to the special needs of Forest Officers, to whose efforts, as has been explained, our knowledge of the botany of the region is so largely due, points of economic importance are noted in connection with particular species; a guide to the genera, which it is hoped may be an aid in the identification of these Sundribun plants, precedes this census.

The map accompanying this sketch, which may be usefully consulted in connection with the chapter that follows, and in studying the census of Sundribun species with which the paper concludes, is a reduction from that of Ellison, published in 1873.

II.—TOPOGRAPHY OF THE SUNDRIBUNS.

The region known as the Sundribuns forms the southern part of the Gangetic delta between the Hughli on the west and the Megna on the east. The included area consists of a number of low-lying swampy islands formed by the principal distributaries of the Ganges

and their connecting water-channels and creeks. Along the northern border and particularly at the western end there is a certain amount of clearing and cultivation continuous with the cultivated ground of Central Bengal; in the eastern section of the area, between the Madumati and the Megna, cultivation and clearings extend almost to the sea-face. The central and western portions, except for the gradually extending but still comparatively insignificant amount of cultivated ground along their northern fringe, are occupied by extensive forests; those of the central section, between the Madumati (known within the Sundribun area as the Baleswar) and the Raimangal, being Reserved Forests; those of the western section, between the Raimangal and the Hughli are merely Protected Forests. These three very distinct sections form, from west to east, the southern portions of the districts of the 24-Perganahs, Khulna, and Backerganj, respectively.

The courses and relative position of the Hughli and the Megna are well known to residents of Bengal or, if not familiar, are easily traceable on the map; they need not therefore be described here. The intervening rivers are, however, less familiar; for this reason and also because it is only by forming some impression of the entangled nature of their courses and intercommunications that an adequate idea of the Sundribuns is to be obtained, a brief sketch of their ramifications is here given.*

The *Hughli*, though it forms the western boundary of our area, is not really a member of the Sundribun river-system, and is only incidentally connected with it owing to its giving off at Mud Point an eastern branch known as the Muriganga or the Awatola river which flows southward on the east side of Saugor Island to reach the sea at Dhubelát Island. The first Sundribun river of importance, as we pass eastward from the Hughli, is the *Sabtamúkhi*. This originates near Sultanpur and reaches the sea after a winding course of 50 miles. It is connected with the Muriganga branch of the Hughli by the Gagúdanga Gang and by the Doággra Khal.

The *Thákúrán*, which originates near Jainagar, has also a southerly but less tortuous course of 50 miles before reaching the sea. It increases rapidly in volume on the way and near its mouth is known as the Halúra or Jamerá river. Various khals connect it with the Sabtamúkhi, the principal being the Maral Gang and the Kumária.

* The details of this sketch of the Sundribun river-system are taken from the fuller account of the topography of the region by Heinig, to which it will be necessary to make frequent references in the pages that follow.

Through the Kúltolla Nadi and the Piáli Nadi it is connected with the Calcutta canals.

The *Mátla* is formed close to Canning Town by the junction of the Bidhyadari, the Khuratya, and the Rampura khals. From its point of origin it flows 60 miles to the sea. It is the largest and deepest of the Sundribun streams, being an arm of the sea rather than a river, navigable throughout its course by ocean-going vessels. With the Calcutta canals the *Mátla* is connected by the Piáli Nadi and the Bidhyadari; with the rivers and channels to the east it is connected by the Rampura Khal and by the Bidda with its many affluents and effluents.

The *Guasábá*, which originates in the net-work of minor channels that lie between the upper reaches of the Raimangal and the *Mátla*, is the next important stream to the east. It has a course of about 45 miles before reaching the sea; with the *Mátla* it is directly connected by the Netadupáni.

The *Raimangal*, which separates the district of the 24-Perganahs from that of Khulna and at the same time divides the Protected Forests from the Reserved Forests, has a course of 50 miles from Sahebkhali to the sea. It is connected with the Rampura Khal by the *Bárakálágáchya*; with the *Guasábá* by the *Terá Banka* and the *Hari Bhánga*; with the *Jabúna*, the next considerable river to the east, by several streams of which the principal are the *Barakúlia*, the *Kalindi Nadi* and the *Atthára Banka*.

These western Sundribun rivers are not in any instance immediate distributaries of the Ganges; they more resemble long arms of the sea than rivers; they are subject to tidal influence throughout their course, and their waters are consequently more saline than those of the rivers in the central and eastern Sundribuns. The effect of all this is distinctly reflected in the character of the vegetation.

Passing eastward from the *Raimangal* the next main-river is the *Jabúna* which begins at Kishenganj and after a course of 200 miles joins the *Raimangal* shortly before the latter reaches the sea. The *Isamati*, soon changing its name to the *Molingchu*, is the next considerable stream. It begins near Halderkhali and after a course of 50 miles through the *Satkhira* forest, which constitutes the western half of the central Sundribuns, joins the *Barápúnga* near the sea-face. The *Molingchu* and the *Jabúna* are directly connected by the *Fringi*, the *Aburi*, and various other khals.

The *Arpangassia*, formed by the junction, near *Burigoálni*, of the *Kalpatta* and the *Kobaduc* rivers, flows southward for about 40 miles between the *Satkhira* forest and the forests of the *Khulna Reserve*.

In its lower reaches this river is known as the Barápúnga; it is joined by the Molingchu just before reaching the sea and is connected with that river further to the north by the Arabibanki, the Golapatti, and various other streams.

Next after the Arpangassia comes the *Sipsa*, a river which originates at Deluti from the union of a number of khals derived from the Kobaduc on the west and from the Bhadder on the east. After a course of 40 miles it distributes itself as the Mandabári, the Moazál, and the Hondurás rivers. These three again unite to form one stream known as the Múrhata. This Sipsa river-system is connected with the Arpangassia by the Hansurá, the Batlagang and various other channels. The *Bhadder* leaves the Kobaduc at Jhinárgách near Jessore, enters the forest reserves at the northern end of Sútarkháli and from this point has a course of 25 miles before it is merged in the Sipsa.

The *Pussur*, the next important river, is an effluent of the Bhyrah at Khulna; from this point it flows 85 miles to the sea. It is connected with the Bhadder by the Chunkori, the Bajna, the Daodobe, the Laula, the Barájongana, the Bori, the Arpangassia,* and the Mángi khals; with the Sipsa it is connected by the Cháila Bogi river. About 20 miles from its mouth the Pussur gives off a considerable river, the Bángará; this last takes a more direct course, of 16 miles, to the sea, receiving on the way the Kágá, the Baráshiála and the Shella rivers. A perfect net-work of rivers and khals connect these tributaries of the Bángará with the Pussur on the west and the Bhola on the east; the chief of these are the Khúrma, the Chachan Gang, the Andramoni, the Mrigya ná, the Shellagang, the Aria Banki, the Char Nangúli, the Pankassia, the Harintáná, the Ghosiángu, the Putia, the Kátá, the Bentmori, the Chandésar.

The *Bhola*, the next main-stream, which begins as a distinct river near Rámpúl, is connected on the north by means of a net-work of khals with the Bhyrah and the Baleswar rivers. After flowing for 40 miles it joins the Pankassia near the junction of that river with the Haringháta.

The *Baleswar*, the next great river, is a direct effluent of the Ganges, the main-stream of which it leaves near Pabna. In the northern part of its course it is known as the Madumati. From Bogi Khal southward it forms the eastern boundary of the reserved forests and separates the district of Khulna from that of Backerganj. In its lower reaches the Baleswar widens considerably and is termed the

* Not to be confounded with the *River Arpangassia*.

Haringháta. With the Bhola on the west it is connected by the Jeodhára, the Chipa Bári, the Daunságar, the Saronkhola, the Sápala ; its eastern effluents or affluents, permeating the eastern Sundribuns, are the Kocha, the Haltua, the Bishkhali.

These rivers of the central and eastern Sundribuns, being directly connected with the Ganges, bring down an enormous volume of fresh water, especially during the rains. Their streams are thus less brackish than those of the western rivers, and the character of the vegetation in these divisions of the Sundribuns is thus markedly affected.

The area of this region of interlacing rivers and creeks is about 7,000 square miles ; the various water-channels constitute almost one-fourth of the whole, the remaining three-fourths being composed of the low-lying swampy islands which these channels surround. These islands in the eastern or Backerganj Sundribuns are, where not cleared for cultivation, largely occupied by grassy or sedgy savannahs ; in the western and central Sundribuns they are mainly forest-clad. The islands are, as a rule, rather higher along the river-banks than they are elsewhere, with somewhat lower and more swampy land inside ; as the banks at intervals are cut, and the whole of the interior penetrated and permeated by numberless small creeks, the entire surface of the soil, during the rains and when the rivers are full, is practically under water at every high tide. At low-water during the same season the whole surface is a sheet of somewhat adhesive mud interspersed with shallow pools of standing water. During the cold-season, when the body of water in the rivers is smaller, many of the islands become quite dry, and the superficial mud, which is soft and adhesive when wet, hardens and cakes and cracks on the surface.

This mud is composed of a rather tenacious loam, mixed with a certain proportion of fine sand ; the whole, owing to the presence of much humus, is of a bluish-grey tint. The surface of this mud has everywhere a thin coating of river-slime. Near and at the sea-face this mud is at times continued under the lowest tide-level ; at times, owing to the action of the waves the slime entirely, and the humus and loam largely, disappear, only the fine sand remaining. The subsoil, as seen at low tide along steep river-banks where erosion is in progress, is also loamy, with here and there patches of almost pure sand—vestiges usually of old sand-banks and river-churs, though doubtless sometimes the remains of a former sea face. Less often smaller pockets of a darker and more tenacious loam, approaching in appearance and consistence though not in composition to a clay, are interspersed

among these sandy patches. This subsoil extends, as borings in the Gangetic delta show, to a depth of 120 feet, where it rests on a fairly uniform layer of semi-fluid mud 40 feet in thickness, which is succeeded by a formation of the same character as that which overlies it.

The heavy flow of water in the larger channels that marks the rainy season frequently causes the erosion of the bank against which a current sets. Banks are thus at times washed bodily away; more frequently, however, the root-system of the riparian vegetation holds the actual bank in position and the current only undermines it. When the waters fall to a lower level in the cold weather, such banks, deprived of the support supplied by the pressure of the water, often subside bodily into the stream, with the vegetation growing upon them still intact. The submersion to which the trees are subjected during the higher tides of the subsequent monsoon suffices to kill them, but does not necessarily effect their removal, and the obstruction they now offer to the flow of the stream is apt again to alter the set of the current and to lead to a similar attack by the river on another part of its bank. Where erosion of this kind takes place there is not infrequently a coincident and compensating accretion of shelving muddy bank on the opposite and convex side of the river-reach.

Such newly formed banks become covered with grass which serves to bind the mud already deposited and helps to arrest silt and floating seeds. The latter germinate freely and lead to an extension of the forest over the newly formed land. The peculiar root-systems of many of the resulting species help still further to bind the soil and, by arresting more and more silt, to raise the general level of the bank;

The strong storms from the north-west, so prevalent in the Bengal plain from March till May, and the cyclones that occasionally sweep up from the sea of Bengal at the commencement and the close of the south-west monsoon, do considerable damage to the forests by overturning the taller trees, which break those that check their fall. The trees along the coast-line are, moreover, markedly affected by the steady monsoon winds that blow for half the year; they have in consequence a gnarled and bent and stunted habit of growth.

Throughout much of the western Sundribuns, except in the most northerly islands, the vegetation is largely of the mangrove type though even here the mangroves (*Rhisophoraceæ*) are accompanied by Géngwa (*Excoecaria Agallocha*), by Hiṭal (*Phœnix paludosa*) and by Sátári (*Ægialitis annulata*). In the southern islands of the central Sundribuns, where the influence of the tides is strong, the predominance of the mangroves is equally marked. Throughout the

rest of the central Sundribuns and in the northern islands of the western Sundribuns the predominant species is Sundri (*Heritiera minor*)—a circumstance to which the region owes its name of Sundribuns. Associated with Sundri are several characteristic species, notably Amúr (*Amoora cucullata*), Pussur and Dhundol (two species of *Carapa*) and Báen (*Avicennia*), while the river-banks are fringed with various species, the most notable being the Keora (*Sonneratia apetala*). Along the banks too climbing species are most in evidence. Except along the northern borders of the forests, these islands, whether of the Sundri or of the Mangrove class, are remarkably free from dense undergrowth. The savannahs of the eastern Sundribuns are largely composed of Nál (*Phragmites Karika*) though with this are associated several other grasses and a number of tall sedges. Clearings of considerable extent exist throughout the whole of the eastern Sundribuns; in the central and western Sundribuns these are confined to the northern border of the forests. Besides these existing and slowly but steadily advancing clearings there are traces within the forests, and further to the south than any existing cultivation, of former settlements. These vestiges of abandoned occupation, marking perhaps the dwelling-places of salt-makers and Sundribun pirates, are seen in mounds or platforms of higher ground such as may be met with on the left bank of the Mandabari river, not far from Kobaduc, where there are old ruins; another place of the same kind is to be found at Jatta where there are the ruins of an old Hindu temple. The forest in places of this kind is interesting as containing some species, such as the Báel (*Ægle Marmelos*), the Uriám (*Bouea burmanica*), the Gáb (*Diospyros Embryopteris*), the Amaltás (*Cassia Fistula*), that apparently do not occur and possibly could not exist in the swamp-forests; in all probability some of them have, in the first instance, been intentionally introduced.

III.—NATURE OF THE VEGETATION.

When the vegetation of the Sundribuns is considered in more detail, it is convenient at the outset to separate the clearings, whether existing or abandoned, from the swamp-forests. It is true that in the clearings, especially along embankments and on the banks of creeks and khals, a number of the species characteristic of the swamp-forests still persist. Some of them, like *Pluchea indica*, *Pandanus fascicularis*, *Tamarix gallica*, *Flagellaria indica*, *Dalbergia spinosa*, *Clerodendron inerme*, *Premna integrifolia*, *Suzda maritima*, *Acrostichum aureum* are actually more plentiful and luxuriant than they ever appear to be in the forests proper. Moreover, there are

some truly maritime species, such as *Phaseolus adenanthus*, *Stictocardia tiliæfolia*, *Agyneia bacciformis*, *Blumea amplectens* var. *maritima*, *Sphæranthus africanus*, *Asima tetracantha*, *Solanum trilobatum*, *Psilotrichum ferrugineum*, *Cyperus scariosus*, *Fimbri-stylis polytrichoides* var. *halophila*, *Paspalum distichum*, which are plentiful in the clearings but which one cannot find either in the Sundri or in the Mangrove-forests. A few other species, like *Sesuvium Portulacastrum*, *Zoysia pungens*, *Pycneus polystachyus* occur both in the clearings and at the sea-face. The bulk of the species to be met with in the northern clearings are, however, as will be seen on examining the list of Sundribun plants, either species deliberately introduced by man, or weeds such as accompany his crops, appear in the ponds or ditches that he excavates, or spring up by the sides of his paths and on his rubbish-heaps. The mounds and platforms of higher ground within the forests that mark old settlements, supply a number of species that indicate persistence under favourable conditions, on the sites of abandoned clearings, of species possibly originally introduced. The ruins at Mandabari, examined by Heinig and Gammie, and other similar places where Heinig alone has collected, have yielded a considerable number of species of this class. Having regard to the interest of this question the writer took occasion, when visiting the ruins at Jatta in August 1902, to collect every species that was to be found there; this collection supplies several additions to the list, which includes † *Cratæva Roxburghii*, *Flacourtia sepiaria*, * *Ægle Marmelos*, * *Zizyphus Cenoplia*, † *Eugenia fruticosa*, *Cassia Fistula*, * *Abrus precatorius*, † *Vangueria spinosa*, † *Ixora coccinea* var. *Bandhuca*, *Diospyros Embryopteris*, * *Diospyros montana*, † *Cordia Myxa*, * *Ocimum santum*, * *Antidesma Ghæsembilla*, † *Bouea burmanica*, * *Zingiber Casumunar*, *Croton oblongifolius*, *Odina Wodier*. The species in this list marked with an * have been found so far only at Jatta on the mound where there are the remains of a Hindu Temple; those marked with a † have been collected only at Mandabari, or at places of the kind other than Jatta. The remainder, without any distinguishing mark, are common to Jatta and to other ruins. Only one of these species, *Odina Wodier*, has been found in the swamp-forests proper and even there its only locality was a small (and now unused) wood-cutter's camping-ground on the bank of the Ambaria Khal.

The small patch of forest at Jatta on the temple platform and among the ruins yielded the following species in addition to those indicated in the foregoing list:—*Cleome viscosa*, *Tinospora tomentosa*, *Atylosia scarabaeoides*, *Trichosanthes palmata*, *Luffa graveolens*, *Momordica dioica*, *Limnophila gratissima* (from the small sweet-water

temple-tank), *Anisomeles ovata*, *Acalypha indica*, *Trema orientalis*, *Ficus religiosa*, *Ficus infectoria*, *Dioscorea pentaphylla*, *Commelina bengalensis*, *Kyllinga triceps*, *Fimbristylis monostachya*, *Panicum colonum*, *Panicum prostratum*, *Setaria glauca*, and (on the walls) *Adiantum lunulatum*. All of the species here enumerated are plants characteristic of village-shrubberies, hedges and waste-places in the Bengal plain. Except *Luffa graveolens*, which is plentiful in the Upper Gangetic plain, but for which this would appear to be the first record from the deltaic alluvium, all of them are to be found in the districts of the 24-Perganahs and Khulna outside the Sundribuns. Yet none of them have been found anywhere else within the Sundribuns. Their presence in such a spot as the Jatta platform affords evidence of the power possessed by species of this kind, probably mostly casually introduced while the locality was actually occupied, to persist under favourable conditions. Nor could conditions more favourable be readily conceived. The slight degree of artificial elevation given to the site of this old temple, augmented by a further elevation due to the crumbling of the walls of the temple courtyard,* provides a foothold for these species whereon the conditions to which they are accustomed in the Bengal plain are exactly reproduced. Moreover, the tiny platform is separated by many leagues of low swampy land, suitable only for the species characteristic of the Sundri-forests, from the nearest spot on which competing species can well exist and whence invading forms could readily come. If the conditions afforded by the higher and drier ground of the platform are so sharply contrasted with those of the immediate environment as to prevent surprise that these platform plants have not invaded the swamp-forests, this contrast equally explains why the species of the swamp-forests show just as little tendency to overrun the platform. The surrounding forest, therefore, in place of entering into competition with the species to be met with on the artificially raised mounds that indicate abandoned settlements, affords in reality the best safeguard, to such plants as have already become established there, against outside competition.

The extent to which this is the case is better appreciated when the number of species that are common to the Jatta platform and to (a) other clearings, (b) the sea-face, and (c) the swamp-forests is considered. With other similar mounds or platforms within the limits of the Sundribuns the Jatta one shares only *Glycosmis pentaphylla* and *Breynia rhamnoides*. Species of this class that have

* Jatta Pagoda itself is more or less intact and forms a landmark in the navigation of the khals and creeks in its vicinity.

been recorded from other places of the same kind but that are not present at Jatta are also few in number:—*Aphania Danura*, *Zehneria umbellata*, *Clerodendron Siphonanthus*, *Bridelia stipularis*, and *Streblus asper* probably exhaust the list. The shortness of this roll, as compared with that of species possibly intentionally introduced, is noteworthy. With existing clearings the Jatta platform shares only *Vitis trifolia*, *Crotalaria verrucosa*, *Vernonia cinerea*, *Hygrophila phlomoides*, *Pistia stratiotes*, *Paspalum scrobiculatum*. At the sea-face only four species found at Jatta have been collected; these are *Crotalaria verrucosa*, *Capparis sepiaria*, *Ficus Rumphii*, *Derris scandens*. Only three species, and all of them climbers, are common to the Jatta platform and the swamp-forests; these are *Vitis trifolia* and *Vitis latifolia*, the former common, the latter rare, on river-banks only; and *Derris scandens*, common everywhere throughout the forests from the northern boundary to the sea-face.

Besides those species that are maritime or littoral, which occur in the existing clearings but which one does not find either in the swamp-forests or collect, as Mr. Clarke has put it, "in the Bengal Plain for 100 miles outside the Soondrebun," and in addition to the species which one finds in swamp-forests or at the sea-face but which appear to thrive better in the clearings than elsewhere, there are a number of others that persist in the clearings only along embankments and sides of creeks, but are not there more luxuriant than they are in the forests. As examples may be quoted *Canavalia turgida*, *Vigna luteola*, *Derris uliginosa*, *Pongamia glabra*, *Cæsalpinia Nuga*, *Sonneratia apetala*, *Morinda bracteata*, *Wedelia calendulacea*, *Wedelia scandens*, *Ægialitis annulata*, *Ægiceras majus*, *Sarcobolus globosus*, *Sarcobolus carinatus*, *Acanthus ilicifolius*, *Avicennia officinalis*, *Excoecaria Agallocha*. The majority of the species in existing clearings do not, however, occur in the swamp-forests at all. To a considerable extent they are aquatic species, found in sluggish ditches behind embankments raised to keep out the tides, and in pools or tanks of sweet or only slightly brackish water. The leading examples of submerged aquatics are *Ceratophyllum*, *Hydrilla*, *Lagarosiphon*, *Vallisneria*, *Ottelia*, *Ruppia*, *Naias*, two species of *Utricularia*; of floating water-plants *Pistia*, *Aldrovanda*, *Limnanthemum*, *Panicum Myurus* and *P. proliferum*, *Chamæraphis*, *Leersia*, *Ipomœa aquatica*. Other semi-aquatics, partially submerged or growing in very wet places, are *Hydrolea*, *Ammannia*, *Herpestis*, three species of *Hygrophila*, *Hemigraphis*, two species of *Scirpus*, several grasses, *Ceratopteris thalictroides*. Still another group of semi-aquatics or aquatics affect not pools or jhils or still ditches,

but the edges of rivers, khals or creeks. Among these may be enumerated two species of *Typha*, *Alpinia Allughas*, *Scirpus grossus*, *Panicum repens* and, as a species wholly submerged at every high tide, *Cryptocoryne ciliata*. The species of this group are sometimes to be found penetrating for a short distance into the northern forests, but none of them are truly swamp-forest plants.

Terrestrial species confined to existing clearings are plants either only in cultivation, or escapes from cultivation, or field-weeds. Among those cultivated or occurring as escapes we find *Gynandropsis pentaphylla*, * *Zizyphus Fuzuba*, * *Cyamopsis psoraloides*, * *Sesbania grandiflora*, * *Tamarindus indica*, * *Parkinsonia aculeata*, * *Acacia arabica*, *Turnera ulmifolia*, *Trichosanthes cucumerina*, * *Psidium Guyava*, *Calotropis gigantea*, *Solanum argenteum*, *Angelonia grandiflora*, *Ocimum sanctum*, *Ocimum Basilicum*, * *Amarantus paniculatus*, * *Amarantus polygamus*, *Basella rubra*, *Casuarina equisetifolia*, * *Areca Catechu*, * *Cocos nucifera*, *Oryza sativa*, *Andropogon squarrosus*. The species marked * are only found planted; the others are species that have become thoroughly naturalised and in the case of two of these, *Solanum argenteum* and *Angelonia*, this does not appear to be the case anywhere else in India, though *Angelonia* has become similarly naturalised in places in the Irrawaddy delta and near the sea in Tenasserim.

The weeds to be met with in these clearings include *Senebiera pinnatifida*, *Abutilon indicum* and *A. graveolens*, *Malachra capitata*, *Corchorus acutangulus*, *Oxalis corniculata*, *Portulaca oleracea*, *Cardiospermum Halicacabum*, *Crotalaria verrucosa* and *C. Saltiana*, *Phaseolus trilobus*, *Cassia Tora*, *Cucumis trigonus*, *Cephalandra indica*, *Trianthema monogyna*, *Oldenlandia diffusa*, *Vernonia cinerea*, *Ageratum conyzoides*, *Grangea maderaspatana*, *Xanthium spinosum*, *Cnicus arvensis*, *Oxystelma esculentum*, *Dæmia extensa*, *Tylophora tenuis*, *Hoppea dichotoma*, *Coldenia procumbens*, *Ipomæa sepiaria*, *Solanum nigrum* and *S. xanthocarpum*, *Heliotropium indicum*, *Vandellia crustacea*, *Scoparia dulcis*, *Leucas linifolia*, *Amarantus viridis*, *Euphorbia hypericifolia*, *E. hirta* and *E. thymifolia*, *Phyllanthus Niruri*, *Chrozophora plicata*, *Asphodelus tenuifolius*, *Setaria verticillata*, *Andropogon aciculatus*, *Sporobolus tremulus*, *Chloris barbata*, *Eleusine indica* and *E. ægyptiaca*, *Diplachne fasca*, *Eragrostis tenella* var. *plumosa*, *Asplenium esculentum*, *Nephrodium aridum*, *Polypodium proliferum*. This is a meagre list when the area of these clearings is taken into account and may well be incomplete as regards some of the older clearings. The species themselves are, as a rule, unimportant, and the chief interest of the list lies in the indications it affords as to what species first

extend into these newly opened settlements from the Bengal plain, for with only two exceptions these species are all common weeds in the rice-fields or the village shrubberies of Bengal. The exceptions are *Senebiera pinnatifida* and *Xanthium spinosum*, both plentiful weeds near the banks of the Mátla river which do not occur anywhere in the Bengal plain outside the Sundribuns, and both obviously recent introductions to India. It is worth noting, moreover, that among the first species to appear in the newest and smallest settlements are *Ageratum conyzoides* and *Scoparia dulcis*, neither of which is originally a native of India.

Turning now to the Sundribun species that occupy parts which probably have never been subjected to clearing, the first to be considered are those that occur along the sea-face where the line of low sand hills to be met with at various parts of the coast afford conditions very different from those that prevail on the muddy river-banks or in the swampy islands, and provide a foothold for a number of species characteristic of the littoral of South-Eastern Asia generally. The following list includes all that have hitherto been reported; in all cases where the species occurs elsewhere in the Sundribuns this fact is noted:—

Naravelia seylanica : also northern edge of forests.

Capparis sepiaria : also among ruins at Jatta.

Tamarix gallica : also river-banks throughout the forests and especially in the northern clearings.

Hibiscus tiliaceus : also general.

Thespesia populnea : planted in the northern clearings; not found in Sundri-forests.

Vitis trifolia : also general.

Allophylus Cobbe var. *glabra*.

Odina Wodier : planted in northern clearings, also on sites of old settlements and camping-grounds.

Crotalaria retusa.

Crotalaria verrucosa : also northern clearings and old sites.

Crotalaria Saltiana : also northern clearings.

Desmodium umbellatum : general, but rare.

Erythrina indica.

Canavalia lineata.

Vigna luteola : also river-banks generally.

Dalbergia torta : also general.

Derris scandens : also general.

Derris sinuata.

Cæsalpinia Bonducella : also northern clearings and edges of northern forests.

Cæsalpinia Nuga : also general.

Cassia Sophera.

Barringtonia racemosa : also general.

Sesuvium Portulacastrum : also river-banks.

Ixora parviflora.

Launcea pinnatifida.

Ipomæa pes-capræ.

Ipomæa longiflora.

Ipomæa illustris : also river-banks.

Dolichandrone Rheedei : also general.

Acanthus ilicifolius : also general.

Lippia geminata : also clearings.

Vitex trifolia.

Vitex Negundo.

Clerodendron neriifolium.

Clerodendron inerme : also general.

Aristolochia indica.

Cassytha filiformis.

Trewia nudiflora : also in northern clearings, wild.

Ficus Rumphii : also on ruins at Jatta.

Crinum asiaticum : also general.

Aneilema nudiflorum.

Pycneus polystachyus : also in clearings.

Cyperus tegetiformis.

Mariscus albescens : occasional on river-banks but most plentiful at sea-face.

Fimbristylis ferruginea : also pretty general.

Fimbristylis sub-bispicata.

Oryza coarctata : also shelving muddy banks of all rivers.

Saccharum spontaneum : also savannahs.

Zoysia pungens : also pretty general.

Of the species here enumerated nearly 40 per cent. occur therefore in the Sundribuns only at the sea-face. More striking still, a considerable number of these species, such as *Crotalaria retusa*, *C. Saltiana* and *C. verrucosa*, *Cassia Sophera*, *Derris scandens*, *Naravelia zeylanica*, *Odina Wodier*, *Ixora parviflora*, *Dolichandrone Rheedei*, *Aristolochia indica*, *Aneilema nudiflorum*, *Cyperus tegetiformis*, *Saccharum spontaneum* are not truly littoral species; they therefore owe their presence here to some agency other than that of ocean currents.

The species of the grassy savannah-swamps are not very numerous and include, among sedges, *Cyperus exaltatus* var. *dives*, *Scirpus grossus*, *Cladium riparium* var. *crassa*; among grasses, Ulu (*Imperata arundinacea*), Kashiya (*Saccharum spontaneum*), Guráná (*Andropogon intermedius*) and especially Nál (*Phragmites Karka* var. *cincta*).

The species of the swamp-forests are by habit sharply subdivided into a smaller group of parasitic or merely epiphytic species that do not come in contact with the mud, and a larger group of rooted species. The parasites include *Cuscuta reflexa*, three species of *Loranthus*, and one *Viscum*. The epiphytes include, *Hoya parasitica*, *Dischidia nummularia*, thirteen species of *Orchidaceæ*, seven epiphytic Ferns, a *Lycopodium* and a *Psilotum*. The purely mangrove forests are usually extensive muddy flats covered at every tide by salt water on which the *Rhizophors* themselves are scattered to make an open forest; the individual trees, owing to their habit of sending down stilted adventitious roots, cover considerable spaces, but leave nevertheless wide intervals between. The mud itself, except for the *Rhizophors*, is often devoid of vegetation, though sometimes patches of two salt-worts, *Arthrocnemum* and *Salicornia*, occur on these muddy slopes. Mud-flats that are covered at high-tide only in the rains, and then necessarily with water that is only brackish, are almost always completely covered by a close crop of *Oryza coarctata*. Steeper muddy banks are more usually covered with seedling Báen (*Avicennia*) and with Hargóza (*Acanthus ilicifolius*) bushes in the central Sundribuns; in the western islands Sátári (*Ægialitis*) is usually associated with and sometimes outnumbers Báen on such banks. The tops of the banks, especially along the larger rivers, are often exclusively occupied by Keóra (*Sonneratia apetala*)—most graceful of Sundribun trees and particularly abundant along the convexities of river-reaches. Smaller khals have a more varied riparian vegetation; Ora (*Sonneratia acida*), Báen (*Avicennia*), Dhundol (*Carapa obovata*), Koilsha (*Ægiceras majus*), Dakur (*Cerbera Odollam*), Goría (*Kandelia*), Karanj (*Pongamia*), Bhola (*Hibiscus tiliaceus*), Amanta (*Dalbergia spinosa*)—as frequently erect and shrubby as it is climbing, Gorán (*Ceriops*), Kripa (*Lumnitzera*), Goniári (*Premna integrifolia*), Butráj (*Clerodendron inerme*), Hítal (*Phœnix paludosa*), being there especially plentiful. On the side of this riparian fence next to the stream occur frequent patches of Golpátta (*Nipa*) and of the stately grass *Myriostachya Wightiana*. Immediately within this fence is the favourite habitat of Kúmia (*Barringtonia racemosa*), of Gorshingiah (*Dolichandrone Rhedeei*) and of Bhaila (*Intsia*). Still narrower channels have frequently only

Koilsha (*Ægiceras*) and associated with it Kedar Sundri (*Brownlowia*) as representatives of the riparian fence. The narrowest creeks of all are often lined, to the exclusion of other species, by a fringe of Golpátta (*Nipa*).

It is on the riparian fence that the climbing species are most plentiful; the commonest is the ubiquitous *Derris uliginosa*, followed in order of frequency by *Finlaysonia*, *Vitis trifolia*, *Dalbergia torta*, *Sarcolobus globosus*, *Parsonsia spiralis*, *Dregea volubilis*. *Derris scandens* at times also occurs here but is more plentiful inside the forests than on their margins; *Finlaysonia obovata* also is not uncommon within the forests, the other creepers rarely occur there.

Just behind the riparian fence occurs any undergrowth to be met with. This consists mainly of Kewa (*Pandanus fascicularis*) with occasional tufts of *Scirpodendron*, clumps of *Crinum*, and bushes of Hargóza (*Acanthus ilicifolius*). Except, however, in the most northern forests the undergrowth is rarely dense and often there is none. Overhead is the Sundri forest composed mainly of that tree (*Heritiera minor*); of larger size in the central than in the western forests and in the northern islands of either than it is further south. Associated with Sundri on the higher ground is Báen (*Avicennia officinalis*)—the largest of Sundribun trees often reaching 10, sometimes 12-15 feet in girth, and Géngwa (*Excoecaria*), both fairly common; also Shingra (*Cynometra*) which is less plentiful. In the more swampy interior of the islands the companion trees to Sundri are still Géngwa; with it are Kedar Sundri (*Brownlowia*), Amúr (*Amoora cucullata*) and Fussur (*Carapa gangetica*). As we pass southwards the Sundri diminishes in frequency while Géngwa remains, till at length the forests become almost pure Géngwa. By this time, however, the riparian fence characteristic of the Sundri-forest has been replaced by Rhizophors which, as we pass onwards towards the sea, ultimately supplant the Géngwa and give the pure mangrove forest with which we commenced.

Besides the absence of undergrowth, a feature which the Sundri-forest shares with the mangrove- or the Géngwa-forest, the most remarkable feature of the Sundri-forest is the characteristic crop of vertical blind root-suckers, emitted by the roots of various species, notably by those of Sundri itself. The species besides Sundri (*Heritiera minor*) which develop these suckers are Amúr (*Amoora cucullata*), Fussur (*Carapa gangetica*), Ora (*Sonneratia acida*), Keora (*Sonneratia apelala*), Báen (*Avicennia*) and Hítal (*Phœnix paludosa*).

In the case of *Phœnix paludosa* the roots, which pass almost vertically downwards, give off numerous branches that pass vertically upwards. The vertical branches are usually small and somewhat inconspicuous, nor do they differ greatly in appearance from the down-

ward growing roots from which they arise. Their structure is, however, peculiar and is apparently adapted to serve a respiratory function.*

The root-suckers of Báen (*Avicennia*), though also small, are sufficiently conspicuous owing to the main roots passing horizontally for great distances from the tree to which they belong and giving off, from their upper side, lines of soft pith-like roots that rise well above the surface of the mud in which the true root is buried. These root-suckers of *Avicennia* are much too soft and flexible to serve either as mechanical supports to the tree or to any great extent as agents in arresting silt and debris. Their chief function appears to be respiratory.

In the case of the remaining species a very decided mechanical effect is produced by these root-suckers. Keora (*Sonneratia apetala*), which is characteristic of river-banks, sends out very wide-spreading roots under the surface of the mud. These roots emit long close lines of root-suckers up to distances of 150 feet or more from the parent stem. The lines of vertical root-shoots act as spurs that deflect the impinging current, lead to accretion of silt, and greatly aid the roots themselves in holding on to the muddy substratum. The shoots that rise from the distal and deeper ends of roots that are nearest to the stream, rise higher and are larger than those on the upper part of the slope and nearer the stem of the tree. In places where the set of a current has become altered, so that the silt thus accumulated is again being removed, it is noticeable that, as the erosion goes on, a deeper layer of roots and root-shoots than the one actually visible at the surface, but belonging to the same tree, becomes bared. These are roots with their suckers that had at some former period become completely buried, when their place was taken by a newer and more superficial system. Roots and suckers thus laid bare after previous complete burial, appear invariably to be dead. The roots of Keora are slender and conical from a rather thick base and are usually quite discrete. Those of Ora (*Sonneratia acida*) are in most respects like those of Keora but are often agglutinated at their bases. In both species they are tough and flexible but not very rigid.

The suckers rising from the roots of Pussur and Amúr, both of which species affect the more low-lying swampy localities in the interior of the islands, are sometimes as much as 3 feet long, the tips of the longest suckers appearing just above the surface of the water at the highest tides. The majority of the suckers hardly reach this level. In both Pussur and Amúr the suckers are cylindrical but taper more

* For an account of the structure of these roots a paper by Gage, *On the Anatomy of the Roots of Phoenix paludosa*, in Sc. Mem. Med. Off., Army of India, XII., 103 (1901), should be consulted.

gently than those of Keora, have blunter points and are more rigid and less flexible.

In the case of Sundri the suckers are not so closely set as they are in the two *Sonneratias*; they are also more rigid and less flexible, in this respect resembling the suckers of *Amoora cucullata*. But they differ from all the other root-suckers in being somewhat compressed laterally instead of being cylindrical and in arising only at points where the true Sundri roots branch instead of arising in lines along the upper surface. The suckers nearer the stem are moreover wider, *i.e.*, have a greater long diameter, than those more remote; the ones nearest the trunk occasionally coalesce with and ultimately form part of the buttresses thrown out at the base of the stem. The root-suckers of Sundri, which prefers to grow on slightly higher ground than Pussur and Amúr, are rarely so long as in these species.* From this fact and from his observations regarding the upper limit of their growth in all the species, Heinig concludes that, besides serving as mechanical supports, these root-suckers in every instance act as respiratory organs. The fact that the roots and suckers of Keora which become completely covered by silt die, and have their places taken by a new and more superficial series of roots and suckers, tends to confirm this conclusion. The conditions under which the species that constitute the Sundri-forests exist are such as to render the suggestion very probable, and the fact that other species, such as Góngwa, are not similarly endowed seems surprising. But in connection with this it is remarkable that though the two *Sonneratias* share the habit, the two *Carapas* do not; moreover, while Sundri (*Heritiera minor*) has root-suckers, another maritime species, *Heritiera littoralis*, not present in the Sundribuns but common on many other Indian coasts, has none.

The extent to which the species characteristic of the Sundribuns accommodate themselves to a greater or lesser degree of brackishness is rather variable. The Rhizophors are plentiful near the coast but some of them, particularly Goría (*Kandelia*), Gorán (*Ceriops*) and Kankra (*Bruguiera gymnorhiza*) are to be found naturally on the banks of the larger rivers even up to the northern boundary of the forests. Their occurrence so far upstream is, however, quite casual, and none of them can be said to extend naturally outside the Sundribuns. Even so near to their natural area as at Calcutta or Chander-

* For an interesting account of the root-suckers of the Sundribuns consult a paper by Heinig in *Journal, Asiatic Society of Bengal*, Vol. 62, pt. 2, p. 158 (1893). In this paper no reference is made to the presence of root-suckers in Hiñal (*Phanix paludosa*).

nagore, the only ones that can be got to thrive and to flower are *Kandelia Rheedei* and *Bruguiera gymnorrhiza*. Sundri (*Heritiera minor*)—and what is true of Sundri holds good for Amúr, Pussur, Kedar Sundri and Shingra—is to be found everywhere throughout the forests, but it diminishes considerably in size as we pass westward to where the rivers become more æstuarial and carry outward less fresh water, and diminishes still more both in size and in quantity as we pass southward to where the mangroves predominate. It reaches its highest pitch of development and forms a far purer forest in the northern Bagirhat and in the Khulna forests, where the islands are flooded during the rains by the fresh water of streams distributed immediately from the Ganges. While, however, this is the case, Sundri and its companions do not extend northward into the Bengal plain and even so near its proper habitat as Calcutta, it cannot be induced to thrive so well as the nearly allied *Heritiera littoralis* which is, in its proper habitat, more tolerant of salt-water than *H. minor*. Gégwa (*Excoecaria Agallocha*), the only species in the Sundribuns that grows with equal vigour in localities suitable for Sundri or for the mangroves, extends naturally into the Bengal plain, and is as healthy and vigorous at Calcutta as it is in its swamp-forest habitat. Keora (*Sonneratia apetala*), which practically ceases southward where the mangroves begin, extends northward a little way into the Bengal plain but only on the banks of tidal rivers and only where the water is distinctly brackish at high tide. The species survives but does not thrive at Calcutta. Hital (*Phœnix paludosa*) does not appear naturally to extend into the Bengal plain, but in spite of this it attains, as a planted species in the Calcutta Garden, to a height of stem surpassing anything to be met with in the Sundribuns. Golpatta (*Nipa*) can be kept alive at Calcutta, but does not there grow vigorously. Amanta (*Dalbergia spinosa*) also extends along river-banks well into the Bengal plain, but the nearly related Pancholj (*Dalbergia torta*) disappears from the banks of the rivers before the northern boundary of the swamp-forest is reached.

A few species seem even more indifferent than Gégwa and extend naturally northwards along river-banks as far as the influence of the tides is felt at all. The best instances of truly littoral species that thus accompany the tide-flow are *Hibiscus tiliaceus*, *Thespesia populnea*, *Erythrina indica*, *Canavalia turgida* (*C. lineata*, though so nearly related, does not), *Phaseolus adenanthus*, *Vigna luteola*, *Derris uliginosa*, *Pongamia glabra*, *Morinda bracteata*, *Stictocardia tiliæfolia*, *Acanthus ilicifolius*.

The 334 species so far reported from the Sundribuns belong to 245 genera and to 75 natural orders. Of these 75 orders, no fewer

than 32 are represented by only one genus; while as many as 27 of these 32 have only one species. Other 15 natural orders are represented by only 2 genera; other 7 by only 3 genera; yet another 7 by only 4 genera. Only 2 natural orders, *Scrophularinæ* and *Rubiaceæ*, have 5 genera apiece and 3 orders, *Cucurbitaceæ*, *Verbenaceæ* and *Palmææ*, have 6 genera. Of natural orders with more than 6 genera, *Orchidaceæ* have 8, *Cyperaceæ* and *Polypodiaceæ* each 9, *Asclepiadaceæ* and *Compositæ* each 11, *Euphorbiaceæ* 14, *Gramineæ* 18, *Leguminosæ* 25. As regards number of species, *Leguminosæ* with 38 species leads; followed by *Gramineæ* with 29; *Cyperaceæ* with 19; *Euphorbiaceæ* with 16; *Polypodiaceæ* with 14; *Orchidaceæ* with 13; *Asclepiadaceæ* with 12; *Convolvulaceæ* with 9; *Cucurbitaceæ* with 7; *Malvaceæ*, *Rhizophoreæ*, *Rubiaceæ*, *Urticaceæ* and *Palmææ* each with 6; the rest with 5, or fewer than 5.

Of the 245 genera, no fewer than 190 are represented by only one species; of the remaining 55, as many as 35 have only 2 species; other 11 have only 3 species; other 6 only 4 species each; one has 5 species; only two genera, *Ipomœa* and *Panicum* have each 6 species. The subjoined table gives a brief *resumé* of the composition of the Sundribun flora from the taxonomic point of view:—

TABLE I.—*Systematic Synopsis of Sundribun Plants.*

	Orders.	Genera.	Species.
Thalamifloræ	10	18	20
Discifloræ	9	17	21
Calycifloræ	10	46	64
Corollifloræ	19	63	86
Incompletæ	9	30	39
Monocotyledons	15	59	87
Vascular Cryptogams	3	12	17
TOTALS	75	245	334

IV.—ORIGIN OF THE SUNDRIBUN FLORA.

The geographical position and the physical condition of the Sundribuns show that they are only part of the alluvial plain of Lower Bengal, the whole of which is of recent geological formation, and that, as a matter of fact, the process of extension of that plain is here going on under our eyes. Moreover, when borings are made or deep tanks or canals are dug in the Lower Gangetic Plain at a considerable distance to the north of the existing Sundribun forests, a layer of soil is found at no very great depth in which are present the remains of species that now exist in the Sundribuns, but that have retreated from

the actual neighbourhood of the excavation. On the other hand, we find places well to the south of the northern limits of the existing Sundri-forest where, on steep banks that are subject to erosion, a layer of broken bricks and pottery is being exposed at a level well below that of the high tides of the rainy season. Whether these facts, taken in conjunction, indicate that the Sundribun area has been subjected to alternations of elevation and subsidence is an open question. Whatever may be the truth in this respect there is no doubt that all of the surface soil in the lower Gangetic delta is newly-formed land. This being the case, there can be no such thing in the Sundribun forests, savannas or clearings as an indigenous species. The nature of the flora, with its extraordinary proportion of genera and even of natural families that, so far as this region is concerned, are monotypic, points to the same conclusion. An examination of the Sundribun flora therefore resolves itself into a discussion of the dispersal and the distribution of its species; a study of how and whence the plants now present in the area have been introduced. The simplest method of dealing with the problems involved is to deal first with the dispersal of these species and to commence with those plants that inhabit the swamp-forests and constitute the more characteristic part of the flora. The different possible agencies of dispersal may be accepted as (1) *Human*, by which the introduction may have been (a) *intentional*, as in the case of cultivated or planted species, and (b) *inadvertent*, as in the case of weeds of fields or waste-places (a) *Bird*, and then either (a) by *water-birds* that carry seeds of small size or, rarely, spores attached to their feet, or to the feathers near the base of their bills, along with pellets of mud; or (b) by *fruit-eating* birds that void uninjured the seeds of fleshy fruits or seeds provided with a mace: (3) *Wind*, carrying seeds or spores that are sufficiently small and light, or seeds or fruits provided with wing-like expansions, or with a coma or pappus, that may act as a parachute: (4) *River*, bringing down from the Indian Hills or from the Gangetic plain seeds and fruits of various kinds: (5) *Sea*, bringing, by means of currents and tides, the seeds and fruits of, usually, littoral species from other shores.

Swamp-Forests.—Species introduced by man whether by accident or by design, are not to be expected in the swamp-forests: the only unequivocal instance is *Odina Wodier*, a species planted in existing clearings and plentiful where there are vestiges of former occupation; this was also obtained by the writer at a small camping-ground used by wood-cutters on the bank of the Ambaria khal. Nor are species likely to be introduced by water-birds to be expected in these forests; none have so far been found. Species in all probability introduced

by fruit-eating birds are not plentiful; the three species of *Vitis*, with the three species of *Loranthus*, a species of *Viscum*, a *Cuscuta*, a *Ficus* (*F. retusa* var. *nitida*) and the *Leea*, are perhaps the least equivocal instances. Except the *Leea*, which may equally well have been introduced by water, it is to be noted that all these species are either climbers or parasites. The *Ficus*, it is true, does not persistently climb, but it begins life as an epiphytic climber. Species introduced by wind agency are nearly thrice as numerous. They include thirteen epiphytic orchids, *vis.*:—an *Oberonia*, two *Dendrobia*, a *Cirrhopetalum*, a *Trias*, two *Luisiæ*, three *Saccolabia*, two *Sarcanthi*, and a *Cleisostoma*, all with minute and very light seeds; eight epiphytic vascular Cryptogams, *vis.*:—*Asplenium falcatum*, *Polypodium quercifolium*, *adnascens* and *irioides*, a *Vittaria*, a *Drymoglossum*, *Acrostichum scandens*, a *Lycopodium* and a *Psilotum*, all reproduced by means of minute spores. The obscure *Pteris* (*P. vittata*), if one may judge from its figure and description, should belong to this category. The other wind-introduced species are mostly climbers, their seeds being provided with a pencil of hairs that serves as a parachute; they include *Parsonsia spiralis* (Apocynæ), *Dregea volubilis* and *Finlaysonia obovata* (Asclepiadacæ) which are rooted in the ground, with two epiphytic Asclepiads, *Hoya parasitica* and *Dischidia nummularia*. The only swamp-forest tree for which introduction by wind seems unequivocal is *Dolichandrone Rheedei*, which has seeds with large membranous marginal wings. One non-epiphytic fern, *Acrostichum aureum*, is possibly also a wind-introduced species.

Species that almost certainly owe their presence in the Sundribun forests to their seeds having been washed down from Upper India or from the Himalayan slopes by the great rivers are less numerous than those introduced by wind-agency. As might be expected they vary considerably in habit and include among herbaceous forms *Alpinia Allughas*, *Typha elephantina*, and *T. angustata*, *Cryptocoryne ciliata* and *Oryza sativa*; among climbers, *Teramnus flexilis*, *Derris scandens*, *Caesalpinia Nuga**, *Mezoneuron cucullatum*, *Entada Pursætha*, *Acacia concinna* and *A. Intsia*, *Mallotus repanda*, *Ipomœa paniculata*, *Calamus tenuis* and *Dæmonorops Fenkinsianus*; among erect species, *Tamarix gallica*, *Micromelum pubescens*, *Flemingia congesta*, *Acacia tomentosa* and *Cyclostemon assamicus*. The two most striking features among the species of this list, as will be seen on consulting the systematic census of Sundribun plants, are the

* This species is also capable of introduction by the sea, and is plentiful on the coasts of the Andamans: in our northern forests it is, however, possibly a riverine immigrant; at the sea-face, where it also occurs, it is quite probably a sea-introduced species.

extent to which these species are confined to the northern forests only, and the number of them that have been only once reported—often only in the old collections from 1796 to 1856. The latter fact suggests naturally the question whether some of them deserve to be considered truly Sundribun species and whether, though now and again one of them has been met with, all or any of them are capable of persisting in the Sundribuns. The only one that is plentiful throughout the forests is *Derris scandens*; the only one for which the agency is doubtful is the *Cryptocoryne*: not one of them, it will be observed, is a tree of any size.

The rest of the swamp-forest species, 58 in number, are probably all sea-introduced species. For the majority this agency is unequivocal; the case of *Paramignya longispina* appears doubtful, yet it is difficult to imagine any other agency as responsible for its presence. Another equivocal case is that of *Kleinhovia hospita*. This is one of Ellis' discoveries and, next to his rediscovery of *Oryza coarctata*, is the most interesting. Ellis only collected it once and has given no exact locality for his specimens, so that it might be suggested that this is not a swamp-forest species but one of the trees characteristic of the sites of abandoned settlements or even a tree planted in some recent clearing. The vernacular name connoting it is given as Bholā, a name usually applied to *Hibiscus tiliaceus* which, in the shape and venation of its leaves, *Kleinhovia* somewhat resembles. The fact that the vernacular name used should be that properly belonging to one of the most plentiful and familiar of Sundribun species, hardly suggests that *Kleinhovia* is an introduced species; had it been so, some qualifying epithet would almost certainly have been employed by a native wood-cutter or forest official. The indication rather is that the tree is a Sundribun species, but that it is so rare as not to have a name of its own. This use of the vernacular name, coupled with the fact that none of Ellis' other specimens are from existing settlements, practically disposes of the suggestion that his *Kleinhovia* was a planted tree. It was carefully looked for in all the settlements visited by the writer, but was nowhere seen; it has never been sent from any settlement by Heinig; the tree is, moreover, of little economic importance and is not at all a likely species for settlers to introduce. The date of the introduction of the species to Bengal by Roxburgh, who received it, from the Moluccas, was 1796, by which time the old settlements of pirates and salt-smugglers in the Sundribuns had either been abandoned or their inhabitants had ceased to hold such intercourse with Calcutta as the introduction of new and rare trees would involve. The suggestion that Ellis' specimens are from some place like Mandabari or Jatta may therefore be ignored. The fruits of

Kleinhovia are well adapted to dispersal by ocean currents; its distribution is very similar to that of *Scirpodendron*, *Cladium*, *Brownlowia*, *Phœnix paludosa*, *Myriostachya* and other characteristic and well known Sundribun species. The fact that the species was introduced to the Calcutta Garden from the Moluccas by Roxburgh in 1796 is no more an argument against its being wild in the Sundribuns than are the facts that *Intsia* was introduced to the same garden from Singapore in 1835, and *Dolichandrone* was introduced from Southern India in 1830, arguments against these two, which are both wide-spread trees in the Sundribun swamp-forests, being truly wild in our area.

The species introduced by the sea are variable in habit; a few are herbaceous, like *Myriostachya*, *Scirpodendron*, *Oryza coarctata*, *Mariscus albescens*, *Crinum asiaticum*, *Salicornia brachiata*, *Arthrocnemum indicum*; a few are climbers, like *Flagellaria indica*, *Acanthus volubilis*, *Ipomœa illustris*, *Merremia hederacea*, *Sarcobolus globosus* and *S. carinatus*, *Dalbergia torta* and *D. spinosa*, *Derris uliginosa*, *Canavalia turgida*, *Mucuna gigantea*; or rambling shrubs, like *Hibiscus tiliaceus* and *H. tortuosus*, *Paramignya longispina* and *Salacia prinoïdes*; the rest are erect shrubs, like *Acanthus ilicifolius*, *Clerodendron inerme*, or trees of smaller or larger size. The most notable feature of the Sundribun swamp-forest flora is that half the species are probably sea-introduced, the balance owing their presence chiefly (1) to wind-agency and (2) to introduction by large rivers; a few have come (3) owing to the agency of frugivorous, but none owing to that of wading birds; only one owes its presence to (4) man.

Grass-Savannahs.—The species that forms the basis of these grassy swamps is *Phragmites Karka* var. *cincta*; this doubtless owes its presence here to wind-agency, which in all probability is also accountable for the presence of *Imperata*, of *Saccharum spontaneum* and perhaps, though in the last instance introduction by rivers is also conceivable, of *Andropogon intermedius* as well. The sedges present cannot well be wind-introduced species, but whether they are to be looked on as introductions by water-birds, by rivers, or by the sea is an open question, since all three agencies of dispersal are conceivable. Having regard to their distribution, however, one may conclude that the *Cladium* is probably a sea-introduced species, while *Scirpus grossus* and *Cyperus exaltatus* may be considered introductions either by means of water-birds or by rivers. The two bulrushes, also found on the margins of such grassy swamps, may similarly be introductions either by water-birds or by rivers; *Acrostichum aureum*, which is also present in such places, may have been dispersed by birds

or by wind. None of the savannah species are likely to have been introduced by fruit-eating birds or by man and, on the whole, the inanimate agencies of dispersal,—winds, river-currents or tides—are the probable agencies for all.

Sea-Face.—The species that constitute the fence of shrubs and creepers immediately behind the line of low sand-hills that occur along the coast wherever the actual shore is subject to the influence of the waves, and the species that are to be met with on these sand-hills themselves, exist under conditions as to light and soil very different from those that prevail in the swamp-forests and, as regards soil at least, quite unlike those offered by muddy banks that shelve under the sea whereon the salt-worts grow, or that exist in the swamp-savannahs. This being the case, it is not surprising to find, as we did in the preceding chapter, that 40 per cent. of the Sundribun sea-face plants are confined to this sea-fence or to these sand-hills.

None of these sea-face plants have been introduced by man, and none are likely to have been introduced by water-birds. Frugivorous birds may, however, be responsible for the introduction of *Capparis sepiaria*, though this is just as likely to have been brought by the sea; of *Allophylus Cobbe*; of *Vitis trifolia*; of *Ixora parviflora*, though this has more probably been washed down from Upper India by one of the rivers; of both species of *Vitex*, though both are common sea-coast species in the Andamans and Burma, and may be here sea-introduced, while, for that matter, *V. Negundo* at least may have been brought down by the rivers; of *Cassytha filiformis*, though this, which is a frequent parasite on *Ipomœa pes-capræ* on Andaman sea-beaches, may have come here by the sea; of *Ficus Rumphii*, though this too may be sea-introduced as it is a very common, indeed almost unfailing denizen of the corresponding sea-fence on the shores of the Andamans. Bird-agency, then, seems unequivocal only in the case of two species. Wind-agency is perhaps unequivocal in the case of *Naravelia seylanica*, *Dolichandrone Rheedei*, and *Saccharum spontaneum*; it may explain the presence of *Aristolochia indica* though this has more probably been washed down by the rivers, and of *Launea pinnatifida*, though this is more likely to have been brought by the tides.

Species at the sea-face almost certainly washed down by rivers are *Cassia Sophera*, *Tamarix*, *Crotalaria retusa*, *C. Saltiana* and *C. verrucosa*, *Aneilema*, *Lippia geminata*, *Cyperus tegetiformis*; those probably introduced here by this agency are *Odina Wodier*, *Derris scandens*, *Ixora parviflora*, *Aristolochia indica*, *Trewia nudiflora*.

Another species which may have been thus introduced, but which is more probably an instance of introduction by the sea, is *Cæsalpinia Bonducella*, a shrub plentiful behind Andaman sea-beaches. The remainder of the sea-face species are probably unequivocal instances of sea-introduction, so that two-thirds of the sea-face flora as against only one half of the swamp-forest flora is of truly littoral type. A few of the species, like *Derris scandens*, *Dolichandrone Rheedei*, *Baringtonia racemosa*, *Acanthus ilicifolius*, *Crinum asiaticum* are to be found within the swampy islands, but the majority of the sea-face plants that are also to be found in the swamp-forests are there strictly limited to the banks of the large rivers. Such species are *Vitis trifolia*, *Desmodium umbellatum*, *Vigna luteola*, *Dalbergia torta*, *Cæsalpinia Nuga*, *Ipomæa illustris*, *Clerodendron inerme*, *Sesuvium Portulacastrum*, *Mariscus albescens*, *Oryza coarctata*. A number of the sea-face plants, however, that find the conditions offered by the swamp-forests uncongenial, recur on the sites of abandoned settlements, along the northern fringe of the forests, or in the existing clearings; examples that may be cited are *Naravelia zeylanica*, *Capparis sepiaria*, *Thespesia populnea*, *Crotalaria verrucosa* and *C. Saltiana*, *Erythrina indica*, *Trewia nudiflora*, *Ficus Rumphii*, *Pycreus polystachyus*, *Pimbristylis ferruginea*, *Zoysia pungens*; the last named is also met with at the upper margins of newly-formed mud-banks not yet afforested by swamp-forest species. One sea-face species, *Saccharum spontaneum*, also occurs in the grassy savannahs.

Abandoned Sites.—In places where there are vestiges of former occupation by salt-smugglers or dacoits or where, as at Jatta, a settled population had at some former time obviously existed, a number of characteristic species are to be found; these have been fully dealt with in a former chapter and, as might be expected from the topography and the physical conditions of such localities, they do not include any species likely to have been introduced by the sea. Nor can rivers be held directly responsible for the introduction of any of the species. Two for which this means of dispersal is conceivable are *Crotalaria verrucosa* and *Derris scandens*, but of these the first is more likely, in places of the kind, to have been inadvertently introduced by man as a field-weed; the *Derris*, though doubtless brought down from Upper India or Assam by rivers in the first instance, has more probably been carried to such spots by wind from the neighbouring swamp-forests. As regards wind-agency too the number of introductions is very small, for even if we consider *Derris scandens* as here locally wind-introduced, we have only five species for which this means of dispersal is at all likely, the other four being *Vernonia cinerea*, which is just as likely to be an inadvertently introduced weed; *Dioscorea pentaphylla*,

which may also be a weed ; *Hemidesmus indicus* and, finally, *Adiantum lunulatum* for which this agency is doubtless unequivocal. The inanimate agencies, for these particular sites, count for little as compared with the animate ones.

Water-birds are probably responsible for the introduction of *Limnophila gratissima*, *Hygrophila phlomoides*, *Pistia stratiotes* and perhaps for that of *Paspalum scrobiculatum* and *Panicum colonum*. Fruit-eating birds, however, have been a more active agency and are probably responsible for the presence of *Vitis trifolia* and *V. latifolia*, of *Breynia rhamnoides* and *Bridelia stipularis*, of *Aphania Danura*, *Olox scandens*, *Glycosmis pentaphylla* and *Tinospora tomentosa*, of *Trema orientalis*, of *Ficus Rumphii*, and of the four Cucurbitaceous plants found on these abandoned sites. Other species, possibly thus introduced, though the agency is not unequivocal since all of them may conceivably have been deliberately introduced by man, are *Clerodendron Siphonanthus*, *Streblus asper*, *Eugenia fruticosa*, *Ficus religiosa* and *F. infectoria*, *Antidesma Ghaesembilla* ; perhaps *Flacourtia sepiaria* might be classed with these.

Human agency may be held less equivocally responsible for the deliberate introduction of *Cratæva religiosa*, *Ægle Marmelos*, *Zisypus Enoplia*, *Bouea burmanica*, *Odina Wodier*, *Cassia Fistula*, *Vangueria spinosa*, *Ixora coccinea* var. *Bandhuca*, *Diospyros Embryopteris*, *D. montana*, *Cordia Myxa*, *Ocimum sanctum*, *Zingiber Casumunar* ; is not improbably responsible for the presence of *Abrus precatorius*, though this may have been inadvertently introduced ; of *Croton oblongifolius*, the existence of which is not otherwise easily explained ; and of *Streblus asper*, *Flacourtia sepiaria* and *Antidesma Ghaesembilla* : *Clerodendron Siphonanthus*, too, is a species that may conceivably have in the first instance been planted.

Species that are mere weeds of cultivation elsewhere, and that in these clearings almost certainly owe their presence to inadvertent introduction by man with his crops are *Cleome viscosa*, *Atylosia scarabæoides*, *Crotalaria verrucosa*, *Anisomeles ovata*, *Acalypha indica*, *Commelina bengalensis*, *Kyllinga triceps*, *Fimbristylis monostachya*, *Panicum prostratum* and *Setaria glauca*,—not a very extensive list, the chief interest of which lies in the fact that eight of these species have not been found as weeds in any of the existing clearings. Another possible member of the group is *Vernonia cinerea*, a common weed in existing clearings that may quite readily be a wind-borne species ; still another is *Abrus precatorius*, which, however, having regard to its reputed qualities, is quite likely to have been deliberately introduced. Very nearly half the species in these old settlements must be looked on as having been introduced by man.

Existing Settlements.—In the extensive clearings that occupy much of the eastern Sundribuns, and in the line of constantly encroaching settlements along the northern border of the swamp-forests, the proportion of species introduced by man, whether purposely or by accident, is naturally very much higher than on abandoned sites. Another class of species well represented in such localities is that of plants introduced in all probability by water-birds: this is to be explained by the existence of many still-water ditches behind the embankments that have been thrown up to keep out the high tides, and by the presence of small ponds dug to provide drinking-water for the population. The number of species introduced by fruit-eating birds, on the other hand, is much smaller; this doubtless is to be explained by the absence of trees on which to rest, and the presence of inhabitants, rendering these clearings less inviting as resting places for birds of this kind than are the forests in their vicinity. Of the inanimate agencies, wind has been here the least effective; rivers, as might be expected, have been responsible for the introduction of not a few species that find the conditions in these clearings practically identical with those in the Bengal rice-plain whence they have been brought, and that therefore survive here when in the swamp-forests or at the sea-face they can find no foothold. Contrary to expectation, however, it is found that the agency of the sea is responsible for a very marked proportion of the species present in these clearings. This is to a considerable extent due to the survival of swamp-forest species along the banks of khals and on the sides of bunds, and to some extent owing to the fact that these clearings offer conditions suitable for plants growing at the sea-face that are incapable of subsisting in the swamp-forests. The littoral element in the vegetation of these clearings is not, however, to be explained entirely in this way; there are a number of species, very characteristic of sea-shores elsewhere in South-Eastern Asia, which one does not find in the Bengal plain outside the limits of these Sundribun clearings, but which one looks for equally in vain in the swamp-forests or at the sea-face.

Maritime species of this class are *Phaseolus adenanthus*, very plentiful on Andaman beaches; *Stictocardia tiliaefolia*, *Agyneia bacciformis*, *Blumea amplectens* var. *maritima*, *Sphæranthus africanus*, *Wedelia scandens*, *Pluchea indica* and *Suaeda maritima*—both occasionally met with in naturally clear spaces in the forests, *Asima*, *Psilotrichum*, *Solanum trilobatum*, *Cyperus scariosus*, *Fimbristylis polytrichoides* var. *halophila*, *Paspalum distichum*, *Scirpus triqueter* var. *segregata*. Other sea-borne species in open clearings are *Pycneus polystachyus* and *Zoysia*. Species introduced by the sea that survive along bunds and banks of khals in the clearings

are *Canavalia turgida*, *Vigna luteola*, *Derris uliginosa*, *Pongamia*, *Dalbergia spinosa*, *Cæsalpinia Nuga*, *Sonneratia apetala*, *Morinda*, *Ægialitis* and *Ægiceras*, the two *Sarcolobi*, *Acanthus ilicifolius*, *Clerodendron inerme*, *Premna integrifolia*, *Avicennia officinalis*, *Excoecaria*, *Flagellaria*, *Pandanus fascicularis*.

Species in clearings that have been introduced by rivers include *Tamarix gallica*, *Cæsalpinia Bonducella* probably, *Barringtonia acutangula*, *Conyza semipinnatifida*, *Wedelia calendulacea*—though this might equally well be an introduction by water-birds, *Ipomœa sepiaria*, *Lantana indica* and *L. trifolia*, *Lippia geminata* and *L. nudiflora*, *Trewia nudiflora*, *Casuarina equisetifolia*,* two species of *Typha*, *Cryptocoryne*, *Cyperus exaltatus*, *Scirpus littoralis*, *Panicum repens*. Wind-introduced species in the clearings include *Vernonia cinerea* and *Ageratum conyzoides*, though both these might have been introduced as weeds with crops; *Grangea maderaspatana* and *Cnicus arvensis*, to which the same remark will apply; *Oxystelma esculentum*, *Dæmia extensa*, *Tylophora tenuis*, *Pentstemon microphylla*, *Imperata arundinacea*, *Chloris barbata*, *Asplenium esculentum*, *Nephrodium aridum*, *Polypodium proliferum*, *Acrostichum aureum*, *Helminthostachys zeylanica*.

Fruit-eating birds are possibly responsible for the introduction of *Passiflora suberosa*, *Cephalandra* and *Cucumis*, and almost certainly responsible for the presence of *Vitis trifolia*; they are also in all likelihood responsible for the dispersal in a wild state of *Basella*, but the influence of this agency is necessarily slight and cannot be associated with any other species. Water-birds, on the other hand, have to be credited with the introduction of all the fresh-water submerged or floating species enumerated in the previous chapter except *Ipomœa aquatica*, which is almost certainly a plant originally deliberately introduced. Besides these this agency probably explains the presence of *Hydrolea*, *Ammannia*, *Herpestis*, three *Hygrophilæ*, *Hemigraphis*, *Eleocharis*, one *Scirpus*, *Paspalum scrobiculatum*, *Eriochloa polystachya*, *Panicum Crus-galli* and, perhaps, *Diplachne fusca*.

Species intentionally introduced by man and still either under cultivation or existing as escapes have been already given in detail. The number of these species is not very great and the list is probably incomplete. The rest of the plants to be met with in clearings are weeds in all probability inadvertently introduced by man. The number of these weeds is by no means great, when the extent of the cleared area is considered, and hardly exceeds that of species

* See remarks regarding this species in the systematic census.

whose presence is almost certainly due to the tides and ocean-currents. The subjoined table gives a synopsis of the facts detailed in the foregoing paragraphs.

Table II.—Mode of introduction of Sundribun Plants.

Species introduced by into	ANIMATE AGENCIES.				INANIMATE AGENCIES.		
	Man.		Birds.		Winds.	Rivers.	Tides.
	Inten- tionally.	Inad- vertent- ly.	Aquatic.	Fragivo- rous.			
Existing clearings	23	56	29	4	15	19	36
Abandoned settlements . . .	16	10	5	20	5	—	...
Grassy savannahs . . . .	...	...	...	...	4	5	1
Swamp-Forests	1	...	...	10	32	21	58
Sea-face fence . . . .	...	...	...	2	3	11	31
Total, eliminating overlapping of species in different areas .	36	58	30	23	50	41	96

The concluding portion of this enquiry into the origin of the Sundribun Flora involves a brief review of the distribution of the species in order to determine whence these have come into the region.

When those species that have possibly been originally introduced intentionally are considered, we find altogether 36 distributed as follows:—

Both westward and eastward from the Sundribuns	31
Cosmopolitan in the Tropics	5
Tropics of Eastern Hemisphere, Australia, Poly- nesia	2
Tropics of Eastern Hemisphere, Australia	4
Tropics of Eastern Hemisphere	1
South-Eastern Asia, America (<i>Parkinsonia</i>)	1
South-Eastern Asia, Australia	3
South-Eastern Asia (India, Indo-China, Malaya) . .	11
India, Indo-China	4
Eastward only to Indo-China and Malaya (<i>Bouea</i>) . . .	1

Westward only	4
India, Africa (<i>Acacia arabica</i>)	1
India only (<i>Cyamopsis</i> , <i>Ægle</i> , <i>Ficus religiosa</i>)	3
	—

With the solitary exception of *Bouea*, which is very rarely cultivated in Eastern Bengal, all of the species in the list are familiar plants in the Bengal Plain immediately to the north of the Sundribuns. This fact, taken in conjunction with the circumstance that for at least 10 per cent. of the species the introduction can only have been from the north, points to the conclusion that all the planted species, except perhaps *Bouea*, have been introduced from Bengal.

This conclusion is somewhat strengthened when the distribution of the introduced weeds is considered, for it may be safely assumed that inadvertently introduced species must in most cases have accompanied the deliberately introduced ones. The 58 weeds present we find to be distributed as follows :—

Both westward and eastward	51
Cosmopolitan in the Tropics	24
Tropics except Australia	2
Tropics except Australia and Polynesia	3
Tropics except Polynesia	1
Tropics of Eastern Hemisphere, Australia, Polynesia	1
Tropics of Eastern Hemisphere, Australia	2
Tropics of Eastern Hemisphere, Polynesia	1
Tropics of Eastern Hemisphere	10
South-Eastern Asia, America	1
South-Eastern Asia, Australia, Polynesia	3
South-Eastern Asia, Australia	1
India, Indo-China	1
India, Chittagong	1
	—
Westward only	7
America only	3
America, Africa	1
Africa, India	1
Europe, India	1
Europe only	1
	—

The weeds, as might be expected, are much more cosmopolitan than the cultivated species (about 50 per cent. in place of 12 per cent.) and the localised, purely South Eastern Asiatic weeds are fewer than the localised, purely South Eastern Asiatic planted species (about 4 per cent. in place of about 40 per cent.). In the case of the weeds there are no species distributed to the east but not to the west, while

as many as 12 per cent. are distributed to the westward of the Sundribuns only. Every thing therefore indicates that the species introduced by human agency have come from the north and west.

The species possibly introduced by water-birds are 30 in number, distributed as follows:—

Both westward and eastward	27
Cosmopolitan in the Tropics	10
Tropics of Eastern Hemisphere and Australia	4
Tropics of Eastern Hemisphere	1
South-Eastern Asia, Australia, America	1
South-Eastern Asia, Australia	3
South-Eastern Asia, Europe	1
South-Eastern Asia	3
Australia, Europe	1
India, Indo-China	3
—	—
Westward only	3
India, Africa	1
India	2
—	—

The high percentage of cosmopolitan species brings plants of this group almost on a parallel with the introduced weeds. Here again none of the species are distributed to the eastward only; the species distributed to the westward only constitute 10 per cent. of the whole; it may therefore be concluded that these bird-introduced species, like the species introduced by man, are immigrants from the north.

When the 23 species, for which dispersal by fruit-eating birds is almost certain, are considered, we find a great contrast in their distribution since none of them are cosmopolitan, and more than half of them are confined to South-Eastern Asia (India, Indo-China, Malaya). The details are:—

Distributed both westward and eastward	21
To Africa and throughout South-Eastern Asia	3
Throughout South-Eastern Asia and to Australia	5
Throughout South-Eastern Asia and to New Caledonia	1
Throughout South-Eastern Asia	8
Throughout India and Indo-China	4
—	—
Distributed westward only (<i>Loranthus longiflorus</i>)	1
Distributed eastward only; to Eastern Bengal north of the Sundribuns, and to Assam (<i>Loranthus Scurrula</i> var.)	1

If one may judge by the predominance of species that pass beyond South-Eastern Asia to Northern Australia and New Caledonia, over those that extend beyond South-Eastern Asia to Africa, we can

suppose that the pendulum-like bird-migrations which alternate with the monsoons throughout the submeridional ranges of hills and islands of Eastern Asia, are chiefly responsible for the introduction of such species into the Sundribuns. The figures, though too meagre to be conclusive, are not contrary to this deduction, which is in keeping with observed facts as regards the Andamans.

Passing now to the various inanimate agencies of dispersal, we have first to deal with species that are introduced by wind. Space forbids an examination in minute detail of the features of distribution of each of these plants, the requisite data for which are, however, given in the systematic census. It is sufficient here to say that they may be divided into four natural groups: (a) those with light spores (Vascular Cryptogams), of which the epiphytic forms either are cosmopolitan or are at least widely disseminated in the Old World and the terrestrial are at least widespread in South-Eastern Asia; (b) those with seeds or fruits of some size provided with a feathery pappus, a coma, or some equivalent arrangement,—again either cosmopolitan or, at least, widespread in South-Eastern Asia; (c) those with seeds provided with wings, of which we have but two examples, a *Dolichandrone* widely spread in South-Eastern Asia, and a *Dioscorea* that is found everywhere in the tropics of the Eastern Hemisphere; lastly, (d) those with very small and light seeds (Orchids) apparently exceedingly well adapted for dispersal by winds but nevertheless with often a remarkably localised distribution. The general features of the distribution of the 50 species of the class are:—

Distributed both westward and eastward	35
Cosmopolitan in the Tropics	6
Tropics of Eastern Hemisphere, Australia, Polynesia	1
Tropics of Eastern Hemisphere, Australia	3
Tropics of Eastern Hemisphere, Polynesia	3
Tropics of Eastern Hemisphere	3
South-Eastern Asia, Northern Australia, Polynesia	1
South-Eastern Asia, Northern Australia	2
South-Eastern Asia, Melanesia	1
South-Eastern Asia	11
India, Eastern Himalaya, Indo-China	3
India (Circars), Tenasserim	1
<hr/>	
Distributed eastward only	10
Indo-China, Malaya, Northern Australia	1
Indo-China, Malaya	1
Eastern Himalaya (Sikkim) and Indo-China	6
Indo-China	2
<hr/>	

Distributed westward only (India and Ceylon)	2
Undistributed (<i>Oberonia Gammiei</i> , <i>Cirrhopetalum Roxburghii</i> , <i>Pteris vittata</i>)	3

The number of Indo-Chinese species that the Sundribuns share with Sikkim, which cannot, however, be regarded as a western region, is rather striking. It is not a little remarkable that three of the species not hitherto collected anywhere except in the Sundribuns should be species of a class eminently adapted for dispersal by means of an agency so constantly active in the area as wind.

The distribution of the 41 probably river-borne species does not call for detailed analysis, and the only remarks that have to be made regarding them turn on the question as to whether their presence in the Sundribuns is due to their having been brought down by the Ganges or the Brahmaputra. The topography of the region indicates that in most cases the Ganges is more likely to have been the agent, though with a number of the species either river may have been responsible, while there are a few species, such as *Micromelum pubescens*, *Teramnus flexilis*, *Eugenia fruticosa*, *Conyza semipinnatifida*, *Lippia geminata*, *Pandanus fœtidus*, *Dæmonorops Jenkinsianus*, *Cyperus inundatus*, that, having regard to their known distribution and in some cases also to their actual locality in the Sundribuns, we must believe to have been brought down by the Brahmaputra and not by the Ganges, if this means of dispersal be really responsible for their presence in our area. One species, moreover, for which the writer assumes tentatively this means of dispersal offers some difficulty. This is *Cryptocoryne ciliata*, a species very plentiful in Lower Bengal and one that is carried about in this particular manner, by upward-flowing tides: it is, however, fair to remark as well as by falling ones. The difficulty lies in the fact that this *Cryptocoryne* is confined to Lower Bengal, so far as India is concerned, and as it is also a Malayan species, the question arises whether it may not really be, as Mr. Clarke considers, a characteristic Sundribun plant, the presence of which in India is due to introduction by the sea. The objection to this conclusion is, after all, only that it does not appear to enter the Sundribun forests, or to establish itself in our area till clearings have been effected—a not insuperable objection when the case of species like *Blumea amplectens* var. *maritima*, *Paspalum distichum*, *Fimbristylis polytrichoides* var. *halophila*, *Solanum trilobatum*, *Azima tetracantha*, *Psilotrichum ferrugineum*, *Agyneia bacciformis* and *Sphæranthus africanus* are considered. The great difference between the *Cryptocoryne* and these other species lies in its submerged habit; it is easy to understand why the other species mentioned should find the conditions of the swamp-forests inimical to their welfare;

there is no obvious reason why *Cryptocoryne* should decline to establish itself on the banks of muddy creeks before the forest disappears and yet do so profusely wherever a clearing has been effected.

The most interesting part of the enquiry into the distribution of the Sundribun species is that which concerns the sea-borne plants to be met with in the swamp-forests, at the sea-face and, to a less but still an appreciable extent, in the northern clearings. The subject has already been very fully and instructively dealt with by Mr. C. B. Clarke* so that here only the briefest summary is necessary. It is sufficient to say that the results of an examination in detail of their distribution indicate that to a greater extent than even with the wind-borne element in the Flora, these species are of Malayan and not of Indian type. The distribution of the 96 species of this kind is summarised as follows:—

Distributed both westward and eastward	63
Cosmopolitan on tropical coasts	—
Coasts from America to Malaya	1
Coasts from Eastern Africa to Polynesia	4
Coasts from Eastern Africa to Northern Australia	1
Coasts from Eastern Africa to Malaya	6
Coasts from Eastern Africa to Malaya but not on those of India or Indo-China	1
Coasts from Mascarenes to Polynesia	3
Coasts from Mascarenes to Polynesia but not on those of India or Ceylon	1
Coasts of Mascarenes, Coromandel and Java	1
Coasts from Malabar to Polynesia	6
Coasts from Malabar to Polynesia but not in Coromandel	2
Coasts from Malabar to Australia	2
Coasts from Malabar to Australia but not in Coromandel	1
Coasts from Malabar to Malaya	11
Coasts from Malabar to Malaya but not in Coromandel	5
Coasts from Malabar to Indo-China	1
Coasts from Malabar to Indo-China but not in Coromandel	1
Coasts of Ceylon, Indo-China, Malaya, Australia	1
Coasts of Ceylon, Malaya, Australia, Polynesia	1
Coasts of Coromandel and Indo-China	1
Coasts of Coromandel and China-Japan	1
<hr/>	
Distributed only eastward	23
Coasts eastward to Polynesia	2
Coasts eastward to Australia and New Guinea	3

* Proceedings, Linnean Society of London, 1894-95, pages 14-29

Coasts eastward to Southern China and Malaya	8
Coasts of Malaya only	4
Coasts to Tenasserim only	6
	—
Distributed only westward	7
Coromandel to Eastern Africa	1
Coromandel to Eastern Africa but not in Malabar	1
Coromandel, Ceylon	1
Coromandel only	1
Ceylon only	2
Scinde only	1
Not reported from elsewhere than the Sundribuns (<i>Hibiscus tortuosus</i> , <i>Carapa gangetica</i> , <i>Psilotrichum</i> <i>ferrugineum</i> .)	3

The Flora to which nearly all except the seven species that are distributed only westward belong, is the Malayan 'Strand-Flora,' composed of littoral species that characterise every shore from Melanesia to the Mascarene Islands. Its natural area includes the shores of the various archipelagos from Vavau to Fiji, from New Caledonia to the Carolines; the shores of the Philippines, of northern Australia, of New Guinea and the other *quasi*-Malayan Islands that lie to the east of the Wallace line; of the Malayan Archipelago and Peninsula; of Ceylon; of Madagascar, Mauritius, the Comoro Islands, the Seychelles. At various points offshoots of this flora branch (*a*) into Polynesia, less marked perhaps than any; (*b*) from Ceylon north-westward along the coast of Malabar and the Concan, where the presence of this factor in the vegetation, though more marked than on Polynesian coasts, is not so strong as in other outlying portions of its domain; (*c*) to the east coast of Africa where the element is more strongly represented than in Malabar but is still not overwhelmingly strong; (*d*) northward along the shores of Cochin-China and Tonkin as far as the coasts of Southern China and Formosa, a few species even reaching Liu-kiu; and (*e*) strongest offshoot of all, northward along the coasts of Tenasserim and the Andamans to Arracan, Chittagong and, as our list shows, into the Sundribuns at the head of the Bay of Bengal, with the result that though certainly the most outlying part of its whole domain, this Sundribun area exhibits the features characteristic of the Flora in question on a scale and to a degree nowhere surpassed. The remarkable paucity of members of this flora on the Coromandel coast, which has nevertheless a distinctive littoral vegetation of its own, is well shown by our summary, since besides the 23 species that extend only eastward from the Sundribuns, 13 of those that extend also to Ceylon, Malabar, the Mascarenes or Africa are absent from Coromandel, as are 3 of those that are only of westward distribution; thus 42 out of

96 or $\frac{7}{8}$ of the sea-borne plants of the Sundribuns are absent from the Coast of Coromandel. Nor is this quite all; of the littoral species found only in the northern clearings, three-fourths, and of the littoral species found only at the sea face, three-fifths are species that occur on the Coromandel Coast, while both the saltworts, which affect muddy slopes covered by every tide, are also Coromandel plants. The proportion of species that occur within the Sundribun forests proper but are not to be found on the Coast of Coromandel is thus appreciably increased and exceeds 50 per cent. of the characteristic Flora.

V.—GUIDE TO THE GENERA.

An attempt is made in the following guide to the genera of plants that occur in the Sundribuns to provide a key sufficiently simple for use by Forest officers and their subordinates at most seasons of the year.

In using this key it is essential that in each case *both* the contrasting statements given for one of the numbers on the left-hand side of the page should be carefully read before deciding to which of the two categories a plant belongs. This done, the number printed in italics against the categorical statement on the right-hand side of the page carries the student to the proper passage. For example, a species is found to possess flowers; we pass to 2: it is not a grass or a sedge; we pass to 29: it is not a floating or submerged aquatic; we pass to 44: it is neither epiphytic nor parasitic; we pass to 59: it has no tendrils; we pass to 71: the leaves are not gland-dotted; we pass to 81: the leaves have distinct leaf-blades; we pass to 83: the leaves are compound; we go on with 84: they are opposite; we pass to 124: the leaflets are digitate; we know the plant to be a *Vitex*. Which *Vitex* it is we learn on turning to the 139th genus in the *Systematic List* where the differential characters of the species of this genus hitherto met with in the Sundribuns are given.

- 1. Plants with distinct flowers 2
 Plants without flowers (*Ferns* and *Fern-Allies*) 237
- 2. Plants with grassy stems; leaves with a distinct leaf-sheath,
 sometimes only the sheath present; flowers in spikelets
 in the axils of glumes. (*Sedges* and *Grasses*) 3
 Plants with woody or herbaceous stems, or if the stems
 grassy (*Bulrushes*) the flowers then not in spikelets 29
- 3. Leaves 3-ranked, rarely without leaf-blades, the sheaths
 closed in front; fruit a small nut with the seed free
 inside; flowers with a glume only (*Sedges*) 4

- Leaves 2-ranked, the sheaths open in front and with a ligule at the top behind; fruit a grain with seed adnate to pericarp; flowers between a glume and a palea (*Grasses*) 12
4. Sedges with leaf-blades unarmed, sometimes absent; nuts minute and not 6 ribbed 5
- Sedges with leaf-blades spiny on edges and mid-rib beneath; nuts large, black, hard, 6-ribbed 215. *Scirpodendron*.
5. Intermediate glumes of a spikelet containing hermaphrodite flowers usually numerous, always more than the 1-2 lowest empty glumes 6
- Intermediate glumes of a spikelet containing hermaphrodite flowers always few, never more numerous than the 2 or more lowest empty glumes 214. *Cladium*.
6. Flowering glumes 2-ranked 7
- Flowering glumes arranged spirally 10
7. Spikelets arranged in an open inflorescence 8
- Spikelets densely clustered in a close head; rachilla of the spikelet deciduous 207. *Kyllinga*.
8. Rachilla of the spikelet persistent 9
- Rachilla of the spikelet deciduous 210. *Mariscus*.
9. Fruit flattened laterally 208. *Pycneus*.
- Fruit 3-cornered or flattened dorsally 209. *Cyperus*.
10. (6) Base of style constricted or jointed above the fruit 11
- Base of style continued into the fruit 213. *Scirpus*.
11. Stem leafy below 212. *Fimbristylis*.
- Stem leafless 211. *Eleocharis*.
12. (3) Stamens 6 13
- Stamens not more than 3 14
13. Glumes firm and chartaceous 221. *Oryza*.
- Glumes thin and membranous 222. *Leersia*.
14. (12) Spikelets deciduous from their pedicels or falling with them; perfect spikelets with 2 heteromorphous florets, the upper hermaphrodite, the lower male or neuter 15
- Spikelets continuous with their pedicels and breaking off so as to leave the persistent or subsistent glumes on the pedicel, or if falling entire not composed of 2 heteromorphous florets 23
15. Rachis not continued beyond terminal spikelet 16
- Rachis continued beyond the terminal spikelet

16. Spikelets in continuous spikes, racemes or panicles ; outer glumes not firmer than flowering glumes, the lowest smallest sometimes very small or obsolete 17
 Spikelets in pairs, one sessile, the other pedicelled, or the terminal 3-nate or solitary ; outer glumes firmer than the flowering glumes, the lowest longer than the florets 21
17. Spikelets not subtended by a whorl of bristles 18
 Spikelets subtended by a whorl of bristles 219. *Setaria*.
18. Spikelets 2-flowered, the upper hermaphrodite, the lower male or barren, separating from their pedicels 19
 Spikelets 1-flowered, deciduous with the pedicels 223. *Zoysia*.
19. Lowest glume obsolete, *i.e.*, only 3 glumes present 20
 Lowest glume present, *i.e.*, glumes 4 218. *Panicum*.
20. Spikelets not thickened at the base 216. *Paspalum*.
 Spikelets thickened at base 217. *Eriochloa*.
21. (16) Spikelets similar 22
 Spikelets dissimilar 226. *Andropogon*.
22. Stamens 3 225. *Saccharum*.
 Stamens 2 224. *Imperata*.
23. (14) Spikelets paniced or if spicate not secund 24
 Spikelets 2-seriate and secund 27
24. Spikelets 2-more-flowered 25
 Spikelets 1-flowered 227. *Sporobolus*.
25. Spikelets without silky hairs 26
 Spikelets with glabrous glumes, but penicillate with long silky hairs on the rachilla 230. *Phragmites*.
26. Outer glume shorter than the lowest flowering glume ; grain minute 231. *Eragrostis*.
 Outer glume longer than the lowest flowering glume ; grain broad 232. *Myriostachya*.
27. (23) Spikelets digitate or whorled 28
 Spikelets on the long, slender, spiciform branches of an elongated simple panicle 233. *Diplachne*.
28. Spikelets 1-flowered 228. *Chloris*.
 Spikelets more than 1-flowered 229. *Eleusine*.
29. (2) Aquatic plants, floating or submerged 30
 Land plants or, if growing in water, not submerged under normal conditions ; leaves and stems not floating 44
30. Leaves and stems floating, with roots from base or nodes suspended in the water 31
 Leaves and stems submerged ; roots attached to soil 34

31. Stems more or less elongated, with leaves and roots at nodes separated by distinct internodes 32
 Stems very short, with a rosette of clustered leaves above and a tuft of roots below 204. *Pistia*.
32. Leaves alternate 33
 Leaves whorled; small plants with articulate stems and almost transparent leaves 61. *Aldrovanda*.
33. Flowers small, white 116. *Limnanthemum*.
 Flowers rather large, purplish 123. *Ipomœa*.
34. (30) Plants submerged only at high-tides 35
 Plants in still water, always submerged 37
35. Shrubs or herbs with leafless, fleshy, jointed stems; flowers not in spathes 36
 Herbs with buried rootstock and tufted linear-lanceolate leaves; flowers on a spadix enclosed in a tubular spathe septate within 203. *Cryptocoryne*.
36. Flowers in sessile cone-like spikes 149. *Arthrocnemum*.
 Flowers sunk in cavities in joints of stem 148. *Salicornia*.
37. (34) Flowers at or above the surface of the water 38
 Flowers as well as leaves submerged 42
38. Flowers white, solitary on a scape 39
 Flowers yellow, in racemes rising above the surface of the water 131. *Utricularia*.
39. Stemless plants; leaves all radical 40
 Stem leafy throughout 41
40. Perianth single; fruit on a slender spiral scape, not winged; male spathes disarticulating 177. *Vallisneria*.
 Perianth double; fruit on a stoutish scape, winged 178. *Ottelia*.
41. (39) Leaves whorled 175. *Hydrilla*.
 Leaves alternate 176. *Lagarosiphon*.
42. (37) Stamens 1-2; leaves linear 43
 Stamens numerous; leaves cut into many filiform, toothed lobes 174. *Ceratophyllum*.
43. Leaves entire; stamens 2 205. *Ruppia*.
 Leaves toothed; stamen 1 206. *Najas*.
44. (29) Plants growing epiphytically or parasitically on the stems or branches of other species 45
 Plants rooted in the ground 59
45. Leafless twining parasites with long slender stems 46
 Leafy not twining partial parasites or epiphytes 47
46. Stems and flowers green; stamens 9 153. *Cassytha*.
 Stems yellowish, flowers white; stamens 5 124. *Cuscuta*.

47. (45) Leaves opposite ; flowers regular or nearly so	48
Leaves alternate or leaf solitary ; flowers irregular (Orchids)	51
48. Juices milky ; non-parasitic	49
Juices watery ; parasitic	50
49. Corolla medium, rotate ; flowers in stalked umbels	114. <i>Hoya</i> .
Corolla, small, urceolate ; flowers in axillary fascicles	113. <i>Dischidia</i> .
50. (48) Leaves usually broad, penninerved ; flowers herma- phrodite	154. <i>Loranthus</i> .
Leaves rather narrow, 3-nerved from the base ; flowers 1-sexual	155. <i>Viscum</i> .
51. (47) Leaf solitary at apex of a rounded pseudobulb	52
Leaves more than one, on a usually elongated stem	53
52. Flowers in umbels ; lateral sepals under the lip, longer than the dorsal	181. <i>Cirrhopetalum</i> .
Flowers solitary ; sepals all equal, spreading	182. <i>Trias</i> .
53. (51) Leaves terete	54
Leaves flattened or compressed	55
54. Lip not spurred	183. <i>Luisia</i> .
Lip spurred	185. <i>Sarcanthus</i> .
55. (53) Leaves flattened with an upper and a lower surface or, if laterally compressed and equitant, with sheath about as long as blade and flowers axillary	56
Leaves compressed, equitant, sheath shorter than blade ; and flowers many, minute, in a narrow raceme	179. <i>Oberonia</i> .
56. Stems not tufted, roots few, large, issuing at intervals from side of stem, leaves flat or channeled, coriaceous ; lip spurred	57
Stems tufted ; roots many, clustered at base ; leaves flat, thin ; or short, equitant and fleshy ; lip with only a short mentum	180. <i>Dendrobium</i> .
57. Spur of the lip partially occluded	58
Spur of the lip with neither occluding calli nor a septum within	184. <i>Saccolabium</i> .
58. Spur occluded by calli but with no septum	186. <i>Cleisostoma</i> .
Spur partially occluded by calli and with besides a vertical antero-posterior septum dividing it into two lateral chambers	185. <i>Sarcanthus</i> .
59. (44) Plants climbing by means of tendrils	60
Plants without tendrils	71
60. Tendrils forming part of a leaf	61
Tendrils not forming part of a leaf	63

61. Leaves compound; tendrils a continuation of main rachis 62
 Leaves simple, the tendrils the spirally curled tips of the
 leaf-blades 194. *Flagellaria*.
62. Leaves once divided, leaflets 2; fruits in clusters of
 feathery achenes 1. *Naravelia*
 Leaves twice compound, leaflets several; fruits of very
 large pods 59. *Entada*.
63. (60) Leaves simple or only once divided; fruit indehiscent
 or opening by a stopple 64
 Leaves twice 3-nately compound; fruit a bladder-like
 3-celled capsule 31. *Cardiospermum*.
64. Flowers with no corona between petals and the stamens . 65
 Flowers with a distinct corona interposed between petals
 and stamens 73. *Passiflora*.
65. Stamens and pistil in different flowers 66
 Stamens and pistils in the same flower; leaves simple or
 once divided 29. *Vitis*.
66. Tendrils branched 67
 Tendrils simple 68
67. Petals with margins entire 75. *Luffa*.
 Petals with margins fimbriately divided . 74. *Trichosanthes*.
68. (66) Corolla divided nearly to base into 5 equal petals . 69
 Corolla campanulate with lobes only divided about half-
 way down 78. *Cephalandra*.
69. Anther-cells folded sigmoidly 70
 Anther-cells straight or, if curved, not sigmoid 79. *Zehneria*.
70. Staminate flowers racemed 76. *Momordica*.
 Staminate flowers clustered or solitary . . 77. *Cucumis*.
71. (59) Leaves dotted with embedded glands 72
 Leaves not dotted with embedded glands 81
72. Leaves alternate; trees or shrubs 73
 Leaves opposite, simple 77
73. Leaves simple 74
 Leaves compound 75
74. Stem unarmed; fruit a narrow, curved capsule 99. *Egiceras*.
 Stem spinous, scandent; fruit globose, umbonate, indehis-
 cent 22. *Paramignya*.
75. (73) Leaflets alternate; stamens 10 or fewer 76
 Leaflets an opposite pair with one terminal; stamens
 30 or more 23. *Agle*.
76. Leaflets 3-5 20. *Glycosmis*.
 Leaflets 9-15 21. *Micromelum*.

77. (72) Herbs ; corolla gamopetalous	78
Trees ; petals free	67. <i>Eugenia</i> .
78. Fruit of 4 small nutlets with a single seed in each	79
Fruit a 2-celled many-seeded capsule	127. <i>Limnophila</i> .
79. Calyx with upper tooth not exceeding the others ; stamens	
- ascending under the upper lip	80
Calyx with upper tooth decurrent, much exceeding the	
others ; stamens declinate	142. <i>Ocimum</i> .
80. Upper lip of corolla flat	143. <i>Anisomeles</i> .
Upper lip of corolla vaulted, densely villous on back	144. <i>Leucas</i> .
81. (71) Leaves very minute and scale-like	82
Leaves with a quite distinct leaf-blade	83
82. Tall trees ; branches, green, cylindric, jointed ; nodes with	
sheaths of connate subulate scales	173. <i>Casuarina</i> .
Small trees with many close-set but not connate, alternate	
imbricating scale-like leaves	10. <i>Tamarix</i> .
83. (81) Leaves compound	84
Leaves simple	125
84. Leaves alternate	85
Leaves opposite	124
85. Leaves digitate	86
Leaves pinnate	92
86. Stems not climbing or twining	87
Stems twining ; leaf axils bulbiferous	190. <i>Dioscorea</i> .
87. Leaflets 3 only	88
Leaflets more than 3	91
88. Shrubs or herbs	89
Trees	6. <i>Cratæva</i> ;
89. Stems erect	90
Stems prostrate	19. <i>Oxalis</i> .
90. Leaflets without resinous glands below	36. <i>Crotalaria</i> .
Leaflets with resinous glands below	48. <i>Flemingia</i> .
91. (87) Flowers yellow	4. <i>Cleome</i> .
Flowers purplish to white	5. <i>Gynandropsis</i> .
92. (85) Leaflets 3 only	93
Leaflets more than 3	102
93. Stems erect	94
Stems prostrate or climbing	97
94. Stems woody	95
Stems herbaceous ; hairs fixed by their centres	37. <i>Cyamopsis</i> .
95. Stem unarmed	96
Stem armed with conical prickles	43. <i>Erythrina</i> .

96. Fruit fleshy, 1-2-lobed; leaflets toothed . . . 32. *Allophylus*.
Fruit a lomentum, breaking up into indehiscent joints;
leaflets entire 39. *Desmodium*.
97. (93) Stems herbaceous; pods without stinging
hairs 98
Stems woody; pods with stinging hairs . . . 42. *Mucuna*.
98. Leaves not glandular beneath 99
Leaves with superficial resinous glands among the hairs
beneath 47. *Atylosia*.
99. Stamens monadelphous 100
Stamens diadelphous 101
100. Flowers small; pods thin, narrow; alternate stamens
abortive 41. *Teramnus*.
Flowers large; pods thick, wide; all the stamens with
perfect anthers 44. *Canavalia*.
101. (99) Keel spirally twisted 45. *Phaseolus*.
Keel obtuse, not spirally twisted 46. *Vigna*.
102. (92) Leaves unequally pinnate 103
Leaves even-pinnate 114
103. Flowers on spadices covered by spathes; woody stems with
the vascular bundles isolated and scattered (*Palms*) . . . 104
Flowers not on spadices; woody stems with vascular
bundles in concentric rings 109
104. Stems erect, or stem very short and leaves tufted . . . 105
Stems scandent with the aid of retrorse hooks 108
105. Leaflets with reduplicate sides 106
Leaflets induplicate; stems long, slender . . . 197. *Phoenix*.
106. Stems elongated, with a terminal tuft of leaves . . . 107
Stems very short, with a tuft of very large leaves close to
the ground 195. *Nipa*.
107. Stems straight, slender; fruits numerous, never more than
2 in. long 196. *Areca*.
Stems rather crooked, stout; fruits fewer, always more than
8 in. long 200. *Cocos*.
108. (104) Spathe tubular, persistent 198. *Calamus*.
Spathe cymbiform, deciduous 199. *Dæmonorops*.
109. (103) Leaflets opposite 110
Leaflets alternate 49. *Dalbergia*.
110. Leaflets once pinnate 111
Leaflets more than once pinnate 30. *Leea*.
111. Erect trees 112
Climbing shrubs 51. *Derris*.

112. Roots without root-suckers ; fruit indehiscent 113
 Roots with vertical blind root-suckers ; fruit a subglobose,
 2-3-celled capsule 24. *Amoora*..
113. Fruit a small compressed drupe with a hard stone ; leaves
 few, at ends of branches 35. *Odina*..
 Fruit a coriaceous, indehiscent 1-seeded pod ; leaves scat-
 tered, many 50. *Pongamia*..
114. (10) Leaves once-pinnate ; unarmed species 115
 Leaves more than once pinnate ; species armed with spines
 or thorns or prickles 121
115. Stems erect 116
 Stems twining 40. *Abrus*..
116. Fruit a pod, dehiscent or indehiscent 117
 Fruit a large, globose, 4-valved capsule 25. *Carapa*..
117. Petals 5 118
 Petals fewer than 5 120
118. Stamens free ; petals equal, the upper inmost 119
 Stamens united nine below in a sheath, one upper free ;
 petals unequal, irregular, the upper the outmost 38. *Sesbania*..
119. Anthers large, often unequal, only seven perfect, opening
 by apical pores 55. *Cassia*..
 Anthers small, opening by lateral slits 56. *Cynometra*..
120. (117) Petals 3 ; stamens 3, filaments short, united ; pod
 pulpy indehiscent 57. *Tamarindus*..
 Petal solitary ; stamens 3, filaments long, free ; pod dry,
 dehiscent 58. *Intsia*..
121. (114) Flowers medium, in racemes or panicles ; petals free ;
 stamens 10 122
 Flowers minute, in globose heads ; petals united below ;
 stamens more than 10 60. *Acacia*..
122. Pod flattened or swollen, but not beaded opposite the seeds ;
 calyx with a larger cymbiform lowest lobe 123
 Pod turgid, beaded opposite the seeds ; calyx lobes all
 subequal 54. *Parkinsonia*..
123. Pod broadly winged down upper suture 53. *Mesoneuron*..
 Pod not winged 52. *Cæsalpinia*..
124. (84) Leaves digitate 139. *Vitex*..
 Leaves pinnate 132. *Dolichandrone*..
125. (83) Flowers minute, in heads surrounded by a whorl of
 bracts 126
 Flowers rarely in heads, and if so not surrounded by a
 whorl of bracts 136

126. Leaves alternate 127
 Leaves opposite 135
127. Plants armed with sharp spines 128
 Plants unarmed 129
128. Spines forked, scattered along stem; margins of leaves not
 spiny 94. *Xanthium*.
 Spines simple, on margins of the leaves 96. *Cnicus*.
129. (127) Juice not milky 130
 Juice milky 97. *Launea*.
130. Herbs 131
 Shrubs or under-shrubs 92. *Pluchea*.
131. Florets yellow 132.
 Florets purple 87. *Vernonia*.
132. Stems not winged 133.
 Stems winged 93. *Sphaeranthus*.
133. Anther-cells without tails 134
 Anther-cells tailed 91. *Blumea*.
134. Outer florets of head (ray) differing from central florets;
 stem erect 90. *Conyza*.
 Outer florets like central; stem prostrate 89. *Grangea*.
135. (126) Florets yellow 95. *Wedelia*.
 Florets purple 88. *Ageratum*.
136. (125) Leaves alternate or radical only 137
 Leaves opposite 193
137. Plants with milky juice; trees 138
 Plants with watery juice; if bitter or resinous, not milky 142
138. Flowers visible 139
 Flowers minute, hidden within a hollow, closed, fleshy
 receptacle 172. *Ficus*.
139. Flowers small or minute, incomplete; perianth green 140
 Flowers large; corolla white 102. *Cerbera*.
140. Leaves smooth; juice acrid; fruit a 3-celled capsule 141
 Leaves scabrid, juice bland; fruit covered by the persistent
 calyx, membranous, 1-seeded 173. *Streblus*.
141. Racemes terminal; leaves toothed 168. *Sapium*.
 Racemes axillary; leaves entire 169. *Excœcaria*.
142. (137) Leaves with a convolute leaf-sheath 143
 Leaves with no distinct leaf-sheath 151
143. Stems erect, woody; shrubs or small trees 144
 Stems herbaceous, or stem none; leaves radical 145
144. Leaves with orbicular blades distinct from leaf-sheaths;
 not prickly 98. *Ægialitis*.

- Leaves with linear blades passing into the leaf-sheaths;
armed with prickles along the margins and the midrib
beneath 201. *Pandanus*.
145. (143) Leaf-blades flattened 146
Leaf-blades linear, spongy or fistular, semi-cylindric or
triquetrous; all radical 150
146. Stems above ground herbaceous, decumbent, rooting . . . 147
Stems underground or none, or if above ground erect . . . 148
147. Cymes included in a large bract 192. *Commelina*.
Cymes naked, paniculate 193. *Aneilema*.
148. (146) Leaves on an erect pseudo-stem formed of clasping
leaf-sheaths 149
Leaves radical; flowers large, umbellate 189. *Crinum*.
149. Flowers in a panicle at the apex of the leafy
pseudo-stem 188. *Alpinia*.
Flowers in a spike rising direct from root-stock, separate
from the leafy pseudo-stem 187. *Zingiber*.
150. (145) Flowers distinct, white, racemose; scape slender;
field-weeds 191. *Asphodelus*.
Flowers minute, close-set on a cylindric spike; large
aquatic plants (*Bulrushes*) growing on edges of ponds
and streams 202. *Typha*.
151. (142) Petals or perianth-segments united in a gamo-
petalous corolla 152
Petals never united, often not present 161
152. Corolla regular, its base surrounded by a calyx 153
Corolla (perianth) irregular; calyx absent 152. *Aristolochia*.
153. Erect trees 154
Herbs or climbing under-shrubs or shrubs 155
154. Stamens 5 or 6 118. *Cordia*.
Stamens 16 or more 106. *Diospyros*.
155. (153) Stems prostrate or, if twining, unarmed 156
Stems erect or, if climbing, prickly 159
156. Flowers large, stalked, pink to purple; stems twining
or if prostrate the leaves not lying flat on the ground and
not crispate 157
Flowers small, sessile, white; stems and crispate leaves
both close to ground 119. *Coldenia*.
157. Sepals coriaceous but not so enlarged in fruit as to hide
the capsule 158
Sepals fleshy and mucilaginous in fruit, quite concealing the
capsule 121. *Stictocardia*.

158. Pollen spinulose 123. *Ipomœa*.
 Pollen not spinulose 122. *Merremia*.
159. (155) Inflorescence of lax racemes, cymes, or umbels . 160
 Inflorescence of dense spikes 120. *Heliotropium*.
160. Fruit a capsule 117. *Hydrolea*.
 Fruit a berry 125. *Solanum*.
161. (151) Plants prickly or spiny or thorny 162
 Plants unarmed 165
162. Sarmentose or semi-erect; armed with thorns or prickles 163
 Erect; armed with rigid spines 8. *Flacourtia*.
163. Fruit sessile above the calyx; stamens not more numerous
 than petals 164
 Fruit stipitate on a carpophore; stamens more numerous
 than petals; thorns of modified stipules . 7. *Capparis*.
164. Leaves glabrous; plant armed with few prickles . 26. *Olox*.
 Leaves more or less hairy; plant armed with numerous
 stipular thorns 28. *Zizyphus*.
165. (161) Stems sarmentose or twining 166
 Stems erect 170
166. Flowers small or very small, greenish 167
 Flowers large, showy, yellow 13. *Hibiscus*.
167. Stems woody, rather stout; flowers all 1-sexual 168
 Stems herbaceous 169
168. Stamens numerous; fruit a capsule 167. *Mallotus*.
 Stamens 5; fruit a small drupe 157. *Bridelia*.
169. (167) Flowers 1-sexual; stamens 6; carpels 3, free; seeds
 curved 2. *Tinospora*.
 Flowers 2-sexual; stamens 5; ovary 1-celled . 151. *Basella*.
170. (165) Trees or large woody shrubs 171
 Herbs or small under-shrubs 182
171. Leaves with margins quite entire 172
 Leaves with margins toothed 180
172. Leaves subcordate, palminerved at the base 173
 Leaves oblong to lanceolate, penninerved 174
173. Flowers large, showy, yellow 14. *Thespesia*.
 Flowers medium, rose-coloured 16. *Kleinhovia*.
174. (172) Fruit not crowned by the calyx 175
 Fruit crowned by the remains of the calyx . 66. *Lumnitzera*.
175. Leaves with silvery scales beneath; ripe carpels free . 176
 Leaves glabrous or hairy but not scaly beneath; ripe car-
 pels united 177
176. Petals 5 17. *Brownlowia*.
 Petals 0 15. *Heritiera*.

177. (175) Leaves glabrous beneath 178
 Leaves tomentose beneath 162. *Antidesma*.
178. Petals 0 179
 Petals 5, each with a basal scale 33. *Aphania*.
179. Stamens 3, united in a central column 160. *Breynia*.
 Stamens 6 or more, free 161. *Cyclostemon*.
180. (171) Flowers small, 1-sexual; fruit not crowned by the
 remains of the calyx 181
 Flowers large, 2-sexual; fruit large, indehiscent with the
 calyx-lobes persistent on its apex 69. *Barringtonia*.
181. Stamens 10-12; sepals clothed with flat scales; fruit a 3-
 celled capsule 163. *Croton*.
 Stamens 3-5; sepals hairy but without scales; fruit minute,
 1-seeded 170. *Trema*.
182. (170) Petals 0 or, if present, similar in size and shape 183
 Petals large, dissimilar and very irregular, the uppermost
 outmost 36. *Crotalaria*.
183. Stamens united 184
 Stamens free 188
184. Flowers conspicuous; petals yellow; stamens many, in a
 tube round the style; flowers 2-sexual 185
 Flowers very small, green, 1-sexual; petals 0 186
185. Styles as many as the carpels 11. *Abutilon*.
 Styles twice as many as the carpels 12. *Malachra*.
186. (184) Stamens 3 only, united in a central column 187
 Stamens 5-15, united in whorls 164. *Chrosophora*.
187. Sepals of male flowers with white margins 158. *Agynenia*.
 Sepals green 159. *Phyllanthus*.
188. (183) Flowers yellow 189
 Flowers white or green, very small 190
189. Stamens 10 or more; flowers small 18. *Corchorus*.
 Stamens 5; flowers large 72. *Turnera*.
190. (188) Leaves entire or toothed, not lobed; petals 0 191
 Leaves deeply pinnatifidly divided; sepals 4; petals 4;
 stamens 6 3. *Senebiera*.
191. Leaves broad, membranous 192
 Leaves narrow, fleshy; sepals 5; stamens 5 150. *Suaeda*.
192. Stamens 5 or fewer; leaves not toothed; sepals scarious;
 fruit 1-celled 145. *Amarantus*.
 Stamens 8 or more; leaves toothed; sepals herbaceous,
 united; fruit 3-celled 165. *Acalypha*.
193. (136) Juices milky 194
 Juices not milky 204

194. Stipules wanting ; fruit 2-follicular 195
 Stipules present, minute ; fruit 3-celled 156. *Euphorbia*.
195. Stems twining 196
 Stems erect 107. *Calotropis*.
196. Seeds with a pencil of hairs (coma) 197
 Seeds without hairs 110. *Sarcolobus*.
197. Corolla with a corona in the throat 198
 Corolla throat naked 103. *Parsonsia*.
198. Filaments of stamens united 199
 Filaments free 203
199. Corona single, staminal only 200
 Corona double, corolline and staminal 106. *Oxystelma*.
200. Corolla rotate 201
 Corolla funnel-shaped 109. *Dæmia*
201. Pollen masses erect, or at least with erect pedicels 202
 Pollen-masses wholly pendulous 108. *Pentatropis*.
202. Flowers green, fairly large ; pollen-masses quite erect ;
 follicles stout 111. *Dregea*.
 Flowers white, minute ; pollen-masses with only the pedi-
 cels erect ; follicles slender 112. *Tylophora*.
203. (198) Scales of corona short, thick 104. *Hemidesmus*.
 Scales of the corona filiform 105. *Finlaysonia*.
204. (193) Leaves with stipules or interpetiolar nodal appen-
 dages or stipular lines 205
 Leaves without stipules or interpetiolar lines 215
205. Trees or large woody shrubs 206
 Herbs with prostrate stems and branches 214
206. Flowers 2-sexual ; corolla always present 207
 Flowers dicæcious ; petals 0 ; leaves palminerved 166. *Trewia*.
207. Petals distinct ; embryo germinating before fruit falls
 (*Mangroves*) 208
 Petals united in a regular tubular corolla 211
208. Petals more than 4 ; stamens more than 8 209
 Petals 4, entire ; stamens 8 62. *Rhizophora*.
209. Calyx-segments and petals 5-6 210
 Calyx-segments and petals 8-14 ; stamens 16-28 65. *Bruguiera*.
210. Petals emarginate ; stamens 10-12 ; ovary 3-celled 63. *Ceriops*.
 Petals lacerate ; stamens over 12 ; ovary 1-celled 64. *Kandelia*.
211. (207) Branches unarmed 212
 Branches armed with axillary spines 84. *Vangueria*.
212. Flowers quite free 213
 Flowers with the calyx-tubes agglutinated to form large
 fleshy heads 86. *Morinda*.

213. Flowers small, in axillary spikes 83. *Petunga*.
 Flowers long-tubed, in terminal cymes 85. *Ixora*.
214. (205) Flowers white; corolla tubular; stamens 4-5; stipules
 connate; leaves herbaceous 82. *Oldenlandia*.
 Flowers yellow; petals free; stamens 8 or more; stipules
 represented by scarious nodal appendages; leaves and
 stems fleshy, succulent 9. *Portulaca*.
215. (204) Roots with blind vertical root-suckers 216
 Roots without blind root-suckers 217
216. Flowers large; stamens very many, rising from calyx;
 petals free or absent 71. *Sonneratia*.
 Flowers small, yellow; stamens 4, adnate to corolla; petals
 connate 141. *Avicennia*.
217. (215) Petals united in an irregular corolla 218
 Petals absent or, if present, free 229
218. Stamens 4 perfect 219
 Stamens 1 only perfect, 3 barren; very small herbs in
 waste-places and fields 115. *Hoppea*.
219. Fruit a 2-celled capsule with more than one seed in each
 of the cells 220
 Fruit with 4 or more 1-seeded cells, rarely a capsule 226
220. Stamens didynamous, one pair longer than the other 221
 Stamens nearly equal in length; flowers very small, white;
 seeds many 130. *Scoparia*.
221. Seeds hard, on rigid curved stalks (retinacula) 222
 Seeds without retinacula 224
222. Seeds more than 2 in each cell; corolla with an upper
 lip or posterior lobes 223
 Seeds only 2 in each cell; corolla with a 3-lobed lower lip
 but no upper 135. *Acanthus*.
223. Corolla distinctly 2-lipped 133. *Hygrophila*.
 Corolla with 5 nearly equal lobes 134. *Hemigraphis*.
224. (221) Corolla-tube distinct, throat not saccate in front 225
 Corolla-tube short, throat saccate in front 126. *Angelonia*.
225. Calyx-segments equal 129. *Vandellia*.
 Calyx-segments unequal 128. *Herpestis*.
226. (219) Flowers in capitate or ovoid spikes 227
 Flowers in open cymes 228
227. Fruit leathery, indehiscent 136. *Lantana*.
 Fruit dry, partially dehiscent 137. *Lippia*.
228. (226) Flowers very small, greenish-white 138. *Premna*.
 Flowers large, white 140. *Clerodendron*.

229. (217) Unarmed species 230
 Armed shrubs or under-shrubs; spines axillary 101. *Asima*.
230. Trees or large shrubs; petals present 231
 Herbs; petals wanting 233
231. Stamens 5 or fewer; fruit not tipped by the calyx 232
 Stamens numerous; fruit large, crowned by the persistent
 calyx-lobes 68. *Psidium*.
232. Flowers 3-6 from small tubercles; fruit a small hard berry;
 rambling shrubs 27. *Salacia*.
 Flowers many, in lax panicles; fruit a compressed fleshy
 edible drupe; considerable trees 34. *Bouea*.
233. (230) Stem prostrate, rooting at the nodes 234
 Stems erect 70. *Ammannia*.
234. Sepals connate in a short calyx; stamens free, inserted
 round mouth of calyx-tube 235
 Sepals free; stamens connate in a cup below ovary 236
235. Capsule 3-5-celled 80. *Sesuvium*.
 Capsule 1-2-celled 81. *Trianthema*.
236. (234) Sepals hard, the outer ones 3-ribbed; stamens 5;
 anthers 2-celled 146. *Psilotrichum*.
 Sepals herbaceous, flexible, not ribbed; stamens 2 3;
 anthers 1-celled 147. *Alternanthera*.
237. (1) Fronds very large as compared with the stem 238
 Fronds small or minute 247
238. Fronds circinate; sporangia on under-surface 239
 Fronds erect; sporangia spicate in crested clusters on a
 separate segment 243. *Helminthostachys*.
239. Sori confined to margins or veins of under-side of fronds 240
 Sori spread over whole under-surface of fertile fronds or
 parts of fronds 242. *Acrostichum*.
240. Epiphytic or terrestrial ferns 241
 Aquatic ferns, growing in still waters 236. *Ceratopteris*
241. Sori remote from margins of fronds 242
 Sori marginal or nearly so 244
242. Sori covered by an indusium 243
 Sori without an indusium 239. *Polypodium*.
243. Indusium reniform 238. *Nephrodium*.
 Indusium oblong or linear 237. *Asplenium*.
244. (241) Sori protected by an indusium 245
 Sori without an indusium 246
245. Sporangia attached to under-side of indusium, which con-
 sists of the intucked margin of the frond 234. *Adiantum*.

- Sporangia not arising from the indusium, which is distinct from the margin of the frond 235. *Pteris*.
246. (244) Fronds grass-like, all similar 240. *Vittaria*.
Fronds dimorphic 241. *Drymoglossum*.
247. (237) Leaves many, crowded; sporangia orbicular, compressed, 1-celled, 1-valved 244. *Lycopodium*.
Leaves minute, distant, rudimentary; sporangia turbinate, 3-celled, 3-valved 245. *Psilotum*.

VI.—SYSTEMATIC CENSUS OF SPECIES.

In the subjoined list of plants hitherto reported from the Sundribuns, the order followed is that of the *Flora of British India*,* which is referred to throughout; there, descriptions of the majority of the species are to be found. References are also given to Roxburgh's *Flora Indica* † for such of the species as are there described. Moreover, Watt's *Dictionary of the Economic Products of India* ‡ is cited under the species referred to in that work. These references, it is hoped, may lead to the identification of any species that it is found impossible to run down with the aid of the *Guide to the Genera* given in the preceding Chapter, and with the help of the keys to species that are given in the *Census* itself.

In the case of the Cryptogams the references are to Clarke's edition of the *Flora Indica* and to the *Synopsis Filicum*§ of Hooker and Baker. Planted or cultivated species are marked(*).

THALAMIFLORÆ.

I.—RANUNCULACEÆ.

1. *Naravelia* DC.

1. *Naravelia zeylanica* DC.; F. B. I. i. 7. *Atragene zeylanica* F. I. ii. 670. E. D. N 8.

Generally distributed, but not common. Northern Forests, *Calcutta Garden Collectors*! Coast at Tiger Point, *Heinig*!

Vernac. *Murcha*.

Scandent on bushes; stems sometimes twisted into ropes; root tuberous.

DISTRIB.—India; Indo-China; Malaya.

The common Bengali name is Chhagal-bati, which is also used to designate *Damia extensa*.

* Cited as F. B. I. with volume and page.

† Cited as F. I. with volume and page.

‡ Cited as E. D. with letter and reference number.

§ Cited as Synops. Fil. with page.

II.—MENISPERMACEÆ.

2. *Tinospora* Miers.

2. *Tinospora tomentosa* Miers; F. B. I. i. 96. *Menispermum tomentosum* F. I. iii. 813.

Jatta, ruins of pagoda, *Prain*!

Vernac. *Padma-guláncha*.

Scandent; possesses the tonic properties of the common *Guláncha* (*T. cordifolia*).

DISTRIB.—Lower Bengal; Lower Burma: always rare.

III.—CRUCIFERÆ.

3. *Senebiera* Poir.

3. *Senebiera pinnatifida* DC.

Banks of Mátla river, in sandy places, *Calcutta Garden Collectors*!

A diffuse procumbent annual; properties insignificant.

DISTRIB.—Temp. S. America. Apparently a recently introduced plant in India; reported from Upper Sind (*Cooke, Woodrow*) and from Banda (*Mrs. Bell*); earliest Sundribuns record, 1898.

IV.—CAPPARIDEEÆ.

4. *Cleome* Linn.

4. *Cleome viscosa* Linn.; F. I. iii. 128; F. B. I. i. 170. E. D. C 1367.

Jatta, among ruins of pagoda, *Prain*!

Vernac. *Húrhúria*.

An erect annual; seeds yield an oil which, with the juice of the plant, is used for ear complaints; seeds also used as food; flowers yellow.

DISTRIB.—Cosmopolitan in tropical and subtropical regions.

5. *Gynandropsis* DC

5. *Gynandropsis pentaphylla* DC.; F. B. I. i. 171. *Cleome pentaphylla* F. I. iii. 126. E. D. G 753.

Canning Town, *Calcutta Garden Collectors*! *Prain*!

Vernac. *Sada Húrhúria*.

An erect annual, cult. or an escape; properties much as in *Cleome viscosa*; flowers pale-purple to white.

DISTRIB.—Cosmopolitan in the tropics.

6. *Cratæva* Linn.

6. *Cratæva religiosa* Forst.; F. B. I. 172.—*Capparis trifoliata* F. I. ii. 571. E. D. C 2039.

Northern forests and clearings, *Heinig!*

Vernac. *Barún, Tikto-shak.*

An unarmed tree; stands long leafless; properties tonic and rubefacient; flowers purplish-yellow.

DISTRIB.—Supposed wild in Malabar; elsewhere planted.

The presence of this in the Sundribun forests is doubtless one of the vestiges of former occupation on mounds or platforms of higher ground, *e.g.*, on the left bank of the Mandabari river.

7. *Capparis* Linn.

7. *Capparis sepiaria* Linn.; F. I. ii. 568; F. B. I. i. 177. E. D. C. 427.

Coast, *Heinig!* Jatta, *Prain!*

Vernac. *Kanta Gurkamai.*

A stout thorny climbing shrub; said to possess antiperiodic properties.

DISTRIB.—India; Indo-China; Malaya; Philippines.

This species is very characteristic of the sea-fence immediately behind the beaches, on the Burmese and Andaman coasts.

V.—BIXINEÆ.

8. *Flacourtia* Comm.

8. *Flacourtia sepiaria* Roxb.; F. I. iii. 835; F. B. I. i. 194. E. D. P 624.

Northern forests and clearings; Cheila Bogi river, *Heinig & Gammie!* Jatta, *Prain!*

A thorny bush; properties unimportant.

DISTRIB.—India; Indo-China; Malaya.

VI.—PORTULACACEÆ.

9. *Portulaca* Linn.

9. *Portulaca oleracea* Linn.; F. I. ii. 463; F. B. I. i. 246. E. D. P 1179.

Northern clearings, very rare, *Prain!*

Vernac. *Laniya.*

A prostrate succulent annual; a fair vegetable.

DISTRIB.—Cosmopolitan in the tropics.

VII.—TAMARISCINEÆ.

10. *Tamarix* Linn.

10. *Tamarix gallica* Linn. VAR. *indica* Dyer; F. B. I. i. 248. T. *indica* F. I. ii. 100. E. D. T 70.

Everywhere on river-banks from the northern forests to sea-face ; especially plentiful in recent clearings.

Vernac. *Fhao* ; *Nuna gách*.

A shrub or small tree, up to 20 feet high ; cut for firewood : the galls and bruised twigs provide an indifferent tan.

DISTRIB.—Shores of W. and S. Europe ; N. and Trop. Africa ; S.-E. Asia.

VIII.—MALVACEÆ.

11. *Abutilon* Gaertn.

Leaves and branches white with closely felted down ; flowers yellow ; capsules almost glabrous *indicum*.

Leaves and branches hispid with spreading hairs ; flowers orange ; capsules hairy *graveolens* var. *hirtum*.

11. *Abutilon indicum* G. Don ; F. B. I. i. 326. *Sida indica* F. I. iii. 179. E. D. A 89.

Northern clearings, rare, *Calcutta Garden Collectors!* *Prain!*

Vernac. *Potári*, *Kanghi*.

A shrubby weed ; stems give a tolerable fibre ; juices demulcent and diuretic ; seeds said to be laxative.

DISTRIB.—Cosmopolitan, or nearly so, in the Tropics.

12. *Abutilon graveolens* G. Don. VAR. *hirtum* Mast. ; F. B. I. i. 327.—*Sida graveolens* F. I. iii. 179. E. D. A 84.

Northern clearings, very rare, *Calcutta Garden Collectors!*

Vernac. *Bar Potári*, *Bara Kanghi*.

A shrubby weed with a heavy odour ; properties as in *A. indicum*.

DISTRIB.—Tropical and subtropical regions of the Eastern Hemisphere and Australia.

12. *Malachra* Linn.

13. *Malachra capitata* Linn. ; F. B. I. i. 329. E. D. M 60.

In all the northern clearings, plentiful.

Vernac. *Ban Bhindi*, *Ban Dheras*.

An erect annual, apparently recently introduced to India ; yields a soft and silky but apparently not very valuable fibre.

DISTRIB.—Tropical America ; also Tropical West Africa, but there, as in India, probably introduced.

13. *Hibiscus* Med.

Free portion of bracteoles twice the length of their cupular base ; carpels 2-locular at their bases only ; stipules large, spatulate ; flowers yellow with rose-pink veins *tortuosus*.

Free portion of bracteoles much shorter than their cupular base; carpels completely 2-locular throughout; stipules medium, lanceolate; flowers yellow with crimson eye, changing to brownish red *tiliaceus*.

14. *Hibiscus tortuosus* Wall. (not of Roxb.).

"Estuary of the Hughli," Wallich (*Catalogue* n. 1913 A: 1817)!

This plant has only once been collected in an apparently wild state. It grows well in the Calcutta Gardens, where there are some old and large specimens. It has the habit, the pubescence, and much the appearance of *H. tiliaceus*, but has the large stipules and exactly the flowers of *H. macrophyllus* which is, however, a tree, sometimes of considerable size. The fruit, which forms freely, is curiously intermediate between the fruit of *H. tiliaceus* and *H. macrophyllus*. In *H. tiliaceus* the five carpels are each completely subdivided by accessory partitions into 10 chambers; in *H. macrophyllus* the five carpels show no trace of such subdivision. In *H. tortuosus* there are partial dissepiments in each carpel. This intermediate character, with the fact that in the Calcutta Garden the seeds of *H. tortuosus* are always abortive, gives rise to the suspicion that we may have here to do with a natural hybrid between *H. tiliaceus*, the common *Bhola* and *H. macrophyllus* which, though not a Sundribun plant, occurs in Chittagong. In any case *H. tortuosus* should be looked for, more especially in the eastern parts.

15. *Hibiscus tiliaceus* Linn.; F. I. iii. 192; F. B. I. i. 343. *H. tortuosus* F. I. iii. 192. *H. tiliaceus* var. *tortuosus* F. B. I. i. 343. E. D. H 255.

Plentiful everywhere, from the northern border to the sea-face.

Vernac. *Bhola*, *Chelwa*.

A heavy climber, injurious to forest growth: the inner bark yields a strong fibre, used by the wood-cutters for cordage.

DISTRIB.—Cosmopolitan on tropical coasts.

14. *Thespesia* Corr.

16. *Thespesia populnea* Corr.; F. B. I. i. 345. *Hibiscus populneus* F. I. iii. 190. E. D. T. 392.

Coast; at Tiger Point, *Heinig*! but chiefly west of the Raimangal river (*Heinig*).

Vernac. *Dumbla* (*Heinig*); *Paras*; *Paras Pipal*.

A handsome tree, reaching 30 feet in height; wood good; inner bark yields a fair fibre; capsules give a yellow dye.

DISTRIB.—Tropical sea-coasts of the Eastern Hemisphere.

IX.—STERCULIACEÆ.

15. *Heritiera* Ait.

17. *Heritiera minor* Roxb.; F. I. iii. 142. *H. Fomes* F. B. I. i. 363. E. D. H 134.

Everywhere from the northern forests to the sea.

Vernac. *Sundri*.

A small to medium tree, reaching 40-50 feet in height; wood excellent, hard, tough and durable, red in colour; used in boat-building, also for posts, planks, rafters, jhools and dabbas of boats, furniture and firewood; trunk often much buttressed; roots send up vertical blind suckers; charcoal obtained from this tree is used by gold and silver-workers.

DISTRIB.—Delta of the Irrawaddy and (*vide* Masters in *F. B. I.*) Borneo.

Heritiera littoralis Dryand., stated in the *F. B. I.*, and in various other works on Indian Botany, to occur on the coasts of Bengal, has never been collected in the Sundribuns.

16. *Kleinhovia* Linn.

18. *Kleinhovia Hospita* Linn., *F. I.* iii. 141; *F. B. I.* i. 364.

E. D. K 27.

Sundribuns, *Ellis*!

Vernac. *Bhola*.

A tall handsome tree; bark provides coarse rope (*Ellis*).

DISTRIB.—E. Tropical Africa; Malaya; Philippines.

Unfortunately Mr. Ellis, who alone has sent Sundribun specimens of this tree, does not give a precise locality. The species was not introduced to the Calcutta Garden, from the Moluccas, till 1798; it can hardly then be a species in some now abandoned clearing. The tree does not occur in existing clearings; the distribution of the species is precisely that of many of the species truly wild in the Sundribuns; there is, therefore, nothing against *Kleinhovia* being a genuine Sundribun plant. At all events the tree deserves to be carefully looked for again.

X.—TILIACEÆ.

17. *Brownlowia* Roxb.

19. *Brownlowia lanceolata* Benth.; *F. B. I.* i. 381. E. D. B 895.

Widely disseminated but nowhere very plentiful; chiefly found on the banks of creeks and rivers, *Griffith*! *Heinig*! *Prain*!

Vernac. *Kedar Sundri*; *Bhola Sundri*.

A small to medium tree, in leaf rather resembling *Sundri*; wood used as fuel.

DISTRIB.—Tenasserim.

18. *Corchorus* Linn.

20. *Corchorus acutangulus* Lamk.; *F. B. I.* i. 398. *C. fuscus* *F. I.* ii. 582. E. D. C 1840.

Northern clearings, not common, *Clarke*! *Prain*!

Vernac. *Titapát*.

An annual herb, rather resembles jute; properties unimportant.

DISTRIB.—Tropics of Eastern Hemisphere; West Indies.

DISCIFLORÆ.

XI.—GERANIACEÆ.

19. *Oxalis* Linn.

21. *Oxalis corniculata* Linn. ; F. I. ii. 457 ; F. B. I. i. 436. E. D. O 547.

Northern clearings, very rare, *Heinig & Gammie!*

Vernac. *Chuka Tripati; Amrul.*

A small weed of cultivated ground with 'trefoil' leaves; properties not very important; slightly acid and refrigerant or tonic; sometimes used as a vegetable.

DISTRIB.—Cosmopolitan in cultivated ground.

XII.—RUTACEÆ.

20. *Glycosmis* Corr.

22. *Glycosmis pentaphylla* Corr. ; F. B. I. i. 499. *Limonia pentaphylla* F. I. ii. 381. E. D. G 271.

Northern clearings, *Calcutta Garden Collectors!* ruins of Mandabari, *Heinig & Gammie!* ruins of Jatta, *Prain!*

Vernac. *Ashhaura.*

A shrub, evergreen; fruit eaten; twigs used as tooth-cleaners.

DISTRIB.—S.-E. Asia; Australia.

This species is a common constituent of village shrubberies in the Gangetic plain and is an almost certain indication, when it occurs elsewhere, of former human habitation.

21. *Micromelum* Bl.

23. *Micromelum pubescens* Bl. ; F. B. I. i. 501. *Bergera integririma* F. I. ii. 376.

Eastern Sundribuns, *fide Roxburgh.*

Vernac. *Ban-kunch.*

A small, much-branched tree.

DISTRIB.—S.-E. Asia; Polynesia.

Roxburgh says that the tree occurs on the eastern banks of the mouth of the Megna; it might, therefore, be looked for on the opposite or western banks, from Shabuzpur northwards.

22. *Paramignya* Wight.

24. *Paramignya longispina* Hook. f. ; F. B. I. i. 511.

Eastern Sundribuns, at Baniakhali, *Heinig!*

Vernac. *Ban Nimbu.*

A thorny under-shrub; fruit used in cases of colic.

DISTRIB.—Malayan Peninsula.

23. *Egle* Corr.25. *Egle Marmelos* Corr.; F. I. ii. 579; F. B. I. i. 516. E. D. A 534.Jatta, among the ruins, *Prain*!Vernac. *Bél, Vilva*.

A medium to large tree; yields a gum; also a dye from the rind of the fruit; timber white, hard but not durable; fruit medicinal, when unripe astringent, when ripe cooling and mildly laxative; used in dysentery. The tree is sacred; this perhaps explains its existence beside an abandoned temple.

DISTRIB.—Drier parts of India.

XIII.—MELIACEÆ.

24. *Amoora* Roxb.26. *Amoora cucullata* Roxb.; F. B. I. i. 560. *Andersonia cucullata* F. I. ii. 212. E. D. A 983.

General, in swamp-forests, from the northern border to the sea-face.

Vernac. *Amúr; Latmi, Natmi*.

A considerable tree, 30-40 feet high; wood hard, apt to split, of red or brown colour, used for posts and fuel; leaves when bruised applied to reduce inflammation; roots with vertical blind suckers.

DISTRIB.—Andamans; Malay Peninsula.

25. *Carapa* Aubl.

Roots with vertical blind suckers; evergreen; bark smooth; flowers February-March; fruits the size of an orange

moluccensis var. *gangetica*.

Roots with no root-suckers; deciduous; bark rough; flowers most of the year; fruits the size of a shaddock . . . *obovata*.

27. *Carapa moluccensis* Lamk VAR. *gangetica*.Forests east of the Arpangassia, in swampy localities, *Heinig*! *Lace*!Vernac. *Pussur*.

A tree 60 feet high; leaves fall after the new flush so that the species is practically evergreen; bark dark-brown, moderately exfoliating, deep-red within; wood white, reddening on exposure, hard, used for tool-handles, hand-spikes, helves, wheel-spokes, house-posts, planking; withstands moisture. The tree exudes a clear, brown, brittle gum: the fruit yields an illuminating and lubricating oil. The roots send up copious blind root-suckers.

This is, at least, a very distinct variety of *C. moluccensis* and may prove to be a distinct species; the shape of the leaflets is different, though the texture is much the same. The flowers, however, are the same in size and structure and it further agrees with typical *C. moluccensis* in the size of its fruit and in its habit of sending up blind root-suckers. In the Sundribuns this tree affects only the lowest parts of the interior of the swampy islands. The leaflets, though with more rounded

bases than those of *C. obovata*, and though of distinctly thinner texture, nevertheless more resemble these in general shape than they do the leaflets of any hitherto known variety of *C. moluccensis*. They are more obtuse at the apex than is the case with *C. moluccensis* var. *elliptica* Koord. & Val.; our tree further differs from that well-marked form in having only 2—1-jugate leaves, just as in *C. obovata*, never 3-jugate leaves. The form most nearly related to var. *gangetica* appears to be the Java tree named provisionally *C. moluccensis* var. *ovalifolia* by Koorders and Valeton. Our material of this last variety is not, however, sufficiently extensive for a definite decision to be arrived at; so far as it goes it indicates that the two varieties, *gangetica* and *ovalifolia*, are not the same; in any case no characters have been given for var. *ovalifolia*. According to Schimper, whose very careful account of the Strand-flora, based chiefly on Malayan observations, has become classical, *C. moluccensis* in muddy places sends up blind root-suckers, like *Sonneratia*, *Avicennia*, etc.* This is not the writer's recollection with regard to the form usually accepted as typical *C. moluccensis*, so far as the Coco Group is concerned; the tree in question there affects rocky headlands only and does not accompany *C. obovata* into the swamp-forests: this was also the experience of Kurz as regards the tree in the Andamans.†

28. *Carapa obovata* Bl. *C. moluccensis* F. B. I. i. 567 partly, not of Lamk. *Xylocarpus Granatum* F. I. ii. 240. E. D. C 482.

Everywhere throughout the Sundribuns, on river-banks.

Vernac. *Dhundol*; *Gamur*; *Karam Bhola*.

A tree occasionally 40 feet high, usually smaller than the last species; leaves deciduous; bark light-brown, freely exfoliating in large broad flakes, light-red within; wood reddish-brown much resembling that of the preceding in qualities. The fruit is used in tanning; the roots have no root-suckers but form instead horizontal thickened sections that protrude through the mud (as in *Gengwa*) to act as respiratory organs.

DISTRIB.—S.-E. Asia on banks of muddy sea-creeks.

XIV.—OLACINEÆ.

26. *Olax* Linn.

29. *Olax scandens* Roxb.; F. I. i. 163; F. B. I. i. 575. E. D. O 127. Northern forests, *Heinig*!

Vernac. *Koko Aru*.

A large woody climber; properties unimportant.

DISTRIB.—S.-E. Asia.

XV.—CELASTRINEÆ.

27. *Salacia* Linn.

30. *Salacia prinoides* DC.; F. B. I. i. 626. *Johnia coromandeliana* F. I. i. 169.

* Schimper: *Die indo-malayische Strand-flora*, p. 99 (1891).

† Kurz: *Forest Flora of British Burma*, i, 226 (1877).

General, especially in the northern forests, but never common.
Vernac. *Chat-boroni*; *Modhu-phal*; *Dimal*.

A large climber or small straggling tree, 20 feet high; only used for fuel.

DISTRIB.—S. E. Asia.

XVI.—RHAMNACEÆ.

28. *Zizyphus* Juss.

Leaves glabrous on upper side, woolly below . . . *Jujuba*.

Leaves softly pubescent above, silky below . . . *Ænopia*.

31. **Zizyphus Jujuba* Lamk.; F. I. i. 608; F. B. I. i. 632. E. D. z
231.

Occasionally in clearings.

Vernac. *Bér*.

A small tree; often planted, here certainly so: fruit of very poor quality.

DISTRIB.—Tropics of Eastern Hemisphere and of Australia.

32. *Zizyphus Ænopia* Mill.; F. I. i. 611; F. B. I. i. 634. E. D. z
263.

Jatta, *Prain*!

Vernac. *Shiakol*.

A straggling shrub, useful as a hedge-plant; fruit eaten, but quality poor.

DISTRIB.—Tropical Asia and Australia.

Here the species is probably a remnant of cultivation near the old temple.

XVII.—AMPELIDÆÆ.

29. *Vitis* Linn.

Leaves simple:—

Stems 4-winged, fleshy . . . *quadrangularis*.

Stems not winged, not fleshy . . . *latifolia*.

Leaves 3-foliolate . . . *trifolia*.

33. *Vitis quadrangularis* Wall.; F. B. I. i. 645. *Cissus quadrangularis* F. I. i. 407.

Satkhira, *Clarke*!

Vernac. *Harjora*.

A succulent almost leafless climber; properties insignificant.

DISTRIB.—Tropical E. Africa; S.-E. Asia.

34. *Vitis latifolia* Roxb.; F. I. i. 661; F. B. I. i. 652. E. D. v 213.

Jatta, *Prain*!

Vernac. *Govila*.

A large climber; stems may be twisted into ropes.

DISTRIB.—India generally; Assam.

A species almost certainly introduced by bird-agency.

35. *Vitis trifolia* Linn. *V. carnos*a F. B. I. i. 654. *Cissus carnos*a F. I. i. 409. E. D. v 195.
 Everywhere common, from the northern clearings to the sea-face.
 Vernac. *Goeli-lata* ; *Amal-lata*.
 A slender climber ; stems twisted into ropes.
 DISTRIB.—S.-E. Asia.

30. *Leea* Linn.

36. *Leea sambucina* Willd. ; F. I. i. 657 ; F. B. I. i. 666. E. D. L 241.
 Eastern forests, *Heinig & Gammie* !
 Vernac. *Kukur Jhiwa*.
 A glabrous shrub ; properties unimportant.
 DISTRIB.—S.-E. Asia ; N. Australia.

XVIII.—SAPINDACEÆ.

31. *Cardiospermum* Linn.

37. *Cardiospermum Halicacabum* Linn. ; F. I. ii. 292 ; F. B. I. i. 670.
 E. D. C 551.
 Northern clearings, rare, *Prain* !
 A slender climbing herb ; roots and seeds used medicinally.
 DISTRIB.—Almost cosmopolitan in the Tropics.

32. *Allophylus* Linn.

38. *Allophylus* Cobbe Bl. VAR. *glabra* F. B. I. i. 672. *Ornithotrope glabra* F. I. ii. 267. E. D. A 787.
 Sundribuns, *T. Thomson* !
 A deciduous shrub ; properties unimportant.
 DISTRIB.—S.-E. Asia ; N. Australia.
 This has not been collected in the Sundribuns for half a century ; it might be looked for. It is plentiful in the Andaman sea-fence.

33. *Aphania* Bl.

39. *Aphania Danura* Radlk. *Scytalia Danura* F. I. ii. 274.
Sapindus Danura F. B. I. i. 684.
 Eastern and northern forests, *Clarke* ! *Heinig* ! *Calcutta Garden Collectors* !
 Vernac. *Badona* ; *Nuncha*.
 An evergreen shrub ; cut for firewood.
 DISTRIB.—India ; Indo-China,

XIX.—ANACARDIACEÆ.

34. *Bouea* Meissn.

40. *Bouea burmanica* Griff.; F. B. I. ii. 21. *Mangifera oppositifolia* F. I. i. 640. E. D. 8 785.

Sundribun, "reserved forests," *fide* Heinig.

Vernac. *Miri-âm*; *Uri-âm*.

A timber tree 50 feet high, used for constructing parts of boats above the water-line; fruit edible.

DISTRIB.—Pegu; Tenasserim; Andamans; Java.

Of this species, which is given in Mr. Heinig's list, no specimens have ever been received in the Calcutta Herbarium from the Sundribuns. In response to an enquiry on the subject Mr. Heinig has kindly replied as follows:—"I regret that I have lost all recollection of *Bouea burmanica*, but I find the following among my notes of Sundribuns species:—*B. burmanica*. Occurrence doubtful. Probably introduced. Cultivated near villages for the sake of its fruit."

The species should, therefore, be again looked for. Mr. Heinig suggests that it would probably be found, if it occurs at all, on the mounds or raised platforms of higher grounds forming vestiges of the old salt-makers and dacoits, especially near the ruins not far from Cobaduk Revenue Station in Coupe No. 1 of the Khulna Working Circle, on the left bank of the Mandabari river.

35. *Odina* Roxb.

41. *Odina Wodler* Roxb.; F. I. ii. 293; F. B. I. ii. 29. E. D. 0 38.

Northern clearings, self-sown or planted, *Calcutta Garden Collectors!* *Prain!* Mandabari ruins, *Heinig & Gammie!* Jatta ruins, *Prain!* Ambaria khal, at a small cleared camping-ground, *Prain!* Sea-face, *Heinig!*

Vernac. *J'yal*; *Kamila-gách*.

An ill-favoured deciduous tree, 40-50 feet high; wood hard but not durable; bark astringent.

DISTRIB.—India; Indo-China.

The sea-face locality is based on the presence at Calcutta of a specimen, in leaf only, sent by Mr. Heinig as *Kamila-gách*. There does not seem to the writer to be much doubt as to the accuracy of his determination; the communication of an unusual vernacular name still, however, leaves some; having regard to this fact and to the further doubt whether *Odina* deserves to be considered other than a deliberately introduced species in the Sundribuns, complete botanical material of the tree known as *Kamila-gách* is desirable.

CALYCIFLORÆ.

XX.—LEGUMINOSÆ.

36. *Crotalaria*, Linn.

Leaves simple:—

Flowers blue and white, in lateral as well as terminal racemes;
leaves ovate *verrucosa*.

- Flowers yellow, in terminal racemes only; leaves oblanceolate-oblong *retusa*.
 Leaves 3-foliolate; flowers yellow, mostly in long terminal racemes *Saltiana*.
42. *Crotalaria verrucosa* Linn.; F. B. I. ii. 77. *C. angulosa* F. I. iii. 273. E. D. C 2164.
 Frequent in northern clearings, *Calcutta Garden Collectors!*
Prain! also on the coast at Tiger Point, *Heinig!*
 Vernac. *Ban Çan*.
 A shrubby herb; properties unimportant.
 DISTRIB.—Trop. Asia, Africa and America.
43. *Crotalaria retusa* Linn.; F. I. iii, 272; F. B. I. ii. 75. E. D. C 2155.
 Coast, at Tiger Point, *Heinig!*
 Vernac. *Chotka; Bhil Jhanjhan*.
 A robust shrubby herb; yields a tolerable fibre.
 DISTRIB.—Trop. Asia; introd. in Trop. Africa and America.
 Seeds almost certainly washed down by the rivers.
44. *Crotalaria Saltiana* Andr. *C. striata* F. B. I. ii. 84 partly. E. D. C 2159.
 Sea-face, *Lace!* Northern clearings, *G. Thomson!* *Calcutta Garden Collectors!*
 An erect shrubby herb; gives a fair fibre.
 DISTRIB.—Trop. America and Africa; S.-E. Asia.

37. *Cyamopsis* DC.

45. **Cyamopsis psoraloides* DC.; F. B. I. ii. 92. *Dolichos fabæformis* F. I. iii. 316. E. D. C 2514.
 Sundribuns, cultivated, *Calcutta Garden Collectors!*
 Vernac. *Guar*.
 An annual crop; plants erect, stoutish, 2-3 feet high, with thick straight fleshy pods. Probably only occasionally cultivated in Sundribun clearings, as it has not been reported from these since 1845.
 DISTRIB.—India generally, in the drier regions; and Afghanistan.

38. *Sesbania* Pers.

46. **Sesbania grandiflora* Pers.; F. B. I. ii. 115. *Æschynomene grandiflora* F. I. iii. 331. E. D. S. 1186.
 Planted at almost every clearing.
 Vernac. *Bok-phul; Agati*.
 A soft-wooded, quick-growing, short-lived tree, planted to support climbing vegetables; also leaves and flowers eaten.
 DISTRIB.—Mascarenes to Malaya and N. Australia.

39. *Desmodium* Desv.

47. *Desmodium umbellatum* DC.; F. B. I. ii. 161. *Hedysarum arboreum* F. I. iii. 360.

Generally distributed, but nowhere plentiful.

A large shrub or small tree; used for firewood.

DISTRIB.—Mascarenes; coasts of S.-E. Asia; Polynesia.

40. *Abrus* Linn.

48. *Abrus precatorius* Linn.; F. I. iii. 258; F. B. I. ii. 175. E. D.

A 51.

Jatta, *Prain!*

Vernac. *Kunch.*

A climbing plant with slender stems; seeds used as goldsmiths' weights (*rafi*), and as ornamental and rosary beads; root medicinal.

DISTRIB.—Cosmopolitan in the Tropics.

The species is more or less sacred, which may explain its occurrence beside the ruined temple at Jatta.

41. *Teramnus* Sw.

49. *Teramnus flexilis* Benth.; F. B. I. ii. 185.

Eastern Sundribuns, rare, *Clarke!*

A somewhat extensive climber; properties unimportant.

DISTRIB.—E. Himalaya; Assam; Chittagong.

This has only been found east of the Madumati, but may be expected to occur also on the western bank. From the distribution of the species it is possible that the seeds may have been brought down by the Brahmaputra or some of its tributaries.

42. *Mucuna* Adans.

50. *Mucuna gigantea* DC.; F. B. I. ii. 186. *Carpopogon giganteum* F. I. iii. 286.

Eastern Sundribuns, at Arpangassia Khal, Cheila Bogi River and elsewhere, *Kurs! Heinig! Gammie! Lace!*

A very extensive climber; stems twisted into ropes.

DISTRIB.—Coast forests of S.-E. Asia.

43. *Erythrina* Linn.

1. *Erythrina indica* Lamk.; F. I. iii. 249; F. B. I. ii. 188. E. D.

E 342.

Sea-face, *Heinig!*

Vernac. *Palita Mandar.*

A tall prickly tree, quick-growing, soft-wooded but the wood rather durable.

DISTRIB.—Coasts of S.-E. Asia and Polynesia; elsewhere planted.

44. *Canavalia* DC.

Pods not turgid, deeply double-channelled along dorsal suture
lineata.

Pod turgid, almost flat along dorsal suture, endocarp separating
turgida.

52. *Canavalia lineata* DC. *C. obtusifolia* F. B. I. ii. 196 (not of DC.) *Dolichos obcordatus* F. I. iii. 303. E. D. C 294.

Sea-face, *Heinig!*

A glabrous perennial; a good sand-binding species.

DISTRIB.—Cosmopolitan on tropical coasts.

53. *Canavalia turgida* Grah. *C. ensiformis* var. *turgida* F. B. I. ii. 196. *Dolichos rotundifolius* F. I. iii. 302.

Common on river-banks in the central and northern forests.

A rather extensive climber, always near the sea.

DISTRIB.—Coasts of S.-E. Asia.

45. *Phaseolus* Linn.

Stipules attached by their bases; considerable climbers with entire leaflets and large white and purple flowers . . . *adenanthus.*

Stipules attached by their centres; small prostrate herbs with three-lobed leaflets and small yellow flowers . . . *trilobus.*

54. *Phaseolus adenanthus* Mey.; F. B. I. ii. 200. *P. alatus* F. I. iii. 288 (not of Linn.) E. D. P 484.

River-banks of northern forests and clearings.

Vernac. *Ban Barbati.*

A rather extensive climber; root tuberous, sometimes eaten.

DISTRIB.—Cosmopolitan in the Tropics.

55. *Phaseolus trilobus* Ait.; F. I. iii. 298; F. B. I. ii. 201. E. D. P 523.

Northern clearings, occasional. *Kurb! Clarke! Prain!*

Vernac. *Mugáni.*

A small wild pulse; a tolerable fodder.

DISTRIB.—Africa and Asia in tropical and subtropical regions.

46. *Vigna* Savi.

56. *Vigna luteola* Benth.; F. B. I. ii. 205. *Dolichos gangeticus* F. I. iii. 310.

General.

Vernac. *Ban Barbati.*

A trailing or climbing perennial; properties unimportant.

DISTRIB.—Cosmopolitan in the Tropics, near the coast.

47. *Atylosia* W. & A.

57. *Atylosia scarabæoides* Benth. ; F. B. I. ii, 215. *Dolichos scarabæoides* F. I. iii. 315. E. D. R 347.

Jatta, *Prain* !

Vernac. *Banur Kalai*.

A slender biennial climber ; eaten by cattle, otherwise valueless.

DISTRIB.—Mascarenes ; S.-E. Asia.

48. *Flemingia* Roxb.

58. *Flemingia congesta* Roxb. ; F. I. iii 340 ; F. B. I. ii. 228. E. D. F 633.

"Delta of the Ganges," *Meyne* (1796) *vide Roxburgh*.

Vernac. *Bara Salphan*.

An erect woody shrub ; properties unimportant.

DISTRIB.—S.-E. Asia.

The *locus classicus* for this species is given by Roxburgh as the "Delta of the Ganges"—the term generally employed by him when speaking of the Sundribuns. The species has never been reported again from this area ; it might, however, be looked for with a view to confirming Roxburgh's record.

49. *Dalbergia* Linn. f.

Branches spinescent ; a usually erect shrub . . . *spinosa*.

Branches unarmed ; a considerable climber . . . *torta*.

59. *Dalbergia spinosa* Roxb. ; F. I. iii. 233 ; F. B. I. ii. 238. E. D. D 84.

General, on river-banks and near the sea-face.

Vernac. *Amanta*.

A thorny, sometimes climbing shrub ; properties unimportant.

DISTRIB.—Coasts of Chittagong, Burma and Coromandel.

60. *Dalbergia torta* Grah. *D. monosperma* F. B. I. ii. 237. E. D. D 48.

General, especially plentiful in the eastern forests.

Vernac. *Panchioli*.

A scandent shrub ; cut for firewood.

DISTRIB.—Coasts of S.-E. Asia ; N. Australia ; Polynesia.

50. *Pongamia* Vent.

61. *Pongamia glabra* Vent. ; F. B. I. ii. 240. *Galedupa indica* F. I. iii. 239. E. D. P 1121.

General, on river-banks and in the forests, as far as the sea.

Vernac. *Pitajora* ; *Koronja* ; *Kerran* ; *Dalkirancha*.

A tree, up to 50 feet high ; wood white, turning yellow on exposure, hard, but liable to attack by insects ; bark yields a gum ; seed yields an oil (*Karanj-ku-tél*) used for burning and greatly used in native medicine for skin-diseases.

DISTRIB.—Mascarenes ; coasts of S.-E. Asia ; Polynesia ; elsewhere often planted.

51. Derris Lour.

Vexillary stamen free ; sutures of pod sinuate between the seeds

sinuata.

Vexillary stamen more or less united with the others ; pod not sinuate between the seeds :—

Pod narrow, pointed at both ends, several-seeded *scandens.*

Pod suborbicular, obtuse ; seeds solitary *uliginosa.*

62. Derris sinuata Thw. ; F. B. I. ii. 246 !

Sea-face, at Tiger Point, *Heinig!*

Vernac. *Sundri-lata ; Mahajani-lata.*

A large climber ; stems twisted into ropes for tying logs.

DISTRIB.—India ; Indo-China ; Malaya : in coast forests.

63. Derris scandens Benth. ; F. B. I. ii. 241. *Dalbergia scandens* F. I. iii. 232. E. D. D 330.

General.

Vernac. *Nioisha, Noa-lata.*

A large climber ; properties unimportant.

DISTRIB.—S.-E. Asia ; N. Australia : not confined to the coasts.

64. Derris uliginosa Benth. ; F. B. I. ii. 241. *Galedupa uliginosa* F. I. iii. 243.

General.

Vernac. *Kelia-lata ; Pan-lata.*

A large evergreen scandent shrub ; stems twisted into ropes for tying logs.

DISTRIB.—E. Africa ; Mascarenes ; S.-E. Asia ; Polynesia : on coasts and on muddy banks of tidal rivers.

52. Cæsalpinia Linn.

Pod covered with wiry prickles ; petals narrow *Bonducella.*

Pod smooth ; petals broad *Nuga.*

65. Cæsalpinia Bonducella Flem. ; F. I. iii. 357 ; F. B. I. ii. 254. E. D. c 6.

Sea-face ; on skirts of forests ; also in clearings for cultivation, *Calcutta Garden Collectors! Heinig!*

Vernac. *Nátá ; Nátá Karanj.*

A large thorny climber ; seeds, ground and mixed with pepper, are taken in cases of fever ; also worn as necklaces.

DISTRIB.—Cosmopolitan in the Tropics.

66. *Cæsalpinia Nuga* Ait. ; F. B. I. ii. 277. *C. paniculata* F. I. ii. 364. E. D. C 30.

Everywhere, from northern clearings to sea-face, common.

Vernac. *Nátua* ; *Nétu* ; *Shingri-lata*.

A prickly scandent shrub ; properties unimportant.

DISTRIB.—Coasts of S.-E. Asia ; N. Australia ; Polynesia.

53. *Mezoneuron* Desf.

67. *Mezoneuron cucullatum* W. & A. ; F. B. I. ii. 258. *Cæsalpinia cucullata* F. I. ii. 358.

"Delta of the Ganges," *Carey* (1796) *vide Roxburgh*.

A very extensive prickly climber, destructive to forest-growth.

DISTRIB.—S.-E. Asia ; Malaya.

As in the case of *Flemingia congesta*, the *locus classicus* for this species is the "Delta of the Ganges." It has not been obtained again in the Sundribuns, but should be carefully looked for.

54. *Parkinsonia* Linn.

68. * *Parkinsonia aculeata* Linn. ; F. B. I. ii. 260. E. D. P 322.

Planted in some of the northern clearings.

Vernac. *Belati Kikar*.

A hedge plant ; yields fair fuel and makes good charcoal.

DISTRIB.—Native of Tropical America.

55. *Cassia* Linn.

Trees, with indehiscent, cylindric, woody pods ; stamens 10 *Fistula*.

Herbs or shrubs, with dehiscent, compressed pods ; stamens 7 :—

Leaves with a single large gland near base of common petiole ;

leaflets 6-12 pairs ; a small shrub . . . *Sophera*.

Leaves with two glands, one between each of the lower pairs of

leaflets ; leaflets 3 pairs ; an annual herb . . . *Tora*.

69. *Cassia Fistula* Linn. ; F. I. iii. 333 ; F. B. I. ii. 261. E. D. C 756.

Jatta, among ruins, *Praïn* ! also "Reserved Forests," *vide Heinig* in list.

Vernac. *Shongrál* (*Heinig*) ; *Amaltas*.

The "Indian Laburnum," a handsome tree, 50 feet high ; wood red, hard, used for posts, rice-pounders and the like ; bark used for dyeing and tanning.

DISTRIB.—S.-E. Asia : often planted.

Mr. Heinig includes this in his list but has not sent specimens. Replying to an enquiry regarding the tree, Heinig writes :—"As for *Cassia Fistula* I have got a note :—'An introduced, not an indigenous species.' So far as I recollect (although at this time, six years after my departure from the Sundribuns, I cannot feel sure) I found the species on those mounds or platforms of higher ground forming vestiges of the old salt-makers or dacoits, and would

especially look for it near the ruins not far from the Cobaduk Revenue Station, in Coupe No. 1 of the Khulna Working Circle, on the left bank of the Mandabari river." The occurrence of the tree among the ruins round the Jatta temple is in keeping with Heinig's conclusion that it is only an introduced species in the Sundribuns.

70. *Cassia 'Sophora* Linn.; F. B. I. ii. 262. *Senna sophora* F. I. ii. 347. E. D. C 787.

Sea-face at Tiger Point, *Heinig!*

Vernac. *Kálanchi (Heini?)*; *Kalkashonda*.

A shrubby weed; properties medicinal, cathartic.

DISTRIB.—Cosmopolitan in the Tropics, probably a native of Asia. Its occurrence at Tiger Point may be explained by its seeds having been brought down by one of the great rivers.

71. *Cassia Tora* Linn.; F. B. I. ii. 263, in part. *Senna Tora* F. I. ii. 340. E. D. C 797.

Northern clearings, *Calcutta Garden Collectors! Prain!*

Vernac. *Chakunda*.

A gregarious weed; yields a dye; properties also medicinal, cathartic.

DISTRIB.—Cosmopolitan in the Tropics.

56. *Cynometra* Linn.

72. *Cynometra mimosoides* Wall. *C. ramiflora* var. *mimosoides* F. B. I. ii. 267. E. D. C 2577.

Abundant throughout the central and eastern forests, *Calcutta Garden Collectors! Home! Heinig! Prain! Lace!*

Vernac. *Shingar*; *Shingra*.

A tree 20 feet high; wood hard, red, used in making carts, also for posts, and as fuel. Where this species occurs the seedlings of Sundri do not thrive, owing to its spreading and umbrageous habit.

DISTRIB.—Coasts of W. India; Ceylon; Burma; Andamans; Malaya.

57. *Tamarindus* Linn.

73. **Tamarindus indica* Linn.; F. I. ii. 215; F. B. I. ii. 273. E. D. T 28.

Very occasionally planted in the northern clearings.

Vernac. *Tintuli*; *Imli*.

A large tree usually; in the Sundribun clearings small and not thriving; timber excellent but difficult to work; fruits acid and laxative; seeds yield an oil on expression.

DISTRIB.—Generally planted in the Tropics.

58. *Intsia* Thouars.

74. *Intsia bijuga* O. Kuntze. *Fonesia triandra* F. I. ii. 220. *Afselia retusa* F. B. I. ii. 274.

General, but not plentiful in the central and eastern forests,
Heinig! Heinig & Gammie! Prain!

Vernac. *Bhidla; Bháila; Bhádala; Shundal; Somdal; Hinga; Hingeh.*

A tree 30-40 feet high; wood reddish-brown, hard; used for beams, girders of bridges, house-posts, and fuel: the tree coppices freely.

DISTRIB.—Coast-forests of the Mascarenes; Indo-China; Malaya; Polynesia: not elsewhere in India,

59. *Entada* Adans.

75. *Entada Purusaetha* DC. *E. scandens* F. B. I. ii. 287. *Mimosa scandens* F. I. ii. 554. E. D. E 219.

Eastern forests.

Vernac. *Gila.*

A large climber; seeds roasted and eaten.

DISTRIB.—Cosmopolitan in the Tropics.

Though included in Heinig's list, specimens of this have not been sent from the Sundribuns: Heinig's record is, however, confirmed by the existence of an excellent coloured drawing of the plant in the Sundribun Forest office.

60. *Acacia* Linn.

Erect; branches armed with stipular spines:—

Flowers yellow; pod thickened and sinuate between the seeds

arabica.

Flowers purple; pod thin, flat and not sinuate

tomentosa.

Climbing; branches without spines but armed with many recurved prickles:—

Flowers yellowish; pod thick, succulent, somewhat depressed between the seeds

concinna.

Flowers whitish; pod thin, coriaceous and flat

Intsia.

76. **Acacia arabica* Willd.; F. B. I. ii. 293. *Mimosa arabica*
F. I. ii. 557. E. D. A 101.

Occasionally planted in the northern clearings, *Calcutta Garden Collectors! Clarke! Prain!*

Vernac. *Babul; Kikar.*

A shrub or tree; wood good; yields an excellent gum; a good tan; and an indifferent dye.

DISTRIB.—Tropical Africa; India generally.

This is only planted in Sundribun clearings and thrives very indifferently.

77. *Acacia tomentosa* Willd.; F. B. I. ii. 294. *Mimosa tomentosa*
F. I. ii. 558. E. D. A 299.

Northern forests, *Calcutta Garden Collectors!*

A small tree; properties insignificant.

DISTRIB.—Western India and Ceylon; here almost certainly planted: collected in 1856, not received from the Sundribuns since.

78. *Acacia concinna* DC.; F. B. I. ii. 296. *Mimosa concinna* F. I. ii. 565. E. D. A 200.

Northern forests, *Calcutta Garden Collectors!*

Vernac. *Ban-ritha*.

A prickly scandent bush; pods used as a substitute for soap; also as a source of medicine.

DISTRIB.—S.-E. Asia: not collected in the Sundribuns since 1856.

79. *Acacia Intsia* Willd.; F. B. I. ii. 297. *Mimosa Intsia* F. I. ii. 565. E. D. A 233.

Northern forests, *Calcutta Garden Collectors!*

A large prickly climber, destructive to forest-growth.

DISTRIB.—India generally: not collected in the Sundribuns since 1845.

XXI.—DROSERACEÆ.

61. *Aldrovanda* Linn.

80. *Aldrovanda vesiculosa* Linn.; F. B. I. ii. 425. *A. verticillata* F. I. ii. 112.

Northern clearings, *Kurs!*

Vernac. *Malacca Fhangi*.

A floating aquatic, apparently very rare.

DISTRIB.—C. Europe; Australia.

A species, with a peculiarly detached distribution, unless it occurs, but has been overlooked, in intermediate localities. Roxburgh, writing prior to 1814 (not published till 1832), does not say it is rare; Voigt, writing in 1845, mentions his failure to find it near Calcutta. It was rediscovered by T. Thomson in 1855 in salt-pans south of Calcutta and just to the north of the Sundribun area, and again in 1867 by S. Kurz in salt-pans just within the northern boundary of our region.

XXII.—RHIZOPHOREÆ.

62. *Rhizophora* Linn.

Cymes longer than petioles, usually 3-flowered, from axils of leaves; flowers pedicelled; petals fleshy, woolly in front *mucronata*.

Cymes shorter than petioles, unusually 2-flowered, from axils of fallen leaves; flowers sessile; petals thin, glabrous . *conjugata*.

81. *Rhizophora mucronata* Lamk.; F. B. I. ii. 435. *R. Mangle* F. I. ii. 459. E. D. R 242.

Forests near the coast, and on banks of large rivers.

Vernac. *Khamo*; *Bhára*; *Bara Goran*.

A tree 25-35 feet high; wood red, hard, splits on seasoning, used only for fuel; fruit said to be edible; bark used in tanning.

DISTRIB.—Tropical shores of Eastern Hemisphere and Australia.

82. *Rhizophora conjugata* Linn. ; F. B. I. ii. 436.

Forests near and at the coast, *Heinig & Gammie*!

Vernac. *Khamo*; *Bhára*.

A small tree or large shrub (*vide* F. B. I.); properties unimportant (*vide* E. D.).

DISTRIB.—Tropical shores of Eastern Hemisphere.

Our economic knowledge of the species of *Rhizophora* is singularly incomplete. The present species is excluded from Heinig's list; Clarke correctly includes it as a Sundribun species. It should be noted in passing that Heinig & Gammie, as specimens named by the latter in Herb., Calcutta, show, took the species to be "*R. mucronata*," a circumstance that throws considerable doubt on the accuracy of the F. B. I. statement regarding the size of the tree, and on the justice of the E. D. conclusion as to its want of economic importance.

Both these points, and the further question as to its abundance or otherwise in the Sundribuns, require investigation by local officers.

63. *Cerlops* Arn.

83. *Cerlops Roxburghiana* Arn. ; F. B. I. ii. 436. E. D. C 972.

General, especially in the western forests, *Calcutta Garden Collectors*! *T. Thomson*! *Gamble*! *Heinig*! *Prain*! *Lace*!

Vernac. *Gorán*; *Guttia*.

A tree, 12-20 feet high; wood brick-red, hard, used for house-posts and fire-wood; makes excellent charcoal; the bark affords a red dye and is used in tanning.

DISTRIB.—Tropical shores of the Eastern Hemisphere.

Our economic knowledge of the species of *Cerlops* is as inadequate as is that of the species of *Rhizophora*. Both Heinig and Clarke include *C. Candolleana*, as well as *C. Roxburghiana*, in their lists of Sundribun species; on what authority it is difficult to say, since no collector has hitherto sent specimens of *C. Candolleana* to Herb., Calcutta. Heinig, indeed, speaks of *C. Candolleana* as the more important and plentiful of the two; his own specimens, however, as well as those of Gamble distributed under the name *C. Candolleana*, prove on examination to be *C. Roxburghiana*. There is no obvious reasons why *C. Candolleana* should not occur, and under the circumstances it deserves to be carefully looked for; it may be distinguished from the very common *C. Roxburghiana* by its more pointed calyx-segments and its glabrous petals with 3-4 capitate bristles at their emarginate tips. The calyx-lobes of *C. Roxburghiana* are blunter; its concave petals, though glabrous below, are setose-ciliate towards the apex.

64. *Kandelia* W. & A.

84. *Kandelia Rheedei* W. & A.; F. B. I. ii. 437. E. D. K 21.

General, in forests near coast and on banks of the larger rivers.

Vernac. *Goria*.

A tree 20 feet high ; wood soft, used in charcoal-making ; bark yields a dye.

DISTRIB.—Shores of S.-E. Asia.

65. *Bruguiera* Lamk.

Peduncles 1-flowered ; calyx-teeth about 12, as long as the tube in the fruiting stage *gymnorhiza*.

Peduncles many-flowered ; calyx-teeth about 8, much shorter than the tube in the fruiting stage *parviflora*.

85. *Bruguiera gymnorhiza* Lamk ; F. B. I. ii. 437. *Rhisophora gymnorhiza* F. I. ii. 460. E. D. B 898.

General, in forests near coast and on banks of the larger rivers.

Vernac. *Kankra*.

A tree 40 feet high ; wood red-brown, hard, employed for beams, posts, planks, jhools and dabbas of boats, also as fuel ; bark used for tanning.

DISTRIB.—Tropical shores of Eastern Hemisphere and Polynesia.

As will be seen in connection with the species that follows our economic knowledge of the *Bruguieras* is as imperfect as our knowledge of *Rhisophora* or *Ceriops*.

86. *Bruguiera parviflora* W. & A. ; F. B. I. ii. 438. *Rhisophora parviflora* F. I. ii. 461.

"Delta of the Ganges," *Goodlad* (1796) *vide Roxburgh*.

A much smaller species than the true *Kankra* ; qualities unrecorded, but probably similar to those of the other "Mangroves." Roxburgh's record of the occurrence of this tree in the Sundribuns is very precise, and though it has apparently never been met with in our area since it was obtained by Goodlad in 1796 it deserves to be looked for.

DISTRIB.—Shores of Indo-China and Malaya.

XXIII.—COMBRETACEÆ.

66. *Lumnitzera* Willd.

87. *Lumnitzera racemosa* Willd. ; F. B. I. ii. 452. *Petaloma alternifolia* F. I. ii. 372. E. D. L 576.

General, at the sea-face and on river-banks.

Vernac. *Kirpa* ; *Kripa*.

A tree, reaching 40 feet in height but usually much smaller ; wood hard and durable, withstanding moisture, used for rafters and posts, and as fuel ; makes a very good charcoal.

DISTRIB.—Shores of Indo-China ; Malaya ; N. Australia ; Polynesia.

XXIV.—MYRTACEÆ.

67. *Eugenia* Linn.

88. *Eugenia fruticosa* Roxb. ; F. I. ii. 487 ; F. B. I. ii. 499.

Forests, not common, *fide* *Heinig*.

Vernac. *Ban-jamb*.

A large shrub or small tree; cut for firewood.

DISTRIB.—Assam; Chittagong; Pegu; Tenasserim.

Heinig includes this in his list, but has not sent any specimens. The tree occurs in E. Bengal and there is no reason why it should not extend naturally into the northern forests. At the same time it may belong to the category in which *Bouea burmanica*, *Ægle Marmelos*, *Cassia Fistula*, *Diospyros Embryopteris* ought perhaps to be placed, and may indicate the remains of clearings that at one time existed but that have been re-invaded by forest.

68. *Psidium* Linn.

89. **Psidium* *Guyava* Linn.; F. B. I. ii. 468. *P. pomiferum* F. I. ii. 480. *P. pyriferum* F. I. ii. 480. E. D. P 1343.

Northern clearings, planted.

Vernac. *Piyára*.

A small tree, cultivated for its fruit.

DISTRIB.—Native of America, now cosmopolitan in the Tropics.

69. *Barringtonia* Forst.

Calyx valvate; fruit ovoid, when ripe slightly 4-angled near the base
racemosa.

Calyx somewhat imbricate; fruit oblong, fusiform, markedly 4-angled
throughout *acutangula*.

90. *Barringtonia racemosa* Bl.; F. I. ii. 634; F. B. I. ii. 507.
E. D. B 193.

Near river-banks, especially in the northern forests, *Calcutta Garden Collectors!* *Heinig!* *Prain!*

Vernac. *Kumia*; *Samandra*.

A tree, reaching 50 feet in height; wood white and soft, only used as fuel.

DISTRIB.—Shores of S.-E. Asia and Polynesia.

91. *Barringtonia acutangula* Gærtn.; F. I. ii 635; F. B. I. ii. 508.
E. D. B 180.

Northern clearings, *Calcutta Garden Collectors!* also on river-banks, associated with *B. racemosa*, *fide* *Heinig*.

Vernac. *Hidjal*.

A tree 20-30 feet high; wood hard, reddish, durable but apt to warp and not much used; affords an indifferent tan.

DISTRIB.—S.-E. Asia generally; N. Australia: not a coast species.

Mr. *Heinig* reports a third species of *Barringtonia*, *B. speciosa* *Forst.*, as associated with *B. racemosa*. The species may be distinguished from the two preceding ones by its entire leaf-margins—in *B. racemosa* and *B. acutangula* the leaf-margins are crenate-denticulate, and by its much larger showy white flowers and very large quadrangular or nearly ovoid fruit. No specimens of

B. speciosa have, however, been sent to the Calcutta Herbarium, and its presence in these forests is therefore doubtful. There would be nothing to cause surprise in the existence of *B. speciosa* in the Sundribuns; it should, however, be recollected that in the Andamans and elsewhere the species seems confined to the beach-zone of the littoral forest. It may be looked for along the Sundribun sea-face, but its occurrence associated with *B. racemosa* on river-banks in the northern forests would be at least unusual. The species ought, however, to be carefully searched for.

XXV.—LYTHRACEÆ.

70. Ammannia Linn.

92. *Ammannia salicifolia* Monti; F. B. I. ii. 569.
Northern clearings, *Clarke! Heinig & Gammie!*
Vernac. *Dád Mari.*

A weed of wet places, properties unimportant.
DISTRIB.—India generally; Trop. Africa.

71. Sonneratia Linn. f.

Leaves narrow-oblong; calyx 4-lobed; petals 0; stigma very wide-umbellate *apetala.*
Leaves oblong or obovate-elliptic; calyx 6-lobed; petals 6; stigma capitate, not very large *acida.*

93. *Sonneratia apetala* Ham.; F. I. ii. 506; F. B. I. ii. 579. E. D. S 2369.

Banks of tidal rivers, most plentiful east of the Raimangal.
Vernac. *Keora.*

A gregarious tree, 50-60 feet high; wood reddish-brown, hard, used for indoor planks, furniture, boxes, jhools and dabbas of boats, also for fuel and charcoal. The roots send up vertical blind suckers.

DISTRIB.—Coast of W. India, and of Indo-China.

94. *Sonneratia acida* Linn. f.; F. I. ii. 506; F. B. I. ii. 579. E. D. S 2362.

Banks of rivers, principally in the northern forests.
Vernac. *Ora.*

A gregarious tree; wood soft, grey, only to use as fuel; the fruit is eaten and used as a fish-bait. The roots send up blind suckers.

DISTRIB.—Western India; Indo-China; Malaya: on coasts, and on banks of tidal rivers.

XXVI.—TURNERACEÆ.

72. Turnera Linn.

95. *Turnera ulmifolia* Linn.
Northern clearings, *Calcutta Garden Collectors! Heinig!*

A small under-shrub, escaped from gardens; has showy yellow flowers but is of no economic importance.

DISTRIB.—Native of America; generally naturalised throughout S.-E. Asia.

XXVII.—PASSIFLOREÆ

73. *Passiflora* Linn.

96. *Passiflora suberosa* Linn.; F. B. I. ii. 599.

Northern clearings, *Calcutta Garden Collectors*!

A common herbaceous climber; properties unimportant.

DISTRIB.—Native of America; very plentiful everywhere, naturalised, in Lower Bengal. First reported from the Sundribuns in 1845.

XXVIII.—CUCURBITACEÆ

74. *Trichosanthes* Linn.

Bracts of the male flowers small or none; leaves puberulous or pubescent beneath *cucumerina*.

Bracts of the male flowers large and sheathing; leaves glabrous beneath *palmata*.

97. *Trichosanthes cucumerina* Linn.; F. I. iii. 702; F. B. I. ii. 609
E. D. F 576.

Northern clearings, cultivated and self-sown, *Calcutta Garden Collectors*!

Vernac. *Ban Chichinga*.

A large herbaceous climber; the bitter fruit is often eaten cooked.

DISTRIB.—S.-E. Asia; N. Australia.

98. *Trichosanthes palmata* Roxb.; F. I. ii. 704; F. B. I. ii. 606.
E. D. T 600.

Jatta, among ruins, *Prain*!

Vernac. *Makál*.

A large herbaceous climber; fruit when pounded used as an external application in diseases of the ear.

DISTRIB.—S.-E. and E. Asia; N. Australia.

75. *Luffa* Cav.

99. *Luffa graveolens* Roxb.; F. I. iii. 716; F. B. I. ii. 614.

Jatta, among ruins, *Prain*!

A herbaceous climber; properties unimportant.

DISTRIB.—E. Himalaya; Tirhut and N. Bengal; Chittagong.

76. *Momordica* Linn.

100. *Momordica dioica* Roxb.; F. I. iii. 709; F. B. I. ii. 617. E. D.
M 639.

Jatta, among ruins, *Prain*!

A herbaceous climber; fruit and tuberous root sometimes eaten.

DISTRIB.—S.-E. Asia.

77. *Cucumis* Linn.

101. *Cucumis trigonus* Roxb.; F. I. ii. 722; F. B. I. ii. 619. E. D. C 2298.

Northern clearings, not uncommon, *Calcutta Garden Collectors*! *Prain*!

A herbaceous climber; root tuberous; properties unimportant.

DISTRIB.—Tropical and subtropical Asia.

Whether this is the wild plant from which the cultivated melon has been derived, or is a condition of the melon 'feral by reversion' is not absolutely clear, but, in the writer's opinion, the latter is the more probable explanation of its origin, so far at least as Bengal is concerned.

78. *Cephalandra* Schrad.

102. *Cephalandra indica* Naud.; F. B. I. ii. 621. *Momordica monadelpha* F. I. iii. 708. E. D. C 919.

Northern clearings, frequent, *Calcutta Garden Collectors*! *Prain*!
Vernac. *Bhimbu*; *Tela Kucha*.

A herbaceous climber; fruit eaten cooked when green and fresh when ripe.

DISTRIB.—Tropical Africa; S.-E. Asia.

79. *Zehneria* Endl.

103. *Zehneria umbellata* Thw.; F. B. I. ii. 625. *Momordica umbellata* F. I. iii. 710. E. D. Z 182.

Northern forests, *Heinig*!

Vernac. *Kudari*.

A herbaceous climber; fruit sometimes eaten.

DISTRIB.—S.-E. Asia; N. Australia.

XXIX.—FICOIDEÆ.

80. *Sesuvium* Linn.

104. *Sesuvium Portulacastrum* Linn.; F. I. ii. 509; F. B. I. ii. 659. E. D. S 1203.

Locally plentiful on muddy banks, *Calcutta Garden Collectors*! *Prain*! Sea-face, plentiful, *Heinig*! *Prain*!

Vernac. *Noona*; *Gangatora-ság*.

An extensively creeping plant; a tolerable mud-binding and an excellent sand-binding species.

DISTRIB.—Cosmopolitan on tropical shores.

81. *Trianthema* Linn.

105. *Trianthema monogyna* Linn.; F. B. I. ii. 660. *T. obcordata*
F. I. ii. 445. E. D. T 537.

Northern clearings, occasional, *Calcutta Garden Collectors!*
Prain!

A field-weed; properties unimportant.

DISTRIB.—Cosmopolitan in the Tropics.

COROLLIFLORÆ.

XXX.—RUBIACEÆ.

82. *Oldenlandia* Linn.

106. *Oldenlandia diffusa* Roxb.; F. I. i. 423; F. B. I. iii. 65.

Northern clearings, not uncommon, *Calcutta Garden Collectors!*
Prain!

A diffuse weed; properties unimportant.

DISTRIB.—S.-E. and E. Asia.

83. *Petunga* DC.

107. *Petunga Roxburghii* DC.; F. B. I. iii. 120. *Randia racemosa*
F. I. i. 525.

Northern and western forests, *Calcutta Garden Collectors!*
Home! Gamble! Heinig! Eastern forests, *Lace!*

Vernac. *Pitanga; Fhijir; Narkheli; Ban Chár.*

A large shrub or small tree, 15 feet high; wood white, hard, used for making
boxes and native furniture.

DISTRIB.—Indo-China; Malaya: in swamp-forests.

84. *Vangueria* Juss.

108. *Vangueria spinosa* Roxb.; F. I. i. 536; F. B. I. iii. 136.
E. D. v 25.

Northern forests, exact locality not given, *Heinig!*

Vernac. *Moyena.*

A large thorny shrub; fruit eaten.

DISTRIB.—India; Indo-China; Malaya.

Possibly an originally introduced species, and one of the group to which
Diospyros Embryopteris, Cassia Fistula, Ægle Marmelos, Bouea burmanica, etc.,
belong.

85. *Ixora* Linn.

Flowers white, small, in lax branching cymes . . . *parviflora.*

Flowers red, larger, in condensed corymbose cymes

coccinea var. *Bandhuca-*

109. *Ixora parviflora* Vahl; F. I. i. 383; F. B. I. iii. 142. E. D. 1515.

Sea-face, *Heinig & Gammie!*

Vernac. *Rangan.*

An evergreen tree; wood light-brown, hard, close-grained; used for fuel.

DISTRIB.—India and Indo-China.

This species is common in the hotter and drier parts of India and Burma; its presence in the locality where Heinig and Gammie collected it (near Tiger Point) is most probably due to its seeds having been brought down by the great rivers from Upper India.

110. *Ixora coccinea* Linn. VAR. *Bandhuca*; F. B. I. iii. 145. *I. Bandhuca* F. I. i. 376. E. D. 1513.

Northern clearings, planted, *Heinig!*

Vernac. *Rangan.*

A shrub; used largely in native medicine for dysentery, which possibly explains its presence.

DISTRIB.—Indo-China, wild: widely cultivated in S.-E. Asia.

86. *Morinda* Linn.

111. *Morinda bracteata* Roxb.; F. I. i. 544. *M. citrifolia* var. *bracteata* F. B. I. iii. 156. E. D. M 656.

River-banks, and sea-face, *Calcutta Garden Collectors! Ellis! Heinig! Lace!*

Vernac. *Bara Chând.*

A small tree; cut for firewood.

DISTRIB.—Tenasserim and Andamans in the coast-forests, plentiful: elsewhere planted. It extends as a wild shrub along the banks of the Hughli as far north as Calcutta.

XXXI.—COMPOSITE.

87. *Vernonia* Schreb.

112. *Vernonia cinerea* Less.; F. B. I. iii. 233. *Serratula cinerea* F. I. iii. 406. E. D. v 79.

Northern clearings, *Calcutta Garden Collectors! Jatta,* among ruins, *Prain!*

Vernac. *Kük-shim; Kalajira.*

A common weed; properties obscure.

DISTRIB.—Tropics of Eastern Hemisphere.

88. *Ageratum* Linn.

113. *Ageratum conyzoides* Linn. ; F. B. I. iii. 243. *A. cordifolium*
F. I. iii. 415.

Northern clearings, at Chandpie only, *Heinig & Gammie!* but there plentiful, *Prain!*

Vernac. *Oochunti*.

A common weed; properties unimportant.

DISTRIB.—Cosmopolitan in the Tropics; originally American.

89. *Grangea* Forsk.

114. *Grangea maderaspatana* Poir. ; F. B. I. iii. 247. *Artemisia maderaspatana* F. I. iii. 412. E. D. G 660.

Northern clearings, *Kurs!* *Heinig & Gammie!*

Vernac. *Namuti*.

A common weed; properties obscure.

DISTRIB.—Tropical and sub-tropical regions of the Eastern Hemisphere.

90. *Conyza* Less.

115. *Conyza semi-pinnatifida* Wall. ; F. B. I. iii. 257.

Northern clearings, *Calcutta Garden Collectors!*

A common weed; properties unimportant. This has also been found by Mr. Clarke at Barisal in the Sundribun region east of the Madumati.

DISTRIB.—Assam, Burma; on the banks of large rivers.

91. *Blumea* DC.

116. *Blumea amplexans* DC.; F. B. I. iii. 260; VAR. *maritima*.

Northern clearings, *Kurs!* *Clarke!* *Heinig & Gammie!*

A spreading weed; properties unimportant.

DISTRIB.—India; Indo-China: always near the sea or on the coast.

92. *Pluchea* Cass.

117. *Pluchea indica* Less.; F. B. I. iii. 272. *Corysa corymbosa*
F. I. iii. 426.

General, in open places.

Vernac. *Munjhú Rukha; Kukronda*.

A low shrub; properties unimportant.

DISTRIB.—S. E. Asia: on coasts and in maritime swamps.

93. *Sphæranthus* Linn.

118. *Sphæranthus africanus* Linn.; F. B. I. iii. 275. *S. indicus*
F. I. iii. 446 not of Linn.

Northern clearings, very common.

Vernac. *Khatta Palang*.

A coarse weed; properties unimportant.

DISTRIB.—Tropics of Eastern Hemisphere.

94. *Xanthium* Linn.

119. *Xanthium spinosum* Linn.

Banks of Mátla river, abundant, *Calcutta Garden Collectors*!

A spiny weed; properties obscure.

DISTRIB.—Native of S. Europe; recently introduced but now thoroughly established and abundant: so far, not recorded from any other part of India.

95. *Wedelia* Jacq.

Leaves 3-nerved; inner bracts of the involucre bluntish; a considerable climber *scandens*.

Leaves not 3-nerved; inner bracts of the involucre distinctly pointed; a prostrate or creeping herb *calendulacea*.

120. *Wedelia scandens* Clarke. *W. biflora* F. B. I. iii. 306, not of DC. *Verbesina scandens* F. I. iii. 441.

River-banks and sea-face, climbing over bushes.

A considerable climber; properties unimportant.

DISTRIB.—S.-E. Asia; on coasts.

121. *Wedelia calendulacea* Less.; F. B. I. iii. 306. *Verbesina calendulacea* F. I. iii. 440. E. D. w 25.

Muddy banks; at Baniakhali, *Heinig*! Cheila, *Heinig & Gammie*! Ambaria Khal, *Prain*! Chandpie, *Prain*!

Vernac. *Kesaraj*; *Bhimraj*.

A weed of wet places; properties medicinal, used internally for coughs, externally as a stimulant for growth of hair and in skin diseases; an excellent mud-binding plant.

DISTRIB.—S.-E. and E. Asia.

96. *Cnicus* Linn.

122. *Cnicus arvensis* Hoffm.; F. B. I. iii. 362. *Carduus lanatus*
F. I. iii. 408.

Northern clearings, general.

Vernac. *Shial-kanta*.

A common weed ; properties unimportant.

DISTRIB.—N. India ; Himalaya ; N. Asia ; Europe.

97. *Launea* Cass.

123. *Launea pinnatifida* Cass. ; F. B. I. iii. 417. *Prenanthes asplenifolia* F. I. iii. 404 in part.

Sea-face, creeping on sand, *Calcutta Garden Collectors* !

A prostrate herb ; an effective sand-binding species.

DISTRIB.—E. Africa ; Mascarenes ; S.-E. Asia : on sandy sea-shores.

XXXII.—PLUMBAGINEÆ.

98. *Egialitis* R. Br.

124. *Egialitis rotundifolia* Roxb. ; F. I. ii. 111 ; F. B. I. iii. 479. E. D. A 5279.

South-western forests, abundant on edges of creeks, becoming less plentiful towards the east.

Vernac. *Sátári*.

A shrub or small tree ; properties unimportant.

DISTRIB.—W. Indo-China ; Malaya : in mangrove-swamps.

XXXIII.—MYRSINÆ.

99. *Egiceras* Gærtn.

125. *Egiceras majus* Gærtn. ; F. I. iii. 130 ; F. B. I. iii. 533. E. D. A 531.

River-banks and sea-face, very common.

Vernac. *Koilsha* ; *Khalshi* ; *Kulsi*.

A tree, reaching 20 feet in height ; wood hard, only used as fuel.

DISTRIB.—Cosmopolitan on Tropical sea-shores.

XXXIV.—EBENACEÆ.

100. *Diospyros* Linn.

Leaves under 3 in. long, thin, herbaceous or papery, pubescent beneath ; stamens 16 ; fruit glabrous *montana* var. *cordifolia*.

Leaves over 5 in. long, thick, coriaceous, glabrous ; stamens 24 or more ; fruit glandular or rusty-pubescent. *Embryopteris*.

126. *Diospyros montana* Roxb. ; F. B. I. iii. 555 : VAR. *cordifolia*, *D. cordifolia* F. I. ii. 538. E. D. D 628.

Jatta, among ruins, *Prain* !

Vernac. *Ban Gáb*.

A small to medium tree; wood yellowish grey; soft but durable.

DISTRIB.—S.-E. Asia; N. Australia: here most probably a tree originally introduced. This is almost certainly specifically distinct from *D. montana*.

127. *Diospyros Embryopteris* Pers. F. B. I. iii. 556. *D. glutinosa*
F. I. ii. 533. E. D. D 582.

Mandabari ruins, *Heinig*; Jatta, among ruins, *Prain*! Eastern Forests, *Lace*! *Heinig*.

Vernac. *Gáb*; *Makurkendi*.

An evergreen tree, reaching 60 feet in height. Wood white, hard; used for building, for masts and yards, and as fuel; the viscid pulp of the fruit is used to pay the seams of boats and to strengthen nets and cordage; it is full of tannin and is used in native medicine as an astringent; fruit also eaten.

DISTRIB.—S.-E. Asia.

As *Heinig* had not communicated specimens of this tree, which is stated in his list to be found in the reserved forests, but not to be common, and as the writer only met with it at Jatta it appeared possible that this might be only a survival, in *all* its localities, of abandoned settlements like that of Jatta. Consulted on the subject, *Heinig* has informed the writer that there are some fine *Gáb* trees (*Diospyros Embryopteris*) on the mounds or platforms of higher ground left by the old salt-makers or dacoits on the left bank of the Mandabari river. The properties of the *Gáb*, as will be seen, are just such as would lead to its having been planted by people of the class who once occupied these ruins. During a visit to the Sundribuns paid by *Lace* in January, 1903, it was, however, found that this *Diospyros* does occur in the swamp-forests in places where former settlement is not conceivable so that *Heinig*'s record is already quite confirmed.

XXXV.—SALVADORACEÆ.

101. *Azima* Lamk.

128. *Azima tetracantha* Lamk.; F. B. I. iii. 620. E. D. A 1165.
Western river-banks and sea-face, *Calcutta Garden Collectors*!
Vernac. *Trikanta Gati*.

A thorny shrub; properties unimportant.

DISTRIB.—S. India; Mascarenes; S. Africa.

XXXVI.—APOCYNACEÆ.

102. *Cerbera* Linn.

129. *Cerbera Odollam* Gærtn.; F. I. i. 692; F. B. I. iii. 638.
River-banks everywhere, fairly common.
Vernac. *Dákur*; *Dábur*; *Wáko*.

A small tree, sometimes reaching 40 feet in height; wood white, soft, useless; seed yields an illuminating oil.

DISTRIB.—S.-E. Asia; Australia; Polynesia: in maritime swamps.

103. *Parsonsia* R. Br.

130. *Parsonsia spiralis* Wall. ; F. B. I. iii. 650.
 General, *Heinig ! Heinig & Gammie ! Prain !*
 A large climber ; properties unimportant.
 DISTRIB.—S.-E. Asia.

XXXVII.—ASCLEPIADACEÆ.

104. *Hemidesmus* R. Br.

131. *Hemidesmus indicus* R. Br. ; F. B. I. iv. 5. *Asclepias pseudo-*
sarsa F. I. ii. 39. E. D. H 119.
 Northern forests, *Heinig ! Jatta, Prain !*
 Vernac. *Ananta-mal.*
 A twining shrub ; root medicinal.
 DISTRIB.—India generally and Ceylon.

105. *Finlaysonia* Wall.

132. *Finlaysonia obovata* Wall. ; F. B. I. iv. 7.
 Everywhere, rather common.
 Vernac. *Dudhi-lata.*
 A lofty climber ; stems twisted into ropes.
 DISTRIB.—Shores of Indo-China and Malaya.

106. *Oxystelma* R. Br.

133. *Oxystelma esculentum* R. Br. ; F. B. I. iv. 17. *Asclepias rosea*
 F. I. ii. 40. E. D. O 600.
 Kagdip, *Calcutta Garden Collectors !*
 Vernac. *Dudhia-lata.*
 A slender glabrous twiner ; properties obscure.
 DISTRIB.—India ; Indo-China ; Malaya.

107. *Calotropis* R. Br.

134. *Calotropis gigantea* R. Br. ; F. B. I. iv. 17. *Asclepias gigantea*
 F. I. ii. 30. E. D. C 170.
 Northern clearings, apparently very rare, only a few plants observed
 at Rampura, *Prain !* Sea-face at Tiger Point, plentiful, *Lace !*
 Vernac. *Akanda ; Gurtákand ; Maddár.*
 An erect spreading shrub ; yields a fibre used for fishing lines ; also a dye ;
 the sap affords an inferior "Gutta" and is medicinal.
 DISTRIB.—S. E. Asia.

108. *Pentatropis* R. Br.

135. *Pentatropis microphylla* W. & A.; F. B. I. iv. 20. *Asclepias microphylla* F. I. ii. 35. E. D. P 396.

Skirts of northern clearings, climbing over bushes, *Calcutta Garden Collectors! Clarke!*

A small twiner; properties obscure.

DISTRIB.—India; Indo-China.

109. *Dæmia* R. Br.

136. *Dæmia extensa* R. Br.; F. B. I. iv. 20. *Asclepias echinata* F. I. ii. 44. E. D. D. 9.

Canning Town only, but there plentiful, on banks of Mátla river, *Calcutta Garden Collectors! Prain!*

Vernac. *Chhagal Bati*.

A fœtid weedy climber; yields a fair fibre; said to be medicinal.

DISTRIB.—India generally; Afghanistan.

This is one of the usual constituents of the "village shrubberies" characteristic of Lower Bengal; in India it accompanies man as a weed.

110. *Sarcolobus* Wall.

Corolla white with a purplish tinge, lobes pubescent within; fruit large, globose, greyish-brown, coriaceous, not winged. . . . *globosus*,
Corolla yellow with lines of brownish purple dots, nearly glabrous within; fruit small, ellipsoid, yellow, chartaceous, with longitudinal wing-like ridges *carinatus*.

137. *Sarcolobus globosus* Wall. F. B. I. iv. 27.

Everywhere common, especially on river-banks, from the northern clearings to the sea.

Vernac. *Baoli-lata; Baoli-phal*.

A large climber; juice said by wood-cutters to be unwholesome.

DISTRIB.—Coasts of Indo-China and Malaya.

Heinig in his list states:—"The kernel of the ripe fruit is eaten." As the ripe fruit is filled with numerous subdiscoid seeds, there seemed to be here some mistake. Among Heinig's specimens is one of a plant termed "Baoli-phal," collected at Nalkora, regarding which he has noted "fruit eaten": unfortunately "Baoli-phal" has only leaves in a young condition, and the matter could not be satisfactorily settled. Recently, however, some Sundribun fishermen have brought fruiting specimens and have explained that they term the fruits "Baoli-phal" and eat the seeds, as well as the inside of the pericarp.

138. *Sarcolobus carinatus* Wall.; F. B. I. iv. 28.

Skirts of northern clearings and northern forests, common; not met with in the central or southern reserves.

Vernac. *Baoli-lati* (*vide Heinig*).

A small twiner; properties unimportant.

DISTRIB.—Coasts of W. Indo-China.

111. *Dregea* E. Mey.

139. *Dregea volubilis* Benth.; F. B. I. iv. 46. *Asclepias volubilis*
F. I. ii. 36.

River-banks in Eastern forests, *Lace!*

Vernac. *Tita Kunja*.

A stoutish twiner; properties obscure.

DISTRIB.—Throughout India; Ceylon; Malaya.

112. *Tylophora* R. Br.

140. *Tylophora tenuis* Bl.; F. B. I. iv. 42. *Asclepias tenuissima*
F. I. ii. 41.

Northern clearings and skirts of northern forests, very plentiful,
Kurs! Clarke! Prain!

A slender prostrate or twining herb; properties obscure, said to be medicinal.

DISTRIB.—S.-E. Asia.

113. *Dischidia* R. Br.

141. *Dischidia Nummularia* R. Br.; F. B. I. iv. 49.

Bagirhat Reserve forests, epiphytic, *Heinig!*

Vernac. *Pargátcha*.

A small epiphytic twiner, rooting at the nodes; properties obscure.

DISTRIB.—Indo-China; Malaya; N. Australia.

114. *Hoya* R. Br.

142. *Hoya parasitica* Wall.; F. B. I. iv. 57. *Asclepias parasitica*
F. I. ii. 42.

Everywhere throughout the forests, on trees; often very plentiful.

Vernac. *Pargátcha*.

A stout epiphytic climber; properties obscure; flowers waxy, sweet-scented.

DISTRIB.—Indo-China; Malaya.

XXXVIII.—GENTIANACEÆ.

115. *Hoppea* Willd.

143. *Hoppea dichotoma* Willd.; F. B. I. iv. 100. *Pladera pusilla*
F. I. i. 403.

Northern clearings, locally abundant, *Heinig & Gammie!*
Calcutta Garden Collectors! Prain!

A small herb; properties unimportant.

DISTRIB.—India generally; Assam; Chittagong.

116. *Limnanthemum* S. P. Gmel.

144. *Limnanthemum cristatum* Griseb.; F. B. I. iv. 131. *Menyanthes cristata* F. I. i. 459.

Northern clearings, occasional, *Prain!*

Vernac. *Pan-chuli; Chand Malla.*

A floating aquatic; properties obscure.

DISTRIB.—India; Indo-China; S. China.

XXXIX.—HYDROPHYLLACEÆ.

117. *Hydrolea* Linn.

145. *Hydrolea zeylanica* Vahl; F. B. I. iv. 133. *Nama zeylanica*
F. I. ii. 73. E. D. H 504.

Northern clearings, *Heinig & Gammie! Calcutta Garden Collectors!*

Vernac. *Kasshra; Isha-langulia.*

A procumbent herb; properties obscure.

DISTRIB.—Cosmopolitan in the Tropics.

XL.—BORAGINEÆ.

118. *Cordia* Linn.

146. *Cordia Myxa* Linn.; F. I. i. 590; F. B. I. iv. 136. E. D. C 1931.
Chandpie, *Prain!*

Vernac. *Bohnari; Lashora.*

A medium tree; wood grey, only moderately hard, but durable and seasoning well, though liable to attacks by insects; fruit medicinal, mainly demulcent.

DISTRIB.—N. Africa; Tropical Asia; N. Australia; but often planted, as is the case in this instance.

119. *Coldenia* Linn.

147. *Coldenia procumbens* Linn.; F. I. i. 448; F. B. I. iv. 144. E. D. C
1717.

Sundribuns, *Clarke.*

A prostrate scabrous annual weed; properties obscure.

DISTRIB.—Cosmopolitan in the Tropics.

This species is included in Mr. Clarke's Sundribun list: there is no Sundribun specimen in the Calcutta Herbarium. It may be looked for in the Eastern

Sundribuns (Backerganj District) and in the northern clearings. The plant has alternate crisped leaves and usually lies quite flat on the ground.

120. Heliotropium Linn.

148. Heliotropium indicum Linn.; F. I. i. 454; F. B. I. iv. 152
E. D. H 102.

Suta Khal, in clearing, not common, *Prain!*

An annual herb, mostly on waysides and in waste-places, rarely in fields; properties unimportant.

DISTRIB.—Cosmopolitan in the Tropics.

Mr. Clarke's list of Sundribun plants includes also *Heliotropium ovalifolium*. This species is not present from the Sundribuns in the Calcutta Herbarium; it should be looked for in the northern and eastern clearings.

XLI.—CONVOLVULACEÆ.

121. Stictocardia Hallier f.

149. Stictocardia tiliæfolia Hallier f. *Argyreia tiliæfolia* F. B. I.
iv. 184. *Convolvulus gangeticus* F. I. i. 467.

Banks of tidal rivers in western parts, *Kurs!* *Calcutta Garden Collectors!* Sea-face, *Heinig!*

A twining or climbing shrub; properties unimportant.

DISTRIB.—S.-E. Asia.

122. Merremia Dennst.

150. Merremia hederacea Hallier f. *Ipomœa polyantha* F. B. I. iv.
206.

Eastern Sundribuns, *Clarke!*

A twining shrub; properties unimportant.

DISTRIB.—Malaya.

123. Ipomœa Linn.

Flowers large, white; leaves ovate-cordate entire; seeds shaggy with long hairs along the angles; climbing . . . *longiflora*.
Flowers purple or, if whitish or pale-purple, with at least a dark purple eye:—

Leaves palmately 5-7-lobed; seeds shaggy with long hairs along the angles; climbing . . . *paniculata*.

Leaves not palmately or digitately lobed:—

Leaves orbicular, obtuse or emarginate or 2-lobed; seeds villous, but not shaggy with long hairs along the angles; plant creeping in sand . . . *Pes-capræ*.

Leaves acute or acuminate at the tip:—

Floating on water or rooting in mud at edges of ponds; leaves elliptic, oblong-cordate or hastate, sometimes

slightly lobed ; seeds finely silky but not shaggy along the margins *reptans*.

Climbing over bushes or trees ; leaves ovate-cordate :—

Leaves entire ; a heavy creeper with large pink-purple flowers ; seeds shaggy with long hairs along the angles *illustris*.

Leaves more or less lobed ; a light creeper with pale-purple or sometimes nearly white flowers but with always a dark-purple eye ; seeds furred but not shaggy along the angles, *sepiaria* var. *stipulacea*.

151. *Ipomœa longiflora* R. Br. *I. grandiflora* F. B. I. iv. 198.

Sea-face, *Heinig*!

A large climber ; properties unimportant.

DISTRIB.—Coasts of S.-E. Asia ; Australia ; New Caledonia ; Polynesia.

152. *Ipomœa paniculata* R. Br. *I. digitata* F. B. I. iv. 202.

Convulvulus paniculatus F. I. i. 478. E. D. I 379.

Northern forests, *Prain*!

Vernac. *Bilai-kand* ; *Bhui-kumra*.

A large climber ; roots medicinal.

DISTRIB.—Cosmopolitan in the Tropics.

153. *Ipomœa Pes-capræ* Sweet. *I. biloba* F. B. I. iv. 212. *Convulvulus Pes-capræ* F. I. i. 485. E. D. I 362.

Sea-face, very common.

Vernac. *Chhagal-kuri*.

A prostrate herb ; an excellent sand-binding species.

DISTRIB.—Cosmopolitan in the Tropics.

154. *Ipomœa reptans* Poir. *I. aquatica* F. B. I. iv. 210. *Convulvulus repens* F. I. i. 432. E. D. I 343.

Northern clearings, occasional, *Calcutta Garden Collectors*!

Vernac. *Kalmi Sák*.

A floating aquatic ; used as a vegetable.

DISTRIB.—Tropics of Eastern Hemisphere and Australia.

155. *Ipomœa illustris* Prain. *I. campanulata* var. *illustris*, F. B. I. iv. 211.

Sea-face, *Heinig*! Cheila Bogi river, *Heinig & Gammie*! Pussar and Ambaria rivers, *Prain*! Eastern river-banks, *Lace*!

A large climber with handsome flowers ; properties unimportant.

DISTRIB.—W. Indo-China ; Malaya : on coasts.

156. *Ipomœa sepiaria* Kœn. VAR. *stipulacea* F. B. I. iv. 209. *Convulvulus stipulaceus* F. I. i. 484.

Very common on the skirts of the northern forests and in the northern clearings.

Vernac. *Ban Kalmi*.

A slender climber; properties unimportant.

DISTRIB.—Lower Bengal; Chittagong.

124. *Cuscuta* Linn.

157. *Cuscuta reflexa* Roxb.; F. I. i. 446; F. B. I. iv. 225. E. D. C 2508.

Northern clearings and skirts of northern forests, *Calcutta Garden Collectors!* In central forests only noticed in one place, *Prain*.

Vernac. *Alag-lata*.

A parasitic leafless twiner; whole plant used in native medicine.

DISTRIB.—S.-E. Asia.

XLII.—SOLANACEÆ.

125. *Solanum* Linn.

Flowers white, small; leaves green on both sides, glabrous; plants without prickles *nigrum*.

Flowers blue:—

Plants without prickles; leaves very white beneath *argenteum*.

Plants armed with prickles; leaves green:—

Spines long, straight; berry large, half an inch or more across; prostrate herbs *xanthocarpum*.

Spines short, recurved; berry rather small, one-third inch or less across; scandent under-shrubs . . . *trilobatum*.

158. *Solanum nigrum* Linn.; F. B. I. iv. 229. *S. rubrum* F. I. i. 565. E. D. s 2299.

Northern clearings, rare, *Prain!*

Vernac. *Gurkhi*; *Gurkamai*.

A small under-shrub or herb; whole plant used in native medicine.

DISTRIB.—Cosmopolitan in temperate, sub-tropical and tropical regions.

159. *Solanum argenteum* Dun.

Abundant and thoroughly naturalized on banks of Mátla river, near Canning Town; *Calcutta Garden Collectors!* *Prain!*

A shrub, occasional in gardens; here wild and thoroughly established; properties obscure.

DISTRIB.—Native of S. America: here an escape.

160. *Solanum xanthocarpum* Schrad. & Wendl.; F. B. I. iv. 236.

S. diffusum F. I. i. 568. *S. Jacquinii* F. I. i. 569. E. D. s 2345.

Banks of Mátla river at Canning Town, *Prain!*

A diffuse very prickly herb; root and fruit reputed medicinal.

DISTRIB.—S.-E. Asia; Australia; Polynesia.

161. *Solanum trilobatum* Linn.; F. I. 571; F. B. I. i 236. E. D. s 2315.

General in the northern and western forests on river-banks and skirts of clearings.

A scandent under-shrub; root, leaves and fruit reputed medicinal.

DISTRIB.—S.-E. Asia: in or near tidal swamps.

XLIII.—SCROPHULARINEÆ.

126. *Angelonia* H. & B.

162. *Angelonia grandiflora* C. Morr.

Kagdip, rather common, *Prain*!

A "garden escape," though there are no gardens at Kagdip except that of the forest office, within which the species did not happen to occur. The same plant has been found by Kurz similarly established in places in the Irrawaddy Delta: the present is the first record of the species, other than as a garden plant, from Bengal.

DISTRIB.—Native of S. America.

127. *Limnophila* R. Br.

163. *Limnophila gratissima* Bl.; F. B. I. iv. 268.

Jatta, margin of the old temple tank, *Prain*!

An aquatic or marsh weed; properties unimportant.

DISTRIB.—S.-E. Asia.

128. *Herpestis* Gært. f.

164. *Herpestis Monnieria* H. B. K.; F. B. I. iv. 272. *Gratiola Monnieria* F. I. i. 141. E. D. H 149.

Northern clearings, general.

Vernac. *Adha Birni*.

A weed of marshy places; properties obscure.

DISTRIB.—Cosmopolitan in the Tropics.

129. *Vandellia* Linn.

165. *Vandellia crustacea* Benth.; F. B. I. iv. 279. *Torenia varians* F. I. iii. 96.

Northern clearings, occasional.

A weed of fields and waste places; properties unimportant.

DISTRIB.—Tropics of Eastern Hemisphere.

130. *Scoparia* Linn.

166. *Scoparia dulcis* Linn.; F. B. I. iv. 289.

Chandpie only, *Heinig & Gammie*! but there quite abundant, *Prain*!

An under-shrub ; twigs used as tooth-brushes.

DISTRIB.—Native of America, now widespread in the Eastern Hemisphere and Australia.

XLIV.—LENTIBULARIACEÆ.

131. *Utricularia* Linn.

Peduncles with a whorl of oblong vesicles about the middle

Peduncles naked or with a few obscure scales . . . *stellaris*,
 . . . *flexuosa*.
 167. *Utricularia stellaris* Linn. f. ; F. I. i. 143 ; F. B. I. iv. 328.

Ponds in northern clearings, rare.

Vernac. *Zhangi*.

A floating aquatic ; properties unimportant.

DISTRIB.—Tropics of Eastern Hemisphere and N. Australia.

168. *Utricularia flexuosa* Vahl ; F. B. I. iv. 329. *U. fasciculata*
 F. I. i. 143.

Ponds in northern clearings.

Vernac. *Zhangi*.

A floating aquatic ; properties unimportant.

DISTRIB.—S.-E. Asia ; N. Australia.

XLV.—BIGNONIACEÆ.

132. *Dolichandrone* Seem.

169. *Dolichandrone Rheedel* Seem. ; F. B. I. iv. 379. E. D. D 753.

General, but never common, from the northern forests down to the coast, *Heinig ! Prain !*

Vernac. *Gorshingiah*.

A tree, height 50 feet ; wood white, soft, brittle ; an indifferent fuel.

DISTRIB.—S.-E. Asia.

XLVI.—ACANTHACEÆ.

133. *Hygrophila* R. Br.

Unarmed herbs ; calyx 5-toothed :—

Leaves lanceolate ; capsule much longer than the calyx

quadri-valvis.

Leaves obovate ; capsule hardly longer than the calyx

phlomooides var. *Roxburghii*.

Spinescent herbs ; calyx 4-partite ; leaves lanceolate . . . *spinosa*.

170. *Hygrophila quadri-valvis* Nees ; F. B. I. iv. 408.

Chandpie, *Heinig & Gammie !*

A weed of marshy places ; properties obscure.

DISTRIB.—India ; Malaya ; Indo-China.

171. *Hygrophila phlomoides* Nees VAR. *Roxburghii* F. B. I. iv. 408.

Ruellia obovata F. I. iii. 51.

Common in the northern parts, *Hooker ! Clarke ! Kurs ! Prain !*

A weed of marshy places ; properties obscure.

DISTRIB.—Sub-Himalayan region ; Bengal ; Indo-China.

172. *Hygrophila spinosa* T. And. ; F. B. I. iv. 408. *Ruellia longi-*

folia F. I. iii. 50. E. D. H 508.

Northern clearings, common.

Vernac. *Kanta Kalika ; Kulia Khara.*

A spinous weed of wet places ; properties obscure.

DISTRIB.—India generally : Andamans, but there probably introduced.

134. *Hemigraphis* Nees.

173. *Hemigraphis hirta* T. And. ; F. B. I. iv. 422. *Ruellia hirta*

F. I. iii. 46.

Northern clearings, very rare, *Prain !*

A prostrate weed ; properties unimportant.

DISTRIB.—Gangetic Plain generally.

135. *Acanthus* Linn.

Leaves spinous ; bracteoles broad ; corolla blue ; stems erect

ilicifolius.

Leaves unarmed ; bracteoles 0 ; corolla white with a yellowish tinge ; climbing *volubilis.*

174. *Acanthus ilicifolius* Linn. ; F. I. iii. 32 ; F. B. I. iv. 481. E. D.

A 324.

Everywhere on river-banks and in low swampy places within the forests.

Vernac. *Hargosa ; Kintki.*

An under-shrub ; an excellent mud-binding species.

DISTRIB.—S.-E. Asia and N. Australia : on coasts.

Heinig reports from the western forests another species with spinous leaves, *A. ebracteatus*, but no specimens of this have reached the Calcutta Herbarium. It should be looked for ; it differs from *A. ilicifolius* in having no bracteoles.

175. *Acanthus volubilis* Wall. ; F. B. I. iv. 481.

River-banks in the western forests, very rare, *Wallich ! Calcutta Garden Collectors ! Heinig !*

A climbing under-shrub ; properties unimportant.

DISTRIB.—Indo-China ; Malaya : on coasts.

XLVII.—VERBENACEÆ.

136. *Lantana* Linn.

Leaves usually in whorls of 3, sometimes opposite ; branches covered throughout with spreading hairs *trifolia*.

Leaves usually opposite, sometimes in whorls of 3 ; branches scabrid with adpressed hairs *indica*.

176. *Lantana trifolia* Linn.; F. B. I. iv. 563.

Eastern Sundribuns, at Barisal, *Clarke*!

A shrub, 3-8 feet high ; a common weed on banks of rivers and creeks, of no economic importance. Though never yet recorded from the country between the Madumati and the Hughli, there is much likelihood that it occurs there ; it ought to be searched for. Another reason for calling attention to the plant is the difficulty there is in distinguishing it from *Lantana indica*, and the further difficulty in distinguishing either of these *Lantanas* from *Lippia geminata*. The present is an American species, somewhat recently introduced to India.

177. *Lantana indica* Roxb.; F. I. iii 89 ; F. B. I. iv. 562.

Northern clearings, apparently very rare, *Calcutta Garden Collectors*!

A shrub 3-8 feet high ; of no economic importance : exceedingly like the preceding species which is often only to be distinguished by its spreading pubescence. Though very common in Lower Bengal, outside the Sundribun area, it seems to have barely yet established itself in Sundribun clearings.

DISTRIB.—India generally ; Beluchistan ; Tropical Africa.

137. *Lippia* Linn.

Perennial, erect, softly strigose shrubs ; leaves ovate-oblong, crenate ; peduncles mostly opposite ; bracts ovate-acuminate

geminata.

Annual, creeping, minutely hairy herbs ; leaves cuneate-spathulate, serrate ; peduncles rarely opposite ; bracts obovate-acute

nodiflora.

178. *Lippia geminata* H. B. & K ; F. B. I. iv. 563.

Northern clearings, rare, *Heinig*!

A shrub 3-8 feet high ; of no economic importance : resembles *Lantana indica* even more closely than *Lantana trifolia* sometimes does, and when in flower often hardly distinguishable. When in fruit *Lippia geminata* is recognised by its fruit separating into two 1-seeded pyrenes ; the fruits of the two *Lantanas* remain entire and contain the two 1-seeded pyrenes. In the Gangetic Plain north of the Sundribuns this is even more common than *Lantana indica*, but like that species has as yet hardly established itself in the Sundribun clearings.

DISTRIB.—E. Bengal : native of America.

179. *Lippia nodiflora* Rich.; F. B. I. iv. 563. E. D. L 451.

Common in every clearing; occasional in suitable localities (upper margins of mud-banks) throughout the forests; also at the sea-face.

Vernac. *Bhui Okra*.

A prostrate herb; an excellent sand-binding and still more effective mud-binding species.

DISTRIB.—Cosmopolitan in tropical and sub-tropical regions.

138. *Premna* Linn.

180. *Premna integrifolia* Linn.; F. I. iii. 81; F. B. I. iv. 574. *P. serratifolia* F. I. iii. 77. *P. spinosa* F. I. iii. 77. E. D. p 1233.

River-banks, widely spread from the northern clearings to the sea, but not plentiful except at the sea-face, *Calcutta Garden Collectors! Gamble! Ellis! Prain!*

Vernac. *Goniári; Bhút Biravi*.

A shrub or small tree; wood white with reddish streaks, moderately hard; used as fuel.

DISTRIB.—Coasts of S.-E. Asia; E. Africa.

139. *Vitex* Linn.

Leaves 3-foliolate, and occasionally 1-foliolate; leaflets without petiolules, obovate and obtuse *trifolia*.

Leaves 5-foliolate, and occasionally 3-foliolate; leaflets with distinct petiolules, lanceolate and acute *Negundo*.

181. *Vitex trifolia* Linn. f.; F. I. iii. 69; F. B. I. iv. 583. E. D. v 181.

Sea-face to the east of the river Madumati.

Vernac. *Pani Sanbhalu*.

A small deciduous tree or large shrub; wood greyish-white, hard; used as fuel.

DISTRIB.—S.-E. Asia; N. Australia.

Though this has not yet been recorded from the central or western Sundribuns, it grows in similar situations to *V. Negundo* in a locality so adjacent that there is no reason why it should not occur. The species should, therefore, be looked for. It is exceedingly like, and might easily be casually mistaken for, *V. Negundo*.

182. *Vitex Negundo* Linn.; F. I. iii. 70; F. B. I. 583. E. D. v 164.

Sea-face at Tiger Point and elsewhere, plentiful, *Heinig! Prain!*

Vernac. *Sanbhalu; Nishinda*.

A deciduous small tree or large shrub; wood greyish-white, hard; used as fuel.

DISTRIB.—S.-E. Asia; Afghanistan.

140. *Clerodendron* Linn.

Corolla irregularly salver-shaped, never exceeding an inch in length; panicles axillary:—

Leaves obovate or elliptic, sub-obtuse, opposite or very rarely in whorls of 3; calyx in fruit closely applied to the base of the berry
inermis.

Leaves elliptic, acute, or linear-oblong, generally in whorls of 3; calyx in fruit somewhat spreading, the fruit considerably larger

neriifolium.

Corolla narrowly funnel-shaped, never less than 3 inches in length; panicle terminal; leaves narrowly lanceolate . . . *Siphonanthus*.

183. *Clerodendron inerme* Gært. n. ; F. I. iii. 58; F. B. I. iv. 589. E. D. C 1377.

Common on river-banks everywhere from the northern clearings to the sea, occasionally also in the forests.

Vernac. *Ban-jai*; *Ban-jám*; *Ban-jumet*; *Ban-modi*; *Butráj*.

An under-shrub; used as fuel.

DISTRIB.—India; Indo-China: on coasts.

184. *Clerodendron neriifolium* Wall.; F. B. I. iv. 589. *Volkameria neriifolia* F. I. iii. 64.

Sea-face, apparently very rare, *Heinig!*

An under-shrub; used as fuel.

DISTRIB.—Indo-China; Malaya; Philippines; Australia; China: on coasts.

185. *Clerodendron Siphonanthus* R. Br.; F. B. I. iv. 595. *Siphonanthus indica* F. I. iii. 67; E. D. C 1394.

Reserved forests, associated with *C. inerme*, *fide Heinig*.

Vernac. *Bámankhatti*.

A shrub, soft-wooded, useless.

DISTRIB.—S.-E. Asia: often planted.

This is given by Heinig in his list, but as no specimens of the plant have been sent, the record requires verification. It is possibly a plant of the same category as *Bouea*, *Cassia Fistula*, *Diospyros Embryopteris*, *Ægle*, etc.

141. *Avicennia* Linn.

Leaves obovate or elliptic obtuse, yellowish beneath; capsule broadly oblong obtuse *officinalis*.

Leaves lanceolate acute, white beneath; capsule narrowly conical, acute *alba*.

186. *Avicennia officinalis* Linn.; F. B. I. iv. 604. *A. tomentosa* F. I. iii. 88. E. D. A 1661.

Common everywhere from the northern borders to the sea-face.

Vernac. *Báen*; *Bani*; *Bina*.

A large timber-tree 40-60 feet high; wood dark-grey, hard, used for planking, beams, drain-pipes, sluices, oil-mills, jhools and dabbas of boats, and for fuel; exudes a gum applied to ulcers. The roots send up soft and pith-like blind root-suckers.

DISTRIB.—S.-E. Asia; N. Australia; Polynesia.

This is one of the tallest and is much the thickest of Sundribun species; the stems of old trees are very apt to become hollow. The structure of the wood

is somewhat peculiar, in that the fibres of any particular ring of growth do not pass vertically upwards, but instead diverge "herring-bone fashion" from an indistinct vertical linear raphe, which appears to correspond to the plane of an original branch, at an angle of about 15°, their upper ends blending in a much less definite raphe midway between two raphes of divergence. The raphes of divergence of the ring of growth next above and next below any particular ring alternate, so that in weathered trunks and to a less extent in freshly cut sound logs, a lace-work arrangement of the fibres of the various rings of growth presents itself. This configuration and arrangement is to be observed also in the bark of the *Bakayan*, where it is more immediately patent, though perhaps less definite.

The wood-cutters speak of the existence of four distinct Báens: so far as could be gathered one of these is *Avicennia alba*, Dudhi Báen, with acute leaves and narrow sharp-pointed capsules, which is certainly a very distinct species. The other three have obtuse leaves and broad capsules and are all apparently forms of the present species. The three forms are (1) the tree, 40-60 feet high, with a girth of 12-15 feet, which has sometimes ovate-obtuse, sometimes oblong-obtuse leaves; (2) the shrub or small tree with broader ovate-obtuse leaves; (3) the shrub or small tree with narrower oblong-obtuse leaves. These three are, however, only distinguishable by the characters indicated and exhibit no botanically distinctive characters.

87. *Avicennia alba* Bl. *A. officinalis* var. *alba* F. B. I. iv. 604. E. D. A 1665.

River-banks, very rare; at Malanchi, *Lace & Prain!* Nalkhora, *Prain!*

Vernac. *Dudhi Báen*.

A small shrub; used as firewood.

DISTRIB.—Coasts of W. India; Indo-China; Malaya; N. Australia.

XLVIII.—LABIATÆ.

142. *Ocimum* Linn.

Pedicels of individual flowers as long as calyx . . . *sanctum*.

Pedicels of individual flowers shorter than the calyx . . . *Basilicum*.

188. *Ocimum sanctum* Linn.; F. I. iii. 14; F. B. I. iv. 609. E. D. O 31.

Chandpie, *Heinig & Gammie!* Jatta, among ruins, *Prain!*

Vernac. *Túlsi*.

A herb or under-shrub; sacred.

DISTRIB.—Orient; S.-E. Asia; Australia; Polynesia.

189. *Ocimum Basilicum* Linn.; F. I. iii. 17; F. B. I. iv. 60². *O. pilosum* F. I. iii. 16. E. D. O 18.

Rampura, *Prain!*

Vernac. *Babui Túlsi*.

A herb or under-shrub: medicinal, and used as a flavouring in cookery.

DISTRIB.—Tropics of Eastern Hemisphere; Polynesia.

143. *Anisomeles* R. Br.

- 190.
- Anisomeles ovata*
- R. Br.; F. B. I. iv. 672: VAR.
- mollissima*
- .

Ajuga disticha F. I. iii. 2. E. D. A 1136.Jatta, among ruins, *Prain*!Vernac. *Gobura*.

A coarse annual herb; properties obscure.

DISTRIB.—S.-E. Asia.

144. *Leucas* R. Br.

- 191.
- Leucas linifolia*
- Spreng.; F. B. I. iv. 690.
- Phlomis seylanica*
- F. I. iii. 9. E. D. L 323.

Northern clearings, common.

Vernac. *Hal-kúsa*; *Guma*.

A herb; properties obscure.

DISTRIB.—Mauritius; S.-E. Asia.

INCOMPLETÆ.

XLIX.—AMARANTACEÆ.

145. *Amarantus* Linn.Bracts awned, recurved, longer than the sepals; sepals 5; stamens 5
paniculatus.Bracts acute but hardly awned, shorter than the sepals; sepals 3;
stamens 3:—Clusters of flowers both terminal and axillary; utricle with an
acute tip *viridis*.Clusters of flowers, all axillary; utricle blunt *polygamus*.

192. *
- Amarantus paniculatus*
- Linn.; F. B. I. iv. 718.
- A. frumentaceus*
- F. I. iii. 610. E. D. A 925.

Canning Town, *Calcutta Garden Collectors*!

A large herb, 4-5 feet high; cultivated as a pot-herb.

DISTRIB.—Trop. Africa and Asia.

- 193.
- Amarantus viridis*
- Linn.; F. I. iii. 605; F. B. I. iv. 720.
-
- E. D. A 953.

Kagdip, *Prain*!Vernac. *Tún-túni Nati*.

A weed; used as a pot-herb.

DISTRIB.—Cosmopolitan in the Tropics.

194. *
- Amarantus polygamus*
- Linn.; F. B. I. iv. 721.
- A. polygonoides*
- F. I. iii. 602. E. D. A 941.

Canning Town, *Calcutta Garden Collectors*!Vernac. *Champa Nati*.

A small cultivated pot-herb.

DISTRIB.—Cosmopolitan in the Tropics.

146. Psilotrichum Bl.

195. *Psilotrichum ferrugineum* Moq.; F. B. I. iv. 725. *Achyranthes ferruginea* F. I. i. 675.

Northern and western parts, in clearings and on mud-banks.

Vernac. *Rakto Sirinchi*.

A weed; of no economic importance.

DISTRIB.—Common in Lower Bengal.

147. Alternanthera Forsk.

196. *Alternanthera sessilis* R. Br.; F. B. I. iv. 731. *Achyranthes triandra* F. I. i. 678. E. D. A 877.

Northern and western parts, in clearings and on mud-banks.

A weed; of little importance except as a mud-binding species.

DISTRIB.—Cosmopolitan in the Tropics.

L.—CHENOPODIACEÆ.

148. Salicornia Linn.

197. *Salicornia brachiata* Roxb.; F. I. i. 84; F. B. I. v. 12 E. D. S 527.

Sundribuns, "on such low wet salt ground as is overflowed by the spring tides," *Roxburgh*.

A gregarious under-shrub; yields barilla; a good mud-binding species.

DISTRIB.—N. Ceylon; Coromandel Coast.

149. Arthrocnemum Moq.

198. *Arthrocnemum indicum* Moq.; F. B. I. v. 12. *Salicornia indica*, F. I. i. 85. E. D. A 1475.

Sundribuns, "grows with the former (*Salicornia brachiata*) and on similar ground," *Roxburgh*.

Vernac. *Jadu Palang*.

A gregarious prostrate undershrub; yields barilla; a mud-binding species.

DISTRIB.—Trop. Africa; coasts of India both west and east.

150. Suaeda Forsk.

199. *Suaeda maritima* Dumort.; F. B. I. v. 14. *Salsola indica* F. I. ii. 62. E. D. S 2990.

General, on muddy banks.

An erect herb ; sometimes used as a vegetable.

DISTRIB.—Asia generally ; Europe ; N. Africa ; N. America.

151. *Basella* Linn.

200. *Basella rubra* Linn , F. B. I. v. 20. *B. alba* F. I. ii. 104.
E. D. B 203.

Clearings, cultivated ; at Chandpie and Canning Town, also feral,
Prain!

Vernac. *Poi Ság ; Ban Poi.*

A much-branched twining herb : a favourite vegetable.

DISTRIB.—Tropical Africa and Asia.

The form seen in cultivation was in each case the very large form that is propagated by cuttings and not by seed ; the feral state was the white-flowered Ban Poi, probably not truly wild, but only feral by reversion, in our area.

LI.—ARISTOLOCHIACEÆ.

152. *Aristolochia* Linn.

201. *Aristolochia indica* Linn. ; F. I. iii. 489 ; F. B. I. v. 75.
E. D. A 1398.

Sea-face at Tiger Point, prostrate on the sand, *Heinig!*

Vernac. *Isharmal.*

A prostrate or climbing under-shrub ; used in native medicine ; also (*Heinig*) a sand-binding plant.

DISTRIB.—Throughout India and in Chittagong.

LII.—LAURINEÆ.

153. *Cassytha* Linn.

202. *Cassytha filiformis* Linn. ; F. I. ii. 314 ; F. B. I. v. 188. E. D.
C 805.

Sea-face, parasitic, *Heinig!*

Vernac. *Akas-bél.*

A parasitic leafless twiner ; reputed medicinal.

DISTRIB.—Cosmopolitan in the Tropics.

LIII.—LORANTHACEÆ.

154. *Loranthus* Linn.

Flowers with scale-like bracts but without bracteoles :—

Leaves beneath covered with a rusty or whitish scurfy tomentum ;
corolla-tube 4-cleft *Scurrula.*

Leaves beneath glabrous ; corolla-tube shortly 5-fid *longiflorus.*

Flowers with both bracts and bracteoles, the latter connate in a cup; leaves glabrous, corolla tube 6-angled or rarely 5-angled below, and usually 6-partite, rarely 5-partite above . *globosus*.

203. *Loranthus Scurrula* Linn.; F. I. i. 550; ii. 186; F. B. I. v. 208; var. *bengalensis*.

General, especially on Gengwa (*Excœcaria Agallocha*).

Vernac. *Banda*; *Pargátcha*.

A leafy parasite; properties unimportant.

DISTRIB. (of this variety)—Assam; East Bengal.

204. *Loranthus longiflorus* Desr.; F. B. I. v. 214. *L. bicolor* F. I. i. 548; ii. 185. E. D. L. 549.

General, and on many species.

Vernac. *Bara Manda*; *Banda*; *Pargátcha*.

A leafy parasite; properties unimportant.

DISTRIB.—Throughout India.

205. *Loranthus globosus* Roxb.; F. I. i. 550; ii. 187; F. B. I. v. 220.

Occasional, and only seen on *Keora* (*Sonneratia apetala*).

Vernac. *Chhota Manda*; *Banda*; *Pargátcha*.

A leafy parasite; properties unimportant.

DISTRIB.—India generally; W. Indo-China; Malaya.

155. *Viscum* Linn.

206. *Viscum monoicum* Roxb.; F. I. iii. 763; F. B. I. v. 224. E. D. v. 154.

Occasional; Bringoalni, *Heinig & Gammie*! Suta Khal, *Prain*!

Vernac. *Banda*; *Pargátcha*.

A leafy parasite; properties unimportant.

DISTRIB.—India; Indo-China.

LIV.—EUPHORBIACEÆ.

156. *Euphorbia* Linn.

Glands of the involucre with a distinct membranous, petaloid limb

hypericifolia var. *indica*.

Glands of the involucre narrowly winged or wingless:—

Erect or ascending herbs; leaves distinctly nerved and copiously hispid with crisped hairs; leaves rarely less than three-quarters of an inch long *pilulifera*.

Prostrate herbs; leaves very indistinctly nerved and sparingly hispid; leaves never more than one-third of an inch long

thymifolia.

207. *Euphorbia hypericifolia* Linn. VAR. *indica* F. B. I. v. 512. *E. uniflora* F. I. ii. 473. E. D. E. 512.

Northern clearings, rare, *Prain!*

A weed ; properties unimportant.

DISTRIB.—Tropical Asia and Africa.

208. *Euphorbia pilulifera* Linn. ; F. B. I. v. 250. *E. hirta* F. I. ii. 472. E. D. E 531.

Northern clearings, *Calcutta Garden Collectors!*

Vernac. *Bara Kerui*.

A weed of waste places ; properties unimportant.

DISTRIB.—Cosmopolitan in tropical and sub-tropical regions.

209. *Euphorbia thymifolia* Burm. ; F. I. ii. 473 ; F. B. I. v. 252. E. D. E 549.

Northern clearings, rare, *Prain!*

Vernac. *Çveta Kerui*.

A prostrate field-weed ; properties strongly purgative.

DISTRIB.—Tropics everywhere, except in N. Australia.

157. *Bridelia* Willd.

210. *Bridelia stipularis* Bl. ; F. B. I. v. 270. *B. scandens*, F. I. iii. 736. E. D. B 873.

Northern forests, *Calcutta Garden Collectors!*

Vernac. *Harinhárú*.

A large subsucculent evergreen shrub ; wood hard, brown, used as fuel.

DISTRIB.—Trop. Africa ; S.-E Asia.

158. *Agyneia* Vent.

211. *Agyneia bacciformis* A. Juss. ; F. B. I. v. 285. *Phyllanthus bacciformis* F. I. iii. 661.

Clearings, and open muddy places in northern and western parts ; common.

A sub-littoral herb or under-shrub ; properties unimportant.

DISTRIB.—Mauritius ; Coromandel Coast ; Ceylon ; Java.

159. *Phyllanthus* Linn.

212. *Phyllanthus Niruri* Linn ; F. I. iii. 659 ; F. B. I. v. 298. E. D. P 657.

Northern clearings, very plentiful.

Vernac. *Bhui Amla*.

A field weed ; properties medicinal—used externally for skin-affectations, internally as a febrifuge.

DISTRIB. Tropics everywhere, except in N. Australia.

160. *Breynia* Forst.

213. *Breynia rhamnoides* Muell-Arg.; F. B. I. v. 330. *Phyllanthus Vitis-Idæa* F. I. iii. 665. E. D. B 858.

Reserved forests, *Heinig!* Jatta, among ruins, *Praïn!*
Vernac. *Kali Siki.*

A shrub or small tree; an unimportant weed.

DISTRIB.—S.-E. Asia.

161. *Cyclostemon* Bl.

214. *Cyclostemon assamicus* Hook. f.; F. B. I. v. 342.

Reserved forests, *Heinig!* *Heinig & Gammie!*

Vernac. *Ban Bokal.*

A tree, 30 feet high; wood brown, hard, used for planking.

DISTRIB.—Himalaya; Indo-China.

162. *Antidesma* Linn.

215. *Antidesma Ghaesembilla* Gærtn.; F. B. I. v. 357. *A. paniculatum* F. I. iii. 770. *A. pubescens* F. I. iii. 770. E. D. A 1219.

Jatta, among ruins, *Praïn!*

Vernac. *Khúdi Jamb; Timtóa.*

A small tree; leaves and fruit eaten; wood used as fuel.

DISTRIB.—Tropics of the Eastern Hemisphere.

163. *Croton* Linn.

216. *Croton oblongifolius* Roxb.; F. I. iii. 685; F. B. I. v. 386.
E. D. C 2180.

Northern forests, *Heinig!*

Vernac. *Chucka; Uri-ám (fide Heinig).*

A small deciduous tree; wood whitish-yellow, fairly hard and heavy but liable to crack, used as fuel; seeds yield a purgative oil.

DISTRIB.—India; Indo-China.

This tree is often used as a fence, whence possibly its occurrence in our area is to be explained.

164. *Chrozophora* Neck.

217. *Chrozophora plicata* A. Juss; F. B. I. v. 409. *Croton plicatus* F. I. iii. 681. E. D. C 2211.

Northern clearings, *Praïn!*

Vernac. *Khúdi Okra.*

An annual but sometimes shrubby weed; leaves yield a dye; seeds purgative; liber yields a fibre; whole plant used as fuel.

DISTRIB.—India; Orient; S. Europe; N. Africa.

165. *Acalypha* Linn.

218. *Acalypha indica* Linn.; F. I. iii. 675; F. B. I. v. 416. E. D.
A 306.

Jatta, among ruins, *Prain*!

Vernac. *Khokli*.

An annual weed; whole plant medicinal—expectorant or emetic according to dose.

DISTRIB.—Tropics of Eastern Hemisphere.

166. *Trewia* Linn.

219. *Trewia nudiflora* Linn.; F. I. iii. 837; F. B. I. v. 423. E. D.
F 525.

Sea-face, *Heinig*! Northern clearings, not planted.

Vernac. *Pitáli*.

A large tree; wood soft, not durable, used in making native drums; pulp of fruit sometimes eaten.

DISTRIB.—S-E. Asia.

167. *Mallotus* Lour.

220. *Mallotus repandus* Muell-Arg.; F. B. I. v. 442. *Rottlera*
dicocca F. I. iii. 829.

Northern parts, *Calcutta Garden Collectors*!

Vernac. *Nuna Bhanduri*; *Akús*.

An erect or climbing shrub; wood yellowish-white, hard, used as fuel.

DISTRIB.—S-E. Asia; New Caledonia.

Heinig cites the first vernacular name here given as connoting *Croton caudatus*, which it apparently does in the Gangetic Plain. So far, however, specimens of *Croton caudatus* have not been sent from the Sundribuns to the Calcutta Herbarium, while the name is given by our collectors along with specimens of *Mallotus repandus*. The two plants are not unlike each other and the use of the same name for both is not surprising. *Croton caudatus* should be looked for.

168. *Sapium* P. Br.

221. *Sapium indicum* Willd.; F. I. iii. 692; F. B. I. v. 471. E. D.
S 833.

General, *Roxburgh*, *T. Thomson*! *Clarke*! *Heinig*! *Prain*!

Vernac. *Batul*.

A tree, 20 feet high; wood light-brown, soft, used as fuel; seeds used by fishermen to poison water.

DISTRIB.—Southward to Tenasserim.

169. *Excoecaria* Linn.

222. *Excoecaria Agallocha* Linn.; F. I. iii. 756; F. B. I. v. 472
E. D. E 593

Extremely plentiful everywhere, from the northern clearings to the sea-face.

Vernac. *Gengwa*; *Geria*; *Gheria*; *Geo*.

A tree, 30-50 feet high; wood white, soft, chiefly used as fuel, but also for making jhools, dabbas, posts, planks, native drums and toys: charcoal also is made from it and an oil is extracted. The juices of this tree, which is the commonest of all the Sundribun species, are poisonous.

DISTRIB.—Coasts of S.-E. Asia; N. Australia; and Polynesia.

The breathing organs developed in connection with the roots of *Gengwa* do not assume the form of vertical blind root-suckers like those of *Amoora*, *Avicennia*, *Sonneratia*, etc., but consist of horizontal thickened segments, richly furnished with lenticels, that protrude through the mud, exactly as in *Carapa obovata*.

LV.—URTICACEÆ.

170. *Trema* Lour.

223. *Trema orientalis* Bl.; F. B. I. v. 484. *Celtis orientalis*
F. I. ii. 65. E. D. T 522.

Jatta, among ruins, *Prain*!

Vernac. *Chikun*.

A large tree-weed; wood soft, used for making charcoal; liber yields a tolerable fibre.

DISTRIB.—S.-E. Asia.

171. *Streblus* Lour.

224. *Streblus asper* Lour.; F. B. I. v. 489. *Trophis aspera*
F. I. iii. 761. E. D. S 2912.

Northern forests, *Calcutta Garden Collectors*!

Vernac. *Shiora*.

A shrub or small tree; wood white, moderately hard, close-grained, tough, elastic; used to make cart-wheels, and gives a good fuel; juice medicinal, and used instead of rennet; the twigs are used in cleaning teeth; the leaves are used to polish wood.

DISTRIB.—Everywhere throughout S.-E. Asia.

This is often used as a hedge-plant—a purpose which it serves admirably; possibly its presence in our area is due to this fact.

172. *Ficus* Linn.

Petiole rigid, never more than half-an-inch long, usually shorter;
aves ovate or rhomboid-elliptic . . . *retusa* var. *nitida*.

Petiole flexible, never less than an inch and a half long, usually longer :—

Leaves 3-nerved at base ; petiole not exceeding two inches long *infectoria*.

Leaves 5-7-nerved at base ; petiole two and a half inches long or longer :—

Stipules large ; petiole two and a half to three and a half inches long ; leaf-blade with a cuspidate apex one-fifth the length of the blade proper *Rumphii*.

Stipules minute ; petiole three to four inches long ; leaf-blade with a caudate apex half the length of the blade proper
religiosa.

225. *Ficus retusa* Linn. VAR. *nitida* King ; F. B. I. v. 541. *F. Benamina* F. I. iii. 550.

Reserved Forests, *Heinig! Lace!*

Vernac. *Jir; Zir*.

A tree, 50 feet high ; wood worthless.

DISTRIB.—S.-E. Asia ; N. Caledonia.

226. *Ficus infectoria* Roxb. ; F. I. iii. 550 ; F. B. I. v. 515. E. D. F 216.

Jatta, among ruins, *Prain!*

Vernac. *Pakúr*.

A low deciduous tree ; wood worthless.

DISTRIB.—S.-E. Asia. In India it is often planted, as it possibly originally was here.

227. *Ficus Rumphii* Bl. ; F. B. I. v. 512. *F. cordifolia* F. I. iii. 548. E. D. F 265.

Sea-face, *Heinig!* Jatta, among ruins, *Prain!*

Vernac. *Ausat; Gaiasvattha*.

A large tree ; wood worthless.

DISTRIB.—S.-E. Asia.

228. *Ficus religiosa* Linn. ; F. I. iii. 547 ; F. B. I. v. 513.

Jatta, growing on an old pagoda, *Prain!*

Vernac. *Asvattha; Ausat*.

A large tree ; wood worthless. A sacred species, whence possibly its presence here.

DISTRIB.—Bengal generally to the foot of the Himalaya ; C. India : elsewhere planted.

LVI.—CASUARINÆ.

173. *Casuarina* Forst.

229. *Casuarina equisetifolia* Forst. ; F. B. I. v. 509. *C. muricata* F. I. iii. 519.

Banks of Jeodhara Khal, self-sown, *Lace! Prain!*

Vernac. *Bilati Fau.*

A tall handsome tree; wood brown, very hard and durable, but apt to crack; makes excellent fuel.

DISTRIB.—Shores of Indo-China; Malaya; Australia; Polynesia.

The presence of this species within our area as a wild tree, far from any planted examples, was first noticed by Mr. Lace. Probably the seeds which have given origin to these trees along the Jeodhara Khal, have been brought down by the stream from Morellganj, where an avenue of *Casuarinas* exists that was planted about 100 years ago.

LVII.—CERATOPHYLLÉE.

174. *Ceratophyllum* Linn.

230. *Ceratophyllum demersum* Linn.; F. B. I. v. 639. C.
verticillatum F. I. iii. 624.

Ponds and jhils in northern clearings.

Vernac. *Fhangi.*

A submerged aquatic; properties unimportant.

DISTRIB.—Cosmopolitan in the Tropics.

MONOCOTYLEDONES.

LVIII.—HYDROCHARIDÉE.

175. *Hydrilla* Rich.

231. *Hydrilla verticillata* Casp.; F. B. I. v. 659. *Serpicula verticillata* F. I. iii. 578. *Vallisneria verticillata* F. I. iii. 751.

Ponds and jhils in northern clearings.

Vernac. *Fhangi; Kuréli.*

An aquatic weed; properties unimportant.

DISTRIB.—Tropical and sub-tropical regions of the Eastern Hemisphere and Australia.

176. *Lagarosiphon* Harv.

232. *Lagarosiphon Roxburghii* Benth.; F. B. I. iii. 659. *Vallisneria alternifolia* F. I. iii. 50.

Ponds and jhils in northern clearings.

Vernac. *Rasna-jhangi.*

An aquatic weed; properties unimportant.

DISTRIB.—S.-E. Asia.

177. *Vallisneria* Linn.

233. *Vallisneria spiralis* Linn.; F. B. I. iii. 660. *V. spiraloïdes* F. I. iii. 750. E. D. v 14.

Ponds and jhils in northern clearings.

Vernac. *Syála*.

An aquatic weed ; properties unimportant.

DISTRIB.—Cosmopolitan in tropical and sub-tropical regions.

178. *Ottelia* Linn.

234. *Ottelia alismoides* Pers. ; F. B. I. v. 662. *Damasonium indicum* F. I. ii. 216.

Ponds in northern clearings, rare, *Heinig*!

Vernac. *Parmi Kalla*.

An aquatic weed ; properties unimportant.

DISTRIB.—S.-E. Asia ; N. Australia.

LIX. — ORCHIDACEÆ.

179. *Oberonia* Lindl.

235. *Oberonia Gammiei* King & Pantling.

Eastern forests, *Heinig & Gammie*! *Prain*! *Lace*!

An epiphytic orchid ; properties insignificant.

180. *Dendrobium* Sw.

Leaves equitant, fleshy, distichous ; flowers small . . . *anceps*.

Leaves not equitant, subcoriaceous ; flowers showy . . . *Pierardi*.

236. *Dendrobium anceps* Sw. ; F. I. iii. 487 ; F. B. I. v. 724.

Reserved Forests, *Roxburgh*, *Heinig & Gammie*! *Lace*!

An epiphytic orchid ; of no economic value.

DISTRIB.—E. Himalaya ; Assam ; Tenasserim.

237. *Dendrobium Pierardi* Roxb. ; F. I. iii. 482 ; F. B. I. v. 738.

"Delta of the Ganges," *Roxburgh*.

A showy epiphytic orchid.

DISTRIB.—E. Himalaya ; Chittagong ; Tenasserim.

For this species the *locus classicus* is the Sundribuns, though it has not been collected there since *Roxburgh's* day ; it should be looked for.

181. *Cirrhopetalum* Lindl.

238. *Cirrhopetalum Roxburghii* Lindl. ; F. B. I. v. 774. *Ærides radiatum* F. I. iii. 476.

Eastern forests, *Carey*, *vide Roxburgh* ; *Prain*! *Lace*!

An epiphytic orchid with small but handsome flowers.

182. *Trias* Lindl.

239. *Trias oblonga* Lindl. ; F. B. I. v. 780.

Eastern forests, *Heinig & Gammie*! *Prain*! *Luce*!

An epiphytic orchid ; of no economic importance.

DISTRIB.—Chittagong ; Tenasserim.

183. *Luisia* Gaud.

Stems rather stout ; sepals and petals pale yellowish-green ; epichile of lip rhomboid, subtruncate, hypochile saccate *teretifolia*.

Stems very slender ; sepals green outside, rose-purple inside, petals rose-purple with green base and tip ; epichile of lip wide-ovate, hypochile almost flat *brachystachys*.

240. *Luisia teretifolia* Gaud. ; F. B. I. vi. 22. *Cymbidium triste* F. I. iii. 46 :

General, but not plentiful, *Egerton, fide Roxburgh* (1809) ; *Heinig & Gammie ; Prain !*

Vernac. *Pargátcha*.

An epiphytic orchid ; of no economic value.

DISTRIB.—S.-E. Asia ; Melanesia.

241. *Luisia brachystachys* Bl. ; F. B. I. vi. 23.

Everywhere in the eastern and central forests, very common, *Heinig ! Heinig & Gammie ! Prain ! Lace !*

Vernac. *Pargátcha*.

An epiphytic orchid ; of no economic value.

DISTRIB.—Himalaya ; Assam ; Tenasserim.

184. *Saccolabium* Bl.

Peduncle slender, long, laxly paniculately branched ; lip with a long cylindrical spur *ochraceum*.

Peduncle stout, short ; lip with a short conical spur :—

Peduncles shortly corymbosely branched *longifolium*.

Peduncles simple, flowers in umbel-like corymbs *papillosum*.

242. *Saccolabium ochraceum* Lindl. ; F. B. I. vi. 62.

Eastern forests, rather common, *Heinig ! Heinig & Gammie ! Prain ! Lace !*

Vernac. *Pargátcha*.

An epiphytic orchid ; properties unimportant.

DISTRIB.—S. India ; Ceylon ; E. Himalaya ; Khasia ; Tenasserim.

243. *Saccolabium longifolium* Hook. f. ; F. B. I. vi. 62.

Eastern forests, at Supoti, *Heinig !*

Vernac. *Pargátcha*.

An epiphytic orchid ; properties unimportant.

DISTRIB.—E. Himalaya ; Assam ; Tenasserim.

244. *Saccolabium papillosum* Lindl. ; F. B. I. vi. 63. E. D. A 317.

Reserved forests, not uncommon, *Calcutta Garden Collectors!*
Heinig! Lace!

Vernac. *Pargátcha*; ? *Rasna*.

An epiphytic orchid; properties unimportant.

DISTRIB.—Circars; E. Himalaya; Assám; Tenasserim.

185. *Sarcanthus* Lindl.

Leaves elongate, filiform; flowers in longish racemes *appendiculatus*.

Leaves oblong, short, amplexicaul; flowers in short spikes *insectifer*.

245. *Sarcanthus appendiculatus* Hook. f.; F. B. I. vi. 67.

Forests near sea-face, *Prain!* Eastern Forests, *Lace!*

Vernac. *Pargátcha*.

An epiphytic orchid; properties unimportant.

DISTRIB.—Tenasserim: E. Himalaya.

246. *Sarcanthus insectifer* Reichb. f.; F. B. I. vi. 68.

Reserved forests, everywhere, very common, *Heinig! Heinig & Gammie!* *Prain!* *Lace!*

Vernac. *Pargátcha*.

An epiphytic orchid; of no economic value.

DISTRIB.—Bengal; Behar; Cachar; Tenasserim.

This species is exceedingly plentiful throughout the Sundribuns and is the commonest orchid in these forests; the next most common is *Luisia brachystachys*, which is almost as plentiful. The third place, but a long way behind the other two, is taken by *Saccolabium ochraceum*. All the other species may be looked on as rare or uncommon.

186. *Cleisostoma* Hook. f.

247. *Cleisostoma ramosum* Hook. f.; F. B. I. vi. 72.

Occasional in the reserved forests; *Wallich!* *Clarke!* *Heinig & Gammie!*

Vernac. *Pargátcha*.

An epiphytic orchid; of no economic value.

DISTRIB.—E. Himalaya; Tenasserim.

LX.—SCITAMINEÆ.

187. *Zingiber* Adans.

248. *Zingiber Casumunar* Roxb.; F. I. i. 49; F. B. I. vi. 248.

E. D. z 199.

Jatta, among ruins, *Prain!*

Vernac. *Ban Ádá*.

A herb with perennial rootstock; properties aromatic and stimulant.

DISTRIB.—Tropical Asia, usually cultivated: no doubt here the species was originally introduced.

188. *Alpinia* Linn.

249. *Alpinia Allughas* Roscoe; F. I. i. 61; F. B. I. vi. 253. E. D. A 849.

Northern river-banks, Dacopie, *Heinig*!

Vernac. *Hasi*; *Taruko*.

A large herb with perennial rootstock; properties aromatic.

DISTRIB.—India; Indo-China.

LXI.—AMARYLLIDACEÆ.

189. *Crinum* Linn.

250. *Crinum asiaticum* Linn.; F. B. I. vi. 280. *C. toxicarium* F. I. ii. 134. E. D. C 2062.

Plentiful on river-banks in the northern and central forests, sometimes occurring also in the interior of the islands, *Heinig*! *Prain*!

Vernac. *Káchori*.

A large succulent herb; properties emetic.

DISTRIB.—Coasts of Ceylon: common elsewhere in India, but cultivated.

LXII.—DIOSCOREACEÆ.

190. *Dioscorea* Linn.

251. *Dioscorea pentaphylla* Linn.; F. I. iii. 806; F. B. I. vi. 289. E. D. D 522.

Jatta, among ruins, *Prain*!

Vernac. *Kanta-álu*.

A large climber with bulbiferous stems; root-tubers sometimes eaten.

DISTRIB.—Tropics of Eastern Hemisphere.

LXIII.—LILIACEÆ.

191. *Asphodelus* Linn.

252. *Asphodelus tenuifolius* Cav.; F. B. I. vi. 332. *A. clavatus* F. I. ii. 148. E. D. A 1579.

"Sundribuns," *Calcutta Garden Collectors* (1845)!

An annual weed; occasional only in fields in Lower Bengal and then usually only when the crop with which it is associated is raised from seed imported from Upper India; it has not been reported from the Sundribun clearings since 1845. In Upper India the seeds are used medicinally.

DISTRIB.—Africa; Upper India.

LXIV.—COMMELINACEÆ.

192. *Commelina* Linn.

- 253.
- Commelina benghalensis*
- Linn.; F. B. I. vi. 370. E. D. C 1748.

Jatta, among ruins, *Prain*!Vernac. *Kánchará*.

A weed; leaves sometimes used as a vegetable.

DISTRIB.—Tropics of Eastern Hemisphere.

193. *Aneilema* R. Br.

- 254.
- Aneilema nudiflorum*
- R. Br.; F. B. I. vi. 378.
- Commelina nudiflora*
- F. I. i. 173.

Sea-face, growing in sand, *Heinig*!

A slender weed; of no economic importance.

DISTRIB.—S.-E. Asia.

The presence of this species on the coast is probably due to its seeds having been brought from the Upper Gangetic plain by the great rivers.

LXV.—FLAGELLARIÆ.

194. *Flagellaria* Linn.

- 255.
- Flagellaria indica*
- Linn.; F. I. ii. 154; F. B. I. vi. 391.

Northern forests, and margins of clearings; also sea-face at Tiger Point, *Heinig*! *Calcutta Garden Collectors*! *Prain*!Vernac. *Ah Beti*; *Kuh Bent*; *Banchanda*.

A lofty, slender, glabrous, cane-like climber; the stems are used to make native pens.

DISTRIB.—Tropics of the Eastern Hemisphere, near the coasts.

LXVI.—PALMÆ.

195. *Nipa* Wurmbr.

- 256.
- Nipa fruticans*
- Wurmbr.; F. I. iii. 650; F. B. I. vi. 424. E. D. N 163.

Everywhere on banks of estuaries and tidal rivers, and in swampy localities in interior of reserved forests.

Vernac. *Gólpatta*.

A socaliferous palm with a very large rootstock; an excellent protection for muddy banks. The large grooved leaf-stalks are used as floats for sundri-logs; the young leaves are twisted into rough ropes; the full-grown leaves are cut and exported for thatch. The young fruit is edible; toddy is obtained from the spathe.

DISTRIB.—Ceylon; Indo-China; Malaya; N. Australia: in mangrove-swamps.

196. *Areca* Linn.257. **Areca Catechu* Linn.; F. I. iii. 615; F. B. I. vi. 405. E. D.

A 1294.

Eastern Sundribuns, Backerganj, Dist., cultivated.

Vernac. *Supári*.

A tall graceful palm with slender stem; yields the Betel-nut.

DISTRIB.—Cultivated, usually near the sea, throughout S.-E. Asia.

197. *Phoenix* Linn.258. *Phoenix paludosa* Roxb.; F. I. iii. 789; F. B. I. vi. 427.

E. D. P 582.

Everywhere on or near banks of tidal rivers.

Vernac. *Hantál*; *Hiñál*.

A gregarious palm, usually about 12 feet high, rarely higher; stems used for the framework of walls of native houses and for the dunnage of roofs; leaves used in thatching; fruit eaten; the roots send up short blind vertical root-suckers.

DISTRIB.—All Indo-Chinese coasts.

The height given for this species in the F. B. I. is up to 25 feet, but the tallest examples in the Calcutta Garden (and these are taller than any seen in the Sundribuns) do not reach 20 feet. The diameter is given in the F. B. I. as 12-18 inches; the largest stem, out of many hundreds measured, has not been found to exceed 2½ inches in diameter; local officers might make observations on these points.

Phoenix sylvestris Linn., the Khajúr or wild date, is grown in the Bengal plain as a toddy palm just north of the Sundribun area, and possibly exists within the eastern Sundribuns (South Backerganj).198. *Calamus* Linn.259. *Calamus tenuis* Roxb.; F. I. iii. 780; F. B. I. vi. 447.

E. D. C 114.

Northern forests, *Heinig*!Vernac. *Sanchi Bent*.

A cane with long scandent stems; used for making the seats and backs of chairs, baskets, and the like.

DISTRIB.—Himalaya; Indo-China.

This is given in *Heinig's* list as *C. Rotang*; that species, however, is confined to S. India and Ceylon: Mr. *Heinig's* specimens are of *C. tenuis*.199. *Dæmonorops* Bl.260. *Dæmonorops Jenkinsianus* Mart.; F. B. I. vi. 462. E. D. C 99.Northern forests, *T. Thomson*! *Heinig*!Vernac. *Gola Bent*.A stout scandent "rattan"; stems used for the same purposes as those of *Calamus tenuis*.

DISTRIB.—E. Himalaya ; Assam ; Chittagong.

This is given as *Calamus longipes* by Heinig, who mentions other "rattans" as associated with this and *C. tenuis*. No specimens of other species have been communicated, but, from Mr. Heinig's remark, it is probable that others do occur : they should be looked for.

200. *Cocos* Linn.

261. **Cocos nucifera* Linn. ; F. I. iii. 614 ; F. B. I. vi. 482. E. D. C 1520.

Eastern Sundribuns, S. Backerganj, cultivated.

Vernac. *Narikel*.

A tall unbranched palm ; yields the coco-nut, also coir from the husk of the nut ; the wood, known as Porcupine wood, is durable.

DISTRIB.—Cosmopolitan on tropical coasts.

Borassus flabellifer Linn., the Tari Gách, a tall dioecious palm with fan-shaped leaves, is cultivated in the Bengal plain just north of the Sundribuns and may occur in the Eastern Sundribuns (S. Backerganj).

LXVII.—PANDANEE.

201. *Pandanus* Linn. f.

Carpels not united in groups ; stamens free . . . *fœtidus*.

Carpels united in groups ; stamens connate . . . *fascicularis*.

262. *Pandanus fœtidus* Roxb. ; F. I. iii. 742 ; F. B. I. vi. 483.

Northern forests, *Heinig*.

Vernac. *Kotki Kánta*.

A shrubby screw-pine ; properties insignificant.

DISTRIB.—Assam ; Burma ; Chittagong.

This is given in Heinig's list, but no specimens have been received ; the record needs confirmation. This species is occasionally planted as a hedge and it may belong to the category of plants to which *Bouea*, *Cassia Fistula*, *Diospyros Embryopteris*, *Ægle*, *Cratæva*, etc., belong.

263. *Pandanus fascicularis* Lamk. ; F. B. I. vi. 485. *P. odoratissimus* F. I. iii. 738. E. D. P 26.

Very general and often very abundant.

Vernac. *Kewa Kánta*.

A shrubby screw-pine, occasionally 10-15 feet high, usually much smaller. Leaves used for thatching ; flowers eaten with pán ; oil distilled and employed to mitigate the odour of castor oil.

DISTRIB.—India ; Indo-China ; Malaya ; S. China ; Polynesia.

LXVIII.—TYPHACEÆ.

202. *Typha* Linn.

Leaves usually more than an inch wide, trigonous above the sheath .
elephantina.

Leaves usually less than an inch wide, semi-cylindric above the sheath
angustata.

264. *Typha elephantina* Roxb. ; F. I. iii. 566 ; F. B. I. vi. 489.
E. D. T 864 partly.

Northern parts, on river-banks along the outskirts of the reserved forests.

Vernac. *Hogla*.

A large bulrush ; leaves used in thatching ; the split reeds are woven into mats for covering boats and for making walls and partitions of houses.

DISTRIB.—India ; Indo-China ; N. Africa.

265. *Typha angustata* Chaub. & Bory ; F. B. I. vi. 489. *T. angustifolia* F. I. iii. 567. E. D. T 864 partly.

Northern parts, on banks of ponds and rivers.

Vernac. *Hogla*.

A large bulrush ; used with and like the preceding.

DISTRIB.—S. Europe ; N. Africa ; N. Asia ; India ; Indo-China.

This is the commoner of the two bulrushes in Lower Bengal, to the north of the Sundribun area.

LXIX.—AROIDEÆ.

203. *Cryptocoryne* Fisch.

266. *Cryptocoryne ciliata* Fisch. ; F. B. I. vi. 492. *Ambrosinia ciliata* F. I. iii. 491.

Small creeks in northern clearings, on fringe of northern forests, very abundant. *Prain*!

A stoloniferous aquatic with linear-lanceolate leaves, growing in mud and submerged at high-tides ; properties unimportant.

DISTRIB.—C. Bengal ; Malaya.

204. *Pistia* Linn.

267. *Pistia Stratiotes* Linn. ; F. I. iii. 131. ; F. B. I. vi. 497.
E. D. P 874.

Tanks and jhils, northern clearings, *Heinig* ! *Prain* !

Vernac. *Tákh-páná*.

A floating aquatic ; an infusion of the leaves, also the soluble part of the ashes of the incinerated plant, used medicinally.

DISTRIB.—Cosmopolitan in the Tropics.

LXX.—NAIADACEÆ.

205. *Ruppia* Linn.

268. *Ruppia rostellata* Koch ; F. B. I. vi. 568.

Northern parts, in ponds and jhils, very common.

Vernac. *Jhángi*.

A submerged aquatic; properties unimportant.

DISTRIB.—Europe; Temp. and Trop. Asia.

206. *Najas* Linn.

269. *Najas minor* All.; F. B. I. vi. 569. *N. dichotoma* F. I. iii. 749.

Pond at Jeodhara, *Prain*!

Vernac. *Fhángi*.

A submerged aquatic; properties unimportant.

DISTRIB.—General in the Eastern Hemisphere.

LXXXI.—CYPERACEÆ.

207. *Kyllinga* Rottb.

270. *Kyllinga triceps* Rottb.; F. I. i. 181; F. B. I. vi. 587.

Jatta, among ruins, *Prain*!

Vernac. *Nirbishi*.

A small sedge; properties unimportant.

DISTRIB.—Africa; S.-E. Asia; Australia.

208. *Pycneus* Beauv.

271. *Pycneus polystachyus* Beauv.; F. B. I. vi. 392. *Cyperus polystachyus* F. I. i. 193.

In all the northern cleared or partially cleared spaces, plentiful; also at the sea-face among sand, *Heinig*! *Prain*!

Vernac. *Jangli Modhi*.

A small glabrous sedge; properties unimportant, except that it is a sand-binding species.

DISTRIB.—Cosmopolitan on or near tropical and sub-tropical sea-shores.

209. *Cyperus* Linn.

Fruit, a plano-convex nut, with a flat face next the rachilla; umbels compound; leaves and bracts long . . . *inundatus*.

Fruit, an equilaterally trigonous nut:—

Stoloniferous sedges:—

Stolons long, hardening at length into woody rootstocks; leaves short or 0; stems stout:—

Leaves very few, 2-3 in. (rarely as much as 6 in.) long; rachilla with a very narrow wing; glumes when dry with their margins crisply incurved all round

malaccensis.

Leaves hardly any; rachilla distinctly winged; glumes when dry with their margins recurved *tegetiformis*.

Stolons short, slender, with very slender stems

scariosus.

- Stolons 0 ; leaves and bracts long ; rachilla distinctly winged *exaltatus* var. *dives*.
272. *Cyperus inundatus* Roxb. ; F. I. i. 301. *Juncellus inundatus* F. B. I. vi. 595. E. D. C 2601.
River-banks, not uncommon.
Vernac. *Pati*.
273. *Cyperus malaccensis* Lamk. ; F. B. I. vi. 608. *C. Pangorei* F. I. i. 202. E. D. C 2609.
Banks of Cheila Bogi river, *Heinig & Gammie!*
Vernac. *Chumati Pati*.
A large glabrous sedge ; useful for binding and protecting muddy river-banks.
DISTRIB.—S.-E Asia ; Australia ; Polynesia.
A stout sedge ; an excellent mud-binding species.
DISTRIB.—Silhet ; E. Bengal ; C. Bengal.
274. *Cyperus tegetiformis* Roxb. ; F. B. I. vi. 612. *C. nudus* F. I. i. 209.
Sea-face at Tiger Point, *Heinig!*
Vernac. *Halaisu ; Goola-methi*.
A large glabrous sedge ; properties unimportant.
DISTRIB.—India ; Indo-China ; China ; Japan.
This sedge is plentiful in swampy places in C. Bengal, but has not hitherto been reported from the coasts of India ; doubtless its seeds have been washed down by the great rivers and cast up at Tiger Point.
275. *Cyperus scariosus* R. Br. ; F. B. I. vi. 612. *C. pertenuis* F. I. i. 198. E. D. C 2617 partly only.
Northern settlements and partial clearings, plentiful, *Clarke!*
Vernac. *Nagar Modhi*.
DISTRIB.—Indo-China ; Australia.
Very like the preceding species but more slender in all its parts ; in India this plant is confined to the northern Sundribuns and the immediately adjacent portion of Lower Bengal.
276. *Cyperus exaltatus* Retz VAR. *dives* Clarke ; F. B. I. vi. 617. *C. umbellatus* F. I. i. 205.
Northern clearings, in ponds and jhils, *Kurs! Calcutta Garden Collectors! Clarke!*
A tall sedge ; used for making matting.
DISTRIB.—Northern India.

210. *Mariscus* Vahl.

277. *Mariscus albescens* Gaud. ; F. B. I. vi. 623.
Chandpie, *Prain!* Sea-face, very abundant, *Heinig! Prain!*

Vernac. *Halaiya*.

A large greyish sedge; one of the most useful of sand-binding species.

DISTRIB.—Tropical shores from Africa to Polynesia.

211. *Eleocharis* R. Br.

278. *Eleocharis spiralis* R. Br.; F. B. I. vi. 627. *Scirpus spiralis*
F. I. i. 212.

In shallow standing water, near coast, *Heinig!*

Vernac. *Halaiya*.

A slender pipe-sedge; properties unimportant.

DISTRIB.—India; Indo-China.

212. *Fimbristylis* Vahl.

Lower glumes of the spikelets in a continuous spiral:—

Spikelets never more than half an inch long, usually considerably shorter:—

Spikelets in an umbel of usually 5-10, sometimes up to 20, very rarely 3, 2 or 1; glumes puberulous *ferruginea*.

Spikelets usually solitary, very rarely 2 or 3; glumes glabrous *polytrichoides* var. *halophila*.

Spikelets always three-quarters of an inch to an inch long, solitary or 2-3, rarely 4-6 *sub-bispicata*.

Lower glumes of the spikelets distichously imbricate *monostachya*.

279. *Fimbristylis ferruginea* Vahl; F. B. I. vi. 638. *Scirpus globulosus* F. I. i. 227.

Very common, both in the northern clearings and at the sea-face.

A tufted sedge; sand-binding, otherwise with properties unimportant.

DISTRIB.—Cosmopolitan in tropical and sub-tropical countries.

280. *Fimbristylis polytrichoides* Vahl VAR. *halophila* Kurz; F. B. I. vi. 632.

Canning Town, *Kurz!* *Calcutta Garden Collectors!* Jatta, Chandpie, Jeodhara, etc., *Prain!*

A sub-littoral sedge, known only (this variety) from the Sundribuns and Madras.

281. *Fimbristylis sub-bispicata* Nees & Meyen; F. B. I. vi. 634.

Sundribun sea-face, *Heinig!*

A littoral sedge; sand-binding; known in India only from the Sundribun coast and from Orissa; common on the coasts of China and Japan.

- 282 *Fimbristylis monostachya* Hassk.; F. B. I. vi. 649. *Scirpus schænoides* F. I. i., 221,

Jatta, *Prain!*

A small glabrous sedge, common in the Gangetic plain.

DISTRIB.—Cosmopolitan in the Tropics.

213. Scirpus Linn.

Spikelets very many, in large decomposed corymbs with several very large flat divaricate leafy bracts *grossus*.

Spikelets few ; lowest bract alone manifest and resembling a continuation of the stem :—

Stems more or less 3-cornered at least in the upper portion and not transversely septate ; flowers with hypogynous bristles ; spikelets pedicelled :—

Hypogynous bristles plumose with spreading hairs *littoralis*.

Hypogynous bristles scabrid but not plumose

triqueter var. *segregata*.

Stems terete throughout, transversely septate ; flowers without hypogynous bristles ; spikelets clustered in a dense lateral head *articulatus*.

283. *Scirpus grossus* Linn. f. ; F. I. i. 231 ; F. B. I. vi. 659.

Northern and eastern parts, in still water.

Vernac. *Kasúru*.

A large sedge ; properties unimportant.

DISTRIB.—S.-E. Asia.

284. *Scirpus littoralis* Schrad. ; F. B. I. vi. 659. *S. pectinatus* F. I. i. 218.

Northern parts, *Kurs* ! *Calcutta Garden Collectors* !

An aquatic sedge ; properties unimportant.

DISTRIB.—Europe ; Africa ; Orient ; India ; Australia.

285. *Scirpus triqueter* Linn. VAR. *segregata* Clarke ; F. B. I. vi. 658.

Northern clearings, *Clarke* !

A sedge of muddy places ; properties unimportant.

DISTRIB.—Northward into the Bengal Plain ; New Guinea.

286. *Scirpus articulatus* Linn. ; F. I. i. 214 ; F. B. I. vi. 656.

Northern parts, rare, *Heinig* !

An aquatic sedge of wet places ; properties unimportant.

DISTRIB.—Africa ; S.-E. Asia ; Australia.

214. Cladium P. Br.

287. *Cladium riparium* Benth. VAR. *crassa* Clarke ; F. B. I. vi. 675. Eastern Sundribuns, plentiful, *Clarke* !

A very large sedge, about 6 feet high.

DISTRIB.—Ceylon.

This has only been obtained by Clarke and only to the east of the Madumati, but it is, where it occurs, abundant. It might be looked for in the area between the Hughli and the Madumati.

215. *Scirpodendron* Zipp.

288. *Scirpodendron costatum* Kurz ; F. B. I. vi. 684.

Reserved forests, south of Suta Khal, growing with *Pandanus* in the swampy interior, *Prain* !

A stout sedge with large woody nuts enclosed in a succulent, edible epicarp.
DISTRIB.—Ceylon ; Malaya ; Australia ; Samoa.

LXXII.—GRAMINEÆ.

216. *Paspalum* Linn.

Stems decumbent at base ; leaves rather broad ; spikelets orbicular
scrobiculatum.
Stems creeping and rooting ; leaves narrow ; spikelets ovate-oblong
distichum.

289. *Paspalum scrobiculatum* Linn. ; F. I. i. 278 ; F. B. I. vii. 10.

P. Kora F. I. i. 279. E. D. P 332.

Jatta, *Prain* ! Canning Town, *Calcutta Garden Collectors* !

Vernac. *Kodo-dhan*.

A fodder grass.

DISTRIB.—Cosmopolitan in the Tropics.

290. *Paspalum distichum* Linn. ; F. B. I. vii. 12. *P. longiflorum*
F. I. i. 279.

Sundribuns, *Hooker & Thomson* ! at Kabutar, plentiful, *Prain* !

An indifferent fodder-grass ; valuable as a mud and sand-binding plant.

DISTRIB.—On all tropical coasts.

217. *Eriochloa* H. B. & K.

291. *Eriochloa polystachya* H. B. & K. ; F. B. I. vii. 20. *Milium*
ramosum F. I. i. 316. E. D. E 287.

Northern clearings, very plentiful.

A quick-growing grass of wet places ; a tolerable fodder.

DISTRIB.—Cosmopolitan in the Tropics.

218. *Panicum* Linn.

Spikelets paniculate :—

Panicles open, with long slender branches :—

Leaves green, flat *proliferum*.

Leaves glaucous, convolute *repens*.

Panicles compact, spiciform, with short adpressed branches

Myurus.

Spikelets on the branches of a simple raceme :—

Raceme with subsecund at length spreading branches

prostratum.

Racemes contracted or pyramidal :—

Spikelets not awned *colonum.*

Spikelets awned *Crus-Galli.*

292. ***Panicum proliferum*** Lamk. ; F. B. I. vii. 50. *P. paludosum*
F. I. i. 307.

Northern clearings, in ponds and jhils.

Vernac. *Borúti* ; *Kalas-nár.*

A matted floating grass ; a poor fodder.

DISTRIB.—Cosmopolitan in the Tropics.

293. ***Panicum repens*** Linn. ; F. B. I. vii. 49. *P. uliginosum* F. I.
i. 308. E. D. P 75.

Northern parts, in wet places and on river-banks.

Vernac. *Barandá.*

A coarse grass and an indifferent fodder, but a very valuable mud-binding species.

DISTRIB.—Cosmopolitan in tropical and sub-tropical countries.

294. ***Panicum Myurus*** H. B. & K. ; F. B. I. vii. 39. *P. serrulatum*
F. I. i. 307.

Northern clearings, in ponds, *Heinig!*

A matted floating grass ; a poor fodder.

DISTRIB.—S.-E. Asia ; N. Australia ; Trop. America.

295. ***Panicum prostratum*** Lamk. ; F. B. I. vii. 33. E. D. P 72.
Jatta, among ruins, *Prain!*

A small creeping grass ; an excellent fodder.

DISTRIB.—Cosmopolitan in the Tropics.

296. ***Panicum colonum*** Linn. ; F. B. I. vii. 32. E. D. P 45.
Jatta, *Prain!*

Vernac. *Sháma.*

A slender grass ; an excellent fodder.

DISTRIB.—Cosmopolitan in the Tropics.

297. ***Panicum Crus-Galli*** Linn. ; F. B. I. vii. 30. *P. hispidulum*
F. I. i. 303. E. D. P 48.

Northern clearings, rare, *Calcutta Garden Collectors!*

A rather coarse grass ; a good fodder when young.

DISTRIB.—Cosmopolitan in the Tropics.

219. *Setaria* Beauv.

Panicle spiciform, cylindrical; bristles with erect or spreading barbs.

Panicle subpyramidal, the lower involucels in segregate clusters; *glauca.*
bristles with reversed barbs *verticillata.*

298. *Setaria glauca* Beauv.; F. B. I. vii. 79. *Panicum glaucum*
F. I. i. 285. E. D. P 1207.

Jatta, *Prain!*

Vernac. *Pingi Natchi.*

An erect annual grass; a moderately good fodder.

DISTRIB.—Cosmopolitan in tropical and sub-tropical regions.

299. *Setaria verticillata* Beauv.; F. B. I. vii. 80. *Panicum verti-*
cillatum F. I. i. 301. E. D. P 1223.

Northern clearings, rare, *Calcutta Garden Collectors!*

Vernac. *Dora-biyára.*

A rank grass; a tolerable fodder when young.

DISTRIB.—Cosmopolitan in tropical and sub-tropical regions.

220. *Chamæraphis* R. Br.

300. *Chamæraphis spinescens* Poir.; F. B. I. vii. 62.

Northern clearings, in ponds and jhils, *Calcutta Garden Collectors!*

A matted floating grass; a poor fodder.

DISTRIB.—S.-E. Asia; Australia.

221. *Oryza* Linn.

Leaves herbaceous with unarmed margins, ligule long 2-partite;
panicle lax; awn very long *sativa.*

Leaves coriaceous with spinulose margins, ligule very short; panicle
spiciform; awn short, rigid *coarctata.*

301. *Oryza sativa* Linn.; F. I. ii. 200; F. B. I. vii. 92. E. D. O 258.

Everywhere throughout the forests on the sloping alluvium of
river-banks from the northern boundary to the sea-face, "wild, or as
an escape from cultivation," *Heinig!*

Vernac. *Dhán.*

An annual grass; "of no economic value" (*Heinig*).

DISTRIB.—Tropical Australia.

Heinig's specimens, from various localities in the Sundribun forests, give more the suggestion of a condition 'feral after escape' than of a truly wild stock; they have stouter stems and fuller ears than undoubtedly wild plants collected in fresh-water marshes and jhils elsewhere by King and other Indian botanists. Though apparently as widely spread as the next species, *O. sativa* is rare, whereas the next is exceedingly abundant. All *Heinig's* specimens have very long awns.

302. *Oryza coarctata* Roxb.; F. I. ii. 206; F. B. I. vii. 93.

Everywhere in the forests on newly formed sloping alluvial river-banks, from the northern boundary to the sea-face, *Hamilton, Griffith! Ellis! Heinig! Prain!* Sea-face, on sand covered by high tides, *Prain!*

Vernac. *Bani Dhán.*

A tall, rigid perennial grass, with wiry rootstock; an excellent mud- and sand-binding plant.

DISTRIB.—Sind.

First discovered by Hamilton in 1796. This is the most common and most plentiful grass in the Sundribuns; it is the first species to establish itself on the compensation banks of alluvium that are formed on the opposite bank of a river whenever the 'set' of the current produces erosion. Such banks vary in size from a few square yards to several acres; wherever they occur there are closely and uniformly covered by a sheet of *Oryza coarctata*. Where the bank shelves rapidly off into deep water a narrow fringe of *Myriostachya Wightiana* is often associated with the *Oryza* at the river-edge; the upper or forest margin of such a bank becomes at times invaded by a belt of *Hargósa (Acanthus ilicifolius)* bushes, and by young plants of *Géngwa (Excoecaria Agallocha)*, *Keora (Sonneratia apetala)*, *Báen (Avicennia officinalis)* and the like. This belt of shrubbery gradually extinguishes the *Oryza coarctata*. If such a belt, as sometimes happens, does not form immediately, a sward of *Zoysia pungens*, mingled with tufts of *Fimbristylis ferruginea*, springs up instead on the landward side of the alluvial bank and drives the *Oryza* out. The plants of *O. coarctata* near the upper edge of such a bank rarely exceed 18 inches in height; towards the lower or river-edge they may be from 4 to 6 feet high. On the sand at the sea-face, the stems are only 4-8 inches high; they are, however, perfectly healthy and flower profusely though they are covered by every high tide. The species is one of the best sand-binders on the coast, as well as the most effective of the mud-binders on these newly formed alluvial banks.

222. *Leersia* Sw.

303. *Leersia hexandra* Sw.; F. B. I. vii. 94. *L. ciliata* F. I. ii. 207; E. D. L 247.

Northern clearings, in ponds, *Calcutta Garden Collectors!*

A floating grass; a good fodder.

DISTRIB.—Cosmopolitan in the Tropics.

223. *Zoysia* Willd.

304. *Zoysia pungens* Willd.; F. B. I. vii. 99. *Agrostis matrella* F. I. i. 317.

Northern clearings, very common; occasionally also in narrow patches behind alluvial river-banks throughout the forests; sea-face, common.

A wiry grass; useless as fodder; an excellent sand-binder.

DISTRIB.—Shores of Mascarene Islands; S.-E. Asia; Tropical Australia; Polynesia.

This the grass that is next most common in the Sundribuns after *Oryza coarctata*; it occurs in the northern clearings where *Oryza* is not found; frequently is associated with *Oryza* at the upper or landward edge of alluvial banks; and is plentiful along the sea-face just above tide-mark.

224. *Imperata* Cyrill.

305. *Imperata arundinacea* Cyrill.; F. B. I. vii. 196. *Saccharum cylindricum* F. I. i. 234. E. D. 151.

Northern clearings, general.

Vernac. *Ulu*; *Unu*.

A tough grass; extensively used for thatching.

DISTRIB.—Cosmopolitan in the Tropics.

225. *Saccharum* Linn.

306. *Saccharum spontaneum* Linn.; F. I. i. 235; F. B. I. vii. 118. E. D. s 49.

Sea-face, general on the small sand-heaps above tide-mark, in large tussocks, *Heinig! Prain!*

Vernac. *Khágra*; *Kashiya*.

A tall coarse grass; useful as a sand-binder; may also be used for thatching and for making rough ropes.

DISTRIB.—Tropical and sub-tropical parts of Eastern Hemisphere and Australia.

226. *Andropogon* Linn.

Scented, tall; glumes muricated *squarrosus*.
Inodorous; glumes not muricated:—

Tall; joints of rachis and pedicels of upper spikelets compressed, with thickened margins and a translucent centre *intermedius*.

Short; joints of rachis opaque; tips of branches of panicle bearded *aciculatus*.

307. *Andropogon squarrosus* Linn. f.; F. B. I. vii. 186. *A. muricatus* F. I. i. 265. E. D. A 1007.

In large tussocks, on bunds, in northern clearings, *Calcutta Garden Collectors! Prain!*

Vernac. *Khas-Khas*.

A large perennial tufted grass; used elsewhere in India to make aromatic scented mats, fans, baskets and the like; root yields on distillation a fragrant oil.

DISTRIB.—Tropical Africa; India generally; Java. Possibly originally introduced to India by Arab navigators and invaders. The natural conditions are so suitable for this grass that there is no reason why it should not be wild in these northern clearings and, as a matter of fact, it is not actually cultivated.

But the tussocks are so scarce that it is perhaps more probable that the grass was originally introduced by man.

308. *Andropogon intermedius* R. Br.; F. B. I. vii. 175. *A. glaber* F. I. i. 267.

Northern and western clearings, on bunds.

Vernac. *Gandha Guráná*.

A tall grass, forming small tussocks; properties insignificant.

DISTRIB.—Tropical Africa; sub-tropical and tropical Asia; Polynesia.

309. *Andropogon aciculatus* Retz; F. I. i. 262; F. B. I. vii. 188. E. D. A 1073 and C 1053.

Northern clearings, common.

Vernac. *Chor Kanta*.

A small tufted coarse grass; a poor fodder even when young; cattle refuse it after its flowers appear.

DISTRIB.—Tropical Asia; N. Australia; Polynesia.

227. *Sporobolus* R. Br.

310. *Sporobolus tremulus* Kunth; F. B. I. vii. 250. *Agrostis tenacissima* F. I. i. 316.

Northern clearings, very abundant; occasional in grassy spots at forest-edge of mud-banks throughout the reserves; also at the sea-face.

A slender grass with much-matted stems (sometimes 18 in. to 2 ft. long, usually only 2-6 in. long), numerous from a hard knotted stoloniferous stock; the stolons 6-18 in. long, leafy. An indifferent fodder; a good mud-binding but less effective sand-binding species.

DISTRIB.—S. E. Asia.

This is the third most abundant of the Sundribun grasses; in the clearings it is the only really abundant grass though even there it is always more or less accompanied by *Zoysia*, with which it is sparingly associated at the upper edge of alluvial banks and still more sparingly at the sea-face.

228. *Chloris* Sw.

311. *Chloris barbata* Sw.; F. I. i. 329; F. B. I. vii. 292. E. D. C 1026.

Northern clearings, at Kagdip, *Prain!* and elsewhere, *Heinig & Gammie!* *Calcutta Garden Collectors!*

A handsome tufted grass; an indifferent fodder when young; cattle do not eat it after it flowers.

DISTRIB. Cosmopolitan in the Tropics.

229. *Eleusine* Gært. n.

Spikelets closely imbricate, pointing forward, not awned . *indica*.

Spikelets patent, at right angles to rachis of spike, the second glume abruptly shortly awned *ægyptiaca*.

312. *Eleusine indica* Gært. n.; F. I. i. 345; F. B. I. vii. 293. E. D. E 186.

Northern clearings, rare, *Calcutta Garden Collectors!*

A small coarse tufted grass; an indifferent to fair fodder.

DISTRIB.—Tropics of the Eastern Hemisphere, but now introduced in tropical America.

313. *Eleusine ægyptiaca* Desf.; F. I. i. 344; F. B. I. vii. 295.

Kagdip, *Prain!*

A prostrate tufted grass; a good fodder.

DISTRIB.—Tropics of Eastern Hemisphere, but now introduced into tropical America.

This was only met with on a small patch of artificially raised ground where coal for the forest launches is kept, and is no doubt a quite recent introduction, along with coal, from Western Bengal.

230. *Phragmites* Trin.

314. *Phragmites Karka* Trin. VAR. *cincta* Hook f.; F. B. I. vii. 305.

Arundo Karka F. I. i. 348. E. D. A 1539 and P 618.

Northern forests, *Heinig!* and clearings, *Kurz!* *Clarke!* *Heinig!*
Vernac. *Nál*.

A tall, reed-like grass; the split stems are used to make *dharma* matting, also baskets employed in marketing; they are likewise used for the dunnage of boats, walling of *pán-baris*, and the like.

DISTRIB.—Tropical and sub-tropical regions of the Eastern Hemisphere and of Australia.

231. *Eragrostis* Beauv.

315. *Eragrostis tenella* R. & S. VAR. *plumosa* Stapf; F. B. I.

vii. 315. *Poa plumosa* F. I. i. 337. E. D. E 263.

Northern clearings, occasional.

A slender annual grass; a good fodder.

DISTRIB.—India; Ceylon; Burma.

232. *Myriostachya* Hook f.

316. *Myriostachya Wightiana* Hook f.; F. B. I. vii. 327.

General in all parts of the forests, but rarely very abundant.

A tall stout perennial glabrous grass; properties much those of *Phragmites*.

DISTRIB.—Malay Peninsula.

This grass holds the fourth place in order of frequency in the true Sundribun forests, where it very usually is associated with *Oryza coarctata*. In cases where an alluvial newly formed bank slopes gently into deep water this is not, as a rule, seen;

wherever a mud-bank drops suddenly into deep water a line of *Myriostachya* marks the river-margin of the *Oryza*-field. The *Myriostachya*, however, very often occurs in localities where *Oryza* does not, and forms a fringe of reed-like grass close up to the true forest. Though generally distributed from the northern borders to the sea-face it appears nowhere to be very plentiful.

The species is doubtfully reported from S. India in the *Flora of British India*, but the only specimen of the grass from Wight's herbarium seen by the writer appears to have come from Mergui. The species has been also reported from Langkawi south of Tenasserim and has been collected by Mr. C. Curtis both in Penang and in Province Wellesley.

233. *Diplachne* Beauv.

317. *Diplachne fusca* Beauv.; F. B. I. vii. 329. *Poa procera* F. I. i. 332.

Sundribuns; *Calcutta Garden Collectors* (1845)!

A tall tufted grass.

DISTRIB.—Tropics of Eastern Hemisphere and Australia.

There is in the Calcutta Herbarium a Sundribun specimen of this grass, collected in 1845; it has not been reported since. It is a grass the occurrence of which in the northern clearings would not cause surprise; it should therefore be looked for, with a view to confirming this old record.

CRYPTOGAMIA.

LXXIII.—POLYPODIACEÆ.

234. *Adiantum* Linn.

318. *Adiantum lunulatum* Burm.; Synops. Fil. 114. *Pteris lunulata* F. I. iv. (758, Ed. C. B. C.). E. D. A 506.

Jatta, growing on ruins, *Prain*!

Vernac. *Kali-jhamp*.

A tufted wiry fern; properties unimportant.

DISTRIB.—Tropical and sub-tropical regions generally.

235. *Pteris* Linn.

319. *Pteris vittata* Roxb.; F. I. iv. (757, Ed. C. B. C.).

"Delta of the Ganges," *Roxburgh* (1795).

Of this fern, obtained from the Sundribuns, *Roxburgh* has left a coloured drawing which shows that it must be very nearly related to *P. longifolia* Linn. (*P. amplexicaulis* Roxb.).

Roxburgh, however, distinguishes the two very carefully as follows:—

P. vittata; stipes rising singly from a creeping stem, long and polished: pinnæ not enlarging into a stipe-clasping base, tapering to a very long fine point and (generally) fertile for only about two-thirds their length.

P. amplexicaulis (*P. longifolia* Linn.); stipes in tufts, and short; when old scabrous; when young, woolly: pinnæ with enlarged stipe-clasping bases, rather obtusely pointed and fertile almost to the very points.

The other characters may be theoretically assumed to be likely to break down in the case of so common and so wide-spread a fern as *P. longifolia*, but no writer on ferns has, so far, claimed that *P. longifolia* ever has an elongated, stout, creeping rootstock. It may be that those authors are right who maintain that Roxburgh's *P. vittata* is only a badly described *P. longifolia*; it is, however, difficult for those who have had to follow Roxburgh's work elsewhere and had occasion to test its excellence and accuracy to believe in this explanation. The care and precision of Roxburgh's diagnosis are against the assumption, and the native artist who made the figure could have had no particular object in drawing a creeping rootstock if such were not before him. In any case the theory that Roxburgh and his artist were alike in error cannot be admitted till the Sundribuns have once more been carefully searched for this fern.

236. *Ceratopteris* Brogn.

320. *Ceratopteris thalictroides* Brogn.; Synops. Fil. 174. *Pteris succulenta* F. I. iv. (759, Ed. C. B. C.).

Rampura, among standing water in a recent and imperfect clearing, growing in ditches behind bunds, *Heinig & Gammie!* *Prairi!*

Vernac. *Jangli Jhau* (*vide* Roxburgh).

A tufted succulent fern; properties unimportant.

DISTRIB.—Cosmopolitan in the Tropics.

237. *Asplenium* Linn.

Veins free; fronds once pinnate *falcatum*.

Veins copiously anastomosing; fronds usually twice pinnate *esculentum*.

321. *Asplenium falcatum* Lamk.; Synops. Fil. 208.

Northern forests, *Clarke*. Eastern forests, at Supoti, on trees, *Heinig & Gammie!*

A tufted epiphytic fern; properties unimportant.

DISTRIB.—Tropical Africa; S.-E. Asia; Polynesia.

322. *Asplenium esculentum* Presl.; Synops. Fil. 244. *A. bipinnatum* F. I. iv. (756, Ed. C. B. C.).

Northern clearings, rare; Barisal, *Clarke!*

A strong tufted fern; fronds sometimes used as a vegetable.

DISTRIB.—S.-E. Asia.

238. *Nephrodium* Rich.

323. *Nephrodium aridum* Hook. & Bak.; Synops. Fil. 291. *Polypodium semisagittatum* F. I. iv. (753, Ed. C. B. C.).

"Delta of the Ganges" *Roxburgh*; Sundribuns, *Clarke*.

A tufted fern; properties unimportant.

DISTRIB.—S.-E. Asia.

239. Polypodium Linn.

Fronds dimorphic, the barren ones like a sere oak-leaf, the fertile pinnatifid *quercifolium*.

Fronds all similar:—

Fronds pinnate, drooping, often rooting at the tip *proliferum*.

Fronds simple:—

Fronds covered beneath with stellate tomentum *adnascens*.

Fronds glabrous *irioides*.

324. **Polypodium quercifolium** Linn.; F. I. iv. (750, Ed. C. B. C.);

Synops. Fil. 367.

Everywhere common, from the northern boundary to the sea-face.

Vernac. *Gurúr*.

An epiphytic fern with two kinds of fronds; reputed medicinal, used in chest complaints.

DISTRIB.—S.-E. Asia; N. Australia.

325. **Polypodium proliferum** Roxb.; F. I. iv. (752, Ed. C. B. C.)

Synops. Fil. 315.

Northern clearings.

Vernac. *Depu*.

A terrestrial fern with creeping rhizome and drooping often rooting and proli-ferous flagelliform fronds; properties unimportant.

DISTRIB.—Tropical and sub-tropical Africa; S.-E. Asia; N. Australia; Polynesia.

326. **Polypodium adnascens** Sw.; Synops. Fil. 349. *P. pertusum*

F. I. iv. (750, Ed. C. B. C.).

Everywhere from the northern boundary to the sea-face.

A creeping epiphytic fern; properties unimportant.

DISTRIB.—Tropical Africa; S.-E. Asia.

327. **Polypodium irioides** Lamk.; Synops. Fil. 360. *P. glabrum*

F. I. iv. (750, Ed. C. B. C.).

Everywhere from the northern boundary to the sea-face.

Vernac. *Chitiya Bora*.

An epiphytic fern; properties unimportant.

DISTRIB.—Tropics of Eastern Hemisphere and Polynesia.

240. Vittaria Sm.

328. **Vittaria elongata** Sw.; Synops. Fil. 395. *Pteris angustifolia* F. I. iv (757, Ed. C. B. C.).

General, from the northern boundary to the sea-face.

An epiphytic fern ; properties unimportant.

DISTRIB.—Tropical and sub-tropical regions of the Eastern Hemisphere and Australia.

241. *Drymoglossum* Presl.

329. *Drymoglossum piloselloides* Presl; Synops. Fil. 398. *Pteris piloselloides* F. I. iv. (757, Ed. C. B. C.).

Occasional only, but generally distributed.

An epiphytic fern ; properties unimportant.

DISTRIB.—S.-E. Asia (in Ceylon but not in India except Himalaya and Bengal).

242. *Acrostichum* Linn.

Climbing on trees ; fertile and barren pinnæ on distinct fronds

- *palustre*.

Terrestrial ; fertile and barren pinnæ on the same frond *aureum*.

330. *Acrostichum palustre* Bedd. *A. scandens* Synops. Fil. 412. *Pteris scandens* F. I. iv. (758, Ed. C. B. C.).

General.

Vernac. *Dhekwa* ; *Dehia*.

A large scandent epiphytic fern ; of little economic importance ; the leaves are used as thatch.

DISTRIB.—S.-E. Asia ; N. Australia ; Polynesia.

331. *Acrostichum aureum* Linn. ; Synops. Fil. 423. *A. emarginatum* F. I. iv. (749, Ed. C. B. C.).

Northern clearings and northern forests, very plentiful.

Vernac. *Udoban*.

A rigid tufted fern ; growing in muddy places ; leaves used in thatching.

DISTRIB.—Cosmopolitan in the Tropics, especially near the sea.

LXXIV.—OPHIOGLOSSACEÆ.

243. *Helminthostachys* Kaulf.

332. *Helminthostachys zeylanica* Hook. & Bauer ; Synops. Fil. 447. *Osmunda zeylanica* F. I. iv. (748, Ed. C. B. C.).

Eastern Sundribuns in Barisal District, *Clarke*!

Vernac. *Ekbir*.

A fern with a large barren, twice palmately lobed segment, and a smaller fertile spicate segment.

DISTRIB.—Foot of Eastern Himalaya ; Lower Bengal ; Ceylon ; Malaya ; N. Australia.

LXXV.—LYCOPODIACEÆ.

244. *Lycopodium* Linn.

333. *Lycopodium Phlegmaria* Linn. F. I. iv. (746, Ed. C. B. C.).
Reserved forests, rare, *Heinig & Gammie!*

A pendulous epiphyte, stems dichotomously forked ; properties unimportant.
DISTRIB.—Tropics generally.

245. *Psilotum* Sw.

334. *Psilotum triquetrum* Sw.

Eastern Sundribuns in Barisal District, *Clarke!*

A wiry tufted herb, epiphytic on roots of *Cocos nucifera*.
DISTRIB.—Cosmopolitan in the Tropics.

VII.—NEGATIVE FEATURES OF THE SUNDRIBUN FLORA.

In the foregoing chapters our attention has been necessarily given exclusively to those species that are known to occur in the Sundribuns, because specimens from this territory actually exist in the Calcutta Herbarium, or because careful observers like Roxburgh, Clarke and Heinig have reported their presence in the region. Having regard, however, to the fact that, with some of these reported species, e.g. *Barringtonia speciosa*, reported by Heinig only, and *Ceriops Candolleana*, reported both by Clarke and by Heinig, though there is no inherent improbability in the record, there is nevertheless the possibility of some mistake in identification, it has seemed better merely to mention the fact of the record ; while a search for *all* recorded species has been urged, these quite doubtful ones have been excluded from the serial list.

This sketch of the Sundribun Flora would, however, fail to be complete without a brief reference to the general flora of which it forms an integral part, and without a list of the more salient members of this flora that have not hitherto been recorded from the Sundribuns, but that it is not impossible, where the nature of the species actually present in the Sundribuns is considered, may yet be found there. For while it is no doubt true that we probably now know all the common, and the majority of the wide-spread though rare Sundribun species, it must be recollected that the area occupied by these forests is so very extensive as to forbid its systematic exploration island by island, and that therefore in the future, as in the past, accident alone can lead to the collection of any species that is not only rare but local in

its occurrence, or of most species that, even if plentiful where they occur, are confined to restricted areas within the Sundribun region.

The nature of this Littoral Flora, of which the Sundribuns form one of the most important provinces, has been so fully and philosophically dealt with by Schimper, that little has been left for others to add to his statements and conclusions.* Schimper's deductions are largely based on his own observations in the Malay Archipelago, though he has also made use of the observations of others, and notably of Kurz,† as regards the shores of the Andamans and Burma. Besides Schimper's classical work, however, reference may be made to two papers by the writer, wherein will be found an account of the corresponding flora in two non-Malayan localities that have not been dealt with either by Schimper or by Kurz; the shores of the Coco group at the north end of the Andamans,‡ and the Laccadive Archipelago.§ That some of the littoral species characteristic of the Strand-flora which occupies all the coasts from the Mascarenes to Melanesia will never be found in the Sundribuns is quite probable. Some of the characteristic species appear to be exclusively confined to rocky headlands or to shingle beaches, rarely if ever extending to sandy beaches and never appearing in tidal-swamps. For such species the Sundribun area affords no foothold. But for species that are to be found in tidal swamp-forests elsewhere in Malaya, Indo-China or India, the conditions that prevail in the Sundribuns are entirely suitable, and there is not a single Indo-Malayan swamp-forest species whose occurrence in our area would cause surprise. The limited extent of the sandy beaches along the Sundribun sea-face makes it conceivable that there is not sufficient accommodation for all the species that occur on sandy sea-shores elsewhere in the region occupied by this Strand-flora, but there is not in this fact a manifest reason why any particular species should be absent. Subjoined is therefore given a list of species, not hitherto reported from the Sundribuns, that are characteristic of other Indo-Malayan coasts and that therefore should be kept in mind as possible constituents of the Sundribun Flora. This list is in no sense exhaustive; it merely exhibits the names of striking and familiar species common on other shores of the Bay of Bengal.

* Schimper: *Die indo-malayische Strand flora*; Jena, 1891.

† Kurz: *Preliminary Report on the forest and other vegetation of Pegu*; Calcutta, 1875; also *Forest Flora of British Burma*; Calcutta, 1877.

‡ Prain: *Journal of the Asiatic Society of Bengal*, lx. 2, p. 283, et seq.; list of littoral species at p. 380.

§ Prain: *Botany of the Laccadives*; *Journal of the Bombay Natural History Society*, vol. vii (1892) and viii (1893).

*List of littoral species found on Indian Coasts but not yet collected
in the Sundribuns.*

Guttiferæ.

Calophyllum inophyllum.

Sterculiaceæ.

Heritiera littoralis.

Simarubææ.

Suriana maritima.

Rhamnææ.

Colubrina asiatica.

Leguminosæ,

Sophora tomentosa.

Combretaceæ.

Terminalia Catappa.

Lumnitzera coccinea.

Gyrocarpus Jacquini.

Lythraceæ.

Pemphis acidula.

Rubiaceæ,

Stephegyne diversifolia.

Guettarda speciosa.

Ixora brunnescens.

Hydrophylax maritima.

Compositæ.

Adenostemma viscosum.

Goodenoviææ.

Scævola Koenigii.

Sapotaceæ.

Mimusops littoralis.

Apocynææ.

Ochrosia borbonica.

Fabernæmontana crispa.

Boraginæ.

Cordia subcordata.
Tournefortia argentea.

Convolvulacæ.

Ipomœa denticulata.
Operculina Turpethum.

Acanthacæ.

Eranthemum succifolium.

Nyctagineæ.

Boerhaavia repens.
Pisonia aculeata.
Pisonia excelsa.
Pisonia alba.

Laurinæ.

Hernandia peltata.

Euphorbiacæ.

Euphorbia Atoto.

Cycadacæ.

Cycas Rumphii.

Liliacæ.

Gloriosa superba.

Graminæ.

Ischæmum muticum.
Thuarea sarmentosa.
Lepturus repens.
Spinifex squarrosus.

All of these species deserve therefore to be looked for by future explorers in the Sundribuns. The fact that the existing list of Sundribun plants includes such species as *Brownlowia lanceolata*, *Amoora cucullata*, *Carapa obovata*, *Kleinhovia hospita*, *Desmodium umbellatum*, *Erythrina indica*, *Dalbergia torta*, *Derris sinuata*, *Mucuna gigantea*, *Cæsalpinia Nuga*, *Cynometra mimosoides*, *Intsia bijuga*, *Barringtonia racemosa*, *Sonneratia acida*, *Petunga Roxburghii*,

Ægialitis rotundifolia, *Launea pinnatifida*, *Asima tetracantha*, *Sarcobolus globosus*, *Ipomœa longiflora*, *Solanum trilobatum*, *Premna integrifolia*, *Clerodendron nerifolium*, *Avicennia alba*, *Salicornia brachiata*, *Arthrocnemum indicum*, *Agyneia bacciformis*, *Excoecaria Agallocha*, *Ficus Rumphii*, *Crinum asiaticum*, *Nipa fruticans*, *Mariscus albescens*, *Fimbristylis sub-bispicata*, *Cladium riparium*, *Scirpodendron costatum*, *Paspalum distichum*, *Oryza coarctata*, *Zoysia pungens*, *Myriostachya Wightiana*, *Acrostichum palustre*, affords at once an ample proof of the suitability of the region for the great majority of the species to which attention is now directed, and a strong presumption that some at least of the plants given in that list will be found here associated with those enumerated in the census of known Sundribun species.

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A CENSUS OF THE INDIAN POLYGONUMS.

By A. T. GAGE.

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INTRODUCTION.

This paper is an expansion of notes made by the writer during an examination of the Indian Polygonums in the Calcutta Herbarium, undertaken at the request of Major Prain, Superintendent of the Royal Botanic Garden, Calcutta. The notes were originally put together under the idea of their being likely to be of use to workers in the Calcutta Herbarium. It has been thought, however, that they might prove of service to botanists in India generally, who may not have an opportunity of personally consulting the Calcutta Herbarium, and accordingly it has been decided to give them a wider publicity than a pigeon-hole in the Calcutta Herbarium Polygonum cabinet affords. The limits of the channel of publication have restricted the scope of the paper to little beyond a mere list of the species, with their localities, but so far as it goes, the paper gives as complete a distributional survey of the genus in India as the material in the Calcutta Herbarium permits.

The paper consists of three parts:—1st, a list of Indian species, inclusive of all those described in the Flora of British India, whether they are represented in the Calcutta Herbarium or not, with their localities and altitudes, whenever given; 2nd, an artificial key to all the species and the more important varieties mentioned in the list; 3rd, a few notes on the distribution of the Indian species.

In the first part, localities, altitudes and ticket numbers have been quoted as fully as possible and for several reasons. Firstly, that those who may possess any unnamed or, at least according to this list, misidentified duplicates of the sheets quoted, may, if they choose, name or correct according to this list. Secondly, that if any worker finds occasion to differ from the writer as to the naming of any particular sheet or sheets, he or she may, with better opportunities than the writer—who, it is to be recollected, has had under study only the Calcutta Herbarium sheets and at the last moment a rapid survey of the Shaharanpur Herbarium sheets, consider and dispose of the question. Thirdly, that irrespective of names altogether, there may be as little doubt as possible, where there is access to a representative Herbarium, as to what are the plants to which the writer refers. Lastly, to make it possible to plot out, on blank maps of India, the distribution of any species with as great precision as the information supplied by collectors has made possible.

It is to be regretted that this information is not always by any means so complete as it might be. A fair percentage of the Calcutta sheets have not been quoted either because the tickets bear nothing beyond such

expression as "N. W. Him." or "Assam" or "Punjab", or "S. India", which for the purpose of a precise survey are much too vague, or because they give only the name of the hamlet near which the specimen had been picked up. This latter practice of collectors is, in the eyes of the compiler of a paper like the present, just as reprehensible as the former, as it leads to much needless expenditure of time—to mention nothing else—in attempting to identify such insufficiently indicated localities by consulting a multitude of maps, gazetteers, books of travel, etc., each of which probably has its own particular system of mis-spelling Indian place-names. Sheets bearing such expressions as "N. W. Himalaya", "Assam", are quoted only where they are the sole representatives of the species in the Calcutta Herbarium, or where properly localised specimens are very few.

The artificial key does not pretend to the unerring accuracy of an automatic machine, neatly naming and ejecting every Polygonum in whatever condition thrown into it, but it is hoped that it may aid the botanist unfamiliar with the Indian species to approximately place his specimens, so that he can compare them with the descriptions in the Flora of British India, with as little waste of time as possible. The tables of distribution explain themselves, and any additional notes merely have the merit, if it be such, of saving the reader a little mental and visual exercise.

The botanical area considered is practically the same as that dealt with in the Flora of British India. Ceylon, however, is here omitted, partly because that island has now a "Flora" of its own, partly because the Calcutta Herbarium has little beyond Thwaites' distribution numbers. The British Indian Empire, with Nepal, Sikkim, a small part of Tibet, Bhutan, the hills just to the east of Bhutan, and the Malay Peninsula, is taken as the unit. This being itself botanically a sub-area, is divided into sub-sub-areas, and these again into districts, as detailed below.

The sub-sub-areas are, in the main, similar to those adopted by Mr. C. B. Clarke in his paper on the sub-sub-areas of British India in the *Journal of the Linnean Society*, vol. xxxiv, but the writer's sub-sub-areas agree more with the political boundaries, which are more convenient for practical purposes, and probably will not be found to stand much in the way of drawing any phytogeographical inferences from the facts set forth. In the list of species, the distribution of each one is given in the order of the sub-sub-areas detailed below and within each sub-sub-area, where such sub-sub-areas are further sub-divided into districts, in the order of the districts. Each sub-sub-area, and within it each district, has its own number; but in every case the name as well as the number of the sub-sub-area or district is

given, to avoid repeated reference to the list of sub-sub-areas and districts.

Except in one or two cases a rigid definition of the boundaries of the sub-sub-areas or districts is not attempted, as in the majority of cases the names employed to denote them indicate their boundaries with sufficient clearness; any description in detail would be unintelligible without a good map of India and superfluous with one. The sub-sub-areas and districts recognised in this paper are as under: in drawing them up the introductory essay to Hooker and Thomson's *Flora Indica* has been used freely.

I.—NORTH-WEST FRONTIER.

This sub-sub-area includes also the Punjab and Rajputana. The northern boundary is formed by the base of the North-West Himalaya; its eastern by the United Provinces of Agra and Oudh, and southern by the Nerbudda river; its western by the Arabian sea, Baluchistan, and Afghanistan.

Districts.—(1) *The Afghan border.* (2) *British Baluchistan.*
(3) *Scinde.* (4) *Gujrat, Cutch, and Kathiawar.* (5) *Punjab, west of the Sutlej.* (6) *Punjab, east of the Sutlej.*
(7) *Bhawalpur, Rajputana, and Indore.*

II.—CENTRAL PROVINCES.

Districts.—(1) *Central Provinces.* (2) *Berar.* (3) *Hyderabad.*

III.—PENINSULAR INDIA.

This sub-sub-area includes all the peninsula south of the Nerbudda on the west and of Orissa on the east, exclusive of the preceding sub-sub-area.

Districts.—(1) *The Concan.* (2) *Canara, North and South.*
(3) *Coorg.* (4) *Malabar and the Nilgiris.* (5) *Cochin and Travancore.* (6) *The remainder of the Bombay Presidency.*
(7) *The Northern Circars, from the southern boundary of Orissa to the Godavery River.* (8) *The Carnatic, from the Godavery to the Cauvery River.* (9) *The districts of Coimbatore, Madura, and Tinnivelly.* (10) *Mysore.*

IV.—UPPER GANGETIC PLAIN.

Districts.—(1) *Agra and Oudh.* (2) *Bundelcund and Baghelcund.*

Agra and Oudh include the whole plain from the Punjab to Bengal.

V.—BENGAL.

Districts.—(1) *Orissa*. (2) *Chutia Nagpur* including the *Sonthal Pergunnahs*. (3) *Tirhut*, or Bengal north of the Ganges and west of the Kosi River. (4) *Behar* or the district between the Ganges and Chutia Nagpur. (5) *North Bengal*.—Its boundaries are, north the base of the Himalayas; east the Brahmaputra; south the Ganges; west the Kosi. (6) *Central Bengal* and the *Sundribuns*.—Between the Brahmaputra, Hooghly, and Ganges rivers. (7) *West Bengal*.—Between the Hooghly and Chutia Nagpur. (8) *East Bengal*.—East of the Brahmaputra, but excluding Chittagong.

For the above divisions of Bengal the writer is indebted to Major Prain.

VI.—NORTH-WEST HIMALAYA.

Districts.—(1) *Gilgit* and *Hunsa*. (2) *Baltistan*. (3) *Nubra*. (4) *Dras*. (5) *Ladakh*. (6) *Zaskar*. (7) *Rupchu*. (8) *Spiti* and *Parang*. (9) *Chitral* and *Dir*. (10) *Swat Valley*. (11) *Hazara* and *Murree*. (12) *Kashmir*. (13) *Kistawar*. (14) *Lahul*. (15) *Kunawar* and *Bashahr*. (16) *Nowshera (Rajaori)*. (17) *Jamu*. (18) *Chamba*. (19) *Kulu, Kangra, Mandi, Suket*. (20) *Simla*. (21) *Garhwal*. (22) *Kumaon*.

VII.—NEPAL.

VIII.—EASTERN HIMALAYA.

Districts.—(1) *Sikkim* including *Darjeeling*. (2) *Tibet* and *Bhutan*.

By *Tibet*, throughout this paper, is meant the small southward projecting bay between Sikkim and Bhutan, where Chumbi and Phari are situated.

IX.—ASSAM.

Districts.—(1) *Akha, Daphla* and *Miri Hills*. (2) *Mishmi Hills*. (3) *Garo Hills*. (4) *Khasia Hills*. (5) *Jaintia Hills*. (6) *Naga Hills*. (7) *Manipur*. (8) *Brahmaputra Valley*. (9) *Sylhet* and *Cachar*.

The Lushai hills, which politically are in Assam, are in this paper considered more appropriately with Burma.

X.—BURMA.

Districts.—(1) *Chittagong Hill Tracts*. (2) *North* and *South Lushai Hills*. (3) *Chin Hills*. (4) *Arracan Yomah*. (5) *Kachin*

Hills. (6) *North and South Shan and Karen Hills.* (7) *Pegu ; Yomah.* (8) *Chindwin Valley.* (9) *Arracan.* (10) *Irrawaddy Valley.* (11) *Sittang Valley.* (12) *Tenasserim.*

XI.—MALAY PENINSULA and ANDAMANS.

Districts.—(1) *The Peninsula.* (2) *The Andamans and Nicobars.*

PART I.—LIST OF SPECIES.

The genus *Polygonum* has not escaped the numerical increase resulting from the extension of area of British India and the influx of new collections, which have occurred since the publication of vol. v. of the *Flora of British India* in 1890. Nine species have been added to the number given in the *Flora of British India*: of these, only two are new discoveries since the publication of vol. v; of the remainder, some had been overlooked when the account in that volume was written, while the advance of the Indian frontiers, particularly on the west, has rendered necessary the inclusion of others. Descriptions of those additional species have been given, so as to obviate the necessity of consulting various books which quite likely might not be readily accessible to the botanist in India. Species, varieties, and localities new or not mentioned in the *Flora of British India* are distinguished by an asterisk.

SECTION I.—KÆNIGIA Hook. f.

1. *Polygonum islandicum* Hook. f.

VI.—NORTH-WEST HIMALAYA: (2) Baltistan; Dessai, 13,000 ft., *C. B. Clarke*, No. 29813 B! Karpuchu Valley, 13-14,000 ft., *Duthie*, No. 11975! (5) Ladakh; Indus Valley, 12-14,000 ft., *Stoliczka*! (6) Zanskar; North-West from Padam, 12,000 ft., *Stoliczka*! (7) Rupchu; Indus Valley, 12-14,000 ft., *Stoliczka*! (8) Spiti and Parang; Nako, 14-16,000 ft., *Thomson*!

SECTION II.—ELEUTHEROSPERMA Hook. f.

2. *Polygonum delicatulum* Meisn.

VI.—NORTH-WEST HIMALAYA: (12) Kashmir; Musjid Valley, 12-13,000 ft., *Duthie*, No. 13222! (19) Kangra; Laka, *Edgeworth*! (21) Garhwal; Rhudughera-ka Godh, *Duthie*, No. 206! Taulea under Srikanta, 12-13,000 ft.,

Duthie, No. 540! (22) Kumaon; Milam and Ralum, 12,000 ft. *Strachey & Winterbottom*, No. 38!

- VIII.—EASTERN HIMALAYA: (1) Sikkim; Tongloo, 10,000 ft., *King*, No. 4965! Phalut, 11,000 ft., *Thomson*! Sandakphu, 12,000 ft., *Gamble*, Nos. 766 and 8402! Phullalong, 11,000 ft., *C. B. Clarke*, No. 13403! Islumbo, 12,000 ft., *C. B. Clarke*, No. 25563! Jongri, 13-15,000 ft., *T. Anderson*, No. 594! Bloktan, near Jongri, *King's collector*! Niapokri, 12,000 ft., *King's collector*! Momay Samdong, 17,000 ft., *Gammie*, No. 696! Tankra, 15,500 ft., *Gammie*, No. 582! Yakla Pass, 16,000 ft., *C. B. Clarke*, No. 10192! (2) Tibet and Bhutan; Patang-la, 10,000 ft., *King's collector*, No. 4163! Ze-lep-la, *King's collector*! Gup-ten-de-la, a little above Chumbi, *King's collector*!

3. *Polygonum filicaule* Wall.

- VI.—NORTH-WEST HIMALAYA: (11) Hazara; Kagan Valley, 14,400 ft., *Duthie*, No. $\frac{20113}{6}$! (12) Kashmir: Sind Valley, 12,000 ft., *C. B. Clarke*, No. 30998! Yamham Pass, 13-14,000 ft., *Duthie*, No. 14184! (19) Kangra; Laka, *Edgeworth*! (22) Kumaon; Ralum, 12-14,000 ft., *Strachey & Winterbottom*, No. 37!

- VII.—NEPAL: Gossainthan, *Wallich*, Nos. 1694 and 1725! Chiami, 12,000 ft., *King's collector*!

- VIII.—EASTERN HIMALAYA: (1) Sikkim; Tongloo, 10,000 ft., *King*! *Gamble*, No. 2697 B! Phullalong, 11,000 ft., *C. B. Clarke*, Nos. 13416 C and E, and 25696 D! Chandogiri, 11,000 ft., *Gamble*, Nos. 82 B and 773! Singalelah, 10,000 ft., *Gammie*, No. 66! Roskah, 10-11,000 ft.; Jongri, 15,000 ft.; Bloktan, Chokka, and Chooabama, near Jongri, *King's Collector*! Momay Samdong, 15,500 ft., *Gammie*! Lachung Valley, 12,500 ft., *Gammie*, No. 945! Tankra, 10,000 ft., *Gammie* No. 428! (2) Tibet and Bhutan; Chumbi, *Dungboo*! Nathoot, east of the Chumbi Valley, Sikkim side, *King's* No. 4294! Ga-ling, between Chumbi and Phari, *Dungboo*!

VAR. *cæspitosa*.

- VIII.—EASTERN HIMALAYA: (1) Sikkim; Taktoh, 10,000 ft., *King's collector*!

This is a very dwarf form, very small in all its proportions, and not more than two inches high. It is not necessarily a more alpine form as the locality quoted above is at the lowest level for the species.

***VAR. villosa.**

VII.—NEPAL: Huanangi, 10,000 ft., *King's collector*!

VIII.—EASTERN HIMALAYA: (1) Sikkim; Gnatong, 12,000 ft.,
Dunghoo! Gnatut, 15,000 ft., *King's collector*!

This is a very distinct variety, named by Major Cummins, and easily distinguished by its very hirsute stem and leaves.

Polygonum delicatulum and *Polygonum filicaule* evidently grow not infrequently in close intimacy, as on several sheets in the Calcutta Herbarium, the two are inextricably mixed up, as if gathered in the same tuft.

SECTION III.—AVICULARIA Meisn.

4. ***Polygonum biaristatum** Aitch. & Hemsley, *Four. Linn. Soc.*, vol. xviii, p. 90.

A small prostrate glabrous shrub with twisted, often very short branches. *Leaves* small, crowded, subcoriaceous, elliptic or obovate, 4-8 mm. long, often abruptly and shortly acuminate, sessile or very shortly petioled. *Stipules* large, bifid, with two long excurrent nerves. *Flowers* axillary, solitary or in pairs, sessile or shortly pedicelled, 2-4 mm. in diameter. *Perianth* red, 5-partite, segments alike and rather fleshy or with the two inner segments thinner. *Stamens* 8, filaments dilated at the base. *Ovary* glabrous, styles terete. *Nut* triquetrous.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Seratigah, Kurram Valley, 12,000 ft., *Aitchison*, No. 816!

This description is adapted from that in the *Journal of the Linnean Society* quoted above.

5. **Polygonum recumbens** Royle.

VI.—NORTH-WEST HIMALAYA: (12) Kashmir; Basaoli, 4,500 ft., *C. B. Clarke*, No. 31542 B! (15) Kunawar-Bashahr; Wangtu Valley, below Grammon, *Brandis*, No. 3547! Pasada, 6,000 ft., *Lace*, No. 1082! (19) Kulu; Dharmasala, 7,000 ft., *C. B. Clarke*, No. 24003 B! (20) Simla; *Griffith*! Elysium Hill, 7,000 ft., *Gamble*, No. 4715 C! (21) Garhwal; Deoban Range, 7-8,000 ft., *Duthie*, No. 1222! Landour, 7,500 ft., *Vicary*! Mussoorie, 7,000 ft., *King*! *Duthie*, No. 746! (22) Kumaon; *Anderson*! Girgaon, 6,000 ft., *Strachey & Winterbottom*, No. 41!

6. **Polygonum cognatum** Meisn.

VI.—NORTH-WEST HIMALAYA: (4) Dras; Dras and north of the Zozi-la, *Stoliczka*! Dras Valley, 11-12,000 ft., *Duthie*,

No. 11656! (6) Zanskar; East of the Pensi-la, and west of Padam, 12,000 ft., *Stoliczka*! (9) Chitral; Lowari Pass, 10,000 ft., *Harriss*, Duthie's No. 16593!

7. *Polygonum paronychioides* C. A. Mey.

I.—NORTH-WEST FRONTIER: (1) Afghanistan; 3,500 ft., *Aitchison*, No. 561! Kohat to Kurram, *Bellew*, No. 1601 Waziristan; Barwand, 4,000 ft., *Harusukh*, Duthie's No. 15634!

VI.—NORTH-WEST HIMALAYA: (1) Gilgit, 9,000 ft., *Giles* No. 11! (2) Baltistan; Chatpani Nala, 10-11,000 ft., *Duthie*, No. 13823! (4) Dras; Thatayan, 11,000 ft., *Gammie*! (6) Zanskar; 20 miles north-west of Padam, 12,000 ft., *Stoliczka*! (7) Rupchu; south of the Tok-ling-la, 13,500-15,000 ft., *Stoliczka*! (8) Spiti and Parang; ascent to Kibar, 13,000 ft., *T. Thomson*! (9) Chitral and Dir; Ziarat, 7-8,000 ft., *Duthie's* No. 16587! (11) Hazara; Kagan Valley, 9,000 ft., *Inayat*, Duthie's No. 20126! (12) Kashmir; valley of the Kishengunga, *Strachey & Winterbottom*, No. 594! (15) Kunawar; Pangi, *Stoliczka*! Kuri and Changrezing, 11-12,000 ft., *Stoliczka*! (18) Chamba; Triloknath to Jurma, 9,000 ft., *Lace*, No. 1682!

8. *Polygonum salicornioides* Jaub. & Spach.

I.—NORTH-WEST FRONTIER: (3) Scinde; ex *Flora of British India*.

There are no specimens of this species in the Calcutta Herbarium.

9. *Polygonum aviculare* Linn.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Kurram Valley, *Aitchison*, Nos. 632 and 655! Kohat to Tonk, *Bellew*, No. 578 B! Peshawar; *Stewart*! (2) British Baluchistan; Quetta, 6,000 ft., *Duthie*, No. 8704! Fort Sandeman, 4,600 ft., *Harusukh*, Duthie's No. 19001!

VI.—NORTH-WEST HIMALAYA: (5) Ladakh; Indus Valley, Upshi to Leh, 12-14,000 ft., *Stoliczka*! (9) Chitral and Dir, near Drosh, 4-5,000 ft., *Hamilton*, Duthie's No. 17917! (11) Hazara; *Stewart*! Kagan Valley, *Inayat*, Duthie's No. 20120! (12) Kashmir; near Kashmir City, *Strachey & Winterbottom*, No. 274! Kamri Valley, 10-11,000 ft., *Duthie*, No. 12539! Baragam, 9,000 ft., *Duthie*,

No. 13963! (13) Kistawar and Badrawar; Badrawar, 4-10,000 ft., *Stoliczka*! (15) Kunawar; Chini, *Brandis*, No. 2749! Pangj, *Brandis*, No. 4001! (18) Chamba; Nurpur, 4,000-5,500 ft., *Schlagintweit*! (20) Simla, 7,000 ft., *Schlich*! (22) Kumaon; Near Milum, 11,500 ft., *Strachey & Winterbottom*, No. 21! Dhauli Valley, *Duthie*!

10. *Polygonum Bellardi All. (*Fl. Pedem. ii*, 205, t. 90, f. 2).

Annual, glabrous; stem erect, 20 to 45 cm. long, branches slender grooved, nodes distant. *Leaves* sessile, elliptic, lanceolate, acute, 2 to 3.8 cm. long, .4 to .7 cm. broad, flat, midrib distinct, lateral nerves obscure or none. *Stipules* membranous, hyaline, lacerate in their upper half, with a few prominent nerves. *Flowers* on short pedicels as long as the perianth, in clusters of 2 to 3 in the axils of tubular hyaline few-nerved slightly lacerate bracts, distant on a long slender raceme. *Nutlet* trigonous, included, finely punctate or shining.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Kurram district, *Aitchison*, No. 656! (2) British Baluchistan; Rakh Darkhel, Peshin Valley, 4,800 ft., *Lace*, No. 3317.

VI.—NORTH-WEST HIMALAYA: (9) Chitral and Dir; Dir, 6,000 ft., *Harriss*, *Duthie's* No. 16584! (11) Hazara, 3,500 ft., *Stewart*, No. 443!

11. Polygonum setosum Jacq. (*Obs. iii*, 8, t. 57).

Shrubby, glabrous, 15 to 30 cm. high, more or less tufted. *Root-stock* woody, as thick as the little finger with bases of old shoots; branches 15 to 30 cm., erect or ascending, flexuous or geniculate, terete below, triquetrous above, grooved; internodes elongate, lower shorter than the leaves, upper longer than the leaves, shortened again in the inflorescence. *Leaves* very shortly petioled, distinctly articulated with the pulvillus; lamina linear-lanceolate or subulate, 2 to 4.5 cm. long, .4 to .8 cm. broad, mucronate, margin revolute, midrib distinct with many parallel veins running obliquely forward from the midrib to merge in the margin. *Stipules* membranous, sub-hyaline, lacerate, setose at the mouth, with many nerves, at first tubular, then longitudinally split anteriorly. *Flowers* on short pedicels, articulated below the perianth, in clusters of 2 to 3 in the axils of infundibuliform slightly lacerate bracts on at first somewhat dense but latterly interrupted terminal racemes. *Perianth-tube* short, segments in two series, 2 outer and 3 inner, subequal. *Stamens* 8, inserted on the throat, 3 large and 5 small. *Nut* trigonous, polished.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Kurram Valley, *Aitchison*, No. 656!

VI.—NORTH-WEST HIMALAYA: (15) Kunawar; Pangi, *Stoliczka*!

The many-nerved stipules, and the peculiar venation of the leaves with their revolute margins, make this species quite distinct. The Calcutta sheets are intermediate in character between *Polygonum setosum* Jacq., and *Polygonum luzuloides* Jaub. & Spach, as described in Boissier's *Flora Orientalis*, vol. iv, pp. 1038-1039, and as figured in Jaubert and Spach's *Ill. Or.*, *tt.* 125 and 126. Boissier describes *Polygonum luzuloides* as very close to *Polygonum setosum*, and the Calcutta sheets would support the idea that they are really one species.

12. *Polygonum tubulosum* Boiss.

I.—NORTH-WEST FRONTIER: No specimens in the Calcutta Herbarium.

VI.—NORTH-WEST HIMALAYA: (4) Dras, 10,000 ft., *Duthie*, No. 13733! (6) Zanskar, 5-8,000 ft., *T. Thomson*! Near Rangdam Goupa, 12-14,000 ft., *Stoliczka*! (9) Chitral and Dir; Mirga 7,200 ft., *Gatacre*, *Duthie's* No. 17512! (11) Hazara, 3,500-5,000 ft., *Stewart*, No. 326! (12) Kashmir; Kishengunga Valley, below Gurais, 8-9,000 ft., *Duthie*, No. 14101! (14) Lahul; *Brandis*, No. 3545! (21) Garhwal; Ganges Valley above Jangla, 9-10,000 ft., *Duthie*, No. 530.

13.* *Polygonum polycnemoides* Jaub. & Spach. (*Illustr. ii*, 20 t. 120).

Annual, glabrous, prostrate, much branched; branches 7 cm. to rarely 30 cm. long, filiform, flexuous, angled but not grooved, often finely scaberulous on the angles; internodes short, 8 mm. to 16 mm. long, very uniform, but becoming very short towards the apex and entirely covered by the stipules. *Leaves* minute, sessile, alternate, fleshy, flat, entire, obsoletely 1-nerved, mucronulate, 8 mm. long or less. *Stipules* delicate, membranous, white, hyaline, obsoletely 3-nerved, more or less dentate, the lower shorter than the leaves, the upper as long or a little longer and imbricating. *Flowers* axillary, solitary or in pairs, very shortly pedicelled. *Perianth*-segments 5, 3 internal, 2 external. *Stamens* 8, inserted on the perianth-throat, unequal. *Nut* trigonous, very small, included, minutely punctate.

I.—NORTH-WEST FRONTIER: (1) Afghan border; *Griffith*, K. D., No. 4103! Kurram Valley, *Aitchison*, No. 215! (2) British Baluchistan; Bolan Pass, *Griffith*, No. 589 (1725)!

VI.—NORTH-WEST HIMALAYA: (1) Gilgit; Chaelu, 10,000 ft., *Giles*, No. 61! (2) Baltistan; near Gorakote, *Strachey & Winterbottom*, No. 723! Baleshahr Nullah, Astor, 7-8,000 ft., *Duthie*, No. 12493! Shingo Valley 10-11,000 ft., *Duthie*, No. 11908! (15) Kunawar; Pangi, *Stoliczka*!

This species could be confused, in India at least, with only *Polygonum paronychioides*, *Polygonum afghanicum* or *Polygonum tubulosum*. The absence of a perennial woody rootstock distinguishes it from the first two species, while its much more slender, flexuous, and almost leafless-looking habit distinguishes it from *Polygonum tubulosum*. Boissier (*Flora Orientalis*, vol. iv, p. 1033) without assigning any reason, expresses a doubt of the correctness of Meisner's statement (*DC. Prodr.* xiv, 92) that this species is found in Afghanistan. Apparently Boissier could not have seen Griffith's original numbers, which Meisner quotes, and which are also in the Calcutta Herbarium: they leave no room for doubt.

14. **Polygonum afghanicum* Meisn. (*DC. Prodromus* xiv, 90).

Somewhat shrubby, with many erect, filiform, angled, pruinose-papillose branches; internodes about 1.3 cm. long, shorter above, and concealed by the stipules, which below are shorter than the internodes and hyaline, obsoletely 3-nerved, ciliate-lacerate. *Leaves* linear, 8-10 mm. long, setosely mucronate, midrib often lighter in colour than the lamina, otherwise nerveless, flat or with the margins revolute towards the apex, base very slightly narrowed. *Flowers* axillary, usually solitary, sessile. *Perianth*-segments 5, somewhat elongate, the two outer shortly awned. *Stamens* 8, unequal. *Nut* trigonous, finely punctulate.

I.—NORTH-WEST FRONTIER: (1) Afghanistan, 3,000 ft. and over, *Aitchison*, No. 470! (2) British Baluchistan; *Stocks* (Herb. N. Dalzell, Bombay), No. 1135! Gwal, 6,000 ft., *Lace*, No. 3732!

The woody rootstock and erect strict habit distinguish this species quite clearly from *Polygonum polycnemoides*, which has an annual root and very slender and flexuous branches.

15. *Polygonum mollieforme* Boiss.

VI.—NORTH-WEST HIMALAYA: (3) Nubra, 14-16,000 ft., *T. Thomson*! (?) Zaling-Karpo Pass, and south of Bhabeh, *Stoliczka*!

16. Polygonum plebejum R. Br.

- I.—NORTH-WEST FRONTIER AND PUNJAB: (1) Afghan border; Kohat to Kurram, *Bellew*, No. 578 A. (2) British Baluchistan; No specimens in the Calcutta Herbarium. (3) Scinde; No specimens in the Calcutta Herbarium. (4) Gujrat; No specimens in the Calcutta Herbarium. (5) Punjab west of the Sutlej; Peshawar, *Stewart*, Lahore, *Stewart*, Herb. Kurz, No. 2545! *Brandis*, Herb. Kurz, No. 2663! (6) Punjab east of the Sutlej; No specimens in the Calcutta Herbarium. (7) Bhawalpur, Rajputana, and Indore; No specimens in the Calcutta Herbarium.
- II.—CENTRAL PROVINCES: (1) Central Provinces; *Ferdon*!
- III.—PENINSULAR INDIA: (2) Canara; North Canara, Siddapore, *Talbot*, No. 1080!
- IV.—UPPER GANGETIC PLAIN: Lucknow, *T. Anderson*! Banda, *Mrs. Bell*!
- V.—BENGAL: (2) Chutia Nagpur; Dorunda, *Prain*! (5) North Bengal; Caragola Ghat, *King*! Naogaon, *Prain*! (6) Central Bengal; Kushtia, *Kurz*! Sibpur, *Kurz*!
- VI.—NORTH-WEST HIMALAYA: (19) Kulu; Beas Valley, from Bijaura and the base of the Rot'ang Pass, 4-6,500 ft., *Stoliczka*! (21) Garhwal, *King*!
- VII.—NEPAL: Sheopara, *Wallich*, No. 1691 G.!
- VIII.—EASTERN HIMALAYA: (1) Sikkim and Darjeeling district, *T. Anderson*! Sivoke, 800 ft., *King*! (2) Bhutan; Shang-zong-la, 8,000 ft., *Dunghoo*!
- IX.—ASSAM: (4) Khasia Hills; *Simons*! (8) Brahmaputra Valley; Dikho Valley, *Watt*, No. 10348!
- X.—BURMA: (1) Chittagong District; Barkhal, on the Karnaphuli River, *Lister*, No. 119! (11) Sittang Valley; Tonkyeghat, *Kurz*, No. 519!

VAR. effusa.

- I.—NORTH-WEST FRONTIER: (2) British Baluchistan, *Duke*! Quetta, 5,600 ft., *Lace*, No. 4076! Fort Sandeman, *Harsukh*, Duthie's No. 20643! (7) Rajputana; Jodhpur, *King*!
- IV.—UPPER GANGETIC PLAIN: Dehra Dun, 2,000 ft., *King*!
- V.—BENGAL: (2) Chutia Nagpur, *Wood*!
- VI.—NORTH-WEST HIMALAYA: (4) Chitral; Bundai, 4,000 ft., *Harriss*, Duthie's No. 16581!
- IX.—ASSAM: (7) Manipur; Nong Shong Khong Valley, 3,900 ft., *Watt*, No. 6302!

X.—BURMA: (6) Shan Hills; Fort Stedman, *Abdul Huk*! (10) Irrawaddy Valley; *Kurs*, No. 2212! (12) Tenasserim; Chounza, 3,000 ft., *Gallatly*, No. 582!

VAR. *elegans*.

- II.—CENTRAL PROVINCES: (1) Central Provinces; Saugor, *Vicary*!
- IV.—UPPER GANGETIC PLAIN: Oude; *Wallich*, No. 1691 C!
- V.—BENGAL: (5) North Bengal; Mahanadi River, *T. Thomson*! (6) Central Bengal, near Kushtia, *Kurs*! Calcutta, *C. B. Clarke*, No. 33570! Sibpur, *Kurs*!
- VI.—NORTH-WEST HIMALAYA: (16) Kunawar and Bashahr; Pangi, *Stoliczka*! Runang Pass, 12,000 ft., *Lace*, No. 565! (18) Chamba; *Ellis*, No. 433! (22) Kumaon; *Wallich*, No. 1691 D! Naini Tal, *T. Anderson*!
- VII.—NEPAL: *Scully*, No. 50!
- VIII.—ASSAM: (6) Naga Hills; *Prain*! (8) Brahmaputra Valley; *Mann*, No. 47! Dibrugarh, 300 ft., *C. B. Clarke*, No. 37726 A.! Kamikha in Kamrup, *King's collector*!
- IX.—CHITTAGONG and BURMA: (1) Chittagong District; Kasalong, *Gamble*, No. 7865! (6) North and South Shan Hills; Bhamo, *J. Anderson*! Shan States, *Abdul Huk*, No. 30! Fort Stedman, *Abdul Khalil*! (12) Tenasserim; Chu-ku, *Gallatly*, No. 952!

VAR. *indica*.

- II.—CENTRAL PROVINCES: Jubbulpore, *C. B. Clarke*, No. 31972! Saugor, *Ferdon*! Chanda District, *Duthie*, Nos. 9715, 9716, 9718! Tapti Valley, *Duthie*, No. 10545.
- III.—PENINSULAR INDIA: (2) North Canara; *Talbot*, No. 57! (4) Nilgiri Hills; Chemenguli, 7,000 ft., *Gamble*, No. 16218! (7) Northern Circars, *Cleghorn*! Aska, Ganjam District, *Gamble*, No. 14174! Nandial, Karnul District, 1,000 ft., *Gamble*, No. 10928! Bukkapatam, Anantapur District, 1,500 ft., *Gamble*, No. 20945! Cuddapah District, 4,500 ft., *Gamble*, No. 15155! Arcot, *Griffith*! Shevaroi Hills, *Perrottet*, No. 381! (10) Mysore; Bangalore, *Cameron*!
- V.—BENGAL: (2) Chutia Nagpur; Kadampur Valley, *Wood*! Manbhum, *Campbell*! Singbhum, *Haines*, No. 143! (6) Central Bengal; Jessore, *C. B. Clarke*, No. 34587 H!
- X.—BURMA: (6) Shan Hills; Ruby mines, *Abdul Huk*, No. 42! Khoni, *Praser*! Taungyi, *Abdul Khalil*! (7) Pegu; Yomah, *Kurs*, No. 519!

VAR. brevifolia.

I.—NORTH-WEST FRONTIER: (5) Punjab west of the Sutlej; Lahore, *Stewart*, Herb. Calc., No. 2545!

IV.—UPPER GANGETIC PLAIN: Etawah, *Hume*!

V.—BENGAL: (6) Central Bengal; Jessore, *Parry*! Bussirhat, *C. B. Clarke*, No. 21757 B! Baraset, *C. B. Clarke*, No. 34882! Jahanabad, Hughli District, *J. D. Nusker*! Sibpur, *Kurs*! (7) West Bengal, Ranigunge, *Kurs*!

VI.—NORTH-WEST HIMALAYA: (11) Hazara; Siran Valley, *Inayat*, Duthie's No. 20119! (18) Chamba; Dalhousie, 6,700 ft., *C. B. Clarke*, No. 23010 B! (19) Kulu; from Bilaspur to Mandi, 2-300 ft., *Stoliczka*! (20) Simla; Sutlej bank below Kumbarsen, 3,000 ft., *Gamble*, No. 6144 B! (21) Garhwal; Mussoorie, 6,000 ft., *King*! Landour, 7,000 ft., *Vicary*! (22) Kumaon; Naini Tal, 7,000 ft., and Almora, 5,500 ft., *Strachey & Winterbottom*, No. 23!

VAR. micranthema.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Shaik Budia, *Sanders*! (3) Scinde; Karachi District, *Ryan*! (4) Cutch; *Stoliczka*! (5) Punjab west of the Sutlej; Lahore, *Stewart*! (7) Rajputana; Abu Lake, *King*! Jodhpur, *King*!

IV.—UPPER GANGETIC PLAIN: Fattehgarh, *T. Anderson*! Dehra Dun, *King*!

V.—BENGAL: *Kurs*!

VIII.—EASTERN HIMALAYA: *T. Anderson*!

X.—BURMA: (6) Shan Hills, *Abdul Huk*, No. 16! Kyoukse, *Abdul Huk*!

VAR. Griffithii.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Peshawar, *Stocks*! (7) Rajputana and Indore; Marwar, *King*! Goona, *King*! Morar, *Maries*, No. 234!

II.—CENTRAL PROVINCES: Saugor, *Ferdon*! Jubbulpur, *Beddome*, No. 47! *C. B. Clarke*, No. 31974 A.! *Prain*, No. 46! Khandwa, *Duthie*, No. 8398!

III.—PENINSULAR INDIA: (1) Concan; *Stocks*! (4) Malabar; *Stocks*! *Law*!

IV.—UPPER GANGETIC PLAIN: (1) Agra and Oudh; Fattehgarh, *Griffith*! By the Chambal near Etawah, *Duthie*! (2) Bundelcund; Mahobra, *Duthie*, No. 6474!

V.—BENGAL : *Griffith!* (4) Behar, *Kurs!*VAR. *polyneura*.

III.—PENINSULAR INDIA : (2) North Canara ; Sirey, *Talbot*, No. 389!

Exclusive of the varieties *scindica* and *Miqueliana*, which have not been identified by the writer as present in the Calcutta Herbarium there have been enumerated above no fewer than eight forms of *Polygonum plebejum* R. Br. The writer finds it very difficult to accept all these forms as belonging to one species. The varieties in their typical condition at least differ very much more markedly from each other than allied but admitted species, such as *Polygonum recumbens* and *Polygonum cognatum*, or *Polygonum paronychioides* and *Polygonum tubulosum*, do from each other. The writer under other conditions than the purpose of the present paper admits would be strongly inclined to form four species, the composition of which may be briefly indicated here.

1st species =	{	Polygonum plebejum R. Br. proper.
		var. effusa.
		var. elegans.
2nd species =	{	var. micranthema.
		var. indica.
3rd species =		var. brevifolia.
4th species =		var. Griffithii.
		var. polyneura.

The altitudinal distribution of those so-called varieties, to which the reader may here be referred, would tend to corroborate the writer's ideas, which he had formed purely on morphological grounds. The *var. Griffithii*, in particular, is morphologically very distinct, and has a very limited altitudinal range.

SECTION IV.—AMBLYGONON Meisn.

17. *Polygonum orientale* Linn.

IV.—UPPER GANGETIC PLAIN : (1) Agra and Oudh ; Dehra Dun, 2,000 ft., *Duthie*, No. 1973 !

V.—BENGAL : (5) North Bengal ; Garidura in the Terai, *Gamble*, No. 2696 B. ! Caragola, *King!* (6) Central Bengal ; Calcutta, *C. B. Clarke*, No. 3641 ! Howrah, *T. Anderson!* Sibpur, *Kurs!* (8) East Bengal ; Comilla, *C. B. Clarke*, No. 6929 !

VI.—NORTH-WEST HIMALAYA: (12) Kashmir, near Srinagar, *Schlagintweit*, No. 4458!

IX.—ASSAM: (6) Naga Hills; Jaboca, *Prain's collector*, No. 715!
(8) Brahmaputra Valley; Gauhati, *Simons*! *Watt*, No. 12228! (9) Sylhet and Cachar; *Wallich*, No. 1709 B.!

X.—*BURMA: (1) Chittagong District; Kodala Hill, *King's collector*, Nos. 364 and 527! (6) Shan Hills; Fort Stedman, *Abdul Huk*! Shwebo, *Abdul Huk*, No. 80! Hetto and Taungyi, *Abdul Khalil*! (10) Irrawaddy Valley; Mandalay and Mengoon, *J. Anderson*! (11) Sittang Valley; *Kurs*, No. 520! (12) Tenasserim; Chu-ku, *Gallatly*, No. 929!

18. *Polygonum tomentosum* Willd.

II.—CENTRAL PROVINCES: Chanda District; *Duthie*, No. 9714!

III.—PENINSULAR INDIA: (?) (2) Canara; *Birchy*, *Talbot*, No. 2051! (8) Carnatic; *G. Thomson*! (10) Mysore; *G. Thomson*!

V.—BENGAL: *T. Anderson*!

IX.—ASSAM: No specimens from this sub-sub-area in the Calcutta Herbarium.

X.—BURMA: (1) Chittagong District; Kodala Hill and Jandachin Hill, *King's collector*, Nos. 184 and 237! (7) Pegu; Yomah; Phoungyee, *Kurs*, No. 526! (9) Arracan; Kolodyne Valley, *Kurs*! (10) Irrawaddy Valley; Rangoon and Prome, *Wallich*, No. 1709 D, *in whole* in Calcutta Herbarium! (11) Sittang Valley; Toungoo, *Kurs*, No. 525!

XI.—MALAY PENINSULA AND ANDAMANS: (1) Peninsula; Perak, Ipoh, *Curtis*, No. 3178! Simpang, *L. Wray*, No. 2034!
(2) Andamans; Hobdaypur and Port Mouat, South Andaman, *King's collector*! Great Cocos Island, *Prain*!

19. *Polygonum limbatum* Meisn.

II.—CENTRAL PROVINCES: Saugor, *Ferdon*!

III.—PENINSULAR INDIA: *Beddome*, No. 112! (1) Concan, *Stocks*!
Law! (4) Malabar, *Stocks*!

IV.—UPPER GANGETIC PLAIN: (2) Bundelcund, *Vicary*!

V.—BENGAL, *Griffith*! *T. Thomson*! (2) Chutia Nagpur; Oomra, Manbhum, 1,000 ft., *C. B. Clarke*, No. 34433 C!

X.—*BURMA: (6) Shan Hills; Bhamo, *J. Anderson*! (10) Irrawaddy Valley; Minbu district *Gage*!

SECTION V.—TOVARA A. Gray.

20. *Polygonum virginianum* Linn.

VI.—NORTH-WEST HIMALAYA: (11) Hazara; Kagan Valley, *Inayat*, Duthie's No. 20128! (18) Chamba; Bassued Forest, 6,000 ft., *Lace*, No. 1982!

VIII.—EASTERN HIMALAYA: (1) Sikkim; *Kurs*! Semari, Balasun, 7-8,000 ft., *Dungboo*!

IX.—*ASSAM: (6) Naga Hills; Piffima, 3,000 ft., *C. B. Clarke*, No. 40937 E.!

X.—*BURMA: (5) Kachin Hills; *Shaik Mokim*!

SECTION VI.—BISTORTA Tourn.

21. *Polygonum viviparum* Linn.

VI.—NORTH-WEST HIMALAYA: (1) Gilgit; *Giles*! (6) Zanskar; East of Suroo, Zalung Karpo Pass, 14-17,000 ft., *Stolicska*! (7) Rupchu; *Stolicska*! (8) Spiti; Sungnum and Kibles, *Stolicska*! (11) Hazara; Kagan Valley, 11,200 ft., *Inayat*, Duthie's No. $\frac{20122}{6}$! (12) Kashmir; Gurais Valley, *Strachey & Winterbottom*, No. 548! Kishengunga Valley, *Strachey & Winterbottom*! Sangam Valley, 13,000 ft., *Duthie*, No. 13551! Musjid Valley, 12-13,000 ft., *Duthie*, No. 13244! Sind Valley, below Baltal, 9-10,000 ft., *Duthie*, No. 11535! (14) Lahul, *Hay*! Kardong, *Schlegintweit*, No. 3692! Rotang Pass, Chandra Valley side, 13,000 ft. *Holland*! (15) Kunawar; Pangi, *Stolicska*! *Heyde*! (21) Garhwal; Near Mussoorie, *King*! Phuladaru in Nila Valley, 11-12,000 ft., *Duthie*, No. 203! (22) Kumaon, near Ralum, 11,500 ft., *Strachey & Winterbottom*, No. 5! Nipchang Valley in Darma, 14-15,000 ft., *Duthie*, Nos. 3331 and 3348!

VIII.—EASTERN HIMALAYA: (1) Sikkim; Jongri to Aloktong, 13-15,000 ft., *T. Anderson*! Jongri, 13,000 ft., *Gammie*! Bloktan, near Jongri, *King's collector*! Kinchin, 15,000 ft., *King's collector*, No. 556! Jongri and Lachen, *King's collector*! Tankra, 13,500 ft., *Gammie*, No. 419! Sebu Valley, 14,000 ft., *Gammie*, No. 1149! (2) Tibet and Bhutan; Patang-la, 10,000 ft., *King*, Nos. 4184 and 4186! Pedong-Oong, *Dungboo*! Pheemong, near Chumbi,

Dungboo! Beerom, 12,000 ft., and Rookah, 11,000 ft., *King's collector!* Syumpoo, *King's collector!* No. 106! Teumtong, 11,000 ft., *King's collector!* Phari, *King!* No. 4582!

22. *Polygonum sphærostachyum* Meisn.

VI.—NORTH-WEST HIMALAYA: (21) Garhwal; Dudutoli, 10,000 ft., *Strachey & Winterbottom!* No. 1! Kuari Pass, 13,000 ft., *Duthie!* No. 4363! (22) Kumaon; *Wallich!* No. 1683 B!

VII.—NEPAL: *Wallich!* No. 1716! *Scully!* No. 171! Gosain Than, *Wallich!* No. 1683 D!

Wallich! No. 1716 is quoted in the *Flora of British India!* as the type of *Polygonum amplexicaule* var. *speciosa!* which in the Calcutta Herbarium is represented by the *Wallichian!* sheet 1716 A.

VIII.—EASTERN HIMALAYA: (1) Sikkim; Gnatong, 12,000 ft., *King's collector!* No. 4378! Giagong, 13,000 ft., *King's collector!* Tallong above Tallum, 13,000 ft., *King's collector!* Tankra, 15,500 ft., *Gammie!* No. 572! Donkia 15-18,000 ft., *Gammie!* No. 812! (2) Tibet and Bhutan; Cho-le-la, *King's collector!* North-West of Chumbi below Tangkar-la, 14,000 ft., *Waddell!* Do-to, 4 miles from Phari, *Dungboo!* Phari, *King!* No. 4592! Wa-ru-ting, Tibet-Bhutan frontier, *King's collector!*

23. *Polygonum perpusillum* Hook. f.

VI.—NORTH-WEST HIMALAYA: (21) Garhwal; above Chinpul, 14-15,000 ft., *Duthie!* No. 534! Above Bhowani, 13-14,000 ft., *Duthie!* No. 4360! (22) Kumaon; above Ralum, 14,500 ft., *Strachey & Winterbottom!* No. 39!

VIII.—EASTERN HIMALAYA: (1) Sikkim; Kinchin, 14,000 ft., *King's collector!* Cho-la, *King's collector!* No. 4489! Tankra, 15,000 ft., *Gammie!* No. 556! Tang-ka-la, *King's collector!* (2) Tibet and Bhutan; Punka-bee-se-mo, *Dungboo!* No. 378!

24. *Polygonum paleaceum* Wall.

IX.—ASSAM: (4) Khasia Hills, *Wallich!* No. 1684! *Oldham!* No. 8! *Mann!* Nos. 524, 614, 872, all from 3-6,000 ft.: Shillong 6,000, *C. B. Clarke!* No. 3868! A! *Gallatly!* No. 138! *Prain!* No. 26! Tserra, 4-4,500 ft., *C. B. Clarke!* Nos. 5364 and 7199!

X.—*BURMA: (6) Southern Shan Hills; Saikan, *Abdul Khalil*!

The writer agrees with Forbes and Hemsley in the opinion expressed in their *Enumeration of Chinese Plants*, under *P. confusum*, (*Four. Linn. Soc.*, vol. xxvi, p. 336) that it is questionable whether Meisner's *Polygonum confusum* is the same as Wallich's *Polygonum paleaceum*.

In De Candolle's *Prodromus*, vol. xiv, p. 125, Meisner quotes Wall. Cat. No. 1684, which is the type of *Polygonum paleaceum*, under *Polygonum sphærostachyum*. Under *Polygonum confusum* Meisner (*Wall. Plant. Asiat. Rar.*, vol. iii, p. 53) quotes Wall. Cat. No. 1683, which is *Polygonum sphærostachyum*, and he adds a note to the effect that *Polygonum confusum* grows along with and in the same places as *Polygonum sphærostachyum*, from which one would infer that Meisner's *Polygonum confusum* was not confined to Assam. Now if it were the same as *Polygonum paleaceum*, it would be so limited. The writer is, therefore, of opinion that Meisner's *P. confusum* is merely a form of *Polygonum sphærostachyum*.

25. * *Polygonum Bistorta* Linn. (*Sp. Plant.* 360).

Rootstock thick, twisted; annual stems glabrous, simple or with occasionally a branch-peduncle from the axil of one or two of the upper leaves; internodes long, 4-12 cm. *Leaves* glabrous or puberulous on the lower surface, lower leaves cordate with a very long petiole winged above, length of lamina to as much as 14 cm., breadth to as much as 8 cm., length of petiole to as much as 20 cm., upper leaves subsessile on the top of the stipular tube, half-amplexicaule, cordate-lanceolate, 2.5-5 cm. long and 1-1.5 cm. broad. *Stipules* glabrous, tubular, about 5 cm. long, eciliate nervosely striate. *Spike* dense, cylindrical, oblong-obtuse, 2.5-4.5 cm. long, about 2 cm. broad. *Flowers* large, on pedicels longer than the flowers, articulating just below the perianth, and arising in the axils of pale-brown, membranous, lanceolate, entire, closely imbricating bracts. *Perianth* segmented almost to the base, segments 5 sub-equal, broadly oval, with 4-5 distinct veins. *Stamens* 8, filaments long slender exerted, anthers minute. *Nut* trigonous elongated, style long slender trifid above, stigmas capitate.

VI.—NORTH-WEST HIMALAYA: *Royle*! (21) Garhwal; Binh Valley, 12-13,000 ft., *Duthie*, No. 541! Kumari Pass, 13,000 ft., *Duthie*, No. 4364!

VII.—NEPAL, *Scully*!

This in no way differs from the typical European or American plants, but none the less has been confused with the variety *speciosa* of *Polygonum amplexicaule*, and with *Polygonum sphærostachyum*. It resembles the first in the size of the spike but differs altogether in

the leaves, and is quite different from the second both in spike and leaves. Royle's sheet contains both *Polygonum Bistorta* and *Polygonum amplexicaule*, and the name *Polygonum speciosum*, which fits neither, is applied to the mixture of both. Kurz had detected that the greater part of the sheet was *Polygonum Bistorta* and had so named it.

26. Polygonum amplexicaule Don.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Kurram Valley, *Aitchison*, No. 767!

IV.—UPPER GANGETIC PLAIN: Dehra Dun, *King*!

VI.—NORTH WEST HIMALAYA: (9) Chitral; Mirga, *Gatacre*, Duthie's No. 17502. (11) Hazara. Kahi Galli, Black Mountains, 8-9,000 ft., *Duthie*, No. 7560! Kagan Valley, 8,000-14,400 ft., *Inayat*, Duthie's Nos. 20116, 20116 A, 20117, 20118 A! Siran Valley, *Inayat*, Duthie's No. 20118! (12) Kashmir; Gulmarg, 8-11,000 ft., *Aitchison*, No. 29! *C. B. Clarke*, No. 30820 A! Kangar, Sind Valley, 5,500 ft.; Shapeyan, Kashmir Valley, 6,000 ft., *Gammie*! Sangam Valley, above Liddarwat, 12-13,000 ft., *Duthie*, No. 13554! From Kotsu to Palgam, *Gamble*! (15) Kunawar; Wangtu Valley above Grammon. *Brandis*, No. 3553! Brua Gad, 8-9,000 ft., *Lace*, Nos. 374 and 456! (18) Chamba; Chamba to Padri Pass, *Schlagintweit*, No. 3563! Dalhousie, 7-8,000 ft., *C. B. Clarke*, Nos. 22331 B and 22640! (20) Simla; Sirmoor, *Falconer*! *Vicary*! Narkanda, *Stolicska*! Jakko and Gowai, *Gamble*, No. 1387 C and 5319 B! (21) Garhwal; Mussoorie, *King*! *Duthie*, No. 642! Nag Tiba, 9-10,000 ft., *Duthie*, No. 749! Jangla, 8-9,000 ft., *Duthie*, No. 207! (22) Kumaon; *Wallich*, Nos. 1715, 1716-3! Kathee, 7,200 ft., and Kalimundi, 8,900 ft., *Strachey & Winterbottom*, No. 12! Valley of the Gori, 5,500 ft., *Strachey & Winterbottom*, No. 13! near Paton, 7,000 ft., *Strachey & Winterbottom*, No. 14! Naini Tal, *T. Anderson*! *Hume*, Herb. Kurz, No. 55! *Strachey & Winterbottom*, No. 12!

VAR. speciosa.

VI.—NORTH-WEST HIMALAYA: (21) Garhwal; Deoban Range above Chakrata, 7,000 ft., *Duthie*, No. 1226!

VII.—NEPAL: *Scully*, No. 264! Nampa Godh, 11-12,000 ft., *Duthie*, No. 5924! Baeary, *Wallich*, No. 1716 A! Megu, 13,000 ft., *King's collector*!

VIII.—EASTERN HIMALAYA: (1) Sikkim; Phalut, *T. Thomson!* Tongloo, 9,000 ft., *King! Gamble, No. 785!* Singaleleh, 10,000 ft., *C. B. Clarke, No. 13522 C!* Sehn-zen, *King, No. 4428!* Gnatong, 13,000 ft., *Pantling!* Jongri, 12,000 ft., *King's collector, No. 87!* Chooabama, 12,000 ft., *King's collector!* Ko-poop, *Dungboo!* Tumbok, 10,000 ft., *C. B. Clarke, No. 12765 F!* Yakla, 12,000 ft., *C. B. Clarke, No. 10093 A!*

The Wallichian sheet of this species in the Calcutta Herbarium is numbered 1716 A, and labelled "*Polygonum cordifolium* Wall., Baeary, June, 1821." The Wallichian sheet in the Calcutta Herbarium which bears the No. 1716 is, as already mentioned, *Polygonum sphaerostachyum* Meisn.

27. *Polygonum affine* Don.

VI.—NORTH-WEST HIMALAYA: (1) Gilgit; 13,000 ft., *Giles, No. 131!* Chuprot, *Strachey & Winterbottom, No. 493!* (4) Dras; 10,000 ft., *Duthie, No. 13724!* (8) Spiti and Parang; Upper Spiti Valley, 13-14,500 ft., *Stolicka!* (9) Chitral and Dir; Lowari Pass, 10,500 ft., *Harriss, Duthie's No. 16592!* (11) Hazara; Tap to Masenno glacier, *Schlagintweit, No. 7257!* Siran Valley, *Inayat, Duthie's, No. $\frac{20114}{a}$!* Kagan Valley, 14,400 ft., *Inayat, Duthie's No. 20115!* (12) Kashmir; Gurais Pass, *Strachey & Winterbottom, No. 493!* Above Gulmarg, 10-11,000 ft., *Duthie, No. 11273!* Agharwat (Gulmarg), 13,500 ft., *Gammie!* Badsulkod Nala, Liddar Valley, 12-13,000 ft., *Duthie, No. 13401!* Pir Panjal, 11,000 ft., *Gammie! Levinge, C. B. Clarke's No. 27141!* (14) Lahul; *Hay!* Foot of the Bara Latsa Pass, *Schlagintweit, No. 4030!* Upper Bhaga Valley, 9,500-13,000 ft., *Stolicka!* Rotang Pass, *Brandis, No. 3559!* (15) Kunawar; *Vicary!* Pangi, 11-16,500 ft., *Heyde!* (18) Chamba; *Ellis!* Chamba to Padri Pass, *Schlagintweit, No. 3654!* Sach Pass to Douai, *Lace, No. 1467!* (21) Garhwal; near Jumara camping-ground, 11-12,000 ft., *Duthie, No. 204!* Dudu Glacier moraine, 14-15,000 ft., *Duthie, No. 532!* Kuari Pass, 12-13,000 ft., *Duthie, No. 4559!* (22) Kumaon; *Wallich, No. 1692!* Near Milum, 14,500 ft. and below Ralum, 11,000 ft., *Strachey & Winterbottom, No. 2!* Pindi Glacier, 17,000 ft., *Collett!*

VII.—NEPAL: Budhi village, Western Nepal, *Duthie, No. 5935!*

28. Polygonum vacciniifolium Wall

VI.—NORTH-WEST HIMALAYA: (12) Kashmir; Marbul Pass, 11,400 ft., *C. B. Clarke*, No. 31317 A! (15) Kunawar? Harang, 12,000 ft., *Brandis*, No. 3549! (20) Simla; Sirmoor, *Vicary*! (21) Garhwal; Mussoorie, 7,000 ft., *King*! Rocks in the Ganges above Jangla, 11-12,000 ft., *Duthie*, No. 531! (22) Kumaon; Milum and near Ralum, 12,000 ft., *Strachey & Winterbottom*, No. 3!

VII.—NEPAL: *Scully*!

VIII.—EASTERN HIMALAYA: (1) Sikkim; *Watt*, No. 5279! Sughoo, *T. Thomson*! Jongri, 13,500-15,000 ft., *T. Anderson*, No. 1119! *C. B. Clarke*, No. 25822 C! Ze-lep-la, *Dungboo*! Tang-ka-la, *King's collector*! Gnatong, 12,000 ft., *Pantling*! Nathoot, *King's collector*, No. 4506! Ongla-thang, below Kinchinginga, *King's collector*! Domkerka, 12,000 ft., *King's collector*! Lachung Valley, 9,000 ft., *Gammie*, No. 675! Tankra, 12,500 ft., *Gammie*, No. 444! Yakla, *King's collector*! (2) Tibet and Bhutan; Min-dook-la, *King's collector*, No. 527!

29. Polygonum Emodi Meisn.

VI.—NORTH-WEST HIMALAYA: *Duthie*! (20) Simla; Narcanda, 9,000 ft., *Brandis*, No. 3558! (22) Kumaon, *Wallich*, No. 1693!

VIII.—EASTERN HIMALAYA: *Hooker f.*! (1) Sikkim; Lachen, 9,000 ft., *King's collector*! Lachung Valley, 10,000 ft., *Gammie*!

SECTION VII.—PERSICARIA Meisn.

30. Polygonum glabrum Willd.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Peshawar, *Stewart*, No. 177! (3) Scinde; Herb. *Dalsell*, No. 1202! Meera Hills, *Dalsell*! (5) Punjab, west of the Sutlej; Lahore, *Brandis*, No. 3006! (7) Rajputana, Indore; Abu, *King*! Gwalior, *Maries*, No. 21!

II.—CENTRAL PROVINCES: Saugor, *Vicary*! near Bhamgarh, Khandwa District, *Duthie*, No. 8401! Chanda District, *Duthie*, No. 9711!

- III.—PENINSULAR INDIA: (1) Concan; *Herb. Ind. Or. H. f. & T.*! (2) North Canara; *Talbot*, No. 450! Kala Nuddi, Vincholi, *Talbot*, No. 941! (4) Malabar; *Herb. Ind. Or. H. f. & T.*! (5) Cochin and Travancore; Cochin, *Gamble*, No. 14805! Travancore, 1,000 ft., *Bourdillon*, No. 46! (7) Northern Circars; *Cleghorn*! (8) Carnatic; *Herb. Ind. Or. H. f. & T.*! Narsapully, Anantapur District, 2,000 ft., *Gamble*, No. 15257!
- IV.—UPPER GANGETIC PLAIN: *Herb. Ind. Or. H. f. & T.*! Lucknow, *Bonavia*! Ghior, *Duthie*, No. 6475!
- V.—BENGAL: (2) Chutia Nagpur; Kewtbar, Palamow, *Wood*! Lohardugga, 2,000 ft., *C. B. Clarke*, No. 33946! Domree, Hazaribagh, 1,000 ft., *C. B. Clarke*, No. 33871 D! Manbhum, *Campbell*, No. 8227! *Watt*, No. 8423! Damodar River, *Prain*! Kalikund, Sonthal Pergunnahs, *Gamble*, No. 10671! (5) North Bengal; Purneah, *Kurs*! Pabna, *Griffith*! Naogaon, *Prain*! (6) Central Bengal; Rajpore, *Kurs*! Faridpore, *C. B. Clarke*, No. 7480! Sibpur, *Gammie*! Midnapur, *Abdul Huk*!
- VI.—NORTH-WEST HIMALAYA: *Royle*! (21) Garhwal; Mussoorie, *King*! (22) Kumaon, 1,000 ft., *Strachey & Winterbottom*, No. 25!
- VIII.—EASTERN HIMALAYA: (1) Sikkim; *T. Anderson*!
- IX.—ASSAM: No specimens from this sub-sub-area in the Calcutta Herbarium.
- X.—BURMA: (6) Shan Hills; *Abdul Huk*, No. 11! (11) Irrawaddy Valley; Mandalay and Mengoon, *T. Anderson*! Prome, *Kurs*, No. 2213! Minbu district, *Gage*!

The writer is unable to refer any specimen in the Calcutta Herbarium to either VAR. *scabrinervis* or VAR. *macrantha*, as described in the *Flora of British India*.

31. *Polygonum amphibium* Linn.

- VI.—NORTH-WEST HIMALAYA: (2) Baltistan; Iskardo Valley, 7,000 ft., *Strachey & Winterbottom*, No. 843! (12) Kashmir; Woolar Lake, 5,150 ft., *C. B. Clarke*, No. 29147 B! (22) Kumaon; Naini Tal Lake, *Madden*! *T. Anderson*!
- VIII.—* EASTERN HIMALAYA: (2) Tibet; In a small lake near Chumbi, *King's collector*!

32. *Polygonum lanigerum* R. Br.

- I.—* NORTH-WEST FRONTIER: (7) Rajputana; Abu, *King*!

- IV.—UPPER GANGETIC PLAIN: Dehra Dun, *Duthie*, No. 1974!
- V.—BENGAL: (3) Tirhut; Kissengunge, *Kurs!* (5) North Bengal; Siliguri, *C. B. Clarke*, No. 26458! Titalya, *Kurs!* Banks of the Ganges near Sahibgunge, *Kurs!* (8) East Bengal; Jheels near Dacca, *Griffith*, No. 134!
- VI.—NORTH-WEST HIMALAYA: (20) Simla; Sirmoor, *Vicary!* (22) Kumaon; Bhim Tal, 4,400 ft., *Strachey & Winterbottom*, No. 15!
- VII.—NEPAL: *Wallich*, No. 1714-2.
- VIII.—EASTERN HIMALAYA: No specimens in Calcutta Herbarium.
- IX.—ASSAM: (8) Brahmaputra Valley; Nowgong, *Simons!* Tezpur, *C. B. Clarke*, No. 37665!
- X.—BURMA: (6) Shan Hills; Chouchu, *Abdul Huk*, No. 67!
- In the opinion of the writer, *Wallich*, No. 1717, is not a variety of this species, but is to be referred to *Polygonum lapathifolium* Linn. *Wallich's* sheet shows no more canescence than many examples of *Polygonum lapathifolium* from Burma and elsewhere, which show all stages from a quite evident tomentum on the lower surface of the leaves to leaves quite glabrous except for the scabrid midrib and margin; in its annual habit, its glandular peduncles and perianth, *Wallich's* plant in no way differs from *Polygonum lapathifolium* Linn.

33. *Polygonum lapathifolium* Linn.

- I.—NORTH-WEST FRONTIER: (1) Afghan border; Kurram Valley, *Aitchison*, No. 866! Peshawar, *Stewart*, No. 45! (2) British Baluchistan; Shalkot, *Duke!*
- V.—BENGAL: (5) North Bengal; Mahanuddi, *T. Thomson!* (6) Central Bengal; Faridpur, *C. B. Clarke*, No. 7515! Sibpur, *Kurs!*
- VI.—NORTH-WEST HIMALAYA: (1) Gilgit; *Giles!* Nittar Valley, 9-10,000 ft., *Duthie*, No. 12444! (9) Chitral and Dir; Dir, 5,600 ft., *Harris*, *Duthie's* No. 16582! (11) Hazara; Plains to 3,500 ft., *Stewart*, No. 30! Kagan Valley, *Inayat*, *Duthie's* No. 20121! (22) Kumaon; Naini Tal, 6,500 ft., *Strachey & Winterbottom*, No. 17!
- IX.—ASSAM: (8) Brahmaputra Valley; *Simons!* Makum Junction, *Chatterjee!*
- X.—BURMA: (6) Shan Hills; *Abdul Huk*, No. 10! Maymyo Hill, *Badal Khan*, No. 167! Fort Stedman, *King's collector*,

No. 530! Saga, Saikan, Taungyi, *Abdul Khalil!* (10) Irrawaddy Valley; *Wallich*, No. 1717! (11) Sittang Valley; *Kurz*, No. 517!

SUB-SP. maculatum

VI.—NORTH-WEST HIMALAYA: (2) Baltistan; Iskardo, 7-8,000 ft., *Duthie*, No. 12061! (5) Ladakh; Indus Valley from Upshi to Leh, 12-14,000 ft., *Stoliczka!* (12) Kashmir; Suroo to Sanko, *Stoliczka!* (21) Garhwal; Mussoorie, 7,000 ft., *King!*

The sub-species, which here represents the VAR. *nodosa* of the *Flora of British India*, might quite well be raised to specific rank as *Polygonum nodosum* Pers., a course which Forbes and Hemsley have taken in their *Enumeration of Chinese plants*. Judging from the Calcutta Herbarium specimens, the altitudinal range of the sub-species is strikingly different from the species proper, which would tend to support the view of their being specifically different.

34. Polygonum Persicaria Linn.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Kurram Valley, *Harsukh*, *Duthie's* Nos. 15480 and 15481!

VI.—NORTH-WEST HIMALAYA: (1) Gilgit, 10,000 ft., *Giles A.*, No. 51! (11) Hazara; Jaba, 3,700 ft., *Duthie*, No. 22126!

35. Polygonum minus Huds.

III.—PENINSULAR INDIA: *Wight*, K. D., No. 2459! (4) Nilgiri Hills; *Schmidt!* Kolahambi, 5,000 ft., *Gamble*, No. 16760! (9) Colmbatore, Madura, Tinnevelly; Pallangi, Pulney District, *Bourne*, No. 1150!

V.—BENGAL: *Griffith*, K. D., No. 4106 in part!

VI.—NORTH-WEST HIMALAYA: 12,000 ft., *T. Thomson!* (15) Kunawar and Bashahr; Ribba, 7,500 ft., *Lace*, No. 616! (21) Garhwal; Tons Valley, 3,000 ft., *Gamble!*

VII.—NEPAL: *Wallich*, 1722 A!

VIII.—EASTERN HIMALAYA: (1) Sikkim; Rili River, *Dungboo!*

IX.—ASSAM: (4) Khasia Hills, 2-3,000 ft., *Mann*, No. 419! (7) Manipur; NOUNG SHONG KHONG Valley, 3,900 ft., *Watt*, No. 6304! (8) Brahmaputra Valley; *Badal Khan*, No. 36! Dibrugarh 300 ft., *C. B. Clarke*, No. 37784! Gauhati, *King's collector!* Orang, *Shaik Mokim*, No. 61! (9) Sylhet; Companyganj, *C. B. Clarke*, No. 14347 A!

X.—BURMA: (1) Chittagong District, *Herb. Ind. Or. H. f & T.*! (6) Shan Hills; Bhamo, *T. Anderson*!

XI.—MALAY PENINSULA: Pahang, *Ridley*, No. 1616!

36. Polygonum assamicum Meisn.

IX.—ASSAM: (4) Khasia Hills; *Herb. Ind. Or. H. f & T.*! (6) Naga Hills; *Prain*! (8) Brahmaputra Valley; *Mann*, No. 405! Upper Dihing River, Lakhimpur District, *Mann*, No. 529!

37. Polygonum viscosum Ham.

VII.—NEPAL: *Wallich*, No. 1713 A!

IX.—ASSAM: (4) Khasia Hills; *Herb. Ind. Or. H. f & T.*! *Oldham*! (6) Naga Hills; Jaboca, *Prain's collector*, No. 734! (8) Brahmaputra Valley; *Mann*, No. 139! Dibrugarh; *A. C. Chatterjee*! Goalpara; *Fisher*! (9) Sylhet; *C. B. Clarke*, No. 18133 B! Phenchoogunj, *C. B. Clarke*, No. 6968!

X.—* BURMA: (1) Chittagong District; *King's collector*, No. 310! (6) Shan Hills; Fort Stedman, *Abdul Huk*!

38. Polygonum stagninum Ham.

V.—BENGAL: (2) Chutia Nagpur; Basia, 2,000 ft., *C. B. Clarke*, No. 33942! (5) North Bengal; banks of Panar River, and banks of the Ganges near Sahibgunj, *Kurs*! Caragola, *C. B. Clarke*, No. 11743! (8) East Bengal; Dacca, *C. B. Clarke*, Nos. 7106 B and 7406! Ramgopalpore, Mymensingh District, *C. B. Clarke*, No. 17240 E!

VI.—NORTH-WEST HIMALAYA: (18) Chamba; 3,000 ft., *C. B. Clarke*, Nos. 24344 and 24348! (22) Kumaon; below Almora, 5,500 ft., *Strachey & Winterbottom*, No. 19!

IX.—ASSAM: (4) Khasia Hills; 1-2,000 ft., *Mann*! (8) Brahmaputra Valley; *Fisher*! Sibsagar, 250 ft., *C. B. Clarke*, No. 38026 B.! (1) Sylhet; Kurringunj, *C. B. Clarke*, No. 6993!

X.—BURMA: (11) Sittang Valley; *Kurs*, Nos. 528 and 529!

39. Polygonum barbatum Linn.

I.—NORTH-WEST FRONTIER: (1) Afghanistan; *Griffith*, K. D., No. 4115! (6) Punjab, east of the Sutlej; *Griffith*! (7) Rajputana; Abu, *Duthie*, No. 6704!

- II.—CENTRAL PROVINCES: Saugor, *Vicary*! Khandwa, *Duthie*, No. 8402! Chanda Distric, *Duthie*, Nos. 9712 and 9713!
- III.—PENINSULAR INDIA: *G. Thomson*! *Wight*, K. D., No. 2454!
(5) Travancore; *Lawson*, No. 159!
- IV.—UPPER GANGETIC PLAIN: Dehra Dun, *Vicary*!
- V.—BENGAL: (2) Chutia Nagpur; Ranchi, 1,500 ft., *C. B. Clarke*, No. 21360! Domree, Hazaribagh, 1,000 ft., *C. B. Clarke*, No. 33862 A! Palamow, *Gamble*, No. 8795! Bokaro River, *Prain*! Parasnath, *T. Thomson*!
(5) North Bengal, *T. Anderson*! (6) Central Bengal; Sibpur, *Gammie*!
- VI.—NORTH-WEST HIMALAYA: *Royle*! (22) Kumaon, *Wallich*, No. 1708 A!
- VII.—NEPAL: *Buchanan-Hamilton*!
- VIII.—EASTERN HIMALAYA: (1) Darjeeling District, 2,000 ft., *King*! (2) Bhutan, *Dunghoo*!
- IX.—ASSAM: (4) Khasia Hills; *Herb. Kurs*! (6) Naga Hills; *Prain*! (8) Brahmaputra Valley, *Fenkins*!
- X.—BURMA: (2) Lushai Hills; Changsil, *Praser*! (6) Shan Hills; Bhamo, *T. Anderson*! Indine and Saga, *Abdul Khalil*! Meingyan, *Abdul Huk*! Maymyo Hill, *Badal Khan*, No. 98! Makhaye Hill, *King's collector*! (7) Pegu Yomah; Myodwine River, *Kurs*, No. 527! Pansway, *Kurs*, No. 528! (9) Arracan; Akyab, *Kurs*, No. 528! (11) Sittang Valley; Tonkyeghat, *Kurs*, No. 528! (12) Tenasserim; Moulmein, *Falconer*, No. 324! Martaban, *Kurs*, No. 528!
- XI.—MALAY PENINSULA AND ANDAMANS: (1) Malay Peninsula; Malacca, *Griffith*! Singapore, *Hullett*, No. 10! *Ridley*, Nos. 1604 and 3756! Penang, *Curtis*, No. 2785! Perak, *Curtis*, No. 3179! (2) Andamans; Port Mouat, *King's collector*! Anikhet and Bajajagdah Hill, South Andaman; *King's collector*! Table Island, *Prain*!

Were it not that it is the writer's purpose in this paper to follow the *Flora of British India* as far as possible, he would certainly consider *P. stagninum* and *P. barbatum* as one species, placing *P. stagninum* as a variety of *P. barbatum*. The difference between the two is merely a matter of more or less tomentum. The plants with thickly silky strigose leaves and branches have invariably the pubescence extending on to the bracts, the plants which are almost glabrous or show only a very moderate amount of scabridity have always glabrous bracts. The writer has in vain attempted to lay hold of any more satisfactory character. Accordingly all the plants with hairy bracts have been

lumped together as *P. stagninum* Ham., and all those with glabrous bracts as *P. barbatum* Linn. *P. serrulatum* Lagasc., which has also glabrous bracts, is distinguished from *P. barbatum* by its narrower, more linear-looking, and almost always glabrous leaves with a slightly cordate base or if not cordate at least never cuneate as in *P. barbatum*. The leaves of *P. serrulatum* when dry are rather green in colour, those of *P. barbatum* dark-brown. With regard to the note under *Polygonum stagninum* in the *Flora of British India*, it may be of interest to record here that, in the Calcutta Herbarium, there is a sheet of undoubted *Polygonum barbatum* Linn., which is labelled *P. hispidum*, and has a short latin description appended, both name and description being in Buchanan-Hamilton's own handwriting. The occurrence of this sheet certainly supports Meisner's reference of Hamilton's *Polygonum hispidum* to *Polygonum barbatum* Linn. The *Polygonum barbatum* of Roxburgh's unpublished *Icones* is not *Polygonum tomentosum* Willd., which has short racemes and an orbicular nut and is well represented under its proper name amongst the *Icones*. The *Polygonum barbatum* of Roxburgh's *Icones* is an excellent representation of *Polygonum macranthum* Meisn., which is also well described as *Polygonum barbatum* in his *Flora Indica*, where the reference to the twiggy racemes, so characteristic of *Polygonum macranthum* Meisn., is unmistakeable.

It may not be superfluous to give here the writer's identification of all Roxburgh's drawings of *Polygonums* in the *Icon. Ined.*, vol. vii:—

Name on Roxburgh's drawing.	Name under which now known.
104. <i>Polygonum nutans</i> R 1135	= <i>Polygonum lapathifolium</i> Linn.
105. <i>Polygonum lanatum</i> R 939	= <i>Polygonum lanigerum</i> Br.
106. <i>Polygonum pilosum</i> R 934	= <i>Polygonum orientale</i> Linn.
107. <i>Polygonum tomentosum</i> 628	= <i>Polygonum tomentosum</i> Willd.
108. <i>Polygonum glabrum</i> 629	= <i>Polygonum glabrum</i> Willd.
109. <i>Polygonum tenellum</i> R 1134	= ? <i>Polygonum flaccidum</i> Meisn.
110. <i>Polygonum barbatum</i> 631	= <i>Polygonum macranthum</i> Meisn.
111. <i>Polygonum rivulare</i> 630	= <i>Polygonum barbatum</i> Linn.
112. <i>Polygonum flaccidum</i> R 1056	= <i>Polygonum serrulatum</i> Lagasc.
113. <i>Polygonum perfoliatum</i> 1412	= <i>Polygonum perfoliatum</i> Linn.
114. <i>Polygonum elegans</i> Sol. Mss. . . . 632	= <i>Polygonum plebejum</i> R. Br. var. <i>indica</i> of F. B. J.

40. *Polygonum serrulatum* Lagasc.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Peshawar, Stewart, No. 149! Dera Ismail Khan, Harsukh, Duthie's No. 15733! (2) British Baluchistan; Quetta, Hamilton! (3) Indore; Goona, King, No. 85!

III.—PENINSULAR INDIA: Talbot, No. 3140!

- IV.—UPPER GANGETIC PLAIN: (1) Rohilcund, Agra and Oudh; Dehra Dun, *King*! Forests of North Oudh, *R. Thompson*! Lucknow, *Bonavia*, No. 62! Banks of the Gumpti near Indalpur, *Duthie*, No. 4355! (2) Bundelcund; *Vicary*!
- V.—BENGAL: (6) Central Bengal; Howrah, *T. Anderson*! Sibpur, *Kurs*! (8) East Bengal; *Unknown collector*!
- VI.—NORTH-WEST HIMALAYA: (21) Garhwal; Deoban, 8,000 ft., *Rogers*! Mussoorie, *Duthie*, No. 570! (22) Kumaon; Naini Tal, *T. Anderson*!
- X.—BURMA: (1) Chittagong District; Rangamatti, *C. B. Clarke* No. 8291! (6) Shan Hills; *Abdul Huk*, No. 33! Fort Stedman, *Abdul Huk*! Kumay Road, *Abdul Huk*, No. 97! Makhaye Hill, *King's collector*! Maymyo Hill, near Mandalay, *Badal Khan*, Nos. 97 and 163! Monay, *Abdul Khalil*!
- XI.—MALAY PENINSULA AND ANDAMANS: Nicobar Islands; Katchall, *Kurs*!

The writer has failed to identify the variety *Donii* in the Calcutta Herbarium.

41. *Polygonum Posumbu* Ham.

- IV.—UPPER GANGETIC PLAIN: Dehra Dun, 2,000 ft., *King*!
- VI.—NORTH-WEST HIMALAYA: (12) Kashmir; Gulmarg, 9-10,000 ft., *Duthie*! (19) Kangra; *Edgeworth*! (20) Simla; Sirmoor, *Vicary*! (22) Kumaon; Hurrara, 4,000 ft., *Strachey & Winterbottom*, No. 18!
- VIII.—EASTERN HIMALAYA: (1) Sikkim; Kajell, *T. Anderson*! Little Rungeet, *T. Thomson*! Great Rungeet, *Kurs*! *T. Anderson*, No. 234! Ratong to Yoksum, 2,500 to 5,000 ft., *T. Anderson*, No. 1186! Soke, 3,000 ft., *C. B. Clarke*, No. 24902 B! Rishap, 4,000 ft., *C. B. Clarke*, No. 13584 C! Sureil, 5,000 ft., *King*! *Gage*! (2) Tibet and Bhutan; Shong-ong-la, 8,000 ft., *Dungboo*!
- IX.—ASSAM: (1) Daphla Hills; Dikrung Valley, *Lister*! (4) Khasia Hills; *Herb. Ind. Or. H. f. & T.*! (6) Naga Hills; Tingali Bam, *Prain's collector*, No. 178! (8) Brahmaputra Valley; Dibrugarh, 300 ft., *C. B. Clarke*, No. 37743 A! Golaghat; Sibsagar, 300 ft., *C. B. Clarke*, No. 40750!

42. **Polygonum mite* Schrank. (*Bair. Fl.*, 1. 688).

Annual, sub-erect; branches glabrous. *Leaves* very shortly petioled, arising from the base of the stipular tube, lamina 2.5 cm. to 5.5 cm.

long, lanceolate, acute, glabrous or with a few scattered hairs on both surfaces, especially on the midrib, margins ciliolate. *Stipules* with scattered adpressed strigose hairs and cilia as long as the tube. Floriferous portion of raceme 1.3 to 3 cm. long, loose, interrupted; peduncles glabrous, with stout cilia; *perianth* glabrous; *nutlet* small black, plano-convex or trigonous.

VI.—NORTH-WEST HIMALAYA: (12) Kashmir; near Gulmarg, 8-9,000 ft., *Duthie*! Khairpore, Kashmir Valley, 6,000 ft., *Gammie*! (15) Kunawar; Pangi, *Stoliczka*! (18) Chamba; Dalhousie, 7,000 ft., *C. B. Clarke*, No. 22299B! Between Alwas and Tisa, 4,000 ft., *Gammie*, No. 18428! (19) Kulu; Beas Valley from Bijaura to the base of the Rottang Pass, 4-6,500 ft., *Stoliczka*! (20) Simla; *Duthie*, Nos. 8817 and 10084! *Inayat*, No. 8814! (21) Garhwal; Mussoorie, 7,000 ft., *King*! *Duthie*, No. 744!

43. *Polygonum Hydropiper* Linn.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Hango, 3,200 ft., *Inayat*, *Duthie's* No. 20928! Ushtarzai, 1,800 ft., *Inayat*, *Duthie's* No. 20930!

V.—BENGAL: (2) Chutia Nagpur; Damodar River, *Prain*! (5) North Bengal; Purneah, *Kurs*! (6) Central Bengal; Sibpur, *Kurs*! (7) West Bengal, near Ranigunge, *Kurs*!

VI.—NORTH-WEST HIMALAYA: (1) Gilgit; *Strachey & Winterbottom*, No. 985! *Giles*, No. 272! (10) Swat Valley; Chakdara, *Harriss*, *Duthie's* No. 16585! (18) Chamba; Chamba to Masrund, 3,000 ft., *Lace*, No. 1834! (22) Kumaon, *King*! Bagesar, 3,200 ft., *Strachey & Winterbottom*, No. 16!

VIII.—EASTERN HIMALAYA: (1) Darjeeling District; Darjeeling, 6,000 ft., *Lister*! Sureil, 5,000 ft., *Gage*!

IX.—ASSAM: (4) Khasia Hills; 4-6,000 ft., *Mann*, Nos. 237 and 623! (6) Naga Hills; Kohima, 3-4,000 ft., *Prain*! Shillong, *Prain*, No. 57! (8) Brahmaputra Valley; Gauhati, *King's collector*! Jala Busti, near Teock Ghat, *Prain's collector*!

VAR. *glandulosissima.

III.—PENINSULAR INDIA: (2) North Canara; *Talbot*, No. 2682! Near Hubli, Dharwar District, *College of Science, Poona*! Covered everywhere with numerous minute glands, everywhere perfectly glabrous and eciliate.

44. Polygonum flaccidum Meisn.

- I.—NORTH-WEST FRONTIER: (1) Afghan border; Feshawar, *Stewart*, No. 223! (5) Punjab, west of the Sutlej; Rawal Pindi. *Aitchison*, No. 1009!
- III.—PENINSULAR INDIA: *Wight*, K. D., No. 2453! (4) Nilgiris, *G. Thomson*!
- IV.—UPPER GANGETIC PLAIN: Dehra Dun, *King*!
- V.—BENGAL: (2) Chutia Nagpur; Koshang, Singbhum, 2,000 ft., *Gamble*, No. 8993! (5) North Bengal; below Siliguri, *Kurs*! (6) Central Bengal; Jessore, *Parry*! Rajpore, *Kurs*! Badoorea, 24-Pergunnahs, *C. B. Clarke*, No. 34857 A! Sibpur, *Gammie*!
- VI.—NORTH-WEST HIMALAYA: (18) Chamba, 3,000 ft., *C. B. Clarke*, No. 24273 A! Dalhousie, 7,000 ft., *Grant*! *C. B. Clarke*, No. 23131C! (22) Kumaon; Small lake near Bhim Tal, 4-5,000 ft., *Duthie*, No. 4354! Near Ranikhet, 5-6,000 ft., No. 5936!
- VIII.—EASTERN HIMALAYA: (1) Darjeeling District; Rungbee, 5,000 ft., *Gamble*, No. 2692C! Rishap, 3,000 ft., *C. B. Clarke*, No. 12572B! Mungpoo, 3,000 ft., *C. B. Clarke*, No. 26748 A! (2) Bhutan, *Parkes*!
- IX.—ASSAM: (6) Naga Hills; Kohima, *Prain*! *C. B. Clarke*, No. 41704! Shillong, 5,000 ft., *C. B. Clarke*, Nos. 40329 A and 44681 A! (8) Brahmaputra Valley; Dikho Valley, *Watt*, No. 10349! Jorhat, Sibsagar, 250 ft., *C. B. Clarke*, No. 38044 F! Sibsagar, *Watt*, No. 10373! Teock Ghat, near Tingali Bam, *Prain's collector*, No. 338!
- X.—BURMA: (1) Chittagong Hill Tracts; *King's collector*, No. 197! (3) Chin Hills; *Abdul Huk*! (6) Shan Hills; Bhamo, *J. Anderson*! (11) Sittang Valley, *Kurs*, No. 524!
- XI.—MALAY PENINSULA: Kintra River, *King's collector*, No. 809! Larut, *Kunstler*, No. 2503! Perak, *Ridley*, No. 2964! Pahang, *Ridley*, No. 1335!

VAR. hispida.

- III.—PENINSULAR INDIA: (4) Nilgiris, *G. Thomson*! (7) Northern Circars; Dohu Ghat, Ganjam District, 2,500 ft., *Gamble*, No. 1366!
- V.—BENGAL: (8) East Bengal; Dacca, *C. B. Clarke*, No. 8143!

- VI.—NORTH-WEST HIMALAYA: (21) Garhwal; Lobah, 5-6,000 ft., *Duthie*, No. 4350!
- VII.—NEPAL: Ramebund, *Wallich*, No. 1723 A in part!
- VIII.—EASTERN HIMALAYA: *T. Thomson*! (1) Darjeeling District, *Kurz*!
- X.—BURMA: (6) Shan Hills, *Abdul Huk*! (7) Pegu Yomah; Phounggee, *Kurz*, No. 524! (11) Sittang Valley; Tonghoo, *Kurz*, No. 523! Pegu, *Brandis*, No. 1399! (12) Tenasserim, *Helper*, K. D., No. 4133!

The Wallichian sheet 1723A in the Calcutta Herbarium contains two plants of *Polygonum serrulatum* Lagasc., and one indifferent specimen of *Polygonum flaccidum* var. *hispida*. The mixture is labelled *Polygonum hispidum* Hamilt. apud Don, *Prodr. Nepal. Legi in Nepalia ad Ramebund, Aug. 1821*. As explained under *Polygonum barbatum*, the evidence appears to the writer to be in favour of referring *Polygonum hispidum* Ham., to *Polygonum barbatum* Linn.

The description in Don's *Prodromus* is vague enough but appears to the writer to fit *Polygonum barbatum* better than *Polygonum flaccidum* var. *hispida*: the term *spicis densifloris*' could scarcely be applied correctly to the latter.

45. *Polygonum macranthum* Meisn. *P. barbatum* Roxb.

- IX.—ASSAM: *Griffith*, K. D., No. 4109! *Lister*! (4) Khasia Hills; *Hooker f. & Thomson*, No. 21! Soyung, 5,000 ft., *C. B. Clarke*, Nos. 44720 A and 45412 C!

All the above-quoted specimens show minute glands both on perianth and bracts.

SECTION VIII.—CEPHALOPHILON Meisn.

46. *Polygonum humile* Meisn.

- VI.—NORTH-WEST HIMALAYA: (22) Kumaon; Ralum, 8,500 ft., *Strachey & Winterbottom*, No. 45! Gori Valley above Munshiari, 6-7,000 ft., *Duthie*, No. 3334!

47. *Polygonum glaciale* Hook. fil.

- I.—NORTH-WEST FRONTIER: (1) Afghan border; Sikaram, 12,000 ft., Kurram Valley, *Aitchison*, No. 1203!
- VI.—NORTH-WEST HIMALAYA: (12) Kashmir; above Kilam, 12,000 ft., *Aitchison*! Tilail, 12,000 ft., *C. B. Clarke*, No. 30800B! (22) Kumaon; Milam Glacier, 12,500 ft.

Strachey & Winterbottom, No. 44! Near Bhidang in the Dhauli Valley, Darma, 13-14,000 ft., *Duthie*, No. 3350!

48. *Polygonum alatum* Ham.

- I.—NORTH-WEST FRONTIER: (1) Afghan border; Kurram Valley, *Aitchison*, No. 986!
- III.—PENINSULAR INDIA: (4) Nilgiris; *Schmidt*! Ootacamund, 7,000 ft., *King*! *Gamble*, No. 15353! (9) Madura; Kodaikanal Lake, *Bourne*, No. 695! (10) Mysore; Bababuden Hills, *Talbot*, Nos. 2369 and 2988!
- IV.—UPPER GANGETIC PLAIN: Dehra Dun, 2,000 ft., *Duthie*!
- V.—BENGAL: (2) Chutia Nagpur; *Parasnath*, *T. Thomson*! *Kurs*!
- VI.—NORTH-WEST HIMALAYA: (1) Gilgit; Jindrote, 7,500 ft., *Giles*, No. A° 24! (9) Chitral; Mirga, *Harris*, *Gatacre*, *Duthie's* Nos. 16580, 17510, 17511! (11) Hazara; *Stewart*, No. 571! *Schlagintweit*, No. 6409! Kagan Valley, 9,000 ft., *Inayat*, *Duthie's* No. 20125! Kahi Galli, 8,000 ft., *Duthie*, No. 7562! (12) Kashmir; Suru, *Stolicska*! Sonamurg, 8-9,000 ft., *Duthie*, No. 11502! Pir Panjal, 9,000 ft., *Gammie*! (13) Kistawar; Badrawar, 4-10,000 ft., *Stolicska*! (15) Kunawar; Bashahr, 9,200 ft., *Lace*, No. 495! (18) Chamba; Dalhousie, 7,000 ft., *Clark*, Nos. 135 and 136! *C. B. Clarke*, No. 22114 B! (20) Simla; Sirmoor, *Vicary*! Simla, 7,000 ft., *Hawkes*! *Gamble*, No. 5161 C! (21) Garhwal; Mussoorie, 7,000 ft., *King*! (22) Kumaon; near Tola, 11,500 ft., *Strachey & Winterbottom*, No. 9! Naini Tal, 7,000 ft., *Strachey & Winterbottom*, No. 9! *Hume*!
- VII.—NEPAL: *Wallich*, No. 1701-1.
- VIII.—EASTERN HIMALAYA: (1) Sikkim; Punkabari, *Kurs*! Rungno Valley, *Kurs*! Lebung, *T. Thomson*! Mungpoo, 3,500 ft., *Gammie*! Little Rungeet, *Kurs*! *T. Anderson*, No. 239! Senchal, 8,000 ft., *Gamble*, No. 2699 A! Tonglo, 10,000 ft., *King's collector*! Lachung Valley, 8,500-13,000 ft., *Gammie*, Nos. 938 and 1057! (2) Tibet and Bhutan; *King's collector*!
- IX.—ASSAM: (4) Khasia Hills; *Mann*, Nos. 397 and 1136! Shillong, 5,000 ft., *Prain*! *C. B. Clarke*, No. 17680 B! (6) Naga Hills; Kohima, 4,750 ft., *C. B. Clarke*, No. 41638! (7) Manipur; Mao to Kegnin, 6,000 ft., *Watt*, No. 685!

X.—BURMA: (2) South Lushai Hills; 15 miles south-east of Fort Lungleh, 3,000 ft., *Gage*, No. 163! (3) Chin Hills; *Abdul Huk*! (5) Kachin Hills; *Shaik Mokim*! (6) Shan Hills; Maymyo Hill, 40 miles from Mandalay, *Badal Khan*, No. 264! Fort Stedman, *Abdul Huk*! (12) Tenasserim; Martaban, *Kurz*, No. 515!

VAR. *Metziana*.

III.—PENINSULAR INDIA: (4) Nilgiri Hills; *Schmidt*!

V.—BENGAL: (2) Chutia Nagpur; *Parasnath*, *T. Thomson*!

VI.—NORTH-WEST HIMALAYA: (13) Kistawar; Badrawar, 8,000 ft., *C. B. Clarke*, No. 31468B! (18) Chamba; Dalhousie, 5,000 ft., *C. B. Clarke*, No. 23184 B! (20) Simla; North-east of Simla, *Stoliczka*! (21) Garhwal; *King*! (22) Kumaon; Raniket, 6,000 ft., *Duthie*, No. 4344 A!

VIII.—EASTERN HIMALAYA: (1) Sikkim; *T. Anderson*! *Kurz*! Top of Phalut, 10,000 ft., *T. Thomson*!

IX.—ASSAM: (4) Khasia Hills; *Mann*, No. 627! Shillong, *Collett*! Madkadokadok, 5,000 ft., *C. B. Clarke*, Nos. 40411 A and 45367 A! Cherrapunji, 5,000 ft., *Gallatly*, No. 221!

VAR. *parviflora*.

VI.—NORTH-WEST HIMALAYA: (22) Kumaon; Naini Tal, 7,000 ft., *Strachey & Winterbottom*, No. 11!

VII.—NEPAL: *Wallich*, No. 1700!

IX.—ASSAM: (4) Khasia Hills; Dingling, 3,500 ft., *C. B. Clarke*, No. 13078 A! Maolinkaden, 4,000 ft., *C. B. Clarke*, No. 44810! Shillong, 5,500 ft., *C. B. Clarke*, No. 38850 A!

VAR. *tenuicaulis*.

IX.—ASSAM: (4) Khasia Hills; *Mann*! Mairung, 5,000 ft., *C. B. Clarke*, No. 16152! Maokadokadok, 5,500 ft., *C. B. Clarke*, No. 45371 B!

The varieties *arenaria* and *rigidula* are not represented in the Calcutta Herbarium. The writer has failed to recognise amongst the Calcutta sheets the var. *nepalensis* as distinct from *Polygonum alatum* proper. Of the list of sheets quoted under *Polygonum alatum*, only Duthie's No. 17511 from Mirga, Chitral, has trigonous nutlets; it differs in no other particular from the rest of the sheets.

49. *Polygonum microcephalum* Don.

VII.—NEPAL: *Wallich*.

VIII.—EASTERN HIMALAYA: (1) Sikkim and Darjeeling District; *King*, No. 24! Sivoke, *T. Anderson*! *Kurz*! Tonglo,

T. Thomson! Punkabari, *Kurz!* Ryang, 4,000 ft., *C. B. Clarke*, No. 13645! *King!* Sittang, 3,000 ft., Sureil, 5,000 ft., *Gage!* (2) Bhutan; *Parkes!*

IX.—ASSAM: (4) Khasia Hills; 250-5,000 ft., *C. B. Clarke*, No. 5413! (6) Naga Hills; Chedama stream, 4-6,000 ft., *Prain!* Kohima, 3,000 ft., *Prain!* (8) Brahmaputra Valley; Sibsagar, *Masters!* (9) Sylhet, *Wallich*, No. 1704 E!

50. *Polygonum Wallichii* Meisn.

VII.—NEPAL: *Wallich*, No. 1702 A! *Scully*, No. 61!

51. *Polygonum sphærocephalum* Wall.

VI.—NORTH-WEST HIMALAYA: (18) Chamba; *Lace*, No. 1768! (21) Garhwal; *Gollan*, No. 1982! Jaunsar, 8,500 ft., *Gamble*, Nos. 24868 and 26787! (22) Kumaon; Kathi, 7,800 ft., *Strachey & Winterbottom*, No. 10! Dhankiri, 8,000 ft., *Collett!* Forest above Shinkala, 9-10,000 ft., *Duthie*, No. 5931!

VII.—NEPAL: *Wallich*, No. 1703!

Distributed to CENTRAL CHINA: Hupeh; *Henry*, No. 6075! This sheet of Henry's has been identified, in the writer's opinion, wrongly by Forbes and Hemsley as *Polygonum runcinatum* Ham., from which it differs in the venation of the leaf, in the absence of any sign of runcination and in being non-auriculate.

52. *Polygonum runcinatum* Ham.

III.—PENINSULAR INDIA: (4) * Nilgiris; Ootacamund, 7,500 ft., *Gamble*, No. 12701! This is the same plant as is figured in Wight, *Icones Pl.* t. 1805.

VII.—NEPAL: *Wallich*, No. 1698!

VIII — EASTERN HIMALAYA: (1) Sikkim; Darjeeling, 7,000 ft., *C. B. Clarke*, Nos. 8967 B and 12205 C! *Gamble*, No. 2687 B! Rungno and Little Rungeet Valleys, *Kurz!* Rungeet Valley, *T. Anderson*, No. 236! Old Lebong Road, *T. Thomson!* Sureil, 5,000 ft., *King!* Tukvar, *T. Thomson!* Phalut, 10,000 ft., *T. Thomson!* Tongloo, 8-10,000 ft., *T. Thomson!* *T. Anderson*, Nos. 1123 and 1132! *King*, No. 3094! *Gamble*, Nos. 2695 E., 9447, and 10435! Singalelah, 11,000 ft., *Gammie*, No. 76! (2) Tibet, *King's collector!*

IX.—ASSAM : (4) Khasia Hills ; Mairung, 55,00 ft., *C. B. Clarke*, No. 40258 A ! Cherra Plateau, 4,000 ft., *C. B. Clarke*, No. 5551 ! (6) Naga Hills ; Kohima, 4,750 ft., *C. B. Clarke*, No. 41631 !

63. Polygonum sinuatum Royle.

- VI.—NORTH-WEST HIMALAYA : (15) Kunawar and Bashahr ; *Vicary* ! Harang, 10,000 ft., *Brandis*, No. 3554 ! (21) Garhwal ; side of stream above Jalla, Ganges Valley, 10-11,000 ft., *Duthie*, No. 1984 ! (22) Kumaon ; descent to Saba, 8,500 ft., and Ralum River, 9-10,000 ft., *Strachey & Winterbottom*, No. 40 !
- VIII.—*EASTERN HIMALAYA : (1) Sikkim ; Lachung Valley, 10,000 ft., *Gammie*, No. 739 !

64. Polygonum capitatum Ham.

- V.—*BENGAL : (2) Chutia Nagpur ; Manbhum, *Campbell*, *Watt's* No. 9474 !
- VI.—NORTH-WEST HIMALAYA : (15) Kunawar and Bashahr ; Kandrarad Gad, *Lace*, No. 872 ! (18) Chamba ; Rakh to Chamba, 3-5,000 ft., *Lace*, No. 1772 ! Dalhousie, 5-7,000 ft., *Clark*, No. 133 ! *C. B. Clarke*, Nos. 22111 and 23149 B ! (19) Kulu ; Beas Valley from Bijaura to the base of the Rottang Pass, 4-6,500 ft., *Stolicska* ! (20) Simla ; Sirmoor, *Vicary* ! Simla, *Schlich* ! Jheog, 7,000 ft., *Gamble*, No. 367 B ! Tara Devi, 6,500 ft., *Gamble*, No. 5642 B ! (21) Garhwal ; Landour, *Vicary* ! Mussoorie, *King* ! Near Dhunda in the Ganges Valley, 4-5,000 ft., *Duthie*, No. 202 ! Jumna Valley, Kharsali, 8-9,000 ft., *Duthie*, No. 535 ! (22) Kumaon ; *Wallich*, 1699 B ! Naini Tal and Almora, 5,500 ft., *Strachey & Winterbottom*, No. 8 ! Naini Tal, 7,000 ft., *Hume* !
- VII.—NEPAL : *Maries* ! *Scully*, No. 326 !
- VIII.—EASTERN HIMALAYA : (1) Darjeeling District and Sikkim ; Darjeeling, 7,000 ft., *Kurs* ! *T. Anderson*, No. 235 ! Sureil, 5,000 ft., *Gage* ! Punkabari, *Kurs* ! Lingdam, 4,000 ft., *C. B. Clarke*, No. 13084 C ! Gorh, 3,500 ft., and Namdee, 10,000 ft., *King's collector* !
- IX.—ASSAM : (2) Mishmi Hills ; *Griffith* ! (4) Khasia Hills ; *Griffith*, No. 739 ! *Mann*, Nos. 532 and 578 ! Cherrapunji, *Gallatly*, No. 197 ! Cherra Plateau, 4,500 ft., *C. B. Clarke*, No. 5134 ! Borpani, 3,000 ft., *C. B.*

Clarke, No. 38196 A! Kullong, 5,800 ft., *C. B. Clarke*, No. 40010 B! Shillong, *Prain! Badal Khan!* (6) Naga Hills; Kohima, 4,750 ft., *C. B. Clarke*, No. 41700! *Prain!* Mongoemdi Road, *Watt*, No. 11810! (7) Manipur; *Watt*, No. 7407! Mao, 5,800 ft., *Watt*, No. 6129! (9) Sylhet; *Wallich*, No. 1699 C!

85. **Polygonum chinense** Linn. .

IX.—ASSAM: (2) Mishmi Hills; *Griffith!* (6) Naga Hills; Kohima, *Prain!* Jaboca, *Prain's collector*, No. 135! (8) Brahmaputra Valley; Nowgong, *Simons!* (9) Sylhet and Cachar; *Wallich*, No. 1707 A! *Keenan!*

X.—BURMA: (1) Chittagong Hill Tracts; *King's collector*, Nos. 91, 153, 197, 243, 292, 626, 656! (6) Shan Hills; *Abdul Huk!* Bhamo; *F. Anderson!* (7) Pegu Yomah; *Kurz*, Nos. 521 and 2211! (11) Sittang Valley; Toukyeghat, *Kurz*, No. 521!

XI.—MALAY PENINSULA: Perak; *Scortechini!*

VAR. *scabra*.

IX.—ASSAM: (4) Khasia Hills; *Griffith!* (6) Naga Hills; Kohima, 4,750 ft., *C. B. Clarke*, No. 41615!

X.—BURMA: (5) Kachin Hills; *Pottinger!* (6) Shan Hills; Pewhla, *Praser!* Maymyo Hill, *King's collector*, Nos. 122, 164! (12) Tenasserim; Faratoba, 2,500 ft., *Gallatly*, No. 175!

VAR. *ovalifolia*.

III.—PENINSULAR INDIA: (1) Concan; Mahableshtar, *T. Cooke!* (4) Nilgiris, 6,500 ft., *Gamble*, No. 11728! Pykara, *King!* Ootacamund, *Schmidt!* *King!* (5) Travancore; High Range, *Ferguson*, Bourdillon's No. 7! (8) Carnatic; Shevaroi Hills; *Perottet*, No. 22! (9) Madura; Kodaikanal, Pulney Hills, *Bourne!*

V.—BENGAL: (2) Chutia Nagpur; Parasnath, 4,200 ft., *C. B. Clarke*, No. 33730! *T. Thomson!* *Kurz!* Manbhum, *Campbell*, Watt's No. 8257!

VI.—NORTH-WEST HIMALAYA: (22) Kumaon; Durgara, and Naini Tal; *Strachey & Winterbottom*, No. 36!

VII.—NEPAL: *Maries!* *Wallich*, No. 1705 A!

VIII.—EASTERN HIMALAYA: (1) Sikkim and Darjeeling District; *King*, No. 963! Tonglo, 7,000 ft., *T. Thomson!* Yoksum, 4,500 ft., *T. Anderson*, No. 1151! Rungbee, *C. B.*

Clarke, No. 8678! (2) Tibet and Bhutan; *Parkes*! *King's collector*!

IX.—ASSAM: (4) Khasia Hills; *Griffith*! *Hooker & Thomson*! *Mann*! (7) Manipur; on the way to Singli, *Watt*, No. 6692!

X.—BURMA: (5) Kachin Hills; *Pottinger*! (7) Shan and Karen, Hills; Shway Koo, *J. Anderson*! Pwehla, 4,000 ft. *Collett*! Nantuphit Valley, 5,200 ft., *Gatacre*! Ruby Mines, *Abdul Huk*, No. 105! Makhaye Hill, and Madoe Hill, *King's collector*! Fort Stedman, *Abdul Huk*! Indine, Saga and Taungyi, *Abdul Khalil*! Natoung Mountains, *Cross*, Nos. 39 and 40! *Kurz*, No. 522!

X.—MALAY PENINSULA: *Kunstler*, No. 7968!

VAR. *subhastata*.

IX.—ASSAM: (7) Manipur; *Watt*, Nos. 5172 and 7406! (8) Brahmaputra Valley; Dibrugarh, *King's collector*, No. 37! Gauhati, *Gill*, No. 18! Teopora, *Watt*, No. 11131!

X.—BURMA: (2) Lushai Hills; Fort Lungleh, 3,000 ft., *Gage*, No. 52!

VAR. *brachiata*.

IX.—ASSAM: (1) Daphla Hills; Dikrung, 2,000 ft., *Lister*, No. 19! (2) Mishmi Hills; *Griffith*! (3) Garo Hills; *Mann*! (4) Khasia Hills; *Griffith*, No. 562! *Mann*, No. 599! (6) Naga Hills; Pherima, *Collett*! Tingali Bam, *Prain's collector*, No. 429! (9) Sylhet and Cachar; Lukhipur, Cachar, *C. B. Clarke*, No. 7029! Barak, Cachar, *Prager*!

VAR. *corymbosa*.

VI.—NORTH-WEST HIMALAYA: (20) Simla; Sirmoor, *Vicary*! *Gamble*, Nos. 4461 B and 5484 B! (21) Garhwal; Chakrata, 7,000 ft., *Gamble*, No. 26905! Ganges Valley, between Betwari and Dangulha, 5-6,000 ft., *Duthie*, No. 1992! Lobah, 5-6,000 ft., *Duthie*, No. 4348! Nag Tiba, near Mussoorie, 9-10,000 ft., *Duthie*! Mussoorie, *King*! (22) Kumaon; Valley of the Gori, 7,000 ft., *Strachey & Winterbottom*, No. 364.

VII.—NEPAL: *Wallich*, 1706-1! *Scully*, No. 5!

VIII.—EASTERN HIMALAYA: *Hooker fil.*! *Kurz*! (1) Sikkim; Darjeeling, 7,000 ft., *Gamble*, No. 2710 B! Senchal, 8,000 ft., *T. Thomson*!

IX.—ASSAM: (4) Khasia Hills, *Kurz*! *Mann*, Nos. 283 and 344! (6) Naga Hills; Konoma, *Prain*!

The separating out of the varieties of this species is by no means easy, and in the writer's opinion too much reliance may be placed on the presence or absence of glands on the peduncles as varietal distinctions. It is not always possible to distinguish between a "hispidulous" peduncle and one from which the gland heads have dropped off the gland stalks, and in many apparently "hispidulous" peduncles the writer has detected a small proportion of glandular heads still remaining and showing the true character of the peduncle. The confusion which inattention to this resemblance between a truly hispidulous peduncle and one that is only apparently so may bring about, is well illustrated by a concrete example *St. achey & Winterbottom's* No. 36 is represented in Calcutta Herbarium by two sheets, which are practically *fac-similes* of each other in every respect save one; this is that in one of the specimens the gland-heads are very apparent, in the other they have all fallen off. No. 36 is quoted by Meisner under his VAR. *Thunbergianum*, which he describes as eglandular hispidulous. He had seen a specimen on the peduncles of which only the gland-stalks had remained, and, misled by its hispidulous appearance, had placed it under *Thunbergianum*, whereas it is typical *ovalifolia*. The variety *scabra* includes both Meisner's *scabrum* and the variety *hispidula* of the *Flora of British India*. Griffith's Khasia Hill specimen agrees precisely with Meisner's description of his variety *scabrum*, and between it and Gallatly's typically hispid specimens are all gradations.

56. **Polygonum Gilesii* Hemsley. (Hook. *Icones Plant.*, vol. xviii, Pl. 1756).

Herb? everywhere glabrous; branches above filiform, at least three feet long. *Leaves* very few on the lower part of the stem, petioled, rather fleshy, cordate, about 5 in. broad. *Stipules* small, sc le-like. *Flowers* small, apparently white, very shortly pedicelled. *Perianth*-segments oblong, obtuse. *Stamens* 8, included *Nut* smooth, exserted.

VI.—NORTH-WEST HIMALAYA: (1) Gilgit; *Giles!* (9) Chitral, 6,000 ft., *Harriss*, Duthie's No. 16577! Jambatai, 10,000 ft., *Duthie's*, No. 16576!

The description is taken from Hemsley in Hooker's *Icones Plantarum*, vol. xviii, Pl. 1756.

SECTION IX.—ECHINOCAULON Meisn.

57. *Polygonum muricatum* Meisn.

VII.—NEPAL: *Wallich*, No. 1724!

VIII.—EASTERN HIMALAYA: No specimen in the Calcutta Herbarium.

- IX.—ASSAM: (4) Khasia Hills; Cherra, 4,000 ft., *C. B. Clarke*, No. 7267! Surareen, 5,000 ft., *C. B. Clarke*, No. 40419 A! Shillong, 5,000 ft., *C. B. Clarke*, No. 40523 A! Sadoo, 5,500 ft., *C. B. Clarke*, No. 44869!

58. *Polygonum arifolium* Linn.

- VIII.—EASTERN HIMALAYA: (1) Sikkim; Dikeeling, 5-7,000 ft., *C. B. Clarke*, Nos. 9640 B and C, and 9728 C!

- IX.—ASSAM: (4) Khasia Hills; *Hooker & Thomson*, No. 58! The writer can see no difference between this species, as exemplified by the above-quoted numbers, and Henry's Central China plant from Hupeh, No. 5080, *Polygonum senticosum* Meisn. of Forbes and Hemsley's enumeration.

59. *Polygonum perfoliatum* Linn.

- V.—BENGAL: (6) Central Bengal; Munshiganj, *C. B. Clarke*, No. 4727! Faridpur, *C. B. Clarke*, No. 7504!

- VI.—NORTH-WEST HIMALAYA: (22) Kumaon: Ramgunga Valley, 3,000 ft., *Duthie*, No. 3785!

- VII.—NEPAL: *Wallich*, No. 1696!

- VIII.—EASTERN HIMALAYA: (1) Sikkim and Darjeeling District; *Watt*, No. 5574! Rungno Valley, 5,000 ft., *T. Anderson*, No. 237! *Kurz*! Ryang Valley, *King*, No. 579! Mamring, 4,000 ft., *Gammie*!

- IX.—ASSAM: (4) Khasia Hills; *Hooker & Thomson*! *Mann*! (7) Manipur; *Watt*, No. 6828! (8) Brahmaputra Valley; *Masters*! (9) Sylhet; *Wallich*, No. 1696 B!

- X.—BURMA: (6) Shan Hills; Fort Stedman and Keng Taung, *King's collector*!

60. *Polygonum sagittatum* Linn.

- VI.—NORTH-WEST HIMALAYA: (22) Kumaon; Bhim Tal, 4-5,000 ft., *Duthie*, No. 4353!

- IX.—ASSAM: (4) Khasia Hills; Shillong, 5,000 ft., *C. B. Clarke*, No. 5759! Mansmon, 4,000 ft., *C. B. Clarke*, No. 16001! Maolngkaden, 4,000 ft., *C. B. Clarke*, No. 44814 A! (7) Manipur; Myang Khong Valley, *Watt*, No. 7149!

61. *Polygonum strigosum* R. Br.

- III.—PENINSULAR INDIA: (4) Nilgiris; *Schmidt*! *Gough*! Ootacamund, *King*! *Gamble*, No. 15377! Pykara, *Gamble*,

- No. 12051! (9) Madura District; Kodaikanal Lake Pulney Hills, *Bourne*, No 696!
- V.—BENGAL: (5) North Bengal; Siliguri, *Kurs!* Sukna, *Gamble*, 2964 B! Dalkajhar, 500 ft., *C. B. Clarke*, No. 3687 A! (6) Central Bengal; Faridpur, *C. B. Clarke*, No. 7488!
- VI.—NORTH-WEST HIMALAYA: (22) Kumaon; Bhim Tal, 4,400 ft., *Strachey & Winterbottom*, No. 7!
- VII.—NEPAL: *Wallich*, No. 1697 A!
- VIII.—EASTERN HIMALAYA: no specimens in Calcutta Herbarium.
- IX.—ASSAM: (4) Khasia Hills; *Mann*, No. 347! Kalapani, 5,000 ft., *C. B. Clarke*, No. 19031 B! (6) Naga Hills; Jolabusty, *Prairie's collector*, No. 330! (9) Sylhet; *Wallich*, No. 1697 B! *C. B. Clarke*, 7133!
- X.—BURMA: (1) Chittagong Hill Tracts; *King's collector*, Nos. 98 and 556! (3) Chin Hills; *Abdul Huk!* (6) Shan, Hills; Bhamo, *Abdul Huk!*
- XI.—MALAY PENINSULA: Pulau Penang, *Wallich*, No. 1697 D!

62. *Polygonum prætermisum* Hook. f.

VIII.—*EASTERN HIMALAYA: *T. Thomson!* *Kurs!* *Gammie!*

IX.—ASSAM: (4) Khasia Hills; Maoplang, 5,500 ft., *C. B. Clarke*, No. 18584 A!

All the specimens in the Calcutta Herbarium show glandular peduncles, although in some the glands have been almost entirely rubbed off, so that the peduncles appear on casual inspection as if glabrous.

63. **Polygonum birmanicum* sp. nov.

An annual herb with slender procumbent stem, faintly grooved and with angles slightly puberulous or glabrous; internodes about 3.5—6.5 cm. long. Lower leaves petioled, hastate, acute, upper leaves sessile amplexicaule, glabrous on both surfaces or faintly scabrid on the veins above and below; petiole 2—3.5 cm. long; lamina 2.5—6.5 cm. long, 8—2 cm. broad. *Stipules* small spathe-like, glabrous, eciliate, 4—8 mm. long. *Inflorescence* of about 3—6 slender simple axillary and branched terminal flaccid racemes, about 8.5—17 cm. long, each bearing about 6—2 distant bracts. *Bracts* tubular, glabrous, eciliate, unilaterally acuminate, 7 cm. long, with 2-4 flowers in the axil of each, exerted on pedicels 8 mm. long. *Flowers* small, about 4 mm. across or less. *Perianth*-segments 5, eglandular. *Stamens* 8, unequal. *Ovary* triquetrous, smooth; stigma trifid.

X.—BURMA: (6) Shan Hills; *King's collector*, No. 640! Fort Stedman, *King's collector*, No. 469! Indi, Keng Taung, Taungyi, Thamakhan in Southern Shan States, *King's collector*!

This is a quite distinct species near to *Polygonum prætermisum*, but distinguished therefrom by its much longer, quite glabrous and eglandular racemes.

64. Polygonum pedunculare Wall.

III.—PENINSULAR INDIA: (4) Nilgiris; Waterfield, *King*!

V.—BENGAL: (5) North Bengal; Dalkajhar, 500 ft., *C. B. Clarke*, No. 36798 C!

IX.—ASSAM: (6) Naga Hills; Jaboca; *Prain's collector*, No. 54! (8) Brahmaputra Valley; Orang, *Shaik Mokim*, No. 22! Dalgaon, *Shaik Mokim*, No. 336! Udulguri, Darrang District, *Chatterjee*!

XI.—MALAY PENINSULA: *Kunstler*, No. 2498! Singapore, *Wallich*, No. 1718! Malacca, *Griffith*! Johore, *Ridley*, No. 4220! Perak, *Ridley*, No. 2965! *Wray*, No. 1888! Pahang, *Ridley*, No. 1616! Selangor, *Ridley*, No. 8175!

VAR. angustissima.

III.—PENINSULAR INDIA; *Wight*, K. D., No. 2460!

V.—*BENGAL: (2) Chutia Nagpur; Bokaro River, *Prain*!

VAR. nilagirica.

III.—PENINSULAR INDIA: (2) North Canara; Supa, *Talbot*, No. 1383! (4) Nilgiris; Coonoor, 6,000 ft., *C. B. Clarke*, No. 10810 C and D! (9) Madura; Poombai, Pulney Hills, *Bourne*, No. 1151 in part!

VAR. assamica.

IX.—ASSAM: (4) Khasia Hills; *Mann*, No. 421! (8) Brahmaputra Valley; Lakhimpur, *Masters*!

VAR. glabrata.

IX.—ASSAM: (9) Sylhet; *Wallich*, No. 6285!

SECTION X.—ACONOGON Meisn.

65. Polygonum alpinum All.

VI.—NORTH-WEST HIMALAYA: (1) Gilgit; *Giles*, No. 117! (2) Baltistan; Teing, Astor, and Goodeh, *Strachey & Winterbottom*, No. 698! (9) Chitral; *Younghusband*! (11) Hazara; Kagan Valley, *Inayat*, Duthie's No. 20123!

- (12) Kashmir; Kajnag Range, 9-10,000 ft., *Duthie*, Nos. 10941 and 11086! Kanni Valley, 9-11,000 ft., *Duthie*, Nos. 12514 and 12521! Tragbol, 8,500 ft., *C. B. Clarke*, No. 29210 C! Drawa Pass, *Strachey & Winterbottom*, No. 434! Gulmarg, *Duthie*! (14) Lahul; Below Kolang, Bhaga Valley, 11,000 ft., *Holland*!
 (15) Kunawar; Pangi, *Herb. Kurs.*, No. 3978!

66. *Polygonum paniculatum* Blume.

VI.—NORTH-WEST HIMALAYA, *Wallich*, No. 1686!

VII.—NEPAL: No specimens in the Calcutta Herbarium.

VIII.—EASTERN HIMALAYA: (1) Sikkim, *Hooker*! *Kurs*! *King*! Tonglo, 8-10,000 ft., *Thomson*! *Gamble*, No. 8418!

IX.—*ASSAM: (6) Naga Hills; Konoma, *Prain*!

The *Wallichian* sheet in the Calcutta Herbarium is misnamed *Polygonum polystachyum*.

67. *Polygonum rude* Meisn.

IX.—ASSAM: (4) Khasia Hills; *Griffith*, No. 418! Mairung, 5,500 ft., *C. B. Clarke*, No. 40259 A! Maolinkaden, 4,000 ft., *C. B. Clarke*, No. 44817 A! *Mann*, No. 375! Nunklow, *Simons*, No. 449!

X.—*BURMA: (3) Chin Hills; *King's collector*! (5) Kachin Hills; *Prain's collector*! (6) Shan and Karen Hills; Natoung Hills, 7,000 ft., *Kurs*, No. 518!

68. *Polygonum molle* Don.

VI.—NORTH-WEST HIMALAYA: (5) Kunawar and Bashahr; Chini, *Stewart*, *Brandis*, No. 2883!

VII.—NEPAL: *Wallich*, No. 1685 in part! *Hamilton*! *Scully*, No. 268!

VIII.—EASTERN HIMALAYA: (1) Sikkim and Darjeeling District. Mons Lepcha, old Lebong Road, *T. Thomson*! Rungno Valley, 4,000 ft., *Kurs*! *T. Anderson*, No. 238! Senchal, 8,000 ft., *T. Anderson*, Nos. 1137 and 1149! Darjeeling, *T. Anderson*, No. 1136! Rungbee, 6,000 ft., *C. B. Clarke*, Nos. 8549 and 12449! Lachung Valley, 9,000 ft., *Gammie*! (2) Bhutan; *Parkes*!

69. *Polygonum frondosum* Meisn.

VI.—NORTH-WEST HIMALAYA: (19) Kangra; Dharmsala, *Edgeworth*! (22) Kumaon; below Paton, 5,600 ft., and Hurdole Pass, *Strachey & Winterbottom*, No. 34!

This species is exceedingly like *Polygonum paniculatum* Bl., from which in the dry state it can only be distinguished by the glabrous margins of its leaves.

70. *Polygonum polystachyum* Wall.

VI.—NORTH-WEST HIMALAYA: (11) Hazara; Kagan Valley, 14,400 ft., *Inayat*, Duthie's No. 20124! (12) Kashmir; Marbal Pass, *Stoliczka*! (13) Kistawar; 5-8,000 ft., *Stoliczka*! (14) Lahul; *Faeschke*! (15) Kunawar and Bashahr; Asrang, 11,000 ft., *Lace*, No. 395! Pangi, *Stoliczka*! (18) Chamba; Dalhousie, *Clark*, No. 144! *Grant*! (19) Kangra; Laka, 11,000 ft., *C. B. Clarke*, No. 24541 A and B! (20) Simla; Nagkanda, 9,000 ft., *Gamble*, No. 6567 B! Sirmoor, *Vicary*! (21) Garhwal; *Strachey & Winterbottom*, No. 32! Below Kidarkanta, near Oura, 6-7,000 ft., *Duthie*, No. 1224! (22) Kumaon; *Wallich*, No. 1686-1! Saba to Ralum, 9-12,000 ft., *Strachey & Winterbottom*, No. 33!

VIII.—EASTERN HIMALAYA: (1) Sikkim; Darjeeling, *Gamble*, No. 2718 C! Phalut, 11,000 ft., *T. Thomson*! Phullalong, 10,000 ft., *C. B. Clarke*, No. 13399 C and E! Jongri, 13-15,000 ft., *T. Anderson*, No. 1120! *C. B. Clarke*, No. 25814 J! *King's collector*! Nathu-la, Chola range, 14,000 ft., Tankra, 13,000 ft., *Gammie*, No. 382!

All the above-quoted specimens are more or less pubescent, but are unworthy of varietal separation on that account.

VAR. *crispata*.

VI.—NORTH-WEST HIMALAYA: Upper Chenab; *Ellis*, No. 646!

71. *Polygonum rumicifolium* Royle.

I.—NORTH-WEST FRONTIER: (1) Afghan border; *Griffith*, 1,040 and K. D. No. 4127! Kurram Valley, *Aitchison*, No. 794!

VI.—NORTH-WEST HIMALAYA: (1) Gilgit; Kala-pani, 10,500 ft., *Giles*, No. 153! (9) Chitral; Ziarat, 7,200 ft., *Harriss*, Duthie's No. 16579! Mirga, 9,200 ft., *Gatacre*, Duthie's No. 17508! (11) Hazara; Siran Valley, *Inayat*, Duthie's No. 20112! (12) Kashmir; Burzil Valley, *Strachey & Winterbottom*, No. 604! Near Das Kurrim, *Strachey & Winterbottom*, No. 896! Above Kainmul, Liddar Valley, 11-12,000 ft., *Duthie*, No. 13135! (14) Lahul; *Hay*! *Faeschke*! (15) Kunawar; *Vicary*! (21) Garhwal;

above Jhala, in the Ganges Valley, 12-13,000 ft., *Duthie*, No. 200 (a)! Taulea under Srikanta, 12,000 ft., *Duthie* No. 5481 (22) Kumaon; near Ralum, 11,500 ft., *Strachey & Winterbottom*, No. 42!

VII.—NEPAL: opposite Budhi village, Western Nepal, 10-11,000 ft. *Duthie* No. 5930!

Amongst the above sheets, specimens with retrorsely hairy stems and somewhat smaller leaves are fairly frequent.

72. *Polygonum campanulatum* Hook. f.

VI.—NORTH-WEST HIMALAYA: (22) Kumaon; Jhuni, 7,500 ft., *Strachey & Winterbottom*, No. 35!

VIII.—EASTERN HIMALAYA: (1) Sikkim; Tonglo, 10,000 ft., *King! Gamble*, No. 2701 B and C! Singalelah, 11,000 ft., *Gammie*, No. 82! Phullalong, 9-10,000 ft., *C. B. Clarke*, Nos. 12587 B and 13482 B, C, F! Jongri, 13-15,000 ft., *T. Anderson*, No. 1154! Gyree Basha, 12,000 ft., *King's collector!* Lachung Valley, 9,000 ft., *Gammie*, Nos. 657 and 1106! Tankra, *Gammie*, No. 489!

VAR. *fulvida*.

VII.—NEPAL: Thari, 12,000 ft., *King's collector!*

VIII.—EASTERN HIMALAYA: (1) Sikkim; Phalut, 10,000 ft., *T. Thomson!* Tongloo, 8-11,000 ft., *T. Thomson!* *T. Anderson*, Nos. 1122 and 1124! *King!* *C. B. Clarke*, No. 27506 E and G! *Gamble*, Nos. 757 and 1602 C! Jongri, *King's collector!* Thangme, 14,000 ft., *King's collector!* Lachung Valley, 11,000 ft., *Gammie*, No. 752! (2) Tibet and Bhutan; *King's collector*, No. 445! Pheemong, near Chumbi, *King's collector!* Kunboo, Chumbi, *King's collector*, No. 135!

The varieties *membranifolia* and *longipes* have not been separated out by the writer.

73. *Polygonum tortuosum* Don.

VI.—NORTH-WEST HIMALAYA: (2) Baltistan; *Strachey & Winterbottom*, No. 649! (4) Dras; Marpu Nullah, above Dras, 11-12,000 ft., *Duthie*, No. 11774! Kargil, *Stoliczka!* (7) Rupchu; 15-18,000 ft., *Stoliczka!* (12) Kashmir; Suru, *Stoliczka!* Gudhai Valley, 11-12,000 ft., *Duthie*, No. 12195! Kashmir Valley, *Hunter-Weston*, *Duthie's* No. 10274! (15) Kunawar and Bashahr, *Vicary!* Harang, 11,500 ft., *Brandis*, No. 3557!

13,000 ft., *Lace*, No. 542! (21) Garhwal; Rhudghera-ka Godh, 11-14,000 ft., *Duthie*, No. 199! Gangotri, 12-13,000 ft., *Duthie*, No. 1980! (22) Kumaon; Kulti Valley, 14-15,000 ft., *Duthie*, No. 592!

This species has also been found by Lama Ujyen Gyatsko, Nos. 77 and 271, the precise locality unknown, but probably within Tibetan territory to the north of Sikkim.

VAR. *spicata*.

VI.—NORTH-WEST HIMALAYA: *T. Thomson!* *Stoliczka!* (2) Baltistan; Chatpani Nullah, 10-11,000 ft., *Duthie*, No. 13808!

74. *Polygonum sibiricum* Laxm.

VI.—NORTH-WEST HIMALAYA: *T. Thomson*, Nos. 36 and 37! *Hay!* *Stewart!* (1) Gilgit; *Giles!* (7) Rupchu; 15-18,000 ft., *Stoliczka!*

VIII.—EASTERN HIMALAYA: (2) Tibet; *Lama Ujyen Gyatsko*, No. 124! *Fhari, King's collector!*

75. *Polygonum Hookeri* Meisn. (*Ann. Sci. Nat.*, ser. 5, vol. vi, p. 352). *Polygonum acaule Hook f., not of Boissier.*

VIII.—EASTERN HIMALAYA: (1) Sikkim; *Hooker*, No. 70! Ghora-la, 16,500 ft., *Gammie*, No. 823!

76. *Polygonum nummularifolium* Meisn.

VI.—NORTH-WEST HIMALAYA: (12) Kashmir; Sangam Valley, *Duthie*, No. 13553! (21) Garhwal; Pilkanta, 13-14,000 ft., *Duthie*, No. 4362! (22) Kumaon; Barji Kang Pass, 14,500 ft., *Strachey & Winterbottom*, No. 43!

VIII.—EASTERN HIMALAYA: (1) Sikkim; *Hooker!* Tankra-la, 16,000 ft., and Kang-la, 15,000 ft., *Gammie*, No. 505! Momay Samdong, Lachung Valley, 17,000 ft., *Gammie*, No. 861!

SECTION XI.—TINIARIA Meisn.

77. *Polygonum Convolvulus* Linn.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Kurram Valley, *Aitchison*, No. 657!

VI.—NORTH-WEST HIMALAYA: (6) Zanskar; east of the Pensi-la *Stoliczka!* (15) Kunawar; Pangi (?) *Stoliczka!*

VIII.—*EASTERN HIMALAYA: (1) Sikkim; King, No. 4004! (2) Tibet; Chumbi, *King's collector*! Le-ra-ong, *King's collector*!

78. *Polygonum dumetorum* Linn.

I.—NORTH-WEST FRONTIER: (1) Afghan border; Kurram Valley, *Aitchison*!

VI.—NORTH-WEST HIMALAYA: (9) Chitral and Dir; Dir, 6,500 ft., *Harriss*, Duthie's No. 16583! Dir Valley, 4,200 ft., *Gatacre*, Duthie's No. 17513! Near Drosch, *Hamilton*, Duthie's No. 17916! (11) Hazara; Kagan Valley, *Inayat*, Duthie's No. 20127! (12) Kashmir; Sonamurg, 10,000 ft., *C. B. Clarke*, No. 30834 A! Near Gurais, 8,000 ft., *Duthie*, No. 14,000! Gandesbal, 5,500 ft., *Gammie*! (13) Kistawar; 5-8,000 ft., *Stoliczka*! (15) Kunawar and Bashhar; Pangi, *Stoliczka*! Chini, *Munro*! *Brandis*; No. 2739! (18) Chamba; Chamba, 3,000 ft. *C. B. Clarke*, No. 23772 B! *Herb. Kurz*, No. 4273! Dalhousie, 4,500 to 7,000 ft., *Grant*! *C. B. Clarke*, No. 23145 D and E! Alwas to Baira, 6-8,000 ft., *Lace*, No. 1866! (20) Simla; *Gamble*, No. 4832 D!

79. *Polygonum pterocarpum* Wall.

VI.—NORTH-WEST HIMALAYA: *Royle*! (22) Kumaon; *Wallich*, No. 1690!

VIII.—EASTERN HIMALAYA: (1) Sikkim; Darjeeling; 6,000 ft., *King*! *Gamble*, Nos. 130 B, 2682 A, 8521! Hee, 4,000 ft., *C. B. Clarke*, No. 13427 A and E! Lingdam, 4,000 ft., *C. B. Clarke*, No. 13051 C! Yaksum, 4,500 ft., *T. Anderson*, No. 1156! Lachung Valley, 7,000 ft., *Gammie*, No. 1192!

PART II.—ARTIFICIAL KEY.

The key for the most part explains itself, but it may be as well to state explicitly what the writer means by certain terms. Under the term 'axillary' the writer includes even capitula-like clusters, so long as they are in the axils of *unmodified* leaves, whether confined to the apical portion of the stem and branches or not. Thus *Polygonum delicatum* has capitula-like clusters, but they are distinctly in the axils of unmodified leaves, and consequently are classed as axillary. Under the term 'head' the writer includes all more or less globose clusters—whether they are 'capitula' in the rigid botanical sense or not—which are not in the axils of unmodified leaves, but which may be in the axils of

bracts, as is seen in *Polygonum alatum*. Two plants at least, *Polygonum Hookeri* and *Polygonum plebejum* var. *effusa*, have had to be entered twice, as the former may be picked up with a spicate or with a paniculate inflorescence, and the latter with short leaves or long and slender leaves.

I.—TWINING PLANTS.

- * Fruit not winged P. Convolvulus.
- ** Fruit winged
 - Wings very little if at all prolonged down the pedicel P. dumetorum.
 - Wings prolonged down to the base of the pedicel P. pterocarpum.

II.—NON-TWINING PLANTS.

A. Inflorescence axillary.

- * Leaf lamina, elliptic, ovate or orbicular, length not more than four times the breadth, usually much less
 - † Stipules with two distinct excurrent nerves
 - The excurrent nerves spinescent and leaves mucronulate P. biaristatum.
 - The excurrent nerves not spinescent and leaves not mucronulate P. recumbens.
 - †† Stipules without excurrent nerves
 - § Leaves hirsute P. filicaule.
 - §§ Leaves glabrous
 - × Plants tufted delicate annuals with very minute flowers, bipartite stipules and non-tubular bracts
 - Leaves opposite P. islandicum.
 - Leaves alternate P. delicatulum.
 - × × Plants not tufted but prostrate or ascending with fair-sized flowers, with tubular bracts and tubular stipules, which latter may be slightly or much lacerate

- Flowers pedicels long, exerted
well beyond the stipules . *P. plebejum*
VAR. *effusa*.
- Flowers sessile or pedicels quite
short and very little if at all
exserted beyond the stipules
- △ Stipules many-nerved
Nut polished, smooth *P. plebejum*
VAR. *polyneura*.
- Nut dull, striolate . *P. aviculare*.
- △△ Stipules nerveless or
showing only one or
two nerves
- || Leaf lamina
broadly elliptic,
rather large,
1-1.5 cm. long
by .5-1 cm.
broad, shortly
petioled . *P. cognatum*.
- ||| Lamina orbicular
or oblong, very
small, usually
not more than 4
mm. in diame-
ter, sessile
- Branches very
numerous;
leaves orbi-
cular, apicu-
late with a
distinct me-
dian ridge;
stipules very
crinite and
woolly look-
ing . *P. plebejum*
VAR. *Griffithii*.
- Branches not
very numer-
ous; leaves
oblong; sti-

- pules fimbriate not woolly
Flowers and nutlets of average size P. plebejum
VARS. indica and brevifolia.
- Flowers and nutlets very minute P. plebejum
VAR. micranthema.
- ** Leaf lamina linear or subulate, length more than four times the breadth, usually a good deal more
- † Internodes, especially upper ones, almost or quite hidden by the very prominent white hyaline stipules which also considerably overlap the leaves
- § Plant very dwarf, 2.5-5 cm., and of thread-like slenderness P. molliaeforme.
- §§ Plant always at least over 10 cm., with stoutish branches, as thick as the lead of a pencil or thicker
- Root slender, annual P. tubulosum.
- Root-stock very stout and woody P. paronychioides.
- †† Stipules confined to the base of the internodes, leaving the greater part ($\frac{1}{2}$ — $\frac{3}{4}$) of each internode uncovered
- § Branches erect and rigid or erect and flexuous or erect and geniculate
- x Leaves comparatively large, 2-4.5 cm. long and .4-.6 cm. broad, narrowly lanceolate with lateral nerves coming off at an acute angle from the midrib P. setosum.
- x x Leaves minute, never more than 1 cm. long, linear, subulate; no lateral nerves

- Leaf-apex with a distinct
hyaline mucro. *P. afghanicum*.
- Leaf-apex without a
mucro. *P. salicornioides*.
- §§ Branches prostrate
- Stipules very white, almost entire. Internodes very smooth, angled but not grooved. Leaves very small subulate, fleshy, mucronulate *P. polycnemoides*.
- Stipules brownish, fimbriate. Internodes grooved. Leaves up to 2 cm. long, linear or narrowly lanceolate, flat, not mucronulate *P. plebejum* and its variety *elegans*.
- Flowers exerted on long pedicels *P. plebejum*
VAR. *effusa*.
- B. *Inflorescence of sessile or pedicelled flowers closely set on unbranched spikes or spiciform racemes.*
- * Leaves all sessile or only very shortly petioled
- † Laminæ orbicular, broadly elliptic or oblong
- Plant dwarf, not creeping, leaves all radical and very hairy *P. Hookeri*.
- Plant not dwarf, creeping, leaves cauline and glabrous *P. vacciniifolium*.
- †† Laminæ linear or linear-lanceolate
- Racemes many-flowered, from 60 upwards *P. affine*.
- Racemes few-flowered, rarely as many as 20 *P. Emodi*.
- ** All or at least the lower leaves long-petioled
- † Leaves ovate-cordate, upper ones amplexicaul
- Petiole winged above *P. Bistorta*.
- Petiole not winged *P. amplexicaule*.
- †† Leaves lanceolate or linear lanceolate not amplexicaul
- § Lower part of inflorescence bulbiferous *P. viviparum*.

- §§ Inflorescence not bulbiferous
 × Leaf-margins smooth. Leaves usually floating . . . P. amphibium.
 × × Leaf margin crenulated with marginal veinlets. Leaves not floating
 Lamina abruptly or acutely continuous with petiole . . . P. sphærostachyum.
 Lamina very gradually continuous with petiole . . . P. paleaceum.

C. *Inflorescence of sessile or pedicelled flowers, closely set or distant on branched short stout, or long slender spikes or spiciform racemes.*

- * Plants more or less beset with recurved prickles which are often restricted to the base of stipules
 † Stipules orbicular foliaceous. Leaves peltate-deltoid ; very long-petioled . . . P. perfoliatum.
 †† Stipules tubular membranous. Leaves linear or linear-oblong, ovate or oblong-ovate, or linear-sagittate, or hastate; shortly petioled
 § Racemes slender, 2.5 cm. or more in length. Bracts distant. Leaves linear-sagittate or hastate P. prætermissum.
 §§ Racemes very short, 5-1 cm long. Bracts crowded. Leaves ovate or oblong-ovate or linear-oblong
 × Leaves linear or linear-oblong, margin and midrib closely beset with strong recurved prickles . . . P. strigosum.
 × × Leaves ovate or oblong-ovate. Prickles absent from margin, and midrib, or only very feebly developed . . . P. muricatum.

** Plants unarmed

- † Racemes stout, compact. Bracts closely imbricating
 § Nut orbicular or bi-convex

- x Peduncles scurfily glandular
 - Leaves without canescence
 - beneath *P. lapathifolium.*
 - Leaves canescent beneath . *P. lapathifolium*
- SUB-SP. *maculatum.*
- x x Peduncles eglandular and
 - either glabrous or hairy
 - Stipules and bracts eciliate
 - Plant glabrous *P. glabrum.*
 - Plant covered with a
cottony tomentum . . . *P. lanigerum.*
 - Stipules and bracts ciliate
 - △ Leaves long-petioled . *P. orientale.*
 - △△ Leaves short petioled
or sessile.
 - || Peduncles stri-
gously hairy
 - Stipules with
a spreading
or recurved
scabrid limb *P. limbatum.*
 - Stipules with-
out a limb . *P. tomentosum.*
 - ||| Peduncles gla-
brous
 - Spikes oblong-
cylindrical.
 - Nut not less
than 3 mm.
long *P. Persicaria.*
 - Spikes narrow-
ly cylindrical.
 - Nut not more
than 1.5 mm.
long *P. minus.*
- §§ Nut trigonous
 - x Branches and peduncles glandular and hairy . . . *P. viscosum.*
 - x x Branches and peduncles hairy
or glabrous but never glandular
 - Bracts and perianth finely
glandular *P. macranthum.*

- ○ Bracts and perianth eglandular
 - △ Bracts more or less hairy P. stagninum.
 - △△ Bracts quite glabrous
 - Leaf-bases acute or acuminate P. barbatum.
 - Leaf-bases obtuse or slightly cordate P. serrulatum.
- †† Racemes slender, loose. Bracts more or less interrupted
 - § Perianth glandular
 - Raceme long-interrupted. Stipular cilia at least half as long as the tube or longer. Leaves glabrous or very sparingly hairy P. flaccidum.
 - Leaves hispidly hairy at least beneath P. flaccidum
VAR. hispida.
 - Raceme short-interrupted. Stipular cilia quite short or absent P. Hydropiper.
 - Whole plant minutely glandular P. Hydropiper
VAR. glandulosissima.
 - §§ Perianth eglandular
 - × Stipules and bracts entire or only slightly fimbriate; never ciliate
 - Leaves sagittate or hastate. Racemes flaccid P. birmanicum.
 - Leaves elliptic-lanceolate. Racemes rather strict P. Bellardi.
 - × × Stipules and bracts ciliate.
 - Nut bi-convex.
 - Styles hooked P. virginianum.
 - Styles not hooked P. assamicum.
 - ○ Nut trigonous,
 - Nut sharply trigonous, perfectly smooth and polished P. Posumbu.
 - Nut obtusely trigonous, finely punctulate P. mite.

D. *Inflorescence of small more or less globose or obpyramidal heads.*

* Plants dwarf, not exceeding 15 cm. in height, often tufted

† Leaves orbicular P. nummulari-
folium.

†† Leaves linear.

Leaves flat with two basal auricles . P. sibiricum.

Leaf margins recurved, and wanting
basal auricles P. perpusillum.

††† Leaves neither orbicular, nor linear

§ Heads in the axil of an involucre
leaf P. alatum
VAR. rigidula.

§§ Heads without an involucre leaf

Leaves sessile. Nut bi-con-
vex P. humile.Leaves long-petioled. Nut tri-
gonous P. glaciale.

** Plants not dwarf and never tufted.

† Plants armed more or less with recurved
prickles, which may be reduced to a
few at the base of the stipules

§ Peduncles glabrous P. sagittatum.

§§ Peduncles glandular

× Leaves broadly hastate-acumi-
nate, long-petioled. Nut
trigonal P. arifolium.× × Leaves elliptic-oblong or linear-
oblong, short-petioled. Nut
orbicular bi-convex○ Peduncles sparingly
branched, with medium-
sized headsLeaves elliptic-lanceolate
or ovate, acuminate at
both ends P. pedunculare.Leaves oblong or oblong-
lanceolate, 1.9-2.5 cm.
broad P. pedunculare
VAR. nilagirica.Leaves linear lanceolate,
very narrow, .6-.8 cm.broad P. pedunculare
VAR. angustissima.

- ○ Peduncles exceedingly slender branching freely and dichotomously and ending in very small heads . . . P. pedunculare
VAR. assamica.
- †† Plants unarmed
- § Capitula at the apex of exceedingly long, slender, erect, and rodlike stems, with very distant nodes, entirely naked or showing only one or two small feebly developed leaves on the lowest nodes. Stipules scale-like . . . P. Gilesii.
- §§ Capitula on distinct solitary or branched peduncles arising from ordinary leafy branches. Stipules tubular
- × Leaves pinnatifidly lobed
Leaves coarsely lobed. Peduncles glandular-hairy . . . P. runcinatum.
Leaves finely cut. Peduncles glabrous . . . P. sinuatum.
- × × Leaves entire
- Peduncles quite glabrous
Petiole winged; non-auriculate . . . P. microcephalum.
Petiole auriculate, not winged . . . P. Wallichii.
- ○ Peduncles glandular-hairy or hispidulous, at least near the heads
- △ Every or almost every head in the axil of an involucral leaf . . . P. alatum.
- △ △ Heads not in the axils of involucral leaves
|| Main peduncles ending in a single capitulum or dividing into only 2-4 unicapitate branches

- ◇ Plant a tall erect shrub P. chinense
VAR. corymbosa.

- ◇◇ Plant creeping or, if erect, small and herbaceous

- ▽ Petiole broadly winged to the base

Leaves large, 10-12 cm. long from base of petiole to apex of lamina.

Bracts not showing dots

- P. sphærocephalum
VAR. Wightiana.

Leaves small, not more than 4 cm. long including petiole. Bracts showing one or more white dots

- P. alatum
VAR. parviflora.

- ▽▽ Petiole, if present, not winged or only very slightly at the top.

Leaves subsessile, auriculate

- P. capitatum.

Leaves long-petioled, non-auriculate

- P. sphærocephalum.

||| Main-peduncles paniculately branched with numerous heads

◇ Plant a small diffusely branched herb, very slender and small leaved .

P. alatum
VAR. *tenuicaulis*.

◇◇ Plant a shrub, with large leaves

▽ Leaves scabridly hairy on both surfaces .

P. chinense
VAR. *scabra*.

▽▽ Leaves glabrous or almost so
Leaves very broadly oval

P. chinense
VAR. *ovalifolia*.

Leaves broadly lanceolate .

P. chinense.

E. *Inflorescence paniculate.*

* Plant dwarf, unbranched, with only radical leaves

P. Hookeri.

** Plants shrubby and much branched, with cauline leaves

† Flowers very small not more than 4 mm. in diameter

§ Plants glabrous

Leaf-margins ciliolate

P. paniculatum.

Leaf-margins smooth

P. frondosum.

§§ Plants strigosely hairy, often with the hairs on the branches retrorse

P. rude.

§§§ Plants more or less pubescent

Perianth baccate in fruit

P. molle.

Perianth not baccate

P. alpinum.

†† Flowers large, not less than 6 mm. in diameter

§ Perianth campanulate

Plant a low shrub with sessile leaves and dense-flowered panicle

P. tortuosum.

- Plant a shrub of 2-4 ft. high with
petioled leaves and lax divari-
cate cymes P. campanulatum.
Leaves with a dense fulvous to-
mentum on the lower surface P. campanulatum
VAR. fulvida.

- §§ Perianth widely spreading
Tall shrub 3-6 feet high, with
large spreading terminal pani-
cles P. polystachyum.
Herbaceous plant not more than
1½ feet high, with small dense
panicles axillary as well as ter-
minal P. rumicifolium.

PART III.—DISTRIBUTION.

General latitudinal distribution of the Indian species.

In the following diagram the intra-Indian distribution to the various sub-sub-areas is given in black, the extra-Indian distribution in squares which are shaded diagonally when the species is indigenous, horizontally when the species is known to be introduced.

The diagram is followed by an analytical table of the extra-Indian distribution of the non-endemic species, after which is given a table of the intra-Indian distribution of the endemic species.

Indian Sub-sub-areas.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI										
	S. America.	N. America.	Africa.	Europe.	North and Central Asia.	West Asia.	N.-W. Frontier.	Central Provinces.	Penins. India.	Upper Gangetic Plain.	Bengal.	N.-W. Himalaya.	Nepal.	East Himalaya.	Assam.	Burma.	Malay Penin.	China.	Australasia.		
1. <i>P. islandicum</i>																				Sect. I. <i>Koenigia</i> .	
2. <i>P. delicatulum</i>																					Sect. II. <i>Eleutherosperma</i> .
3. <i>P. filicaule</i>																					
4. <i>P. biaristatum</i>																					
5. <i>P. recumbens</i>																					
6. <i>P. cognatum</i>																					
7. <i>P. paronychioides</i>																					
8. <i>P. salicornioides</i>																					
9. <i>P. aviculare</i>																					
10. <i>P. Bellardi</i>																					
11. <i>P. setosum</i>																					
12. <i>P. tubulosum</i>																					
13. <i>P. polycnemoides</i>																					
14. <i>P. afghanicum</i>																					
15. <i>P. molliaeforme</i>																					
16. <i>P. plebejum</i>																					
<i>var. effusa</i>																					
<i>var. elegans</i>																					
<i>var. indica</i>																					
<i>var. brevifolia</i>																					
<i>var. micranthema</i>																					
<i>var. Griffithii</i>																					
<i>var. polyneura</i>																					
17. <i>P. orientale</i>																					
18. <i>P. tomentosum</i>																					
19. <i>P. limbatum</i>																					
20. <i>P. virginianum</i>																					
21. <i>P. viviparum</i>																					
22. <i>P. sphærostachyum</i>																					
23. <i>P. perpusillum</i>																					
24. <i>P. paleaceum</i>																					
25. <i>P. Bistorta</i>																					
26. <i>P. amplexicaule</i>																					
<i>var. speciosa</i>																					
27. <i>P. affine</i>																					
28. <i>P. vacciniifolium</i>																					

Sect. I.
Koenigia.
Sect. II.
Eleutherosperma.

Sect. III.
Avicularia.

Sect. IV.
Amblygonon.
Sect. V.
Tovora.

Sect. VI.
Bistorta.

Indian Sub-sub-areas.

	S. America.	N. America.	Africa.	Europe.	North and Central Asia.	West Asia.	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
30. <i>P. glabrum</i>																	
31. <i>P. amphibium</i>																	
32. <i>P. lanigerum</i>																	
33. <i>P. lapathifolium</i>																	
sub-sp. <i>maculatum</i>																	
34. <i>P. Persicaria</i>																	
35. <i>P. minus</i>																	
36. <i>P. assamicum</i>																	
37. <i>P. viscosum</i>																	
38. <i>P. stagninum</i>																	
39. <i>P. barbatum</i>																	
40. <i>P. serrulatum</i>																	
41. <i>P. Posumbu</i>																	
42. <i>P. mite</i>																	
43. <i>P. Hydropiper</i>																	
<i>var. glandulosissima</i>																	
44. <i>P. flaccidum</i>																	
<i>var. hispida</i>																	
45. <i>P. macranthum</i>																	
46. <i>P. humile</i>																	
47. <i>P. glaciale</i>																	
48. <i>P. alatum</i>																	
<i>var. parviflora</i>																	
<i>var. Metziana</i>																	
<i>var. tenuicaulis</i>																	
49. <i>P. microcephalum</i>																	
50. <i>P. Wallichii</i>																	
51. <i>P. sphærocephalum</i>																	
52. <i>P. runcinatum</i>																	
53. <i>P. sinuatum</i>																	
54. <i>P. capitatum</i>																	
55. <i>P. chinense</i>																	

Sect. VII.
Persicaria.

Sect. VIII.
Cephalothylon.

Indian Sub-sub-areas.

	S. America.	N. America.	Africa.	Europe.	North and Central Asia.	West Asia.	N.-W. Frontier.	Central Provinces.	Penins. India.	Upper Gangetic Plain.	Bengal.	N.-W. Himalaya.	Nepal.	East Himalaya.	Assam.	Burma.	Malay Penin.	China.	Australasia.	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI									
<i>var. ovalifolia</i>																				
<i>var. subhastata</i>																				
<i>var. brachiata</i>																				
<i>var. corymbosa</i>																				
56. <i>P. Gilesii</i>																				
57. <i>P. muricatum</i>																				
58. <i>P. arifolium</i>																				
59. <i>P. perfoliatum</i>																				
60. <i>P. sagittatum</i>																				
61. <i>P. strigosum</i>																				
62. <i>P. prætermisum</i>																				
63. <i>P. birmanicum</i>																				
64. <i>P. pedunculare</i>																				
<i>var. angustissima</i>																				
<i>var. nilagirica</i>																				
<i>var. assamica</i>																				
<i>var. glabrata</i>																				
65. <i>P. alpinum</i>																				
66. <i>P. paniculatum</i>																				
67. <i>P. rude</i>																				
68. <i>P. molle</i>																				
69. <i>P. frondosum</i>																				
70. <i>P. polystachyum</i>																				
71. <i>P. rumicifolium</i>																				
72. <i>P. campanulatum</i>																				
<i>var. fulvida</i>																				
73. <i>P. tortuosum</i>																				
74. <i>P. sibiricum</i>																				
75. <i>P. Hookeri</i>																				
76. <i>P. nummularifolium</i>																				
77. <i>P. Convolvulus</i>																				
78. <i>P. dumetorum</i>																				

Sec. VIII.
Cephalophi-
lon.

Sec. IX.
Echinocau-
lon.

Sec. X.
Aconogon.

Sec. XI.
Trioris

EXTRA-INDIAN LATITUDINAL DISTRIBUTION.

26 Endemic species.

Species distributed westwards.

To Western Asia only	5	{ (8) Polygonum salicornioides <i>Faub. & Spach.</i> (11) Polygonum setosum <i>Faub. & Spach.</i> (12) Polygonum tubulosum <i>Boiss.</i> (13) Polygonum polycnemoides <i>Faub. & Spach.</i> (14) Polygonum afghanicum <i>Meisn.</i>
To Northern Asia only	1	(22) Polygonum sphaerostachyum <i>Meisn.</i>
To Northern and Western Asia only	3	{ (6) Polygonum cognatum <i>Meisn.</i> (7) Polygonum paronychioides <i>C. A. Mey.</i> (15) Polygonum mollizforme <i>Boiss.</i>
To Western Asia and Europe	1	(42) Polygonum mite <i>Schrank.</i>
To Northern Asia, Europe, North America	1	(1) Polygonum islandicum <i>Hook. f.</i>
To Northern and Western Asia, Europe, Africa.	2	{ (10) Polygonum Bellardi <i>All.</i> (77) Polygonum Convolvulus <i>Linn.</i>
To Africa only	1	(19) Polygonum limbatum <i>Meisn.</i>

14 Total of species distributed westwards.

Species distributed eastwards.

To China only	7	{ (24) Polygonum paleaceum <i>Wall.</i> (26) Polygonum amplexicaule <i>Lou.</i> (37) Polygonum viscosum <i>Don.</i> (49) Polygonum microcephalum <i>Don.</i> (51) Polygonum sphaerocephalum <i>Wall.</i> (54) Polygonum capitatum <i>Ham.</i> (57) Polygonum muricatum <i>Meisn.</i>
To Malay Archipelago only	1	(66) Polygonum paniculatum <i>Bl.</i>
To China and Malay Archipelago	5	{ (38) Polygonum stagninum <i>Ham.</i> (41) Polygonum Posumbu <i>Ham.</i> (52) Polygonum runcinatum <i>Ham.</i> (55) Polygonum chinense <i>Linn.</i> (59) Polygonum perfoliatum <i>Linn.</i>
To China and Australia	1	(62) Polygonum prætermissum <i>Hook. f.</i>
To China, Malay Archipelago and Australia	3	{ (17) Polygonum orientale <i>Linn.</i> (61) Polygonum strigosum <i>R. Br.</i> (64) Polygonum pedunculare <i>Wall.</i>
To China and Northern Asia	1	(74) Polygonum sibiricum <i>Laxm.</i>

18 Total of species distributed eastwards.

Species distributed eastwards and westwards.

To Malay Archipelago, China, Western Asia,	1	(44) Polygonum flaccidum <i>Meisn.</i>
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To Malay Archipelago and Africa	1	(18) <i>Polygonum tomentosum Wild.</i>
To Malay Archipelago, China, and Africa	1	(48) <i>Polygonum alatum Ham.</i>
To Malay Archipelago, China, Africa, and Australasia	3	{ (16) <i>Polygonum plebejum R. Br.</i> (32) <i>Polygonum lanigerum R. Br.</i> (39) <i>Polygonum barbatum Linn.</i>
To China, North and Western Asia, Europe	1	(25) <i>Polygonum Bistorta Linn.</i>
To Australasia, Malay Archipelago, China, Northern Asia, Europe	1	(35) <i>Polygonum minus Huds.</i>
To China, North and Western Asia, Europe, Africa	1	(34) <i>Polygonum Persicaria Linn.</i>
To Malay Archipelago, China, Western Asia, Europe, Africa	1	(40) <i>Polygonum serrulatum Lagasc.</i>
To China, North Asia, Europe, North America	3	{ (21) <i>Polygonum viviparum Linn.</i> (65) <i>Polygonum alpinum All.</i> (78) <i>Polygonum dumetorum Linn.</i>
To China, North Asia, Europe, Africa, North America	3	{ (9) <i>Polygonum aviculare Linn.</i> (31) <i>Polygonum amphibium Linn.</i>
To Australasia, China, Africa, North and South America	1	(30) <i>Polygonum glabrum Willd.</i>
China, Northern Asia, North America	1	(60) <i>Polygonum sagittatum Linn.</i>
China and North America	3	{ (20) <i>Polygonum virginianum Linn.</i> (58) <i>Polygonum arifolium Linn.</i>
Cosmopolitan	3	{ (33) <i>Polygonum lapathifolium Linn.</i> (43) <i>Polygonum Hydropiper Linn.</i>

21 Total of Eastward and Westward species.

79 Total of Indian species.

All the species which are distributed to North America are confined to the east of the Rocky Mountains of that Continent, at first sight a curious fact, but one that is quite in accordance with the result established by Asa Gray, that the flora of North-East Asia has more affinities with that of North-East than that of North-West America.

It will be noticed that the endemic area is almost entirely restricted to the Himalayan range, four species going beyond it eastwards and three westwards.

The following tables give detailed lists of the Polygonums found in each sub-sub-area. By "species distributed to other sub-sub-areas" is meant species which are endemic to India as a whole, though not to the particular sub-sub-area in which they occur. By "species with an extra Indian distribution" is meant non-endemic Indian species which are found in the sub-sub-area considered.

I.—NORTH-WEST FRONTIER.

Section III.—*Avicularia*.

Species endemic to the sub-sub-area 1 (4) *Polygonum biaristatum* Aitch. & Hemsley.

Section X.—*Aconogon*.

Species distributed to other sub-sub-areas 1 (71) *Polygonum rumicifolium* Royle.

Section III.—*Avicularia*.

- (6) *Polygonum cognatum* Meisn.
- (7) *Polygonum paronychioides* C. A. Mey.
- (8) *Polygonum salicornioides* Faub. & Spach.
- (9) *Polygonum aviculare* Linn.
- (10) *Polygonum Bellardi* All.
- (11) *Polygonum setosum* Faub. & Spach.
- (12) *Polygonum tubulosum* Boiss.
- (13) *Polygonum polycnemoides* Faub. & Spach.
- (14) *Polygonum afghanicum* Meisn.
- (16) *Polygonum plebejum* R. Br.

Section VI.—*Bistorta*.

(26) *Polygonum amplexicaule* Don.

Section VII.—*Persicaria*.

- (30) *Polygonum glabrum* Willd.
- (32) *Polygonum lanigerum* R. Br.
- (33) *Polygonum lapathifolium* Linn.
- (34) *Polygonum Persicaria* Linn.
- (39) *Polygonum barbatum* Linn.
- (40) *Polygonum serrulatum* Lagasc.
- (43) *Polygonum Hydropiper* Linn.
- (44) *Polygonum flaccidum* Meisn.

Section VIII.—*Cephalophilon*.

- (47) *Polygonum glaciale* Hook. f.
- (48) *Polygonum alatum* Ham.

Section XI.—*Tiniaria*.

- (77) *Polygonum Convolvulus* Linn.
- (78) *Polygonum dumetorum* Linn.

Species with an extra-Indian distribution 23

Total of North-West Frontier species: 25, or 31.6 per cent.

This sub-sub-area, so far as the genus *Polygonum* is concerned, is an extra-Indian extension of Boissier's oriental province. All except four of the species belong to either *Persicaria* or *Avicularia*. The species of the former section have a wide Indian and extra-Indian distribution both eastwards and westwards. The *Avicularia* section, however, is especially characteristic of this sub-sub-area, in which and in the drier districts of the North-West Himalaya the Indian contingent of Boissier's oriental *Polygonums* reach their eastermost limit, with the exception of the polymorphous *Polygonum plebejum*, and *Polygonum aviculare*; the former is found all over India, China and Australia, the latter reaches China.

II.—CENTRAL PROVINCES.

Species endemic to the sub-sub-area

No species.

Species distributed to other sub-sub-areas

No species.

Section III.—*Avicularia*.

(16) *Polygonum plebejum* R. Br.

Section IV.—*Amblygonon*.

Species with an extra-Indian distribution

5 { (18) *Polygonum tomentosum* Willd.
(19) *Polygonum limbatum* Meisn.

Section VII.—*Persicaria*.

(30) *Polygonum glabrum* Willd.
(39) *Polygonum barbatum* Linn.

Total of Central Provinces species: 5, or 6.33 per cent.

The true percentage is probably considerably higher than 6.33, but the Central Provinces are very poorly represented, so far as the genus under consideration is concerned, in the Calcutta Herbarium.

III.—PENINSULAR INDIA.

Species endemic to the sub-sub-area

No species.

Species distributed to other sub-sub-areas

No species.

Species with an extra-Indian distribution

14 { (16) *Polygonum plebejum* R. Br.

Section IV.—*Amblygonon*.
(18) *Polygonum tomentosum* Willd.
(19) *Polygonum limbatum* Meisn.

Species with an extra-Indian distribution	14	<p style="text-align: center;"><i>Section VII.—Persicaria.</i></p> <p>(30) <i>Polygonum glabrum Willd.</i> (35) <i>Polygonum minus Huds.</i> (39) <i>Polygonum barbatum Linn.</i> (40) <i>Polygonum serrulatum Lagasc.</i> (43) <i>Polygonum Hydro Piper Linn.</i> (44) <i>Polygonum flaccidum Meisn.</i></p> <p style="text-align: center;"><i>Section VIII.—Cephalophilon.</i></p> <p>(48) <i>Polygonum alatum Ham.</i> (51) <i>Polygonum runcinatum Ham.</i> (55) <i>Polygonum chinense Linn.</i> <i>var. ovalifolia.</i></p> <p style="text-align: center;"><i>Section IX.—Echinocaulon.</i></p> <p>(61) <i>Polygonum strigosum R. Br.</i> (64) <i>Polygonum pedunculare Wall.</i></p>
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Total of Peninsular India species: 14, or 17.7 per cent.

IV.—UPPER GANGETIC PLAIN.

Species endemic to the sub-sub-area	No species.
Species distributed to other sub-sub-areas	No species.
Species with an extra Indian distribution	10

Section III.—Avicularia.

(16) *Polygonum plebejum R. Br.*

Section IV.—Amblygonon.

(17) *Polygonum orientale Linn.*
 (19) *Polygonum limbatum Meisn.*

Section VII.—Persicaria.

(30) *Polygonum glabrum Willd.*
 (32) *Polygonum lanigerum R. Br.*
 (39) *Polygonum barbatum Linn.*
 (40) *Polygonum serrulatum Lagasc.*
 (41) *Polygonum Posumbu Ham.*
 (44) *Polygonum flaccidum Meisn.*

Section VIII.—Cephalophilon.

(48) *Polygonum alatum Ham.*

Total number of Gangetic plain species: 10, or 12.7 per cent.

V.—BENGAL.

Species endemic to the sub-sub-area	No species.
Species distributed to other sub-sub-areas	No species.
Species with an extra-Indian distribution	19

Section III.—Avicularia.

(16) *Polygonum plebejum R. Br.*

Section IV.—Amblygonon.

(17) *Polygonum orientale Linn.*
 (18) *Polygonum tomentosum Willd.*
 (19) *Polygonum limbatum Meisn.*

Section VII.—*Persicaria*.

- (30) *Polygonum glabrum Willd.*
 (32) *Polygonum lanigerum R. Br.*
 (33) *Polygonum lapathifolium Linn.*
 (35) *Polygonum minus Huds.*
 (38) *Polygonum stagninum Ham.*
 (39) *Polygonum barbatum Linn.*
 (40) *Polygonum serrulatum Lagasc.*
 (43) *Polygonum Hydro Piper Linn.*
 (44) *Polygonum flaccidum Meisn.*

Species with an extra-Indian distribution

19

Section VIII.—*Cephaelis*, *hilon*.

- (48) *Polygonum alatum Ham.*
 (54) *Polygonum capitatum Ham.*
 (55) *Polygonum chinense Linn.*
var. ovalifolia.

Section IX.—*Echinocaulon*.

- (59) *Polygonum perforiatum Linn.*
 (61) *Polygonum strigosum R. Br.*
 (64) *Polygonum pedunculare Wall.*

Total number of Bengal species : 19, or 24 per cent.

VI.—NORTH-WEST HIMALAYA.

Section III.—*Avicularia*.

- (5) *Polygonum recumbens Royle.*

Species endemic to the sub-sub-area

4

Section VIII.—*Cephalophilon*.

- (46) *Polygonum humile Meisn.*
 (56) *Polygonum Gilesii Hemsley.*

Section X.—*Aconogon*.

- (66) *Polygonum frondosum Meisn.*

Section II.—*Eleutherosperma*.

- (2) *Polygonum delicatulum Meisn.*
 (3) *Polygonum filicaule Wall.*

Section VI.—*Bistorta*.

- (23) *Polygonum perpusillum Hook. f.*
 (27) *Polygonum affine Don.*
 (28) *Polygonum vacciniifolium Wall.*
 (29) *Polygonum Emodi Meisn.*

Species distributed to other sub-sub-areas

16

Section VIII.—*Cephalophilon*.

- (47) *Polygonum glaciale Hook. f.*
 (51) *Polygonum sphaerocephalum Wall.*
 (53) *Polygonum sinuatum Royle.*

Species distributed to other sub-sub-
areas—*contd.* 16

Section X.—Aconogon.

- (69) *Polygonum molle* Don.
- (70) *Polygonum polystachyum* Wall.
- (71) *Polygonum rumicifolium* Roy.e.
- (72) *Polygonum campanulatum* Hook. f.
- (73) *Polygonum tortuosum* Don.
- (76) *Polygonum nummularifolium* Meisn.

Section XI.—Tiniaria.

- (79) *Polygonum pterocarpum* Wall.

Section I.—Koenigia.

- (1) *Polygonum islandicum* Hook. f.

Section III.—Avicularia.

- (6) *Polygonum cognatum* Meisn.
- (7) *Polygonum paronychioides* C. A. Mey.
- (9) *Polygonum aviculare* Linn.
- (11) *Polygonum setosum* Jaub. & Spach.
- (12) *Polygonum tubulosum* Boiss.
- (13) *Polygonum polycnemoides* Jaub. & Spach.
- (15) *Polygonum molliaforme* Boiss.
- (16) *Polygonum plebejum* R. Br.

Section IV.—Amblygonen.

- (17) *Polygonum orientale* Linn.

Section V.—Tovara.

- (20) *Polygonum virginianum* Linn.

Section VI.—Bistorta.

Species with an extra-Indian distri-
bution 39

- (21) *Polygonum viviparum* Linn.
- (22) *Polygonum sphærostachyum* Meisn.
- (25) *Polygonum Bistorta* Linn.
- (25) *Polygonum amplexicaule* Don.

Section VII.—Persicaria.

- (30) *Polygonum glabrum* Willd.
- (31) *Polygonum amphibium* Linn.
- (32) *Polygonum lanigerum* R. Br.
- (33) *Polygonum lapathifolium* Linn.
- (34) *Polygonum Persicaria* Linn.
- (35) *Polygonum minus* Huds.
- (38) *Polygonum stagninum* Ham.
- (39) *Polygonum barbatum* Linn.
- (40) *Polygonum serrulatum* Lagasc.
- (41) *Polygonum Posumbu* Ham.
- (42) *Polygonum mite* Schrank.
- (43) *Polygonum Hydropiper* Linn.
- (44) *Polygonum flaccidum* Meisn.

Section VIII.—Cephalophilon.

- (48) *Polygonum alatum* Ham.
- (54) *Polygonum capitatum* Ham.
- (55) *Polygonum chinense* Linn.

		<i>Section IX.—Echinocaulon.</i>
	}	(59) <i>Polygonum perfoliatum</i> Linn.
		(60) <i>Polygonum sagittatum</i> Linn.
		(61) <i>Polygonum strigosum</i> R. Br.
		<i>Section X.—Aconogon.</i>
Species with an extra-Indian distribution 39	}	(65) <i>Polygonum alpinum</i> All.
		(66) <i>Polygonum paniculatum</i> Bl.
		(74) <i>Polygonum sibiricum</i> Laxm.
		<i>Section XI.—Tiniaria.</i>
	}	(77) <i>Polygonum Convolvulus</i> Linn.
		(78) <i>Polygonum dumetorum</i> Linn.
Total number of North-West Himalaya species : 59, or 74·7 per cent.		

This sub-sub-area has much the largest *Polygonum* population, and has the largest number of endemic species. It is the only sub-sub-area which has all eleven sections represented, and from its number of species and sections may be considered as the *Polygonum* head-quarters. The great variety of climates which this sub-sub-area enjoys is no doubt one of the chief causes of this wealth of species. To quote from Hooker and Thomson's essay, this sub-sub-area presents "a very gradual transition from the flora of Nepal to that of the arid Afghan hills. This is the case equally in the tropical, temperate, and alpine zones of vegetation, and in the interior as well as in the exterior Himalaya." We find the species of the section *Avicularia* confined chiefly to the inner drier districts, while other sections are more irregularly distributed over all the districts with a preponderance in the moister. The other sub-sub-areas to which the sixteen species mentioned above are distributed are entirely central or Eastern Himalayan, unless with the exception of that very doubtful variety *Wightiana* of *Polygonum sphærocephalum* in the Nilgiris.

VII.—NEPAL.

Species endemic to the sub-sub-area	}	No species.
		<i>Section II.—Eleutherosperma.</i>
		(3) <i>Polygonum filicaule</i> Wall.
		<i>Section VI.—Bistorta.</i>
Species distributed to other sub-sub-areas 9	}	(27) <i>Polygonum affine</i> Don.
		(28) <i>Polygonum vacciniifolium</i> Wall.
		<i>Section VIII.—Cephalophilon.</i>
	}	(50) <i>Polygonum Wallichii</i> Meiss.
		(51) <i>Polygonum sphærocephalum</i> Wall.

		<i>Section X.—Aconogon.</i>
Species distributed to other sub-sub-areas	9	(66) <i>Polygonum paniculatum Bl.</i> (68) <i>Polygonum molle Don.</i> (71) <i>Polygonum rumicifolium Royle.</i> (72) <i>Polygonum campanulatum Hook. f. var. fulvida.</i>
		<i>Section III.—Avicularia.</i>
		(16) <i>Polygonum plebejum R. Br.</i>
		<i>Section VI.—Bistorta.</i>
		(22) <i>Polygonum sphærostachyum Meisn.</i> (25) <i>Polygonum bistorta Linn.</i> (26) <i>Polygonum amplexicaule Don. var. speciosa.</i>
		<i>Section VII.—Persicaria.</i>
Species with an extra-Indian distribution	17	(32) <i>Polygonum lanigerum R. Br.</i> (35) <i>Polygonum minus Huds.</i> (37) <i>Polygonum viscosum Ham.</i> (39) <i>Polygonum barbatum Linn.</i> (44) <i>Polygonum flaccidum Meisn. var. hispida.</i>
		<i>Section VIII.—Cephalophilon.</i>
		(48) <i>Polygonum alatum Ham.</i> (49) <i>Polygonum microcephalum Don.</i> (52) <i>Polygonum runcinatum Ham.</i> (54) <i>Polygonum capitatum Ham.</i> (53) <i>Polygonum chinense Linn. var. ovalifolia.</i>
		<i>Section IX.—Echinocaulon.</i>
		(57) <i>Polygonum muricatum Meisn.</i> (59) <i>Polygonum perfoliatum Linn.</i> (61) <i>Polygonum strigosum R. Br.</i>
Total of Nepal species : 26, or 33 per cent.		

VIII.—SIKKIM.

		<i>Section X.—Aconogon.</i>
Species endemic to the sub-sub-area	1	(75) <i>Polygonum Hookeri Meisn.</i>
		<i>Section II.—Eleutherosperma.</i>
		(2) <i>Polygonum delicatulum Meisn.</i> (3) <i>Polygonum filicaule Wall.</i>
		<i>Section VI.—Bistorta.</i>
Species distributed to other sub-sub-areas	12	(23) <i>Polygonum perpusillum Hook. f.</i> (28) <i>Polygonum vacciniifolium Wall.</i> (29) <i>Polygonum Emodi Meisn.</i>
		<i>Section VIII.—Cephalophilon.</i>
		(50) <i>Polygonum Wallichii Meisn.</i> (53) <i>Polygonum sinuatum Royle.</i>

Species distributed to other sub-sub-
areas 12

Section X.—Aconogon.

- (68) *Polygonum molle* Don.
(70) *Polygonum polystachyum* Wall.
(72) *Polygonum campanulatum* Hook. f.
(73) *Polygonum tortuosum* Don.

Section XI.—Tiniaria.

- (79) *Polygonum pterocarpum* Wall.

Section III.—Avicularia.

- (16) *Polygonum plebejum* R. Br.

Section V.—Tovara.

- (20) *Polygonum virginianum* Linn.

Section VI.—Bistorta.

- (21) *Polygonum viviparum* Linn.
(22) *Polygonum sphærostachyum* Meisn.
(26) *Polygonum amplexicaule* Don.

Section VII.—Persicaria.

- (30) *Polygonum glabrum* Willd.
(31) *Polygonum amphibium* Linn.
(33) *Polygonum lapathifolium* Linn.
(35) *Polygonum minus* Huds.
(39) *Polygonum barbatum* Linn.
(41) *Polygonum Posumbu* Ham.
(43) *Polygonum Hydropiper* Linn.
(44) *Polygonum flaccidum* Meisn.

Species with an extra-Indian distri-
bution 26

Section VIII.—Cephalophilon.

- (48) *Polygonum alatum* Ham.
(49) *Polygonum microcephalum* Don.
(52) *Polygonum runcinatum* Ham.
(54) *Polygonum capitatum* Ham.
(55) *Polygonum chinense* Linn.

Section IX.—Echinocaulon.

- (57) *Polygonum muricatum* Meisn.
(58) *Polygonum arifolium* Linn.
(59) *Polygonum perfoliatum* Linn.
(61) *Polygonum strigosum* R. Br.
(62) *Polygonum prætermisum* Hook. f.

Section X.—Aconogon.

- (66) *Polygonum paniculatum* Bl.
(74) *Polygonum sibiricum* Laxm.

Section XI.—Liniaria.

- (77) *Polygonum Convolvulus* Linn.

Total number of Sikkim species: 39, or 50 per cent.

IX. — ASSAM.

- | | | | |
|--|----|---|---|
| Species endemic to the sub-sub-area . | 2 | { | <p style="text-align: center;"><i>Section VII.—Persicaria.</i></p> <p>(36) <i>Polygonum assamicum Meisn.</i>
 (45) <i>Polygonum macranthum Meisn.</i></p> |
| Species distributed to other sub-sub-areas | 1 | { | <p style="text-align: center;"><i>Section X.—Aconogon.</i></p> <p>(67) <i>Polygonum rude Meisn.</i></p> |
| | | | <p style="text-align: center;"><i>Section III.—Axicularia.</i></p> <p>(16) <i>Polygonum plebejum R. Br.</i></p> |
| | | | <p style="text-align: center;"><i>Section IV.—Amblygonon.</i></p> <p>(17) <i>Polygonum orientale Linn.</i>
 (18) <i>Polygonum tomentosum Willd.</i></p> |
| | | | <p style="text-align: center;"><i>Section V.—Tovara.</i></p> <p>(20) <i>Polygonum virginianum Linn.</i></p> |
| | | | <p style="text-align: center;"><i>Section VI.—Bistorta.</i></p> <p>(24) <i>Polygonum paleaceum Wall.</i></p> |
| | | | <p style="text-align: center;"><i>Section VII.—Persicaria.</i></p> <p>(30) <i>Polygonum glabrum Willd.</i>
 (32) <i>Polygonum lanigerum R. Br.</i>
 (33) <i>Polygonum lapathifolium Linn.</i>
 (35) <i>Polygonum minus Huds.</i>
 (37) <i>Polygonum viscosum Ham.</i>
 (38) <i>Polygonum staeninum Ham.</i>
 (39) <i>Polygonum barbatum Linn.</i>
 (40) <i>Polygonum serrulatum Lagasc.</i>
 (41) <i>Polygonum Posumbu Ham.</i>
 (43) <i>Polygonum Hydropiper Linn.</i>
 (44) <i>Polygonum flaccidum Meisn.</i></p> |
| Species with an extra-Indian distribution | 29 | } | <p style="text-align: center;"><i>Section VIII.—Cephalophilon.</i></p> <p>(48) <i>Polygonum alatum Ham.</i>
 (49) <i>Polygonum microcephalum Don.</i>
 (52) <i>Polygonum runcinatum Ham.</i>
 (54) <i>Polygonum capitatum Ham.</i>
 (55) <i>Polygonum chinense Linn.</i></p> |
| | | | <p style="text-align: center;"><i>Section IX.—Echinocaulon.</i></p> <p>(57) <i>Polygonum muricatum Meisn.</i>
 (58) <i>Polygonum arifolium Linn.</i>
 (59) <i>Polygonum perfoliatum Linn.</i>
 (60) <i>Polygonum sagittatum Linn.</i>
 (61) <i>Polygonum strigosum R. Br.</i>
 (62) <i>Polygonum prætermissum Hook. f.</i>
 (64) <i>Polygonum pedunculare Wall.</i></p> |
| | | | <p style="text-align: center;"><i>Section X.—Aconogon.</i></p> <p>(66) <i>Polygonum paniculatum Bl.</i></p> |

Total number of Assam species : 32, or 40·5 per cent.

X.—BURMA.

Species endemic to the sub-sub-area	1	(63) <i>Polygonum birmanicum</i> Gage.
		<i>Section IX.—Echinocaulon.</i>
Species distributed to other sub-sub-areas	1	(67) <i>Polygonum rude</i> Meisn.
		<i>Section X.—Aconogon.</i>
		<i>Section III.—Avicularia.</i>
		(16) <i>Polygonum plebejum</i> R. Br.
		<i>Section IV.—Amblygonon.</i>
		(17) <i>Polygonum orientale</i> Linn.
		(18) <i>Polygonum tomentosum</i> Willd.
		(19) <i>Polygonum limbatum</i> Meisn.
		<i>Section V.—Tovara.</i>
		(20) <i>Polygonum virginianum</i> Linn.
		<i>Section VI.—Bistorta.</i>
		(24) <i>Polygonum paleaceum</i> Wall.
Species with an extra-Indian distribution	20	<i>Section VII.—Persicaria.</i>
		(30) <i>Polygonum glabrum</i> Willd.
		(32) <i>Polygonum lanigerum</i> R. Br.
		(33) <i>Polygonum lapathifolium</i> Linn.
		(35) <i>Polygonum minus</i> Huds.
		(37) <i>Polygonum viscosum</i> Ham.
		(38) <i>Polygonum stagninum</i> Ham.
		(39) <i>Polygonum barbatum</i> Linn.
		(40) <i>Polygonum serrulatum</i> Lagasc.
		(43) <i>Polygonum Hydropiper</i> Linn.
		(44) <i>Polygonum flaccidum</i> Meisn.
		<i>Section VIII.—Cephalophilon.</i>
		(48) <i>Polygonum alatum</i> Ham.
		(55) <i>Polygonum chinense</i> Linn.
		<i>Section IX.—Rchinocaulon.</i>
		(59) <i>Polygonum perfoliatum</i> Linn.
		(61) <i>Polygonum strigosum</i> R. Br.

Total of Burmese species : 22, or 27·8 per cent.

XI.—MALAY PENINSULA and ANDAMANS.

Species endemic to the sub-sub-area No species.
 Species distributed to other sub-sub-areas No species.

Species with an extra-Indian distribution	11	<p style="text-align: center;"><i>Section III.—Avicularia.</i></p> <p>(16) <i>Polygonum plebejum R. Br.</i></p> <p style="text-align: center;"><i>Section IV.—Amblygonon.</i></p> <p>(18) <i>Polygonum tomentosum Willd.</i></p> <p style="text-align: center;"><i>Section VII.—Persicaria.</i></p> <p>(35) <i>Polygonum minus Huds.</i> (38) <i>Polygonum stagninum Ham.</i> (39) <i>Polygonum barbatum Linn.</i> (40) <i>Polygonum serrulatum Lagasc.</i> (43) <i>Polygonum Hydropiper Linn.</i> (44) <i>Polygonum flaccidum Meisn.</i></p> <p style="text-align: center;"><i>Section VIII.—Cephalophilon.</i></p> <p>(55) <i>Polygonum chinense Linn.</i></p> <p style="text-align: center;"><i>Section IX.—Echinocaulon.</i></p> <p>(61) <i>Polygonum strigosum R. Br.</i> (64) <i>Polygonum pedunculare Wall.</i></p>
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Total of Malay Peninsula species : 11, or 14 per cent.

The following table shows the 'sectional' distribution of the genus in the various sub-sub-areas. The figure in any given square is the number of species belonging to the section indicated horizontally and found in the sub-sub-area indicated vertically.

Sectional Distribution of the Genus in India.

	I. North- West- Frontier.	II. Central Prov- inces.	III. Penins. India.	IV. Upper Gangetic Plain.	V. North- Bengal.	VI. North- West. Hima- laya.	VII. Nepal.	VIII. East Hima- laya.	IX. Assam.	X. Burma.	XI. Malay Penins.	Total number of Indian species in each section.
Section I	<i>Koenigia</i> Hook. f.	...	...	...	...	1	...	...	...	...	...	1
Section II	<i>Eleutherosperma</i> Hook. f.	...	...	...	...	2	1	2	...	...	...	2
Section III	<i>Asiularia</i> Meisn.	1	1	1	1	9	1	1	1	1	1	13
Section IV	<i>Amblygonon</i> Meisn.	...	2	2	3	1	...	...	2	3	1	3
Section V	<i>Tovara</i> A. Gray	...	...	...	...	1	...	1	1	1	...	1
Section VI	<i>Bistorta</i> Toura.	1	...	...	...	8	5	6	1	1	...	9
Section VII	<i>Persicaria</i> Meisn.	8	2	6	9	13	5	8	13	10	6	16
Section VIII	<i>Cephalophiton</i> Meisn.	2	...	3	1	8	7	7	5	2	1	11
Section IX	<i>Echinocaulon</i> Meisn.	...	...	2	3	3	3	5	7	3	2	8
Section X	<i>Aconogon</i> Meisn.	1	...	...	...	10	4	7	2	1	...	13
Section XI	<i>Tiniaria</i> Meisn.	2	...	...	...	3	...	2	...	...	...	3
	TOTAL	25	5	14	10	59	26	39	32	22	11	79

In the foregoing table it will be noticed that *Koenigia* has the smallest number of species and is least widely distributed in India, while *Persicaria* has the greatest number of species and is most widely distributed. *Avicularia* is especially distinctive to the North-West Frontier and the North-West Himalaya. *Bistorta*, *Cephalophilon*, *Aconogon*, and *Tiniaria* are characteristic of the Himalayan range from west to east. *Amblygonon* is practically restricted to the sub-sub-areas of low altitude. *Echinocaulon* is strongly represented in Assam.

ALTITUDINAL DISTRIBUTION IN INDIA.

The following diagram gives the altitudinal range of every species with the more important varieties occurring in India. Each of the squares represents one thousand feet vertically as indicated on the left margin. Any further facts regarding the altitudinal range of any species can easily be incorporated by the reader simply 'inking in' the appropriate squares. The diagram is not of course likely to be absolutely correct for every species, but the range of error probably does not go much beyond five hundred feet either way.

The species with the greatest vertical range is (21) *Polygonum viviparum* Linn., which is found from 5,000 feet up to 18,000 feet. Several species have a very restricted range. Of these among the more alpine forms are (15) *Polygonum mollisforme* Boiss., (23) *Polygonum perpusillum* Hook. f., (25) *Polygonum Bistorta* Linn., (75) *Polygonum Hookeri* Meisn., and (76) *Polygonum nummularifolium* Meisn. Amongst the low-level species (18) *Polygonum tomentosum* Willd., (19) *Polygonum limbatum* Meisn., and (64) *Polygonum pedunculare* Wall., may be singled out.

The study of the altitudinal range of some of the varieties of *Polygonum plebejum* R. Br. lends some additional support to the writer's opinion, based on morphological grounds, that some of those varieties might well be raised to specific rank. It is seen that *Polygonum plebejum* and its variety *elegans* have the same vertical range, while the varieties *indica* and *brevifolia* are also altitudinal twins. On the other hand the variety *Griffithii* has a distinctly restricted range; *Polygonum tomentosum* and *Polygonum limbatum*, which are so remarkably like each other morphologically, are also linked by their latitudinal and altitudinal distribution.

The diagram of general altitudinal distribution is followed by a similar one for the sections. The pages containing the former are to be held sideways.

Altitudinal distribution of species in India.

	0	1,000.	2,000.	3,000.	4,000.	5,000.	6,000.	7,000.	8,000.	9,000.	10,000.	11,000.	12,000.	13,000.	14,000.	15,000.	16,000.	17,000.	18,000.	19,000.	20,000.	
1. <i>P. islandicum</i> .																						
2. <i>P. delicatulum</i>																						
3. <i>P. filicaule</i> .																						
4. <i>P. biarticulatum</i> .																						
5. <i>P. recumbens</i> .																						
6. <i>P. cognatum</i> .																						
7. <i>P. paronychioides</i>																						
8. <i>P. salicornioides</i>																						
9. <i>P. aviculare</i> .																						
10. <i>P. Bellardi</i> .																						
11. <i>P. setosum</i> .																						
12. <i>P. tubulosum</i> .																						
13. <i>P. polycnemoides</i>																						
14. <i>P. affanicum</i>																						
15. <i>P. molliaforme</i>																						
16. <i>P. plebejum</i> .																						
<i>var. elegans</i> .																						
<i>var. effusa</i> .																						
<i>var. indica</i> .																						
<i>var. brevifolia</i>																						
<i>var. Griffithii</i> .																						
17. <i>P. orientale</i> .																						
18. <i>P. tomentosum</i>																						
19. <i>P. limbatum</i> .																						
20. <i>P. virginianum</i> .																						
21. <i>P. viviparum</i> .																						
22. <i>P. sphaerostachyum</i>																						
23. <i>P. perpusillum</i> .																						
24. <i>P. paleaceum</i> .																						
25. <i>P. Bistorta</i> .																						
26. <i>P. amplexicaule</i>																						
<i>var. speciosa</i> .																						
27. <i>P. affine</i> .																						
28. <i>P. vacciniifolium</i>																						
29. <i>P. Emodi</i> .																						
30. <i>P. glabrum</i> .																						
31. <i>P. amphibium</i>																						
32. <i>P. lanigerum</i> .																						
33. <i>P. lapathifolium</i>																						
sub-sp. <i>maculatum</i>																						
34. <i>P. Persicaria</i> .																						
35. <i>P. minus</i> .																						
36. <i>P. assamicum</i> .																						
37. <i>P. viscosum</i> .																						
38. <i>P. stagninum</i> .																						
39. <i>P. varbatum</i> .																						
40. <i>P. serrulatum</i> .																						
41. <i>P. Posumbu</i> .																						
42. <i>P. mite</i> .																						
43. <i>P. Hydropiper</i> .																						
44. <i>P. flaccidum</i> .																						
<i>var. hispida</i> .																						

S.I. Koenig
S. II Eri-
throsperma

Section III.
A. aviculare

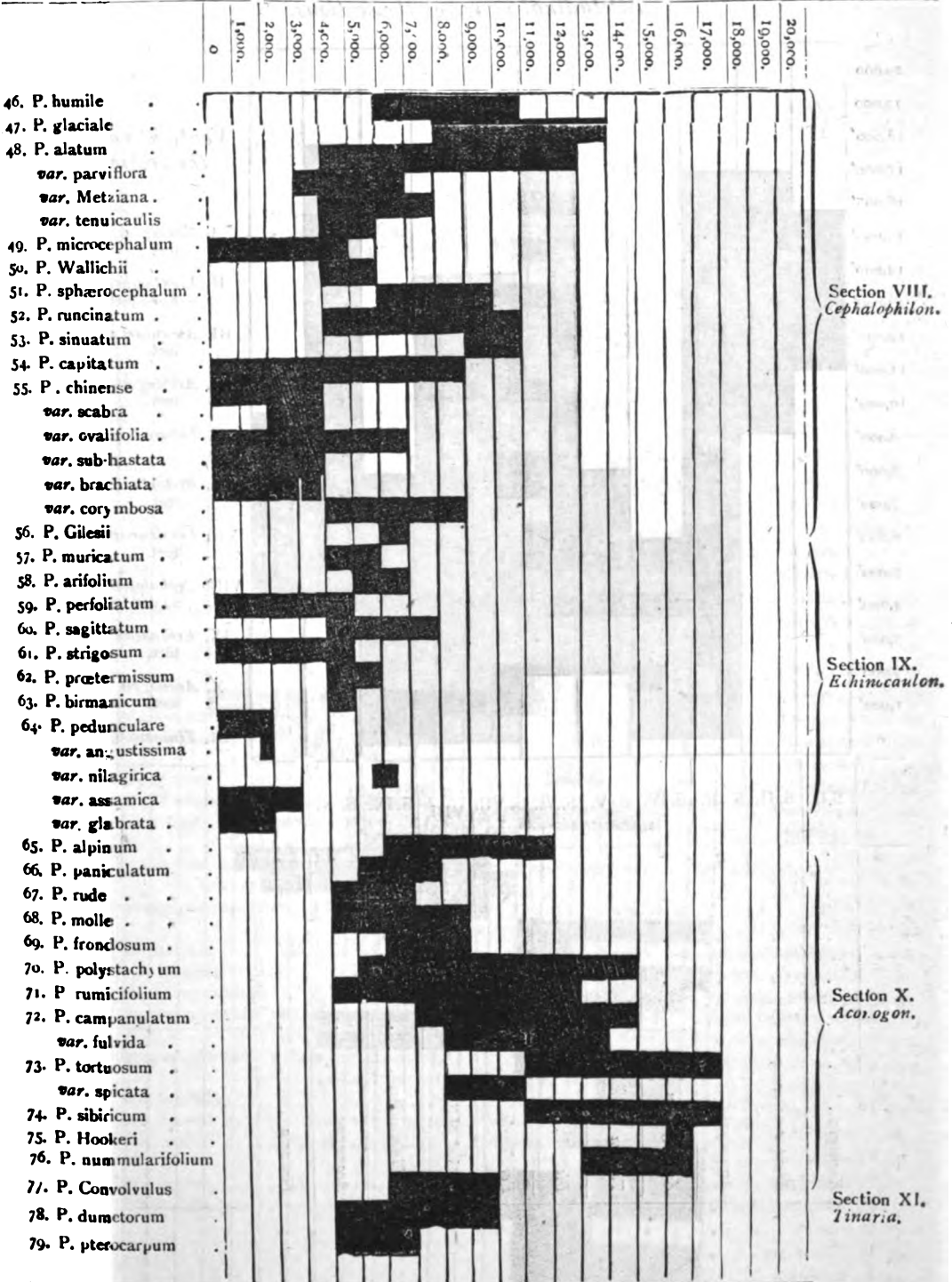
S. IV. Am-
gonon.

S. V. Tenors.

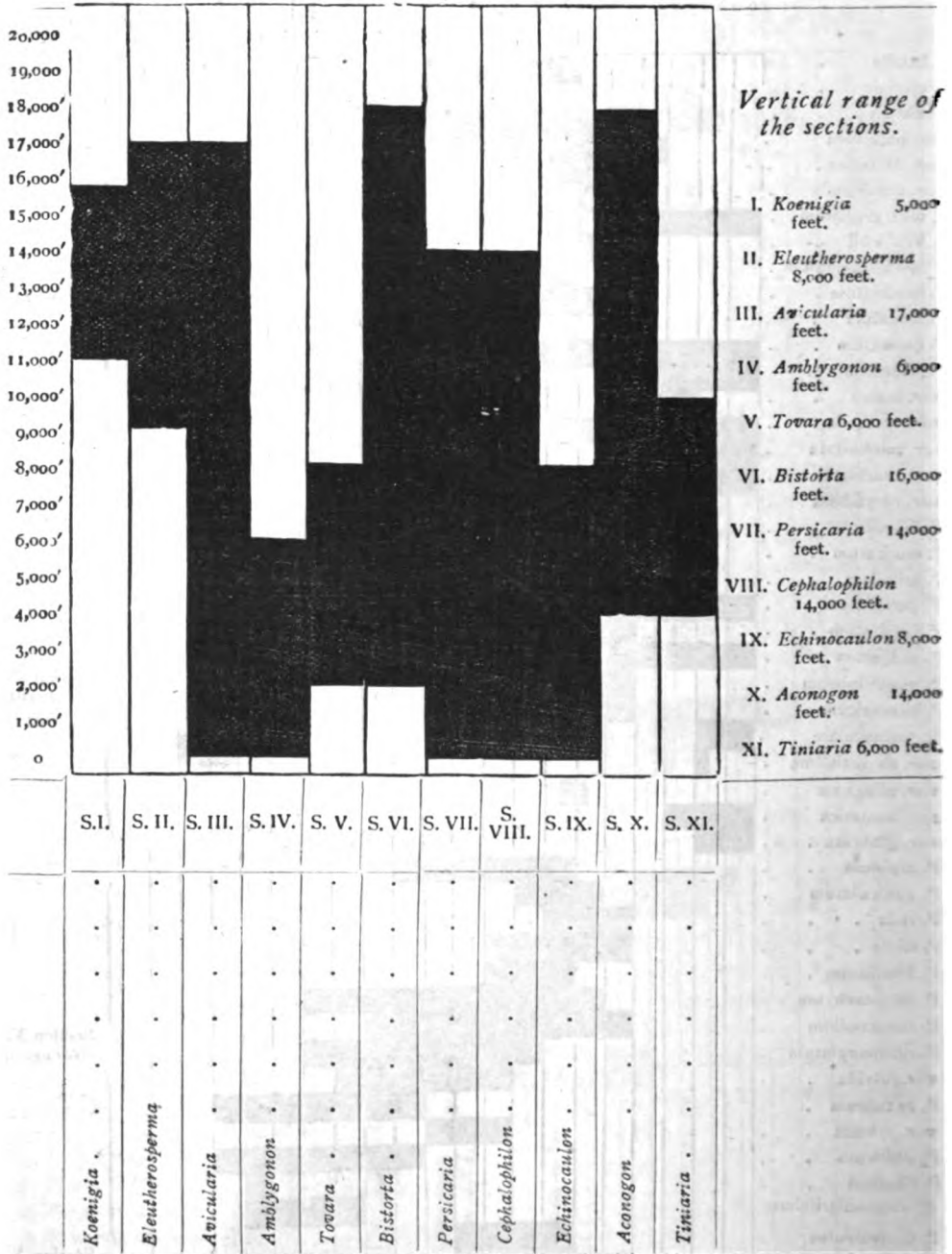
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Altitudinal distribution of species in India.



Altitudinal range of the sections.



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