

# Records

of the

# Botanical Survey of India.

Published by Authority.



VOLUME III.—No. I.

THE VEGETATION OF THE DISTRICT OF  
MINBU IN UPPER BURMA.

BY

A. T. GAGE, CAPTAIN, I.M.S.,

CURATOR OF THE HERBARIUM, ROYAL BOTANIC GARDEN, CALCUTTA.



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BOTANICAL SURVEY OF INDIA

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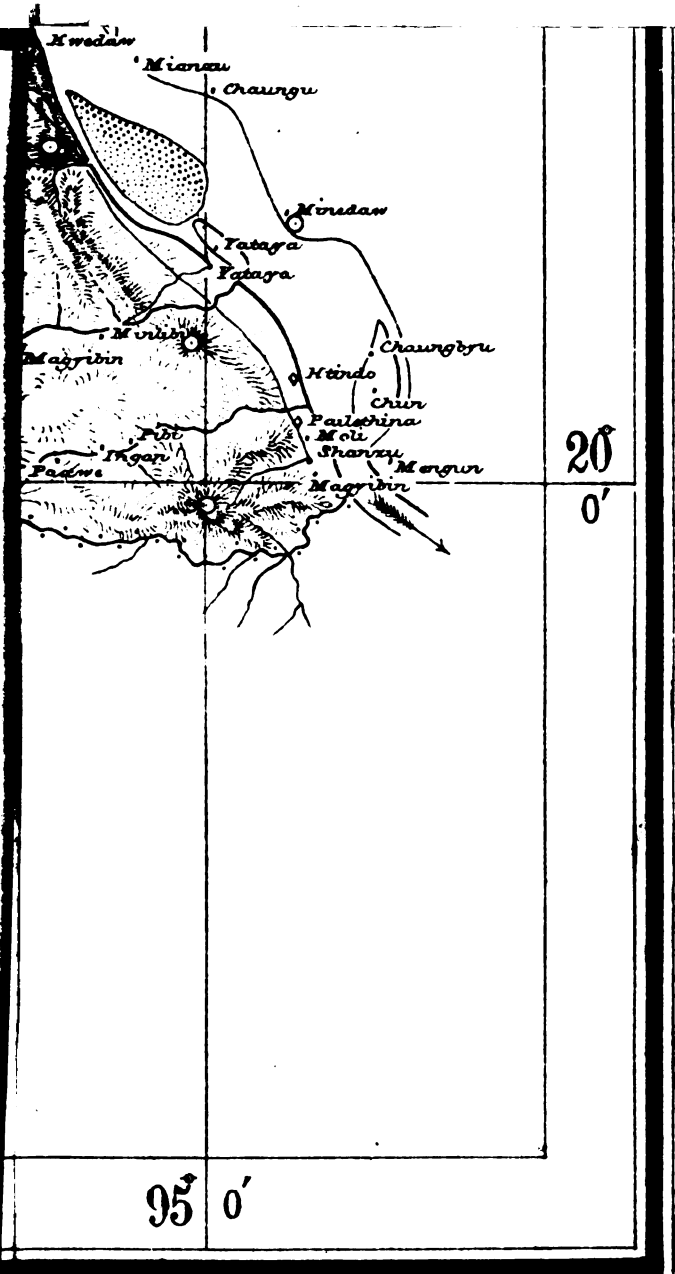


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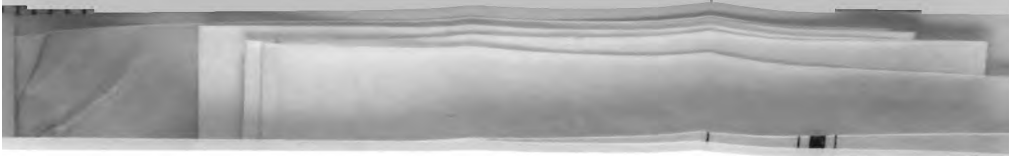


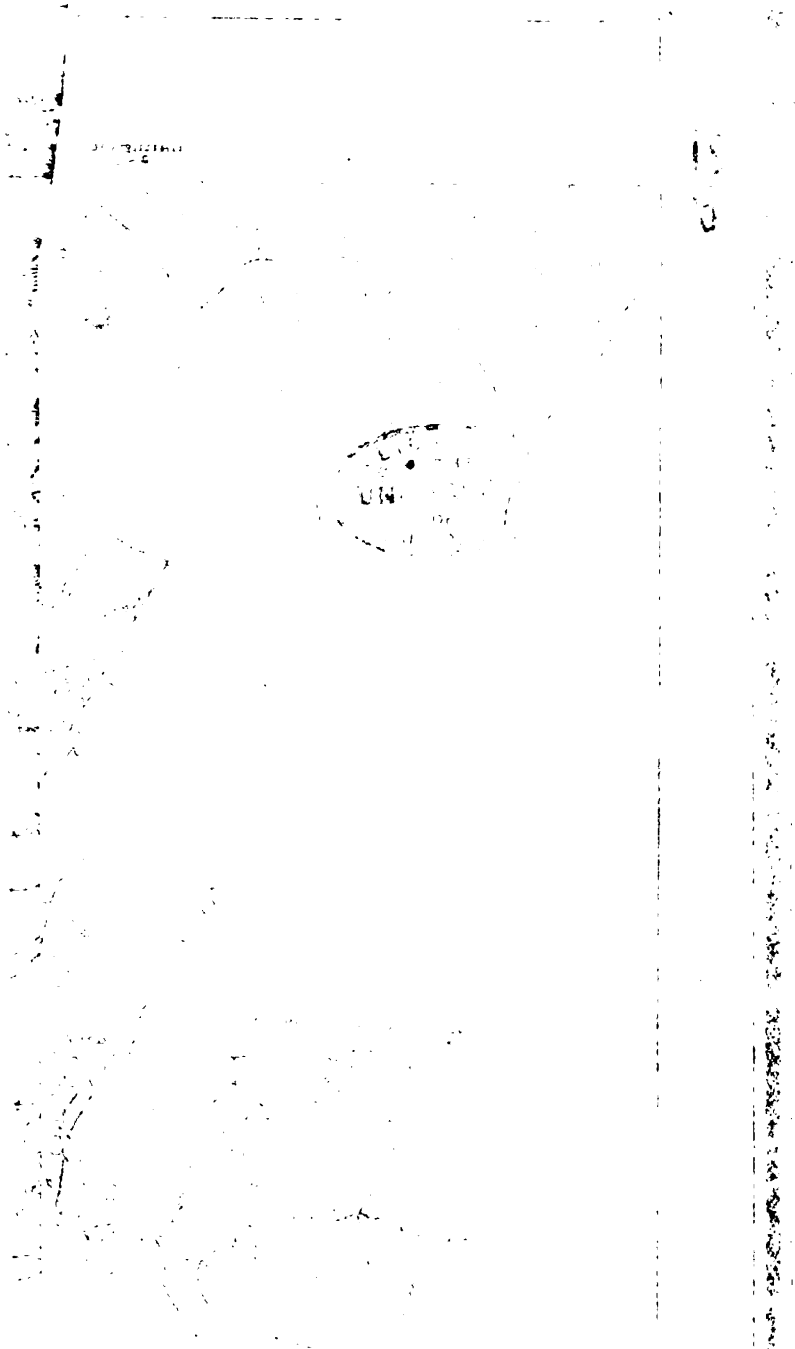
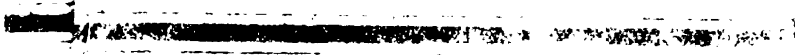




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THE VEGETATION OF THE DISTRICT OF MINBU IN  
UPPER BURMA.

By *A. T. GAGE.*

CHAPTER I.—ITINERARY.

The writer having been deputed by Major Prain, I.M.S., Director of the Botanical Survey of India and Superintendent of the Royal Botanic Garden, Calcutta, to proceed to the district of Minbu in Upper Burma to collect specimens and to study the vegetation of the district, left Calcutta by steamer on the 27th February 1903 and arrived at Rangoon on the 2nd March 1903. As the steamer reached Rangoon just too late to allow the writer to proceed at once to Minbu, he utilised the enforced stay in collecting in the neighbourhood of Rangoon itself. While there the writer also called upon the Director of Land Records and Agriculture and upon the Revenue Secretary, by both of whom he was provided with letters of introduction, by the former to the Deputy Commissioner of Minbu, and to the Superintendent of Land Records there, by the latter to the Deputy Conservator of Forests. The writer left Rangoon on the 4th March by train for Prome, whence the journey was continued by the Irawaddy Flotilla Company's steamers until Minbu was reached on the 7th March, where the writer was received by his friend Captain Fenton, I.M.S., then Civil Surgeon of Minbu. The same day the writer called on Mr. Parry, the Deputy Commissioner, and explained to him the object of the writer's visit to Minbu. The following day the writer met Mr. Aubert, the Superintendent of Land Records, and in company with him visited the island in the Irawaddy opposite the town of Minbu, and collected specimens of all the crops growing there, which were then in flower or fruit. The following day, the 9th March, the writer collected to the west of Minbu town and in consultation with Mr. Aubert drew up a tour through the central part of the district, crossing it from East to West.

Mr. Aubert displayed keen interest in the object of the tour, and volunteered to accompany the writer on his excursion. It is owing to this fortunate circumstance that this account of the flora of Minbu

more especially on its economic side is much less meagre than otherwise it would have been, if the writer had been obliged to rely entirely on himself. Mr. Aubert understanding the Burmese language well, was most untiring in extracting information from villagers as to the uses they made of plants, and only those who have tried it can appreciate what a tax upon one's patience the extraction of even the simplest facts from a dull-brained Asiatic peasant is.

In the following itinerary of our excursion the reader is referred to the map, whereon the route is shown in red and the halting places indicated by a cross. Having laid in a stock of provisions we left Minbu on the evening of the 10th March, travelling all night in aggressively creaking bullock-carts. This, although a primitive and—in the present stage of evolution of the Burmese cart and the Minbu 'roads'—a truly penitential mode of locomotion served our purpose probably better than any more rapid way of travelling would have done. Our route at first followed the right bank of the Irawaddy, which we skirted all night until at dawn we reached Semon. There we engaged a fresh relay of carts to convey our baggage to Khwé-thé by road, while we marched along the river bank collecting as we went, until we arrived at Khwé-thé after noon. It now being exceedingly hot we halted at Khwé-thé for the remainder of the day, taking shelter in a 'Zayat' or bamboo shed. In the evening we left Khwé-thé and travelling again all night in bullock carts arrived at Sinbok at dawn on 12th March. That same morning we marched to Paunglin lake, and after collecting there what we could, returned to Sinbok about noon. We halted at Sinbok for the remainder of that day and the following day collecting and changing and drying paper. On the morning of 14th March we left Sinbok and struck North-Westwards for Pyogingon, where we arrived the same day. We spent that day and the following at Pyogingon, collecting in the neighbourhood, and left on the evening of the 15th March for Salin, arriving at the latter place early on the morning of the 16th March. Salin is the most important town in the district as far as size and trade are concerned being considerably larger than the town of Minbu from which it is distant about forty miles by road. Near Salin is a fairly large lake—not shown in the map—where we collected from a dug-out what acuquatics we could find. In the evening we left Salin for Gwingyin, a name not shown in the map but the position of which is roughly indicated on the route by the cross south of Kontha. We halted at Gwingyin on the 17th and 18th March, collecting in the region around. On the evening of the 18th March we left for Myaung-u, also not shown in the map but indicated by the cross on the route a little to the east of

Chomo and just north of the 20° 30' line of latitude. We arrived at Myaung-u on the morning of the 19th March and we halted there for that day and the following. Here for the time being we had to forsake our carts, as we had now arrived at the outermost ridges of the Arracan Yomahs into which at this point no cart road penetrated at the time of our visit, although one was being made. Accordingly we arranged with the headman of Myaung-u for coolies to carry our baggage, and on the morning of the 20th March we started to march the fourteen miles along and across the Nwamadaung hills to Sidoktaya (Sedoktea) in the Mon valley, which we reached at nightfall. The following day was spent at Sidoktaya, collecting and changing paper. On the 22nd March we marched from Sidoktaya to the Chin village of Kan, situated at about 3,000 feet elevation on the Eastern flank of the Arracan Yomahs.

We halted at Kan village for the 23rd and 24th March, collecting in the neighbourhood and marched down again to Sidoktaya on the 25th, halting there for that day. The following day we stowed ourselves and servants and luggage into two lumbering dug-outs, and proceeded down the Mon river, reaching Monmyin at nightfall. Another day's perfunctory tugging at the makeshift oar on the part of our boatmen landed us at Okpho, where we forsook the river and travelled by night in bullock carts to Legain. There we had an hour or two's rest and then pushed on to Sagu, where we obtained a fresh relay of carts, which brought us into Minbu that same evening the 28th of March. The writer then remained at Minbu for three days, assorting the collections and packing them up. On this being finished he left Minbu on 1st April, arrived at Rangoon on 3rd April, left the latter place on 6th April and arrived in Calcutta on the 9th April. The whole excursion occupied just six weeks, of which more than a fortnight was spent in travelling from Calcutta to Minbu and returning from Minbu to Calcutta. The itinerary succinctly shown is as follows:—

27th February 1903	.	.	Left Calcutta.
28th "	"	"	} at sea.
1st March	"	"	
2nd to 4th "	"	"	at Rangoon.
5th to 7th "	"	"	Rangoon to Minbu.
7th to 10th "	"	"	at Minbu.
11th "	"	"	Minbu to Sinbok.
12th to 13th "	"	"	at Sinbok.
14th to 15th "	"	"	at Pyogingon.
16th "	"	"	at Salin.
17th to 18th "	"	"	at Gwingyin.
19th "	"	"	at Myaung-u.

20th March 1903	.	.	Myaung-u to Sidoktaya.
21st "	"	"	at Sidoktaya.
22nd "	"	"	Sidoktaya to Kan.
23rd to 24th "	"	"	at Kan.
25th "	"	"	Kan to Sidoktaya.
26th "	"	"	Sidoktaya to Monmyin.
27th "	"	"	Monmyin to Legain.
28th "	"	"	Legain to inbu.
29th to 31st "	"	"	at Minbu.
1st to 3rd April	"	"	Minbu to Rangoon.
4th to 5th "	"	"	at Rangoon.
6th to 8th "	"	"	at sea.
9th "	"	"	arrived in Calcutta.

The writer is glad to end this brief account of his tour by expressing his obligations to Mr. Gaitskell, I.C.S., Director of Land Records and Agriculture, Burma; to Mr. Parsons, I.C.S., who kindly presented the writer with a copy of the Settlement Report of the district of Minbu, written by Mr. Parsons himself, wherein the writer found information which otherwise he would not have obtained; to Mr. Parry, the Deputy Commissioner of Minbu; to Captain Fenton I. M. S., the writer's host while in Minbu itself; and especially to Mr. Aubert, the Superintendent of Land Records, who rendered such excellent service on the tour itself.

## CHAPTER II.—TOPOGRAPHY OF THE DISTRICT.

The district of Minbu is a rhomboidal shaped tract, bounded on the east by the river Irawaddy, on the west by the mountain range which separates the district from Arracan and is known as the Arracan Yomahs. The north and south boundaries are not naturally defined, but the district extends from about  $19^{\circ} 48'$  N. to about  $21^{\circ}$  N. measured along the  $94^{\circ} 30'$  E. line of longitude, which practically forms one of the diagonals of the rhomboid, the other diagonal running from the intersection of  $20^{\circ}$  N. latitude with  $95^{\circ}$  E. longitude to the intersection of  $21^{\circ}$  N. latitude with  $94^{\circ}$  E. longitude.

The length of the district due north and south is about 80 miles, its greatest breadth 50 miles. The total area is over 3,000 square miles. The district is divided naturally into three meridional zones very distinct alike in their physical and vegetative characters.

These are :—

I.—A mountainous zone roughly forming the western third of the district and comprising the eastern flanks of the Arracan Yomahs and a very distinct narrow range of low hills running from north to south of the district closely parallel with and a few miles to the east of the



main chain of the Yomahs, and referred to throughout this paper as the Nwamadaung Hills. The Arracan Yomahs geologically belong—as do all the Minbu rocks—to the tertiary period, and deposits of fossil wood are not uncommonly met with. The chief summits of the range in the district reach an altitude of over 6,000 feet and the range is forest clad throughout. The Nwamadaung hills are not named on the map but are readily recognised thereon as a well defined narrow range, single for the greater part of its length but showing a double contour for some distance just north of  $20^{\circ}$  N. latitude and again just north of  $20^{\circ} 30'$  N. latitude. Part of the route traversed runs along the crest of the ridge just south of  $20^{\circ} 30'$  N. latitude. The general altitude of the range appears roughly to be about 1,000 feet. It is clad entirely with deciduous forest. Between the main chain of the Arracan Yomahs and the Nwamadaung hills lies a narrow trough or valley,—at Sidoktaya about four to six miles wide—in which the waters of the Mon and Man rivers flow before breaking through the Nwamadaung hills to make their way to the Irawaddy.

II.—A narrow flat alluvial belt or strip about four to five miles wide fringing the western bank of the Irawaddy from a little north of Minbu town to the northern boundary of the district.

III.—A zone which for lack of a more precisely descriptive term is described throughout this paper as the desert zone. This constitutes the larger part of the district and extends from the Nwamadaung hills to the alluvial belt, north of Minbu town and to the banks of the Irawaddy south of Minbu town. The breadth of this zone varies from twenty to thirty miles. Its surface is abrupt and broken westwards, but becomes more undulating as one travels eastwards until it merges into the alluvial belt. South of Minbu town this zone continues abrupt up to the Irawaddy.

The district is drained by three rivers, the Salin, Mon, and Man. The Salin arises in the north-west corner of the district, at first runs in a south-easterly direction and then sweeps round to the north-east before debouching into the Irawaddy. The Mon river drains the central portion of the district. It arises on the eastern slopes of the Arracan Yomahs, and flows for some distance between the Yomahs and the Nwamadaung hills until it emerges into the desert zone, across which it meanders with many windings in a north-easterly direction, finally turning to the south-east before it falls into the Irawaddy. It is navigable for country boats as far up as Sidoktaya. The Man river has its source in the south-west corner of the district, the southern portion of which it drains.

It flows mainly in a north-easterly direction, joining the Irawaddy just north of Minbu town. These three rivers are bordered on each side by a narrow alluvial belt, of course on a very much smaller scale than the main one bordering the Irawaddy, but practically westward prolongations of that belt traversing the desert zone. These secondary alluvial belts are more evident along the Mon river than along the other two rivers, as irrigation is or until recently was not practised along the Mon river. The Salin and Man rivers by virtue of their irrigation works cut out two cantles from the desert zone, which, albeit they do not quite blossom like the rose, contrive to support a moderate burden of crops and vegetables. The Salin irrigated area is somewhat triangular in outline, the base of the triangle extending roughly from the south end of the Paunglin lake just south of  $20^{\circ} 30'$  N. latitude to just a little north of the Salin river as it passes into the alluvial belt. The southern boundary begins at Paunglin lake and skirts the low hills till it reaches the Salin river about Leywa. The northern boundary follows the Salin river, skirting the base of the low hills just north of the river. The western angle of the triangle is really not closed, for the irrigated tract follows both banks of the Salin as a narrow strip on each side for a long way. The Man irrigated tract is bounded on the south by the Man river, on the east by the part of the Irawaddy alluvial belt, between the Man and Mon rivers; on the north partly by the Mon river for a very short distance, but chiefly by the low hills south of the Mon; on the west by the low hills of the desert zone which ultimately approach close to the north bank of the Man river. Both those irrigated tracts are easily recognised on the map by being devoid of hills and in being crowded with village names, Salin being the chief town in the Salin area, and Legain in the Man area.

There are the ordinary three well marked seasons during the year, the cool season lasting from the beginning of November to the end of February, the hot season extending from March to May, and the rainy season normally from May to October, though it may come on a month earlier and cease a month earlier. During the cool season the temperature may drop at night as low as  $50^{\circ}$  F. and during the hot season may reach as high as  $115^{\circ}$  F. During the latter period hot winds blow, shrivelling up the face of the land and making their effects not only felt by the European resident but also too visible to him in the way in which the covers of his books curve backwards as if in a desperate attempt to dehiscence their contents. Still, existence during the hot season is not unbearable as the heat is unaccompanied by moisture, while life during the rainy season is quite tolerable and in

the cool season pleasant. The annual rainfall on the Arracan Yomahs may reach 100 inches, at Sidoktaya in the Mon valley it varies from 45 to 70 inches, at Minbu town from 20 to 40 inches, and at Salin from 14 to 40 inches. During the hot season the Salin river practically dries up, and only a little water remains in the Man river. The Mon river, as already mentioned, remains navigable to country boats as far up as Sidoktaya.

### CHAPTER III.—SKETCH OF THE VEGETATION.

The following is more an attempt to record the writer's impressions of what was at best but a hasty rush across the district, than an endeavour to give a complete sketch of the vegetation thereof, which would require a much longer stay,—extending over the three seasons—than the writer was able to afford.

At the time of our tour the hot season had set well in, and the conditions normal to it were prevailing, and it is more properly the aspect of the vegetation during that period that is described below.

It is cause for regret that our excursion to the Arracan Yomahs was so short, but official duties compelled our return to Minbu before the close of the Government financial year on the last day of March. This vexing lack of time explains to some extent the sadly deficient account of the Yomah vegetation.

The Nwamadaung range where we traversed it is covered with fairly open deciduous forest, which the writer, if following Kurz's classification set forth in his "*Preliminary Report on the Forests and Vegetation generally of Pegu,*" would describe as an upper mixed forest. At the time of our visit almost all the trees were leafless, and there was in consequence a total absence of shade against the burning rays of an almost vertical sun, which rendered our march across the range distinctly fatiguing. The trees composing the forest are of medium height and of many different species. Amongst the more common and conspicuous are *Shorea siamensis*—Ingen or Ingyn of the Burmese—, a species of *Bombax* with a fruit of large diameter which Kurz appears to have considered—erroneously as it seems to the writer—*Bombax insignis*, *Millettia pendula*, *M. Brandisiana*, *Dalbergia cultrata*, *D. paniculata*, *Pterocarpus macrocarpus*, *Cassia renigera*, *Cassia timoriensis*, *Bauhinia polycarpa*, *B. variegata*, *Xylia dolabriformis*, *Terminalia tomentosa*, *Anogeissus acuminata* var. *lanceolata*, *Lagerstræmia tomentosa*, *Gardenia erythroclada*—very noticeable with its peculiar cinnamon brown bark,—many *Bignoniaceæ*, such as *Oroxylum indicum*, *Dolichandrone stipulata*, *D. Rheedii*, *Heterophragma sulfureum*,

*H. adenophyllum*, *Stereospermum chelonoides*, *Tectona grandis*, *T. Hamiltoniana*, the latter very common, several species of *Vitex* and *Holoptelea integrifolia*.

Climbers and twining plants are represented by such species as *Millettia cana*, *M. cinerea*, *M. auriculata*, *Canavalia ensiformis*, *Mucuna pruriens*, *Spatholobus Roxburghii*, *Butea superba*, *Pueraria Wallichii*, *Atylosia scarabæoides*, *Cylista scariosa*, *Derris scandens*, *Bauhinia diphylla*, *Combretum chinense*, *C. extensum*, *Hodgsonia heteroclita*, *Alsomitra sarcophylla*, *Cryptolepis Buchanani*, *Lettsonia setosa*, *Pharbitis Nil*, *Ipomœa Turpethum*, *Thunbergia laurifolia*, *Symphorema involucreatum*, *Congea tomentosa*, and several species of yams as *Dioscorea dæmona*, *D. pentaphylla*, *D. decipiens*, *D. alata*, etc.

The shrubby undergrowth at the time of our visit was very scanty, and was constituted chiefly by species of *Leguminosæ*, *Compositæ* and *Acanthaceæ*, such as *Crotalaria albida*, *C. neriifolia*, *C. tetragona*, *Indigofera Wightii*, several species of *Desmodium*, *Rhynchosia*, *Flemingia fluminalis*, *Vernonia teres*, *Inula Cappa*, *Wedelia Wallichii*, *Dædalacanthus macrophyllus*, *D. tetragonus*, *D. purpurascens*, *Hemigraphis glaucescens*, *Barleria strigosa*, *Neuracanthus tetragonostachys*, *Cystacanthus insignis*, as well as a few species belonging to other orders such as *Blinkworthia lycioides*, *Baliospermum axillare*, *Sarcoclamys pulcherrima*. The common bamboo is *Dendrocalamus strictus*. The water courses were almost entirely dry save for infrequent small, green and evil smelling pools, and strewn with fossiliferous boulders, amongst which *Homonoia riparia* appeared to flourish despite depressing circumstances.

The herbaceous vegetation when we were trudging through the forest was practically non-existent, the soil baked and glaring with heat. Nevertheless even on this unsympathetic stratum we picked up a few struggling herbs, such as *Sida mysorensis*, *S. rhombifolia*, *Urena lobata*, *U. sinuata*, *Hibiscus pungens*, *Melochia corchorifolia*, *Triumfetta annua*, *Elephantopus scaber*, *Cyathocline lyrata*, *Blumea glomerata*, *B. laciniata*, *B. membranacea*, *Laggera flava*, *L. pterodonta*, *Vicoa auriculata*, *Emilia sonchifolia*, *Canscora diffusa*, *Nelsonia campestris*, *Ocimum Basilicum*, etc.

The above are the chief positive features of the Nwamadaung hills vegetation. A marked negative feature is the absence of palms and orchids.

The lower slopes of the Arracan Yomahs up to between 2,000 and 3,000 feet are covered with practically the same forest as clothes

the Nwamadaung range, with minor differences. *Bignoniaceæ* and the species of *Tectona* are less prominent. *Terminalia tomentosa* is very common, while *Terminalia pyrifolia* and *T. Oliveri* also occur. Other trees met with on the ascent to Kan village in addition to those mentioned as occurring on the Nwamadaung hills are *Sterculia colorata*, *Garuga pinnata*, *Sapindus Mukorossi*, *Buchanania latifolia*, *Melanorrhæa usitata*, *Mæsa indica*, *Schrebera swietenoides*. The shrubby vegetation is to all intents the same as that of the Nwamadaung range, *Composites* and *Acanthaceous* species predominating. Here and there along the steep hill track occur clumps of tall grasses, chiefly such species as *Thysanolaena agrostis*, *Saccharum spontaneum*, *Erianthus longisetosus*, *E. Hookeri* and *Neyraudia madagascariensis*. *Dendrocalamus strictus* and another bamboo are common. The climbers and herbaceous vegetation are represented by the same species as are found on the Nwamadaung hills.

Beyond and above the village of Kan—that is above 3,000 feet elevation—the deciduous forest gives place to an evergreen forest. The chief trees above this elevation so far as we had time to discover are *Dipterocarpus tuberculatus* (the Eng of the Burmese), *Duabanga sonneratioides*, *Quercus Lindleyana*, *Q. dealbata*, and *Castanopsis tribuloides*, all very common. Other characteristic but less common trees are *Taraktogenos Kursii*, *Cedrela Toona*, *Semecarpus albescens*, *Pygeum acuminatum*, *Eriobotrya bengalensis*, *Tupidanthus calyptrotus*, *Diplospora confusa*, *Cinnamomum Tamala*, *C. obtusifolium*, *Engelhardtia Colebrookiana*, *Ficus glomerata*, *Baccaurea sapida*, etc. The climbers comprise such species as *Clematis grewiflora*, *Naravelia seylanica*, *Ventilago calyculata*, *Entada scandens*, *Derris scandens*, etc. The undergrowth consists chiefly of such shrubs as *Vaccinium bancanum*, *Ardisia humilis*, *Ligustrum robustum*, many species of *Acanthaceæ*, *Premna latifolia*, *Clerodendron infortunatum*, *Polygonum chinense*. The herbaceous vegetation is represented by such species as *Pimpinella Leschenaultii*, *Rubia angustissima*, many *Composites* and *grasses*, and some *Scitamineæ*, and *Ferns*.

The flat alluvial belt along the Irawaddy is for the most part under cultivation, the chief crops being rice, maize and a great variety of pulses and cucurbitaceous plants. At the time of our tour the rice-fields were bare but for tufts of stubble, and the soil caked into polygonal blocks of stony hardness resembling the tops of basalt columns, with a tuft of stubble for the nucleus of each block.

Where the alluvial belt is free from cultivation it is covered with Savannah grass, the chief constituent species being *Imperata*

*arundinacea*. Other quite common grasses are *Imperata exaltata*, *Eragrostis cynosuroides*, *Saccharum fuscum*, *Andropogon serratus*, *A. squarrosus*, *A. annulatus*, *A. contortus*, *Cynodon dactylon*.

Trees are evenly but thinly scattered all over the belt, almost justifying its description as a very open Savannah forest.

Amongst those trees the more common species are *Bombax malabaricum*, *Butea frondosa*, *Parkinsonia aculeata*, *Streblus asper*, while others not so frequent are *Cæsalpinia Bonducella*, *Tamarindus indica*, *Adenanthera pavonina*, *Albizia Lebbek*, *Terminalia Bellerica*, *Lagerstræmia parviflora*, *Sarcocephalus cordatus*.

Here and there swampy hollows occur, which are usually fringed with a copse of such species as *Xanthophyllum glaucum*, *Barringtonia acutangula*, *Combretum trifoliatum*, *Butea frondosa*, *Arundo Donax*, *Phragmites Karka*, while the hollows themselves are often choked with a dense growth of *Combretum trifoliatum*, or *Polygonum stagninum*.

Villages and monasteries are thickly dotted along this fertile belt and form centres of cultivation for *Borassus flabellifer*—the Toddy Palm. This is very abundant, forming conspicuous clumps close to the villages and radiating out from them in lines, which when the villages are thickly aggregated cut the horizon in every direction, and when the villages are more sparse indicate their presence from afar. During the heat of the day the haze restricts the horizon so much, that it is only in the early morning and at sunset that the Arracan Yomahs can be seen looming towards the west. Besides the Toddy Palms there are almost always in the neighbourhood of villages and monasteries, clumps of the Coco-nut Palm, the Banyan, (*Ficus bengalensis*), the Peepul, (*Ficus religiosa*), the Mango (*Mangifera indica*) and the Jackfruit (*Artocarpus integrifolia*).

The shrubby element in the alluvial belt vegetation although not very conspicuous, is of a varied character. It includes such species as *Tamarix gallica*, common along the river bank and on sandy spits, several species of *Hibiscus*, *Thespesia Lampas*, *Helicteres elongata*, *Waltheria indica*, *Grewia hirsuta*, *Glycosmis pentaphylla*, several species of *Crotalaria*, *Tephrosia purpurea* exceedingly common, *Sesbania ægyptiaca*, *Æschynomene indica*, *Uraria picta*, *Cassia occidentalis*, *C. Sophora*, *C. Tora*, *C. alata*, *Rosa involuocrata* common, *Combretum trifoliatum* very common, *Solanum torvum*, *S. indicum*, *Hygrophila spinosa* common, *Bridelia retusa*, *B. stipularis*, *Phyllanthus reticulatus*, *P. simplex*, *Jatropha gossypifolia* common, *Ricinus communis* very common.

Climbing and twining plants are, as may be imagined from the very open character of the vegetation, very few. *Tiliacora*

*racemosa*, *Cissampelos Pareira*, *Abrus precatorius*, several species of *Argyrea* and *Ipomœa* are the chief. *Asima sarmentosa* is not uncommon straggling over ruined pagodas.

Herbaceous species are comparatively speaking in great force in the alluvial belt. During the hot season the level of the Irawaddy is twenty feet or more below the top of its bank, leaving exposed a steep broken surface of soil. To this there clings an assemblage of humble plebeians like *Ranunculus sceleratus*, *Nasturtium indicum*, *Melilotus alba*, *Indigofera enneaphylla*, *I. trifoliata*, *Trianthema decandra*, *Mollugo* *Spergula*, *Grangea maderaspatana*, *Sphæranthus peguensis*, *S. africanus*, *S. indicus*, *Gnaphalium indicum*, *G. pulvinatum*, *Xanthium Strumarium*, *Enhydra fluctuans*, *Eclipta alba*, *Spilanthes Acemella*, *Coldenia procumbens*, *Lippia nodiflora*, *Digera arvensis*, several species of *Amarantus* *Chenopodium album*, *Polygonum plebejum*, *P. glabrum*, *P. stagninum*, *Rumex maritimus*, *R. dentatus*, several species of *Euphorbia*, *Chrosophora plicata*, *Fimbristylis dipsacea*, *Scirpus Michelianus*, *Cyperus digitatus*, etc. etc.

Away from the immediate margin of the river, the more noticeable herbaceous species are *Argemone mexicana*, which is apparently very much at home, *Cleome viscosa*, *Polygala erioptera*, *Portulaca oleracea*, *Sida veronicæfolia*, *S. acuta*, *Abutilon indicum*, very common, *Urena lobata* common, *Tribulus terrestris*, *Cardiospermum Halicacabum*, very common, *Crotalaria medicaginea*, *C. quinquefolia*, several species of *Indigofera*, *Lourea obcordata*, *Alysicarpus monilifer*, *A. rugosus*, *Desmodium triflorum*, all quite common, *Mimosa pudica*, *Dentella repens*, *Vernonia cinerea*, *V. anthelmintica*, *Ageratum conyzoides*, *Heliotropium strigosum*, *H. indicum*, *Solanum nigrum*, *Lindenbergia philippinensis*, *Vandellia crustacea*, *V. erecta*, *Bonnaya brachiata*, *Striga lutea*, *S. euphrasioides*, *S. Masuria*, *Ruellia prostrata*, *Leucas mollissima*, *L. pilosa*, *Bærhaavia repens*, *Ærua javanica*, very common, *Achyranthes aspera*, *Alternanthera sessilis*, *Polygonum plebeium*, *P. lapathifolium*, *Euphorbia pilulifera*, *E. thymifolia*.

In the moist hollows already alluded to, *Coldenia procumbens* and *Gnaphalium pulvinatum* are always to be remarked, the latter especially noticeable from the never absent globules of water bedecking its woolly surface.

The vegetation of the irrigated areas is intermediate in character between that of the alluvial belt and that of the desert zone. The Savannah grass is practically absent, and the ground when it is not under crops is covered with such weeds as *Bergia ammannioides*, *Desmodium triflorum*, *Alysicarpus monilifer*, *Tribulus*

*terrestris*, *Indigofera enneaphylla*, *Gnaphalium*, *Coldenia procumbens*, *Striga*, *Ruellia*, *Lippia*, *Achyranthes*, *Polygonum plebejum*, *Euphorbias*, and various species of grasses. Very common shrubs are *Tephrosia purpurea*, *Flemingia lineata* and *Calotropis procera*. The trees belong to the same species as those found in the alluvial belt.

The alluvial belt vegetation is prolonged along the banks of the three rivers of the district, where the dry hills of the desert zone do not approach the banks and cut it off. This secondary alluvial belt vegetation is most distinct along the Mon river.

The desert zone where it borders on the irrigated areas and alluvial belt shows an undulating surface, which gradually becomes more rugged and hilly as one travels westwards until the rampart of the Nwamadaung range is encountered. The vegetation of this zone is very characteristic, consisting of a comparatively small number of mixed gregarious species which constitute in the true classical sense of the adjective a horrid scrub. At Gwingyin the general impression is of a wilderness of thick but not impenetrable jungle, consisting chiefly of shrubs which are almost all armed with spines and prickles of diverse form and size but alike malignancy. One of the chief constituents of this ill-favoured flora, very common and conspicuous is *Zisophus Fuzuba*, the so-called 'wild plum' of the district. The whitish colour of the under-surface of the leaves of this plant gives it at a distance when a breeze ruffles its foliage a peculiarly deceptive appearance of being laden with white blossoms. *Gardenia turgida* is another very common plant of this zone, of a very characteristic aspect. Its almost leafless habit, its branch spines like miniature bayonets and its silvery grey bark give it a curiously spectral appearance. *Euphorbia antiquorum* is another exceedingly common plant often attaining the dimensions of a fair sized tree with a well developed trunk. *Calotropis procera* is also very abundant. The shrubby vegetation is represented by an abundance of species of *Capparis* such as *Capparis grandis*, *C. burmanica*, *C. horrida*, *C. flavicans*, *C. hastigera*, *C. polymorpha* and by species of other genera less conspicuous such as *Corchorus fascicularis*, *C. acutangulus*, *Tephrosia purpurea*, *Flemingia lineata*, *Combretum apetalum*, *Barleria Prionitis*, etc. Apocynaceous and Asclepiadaceous climbers are fairly common. These from their intimate entanglement with their armed supports are themselves able to dispense with spines and prickles, though even without the aid of their involuntary allies the milky juice which most of them contain would probably render them not very palatable to deer or cattle. During the rainy season, *Gloriosa superba* is said to appear in great



profusion. No doubt its poisonous properties efficiently protect it. The herbaceous vegetation is scanty in the extreme and is made up mainly of such unattractive carpeting as *Solanum xanthocarpum*, *Tribulus terrestris*, *Martynia diandra*, *Bærrhaavia repanda*, *Ærua javanica*, *Achyranthes aspera*, *Polygonum plebejum*, etc. Trees are very few. At Gwingyin isolated individuals of *Acacia leucophlœa* and *Albizzia Lebbek* stood out from the desert of dusty grey scrub, the former conspicuous by its bright green foliage and the only thing pleasant to look upon amidst the dreary vegetation and intolerable glare, [the latter leafless and laden with dry pods which rattled against each other in the breeze like pagoda bells. Indeed it does not seem improbable that the rattling of these pods in the breeze may have suggested the idea of the bells. The broken hilly ground to the westwards and near Minbu itself supports the same kind of vegetation as has just been described as prevailing at Gwingyin, but much more sparsely, so that the hills have a general aspect of utter sterility. On the soil cast out from the mud-vulcanoes near Minbu town not a vestige of vegetation is to be seen. There is a complete absence in the desert zone of the toddy and coco-nut palms, as well as of the other trees commonly found about villages in the alluvial belt and irrigated areas. The only palm found in the desert zone was a variety of *Phœnix humilis*. The *Tamarind* is planted near the few villages found in this zone and a species of *Cereus* is grown as a hedge, reaching a height of fifteen feet or more. The vegetation of the desert zone appears to resemble in general aspect, if not in detail, the vegetation of Eastern Rajputana as described by Sir George King. Most of the genera described by him as occurring in Eastern Rajputana also occur in the Minbu desert zone. Many of the species are identical for the two districts so wide apart, and where the species are not identical they are representative of each other.

In the Mon valley between the Nwamadaung hills and the Arracan Yomahs there is a mixed sort of vegetation partaking of the characters of the desert zone and of the alluvial belt. A prickly scrub with *Zizyphus Fuzuba* for its chief constituent predominates, but the herbaceous vegetation is more like that of the alluvial belt and the toddy and coco-nut palms reappear in abundance.

Along the shores of the Salin and Paunglin lakes abound such species as *Fussia repens*, *F. suffruticosa*, *Ipomœa aquatica*, *Herpestis Monniera*, *Polygonum stagninum*. Fringing the margin are found *Cyperus radiatus*, *Juncellus alopecuroides*, *Scirpus articulatus*, *Cyperus platystylis*, *Boottia cordata*, *Monochoria hastæfolia*, *Typha elephantina*, *Limnodhyton obtusifolium*. Within and mixed

up with the fringe of sedges *Pistia Stratiotes* occurs in great abundance, as well as *Nymphæa Lotus*, *N. stellata*, *Netumbium speciosum*, *Limnanthemum indicum*, *Utricularia flexuosa*, *U. exoleta*, *Ceratophyllum demersum*, *Hydrilla verticillata*, *Vallisneria spiralis*, *Lemna polyrhiza*, *Wolffia arrhiza*, *Potamogeton indicus*, *Asolla pinnata*, *Marsilea quadrifoliata*, etc. In Salin lake miniature floating islands composed chiefly of *Cyperus platystylis* and *Eleocharis capitata* are common.

The exposed sand banks and sandy spits of the Irawaddy are absolutely devoid of vegetation save for an occasional tamarisk.

The foregoing account makes it evident that there are well marked and in the main very natural differences in the character of the vegetation of the three zones. Those differences, however, are probably not all of precisely equal value. There can be no question that the difference between the flora of the Arracan-Nwamadaung zone and that of the desert zone is entirely natural and dependent on the difference of altitude of, and the different climatic conditions prevailing in the two zones. The difference between the desert zone and alluvial belt floras is also in essentials a natural one, but, less due to purely climatic causes, as the elevation and rainfall are practically the same for both zones. The determining factor of the difference in this case is the Irawaddy. Its waters permeate the alluvial belt and allow many species, especially those of a herbaceous habit, to flourish, which could not exist or at least would have a very hard struggle for life beyond the zone of its beneficent influence. Amongst such species may be mentioned *Ranunculus sceleratus*, *Cardiospermum Halicacabum*, *Melilotus alba*, *Grangea maderaspatana*, *Xanthium Strumarium*, *Vandellia*, *Rumex*, *Rosa involu-crata*, *Combretum trifoliatum*, *Xanthophyllum glaucum*, and many *Cyperaceæ* and *Gramineæ*.

There is no doubt also that the influence of the Irawaddy acts in the opposite direction in being unfavourable to the spread of typically xerophilous plants such as *Euphorbia antiquorum* and the various species of *Capparis* from the desert zone on to the alluvial belt. One, however, must not lay too much stress on this aspect of the Irawaddy's influence, as another factor—human agency—interferes here. It is probable that a good few species typical of the desert zone would not find even under absolutely natural conditions the alluvial belt by any means a congenial habitat and would probably decline to grow there. On the other hand, there is no doubt that some species have to put up with life in the desert zone not necessarily because they prefer it, but because the human cultivators

of the alluvial belt strongly discourage any attempt of such species to gain a footing thereon. The discouragement may be direct, by rooting out such plants as *Zisypus Fajuba*, or such atrocious weeds as *Tribulus terrestris* or *Martynia diandra*, or indirect by simply occupying the ground with crops. As may be imagined, the demarcation between the two zones is by no means a clear cut line, the two floras mixing to a certain extent where the influence of the Irawaddy fades away. The passage from the one vegetation to the other is of course still more gradual where the irrigated areas intervene.

Excluding cultivated species, such as the various kinds of pulses and cucurbitaceous plants and cereal crops, etc., the number of Phanerogams collected is about 700 species, the number of Cryptogams collected being so few as to be practically a negligible quantity. Nearly half the number of species were collected by Mr. Aubert and the writer and the remainder by the garden collector Shaik Mokim, who spent about five months in the district. On the not unreasonable assumption that these 700 species afford a fair representation of the vegetation of the district, an analysis of the collection should elucidate to some extent the distributional affinities of the flora of the district.

As the differences in the vegetation of the three zones of the district roughly sketched above are sufficiently striking to impress even the most casual non-botanical traveller, it is evident that to consider the whole district as a unit and to analyse the collection in that light would lead to very misleading results.

Accordingly the Arracan-Nwamadaung zone, the alluvial belt, and the desert zone collection have been separately analysed, and the results tabulated in percentages in the table given below. The fourth column shows the erroneous inferences as to the affinities of the flora of the district which might be drawn if the district were considered as a homogeneous unit. Geographically the district of Minbu comes within Major Prain's Assam-Arracan sub-sub-area. Phyto-geographically however only the westernmost portion of the district comprised by the Arracan-Nwamadaung zone can be considered as belonging to that sub-sub-area. The inclusion of the desert zone and alluvial belt plants would merely involve a purely fictitious addition, in the case of the former of Deccan and African species, and in the case of the latter of African and cosmopolitan tropical species. The area and sub-sub-areas mentioned in the table are in the main sufficiently indicated by their names. It may not, however, be amiss to state more precisely the boundaries of the Deccan, Indus plain and Gangetic plain sub-sub-areas. They are the sub-sub-areas recognised by Sir Joseph

Hooker in his recent sketch of the flora of British India written for the Imperial Gazetteer, and they are defined by him as follows:—

- I.—The Indus plain includes “the Punjab, Sind, Rajputana west of the Aravalli range and Jumna river, Cutch and Gujarat.”
- II.—The Gangetic plain extends “from the Aravalli hills and Jumna river to Bengal, the Sundarbans, the plain of Assam, the low country of Orissa north of the Mahanadi river.”
- III.—The Deccan includes “the whole comparatively dry elevated tableland of India east of Malabar and south of the Gangetic and Indus plains, together with the Coromandel coast.” It is practically what is meant by “Peninsular and Central India” in the list of species in this paper.

The respective proportions of the collection furnished by the three zones of the district are approximately:—

Arracan-Nwamadaung plants	. 45·6 per cent.
Desert zone plants	. . . . . 8·4 „ „
Alluvial belt plants	. . . . . 46·0 „ „

This, however, in all probability does not represent accurately the true percentage of the three zones. The writer, as already mentioned, had to be content with the merest glimpse of the Arracan Yomahs, and as it is much easier to collect specimens on the plains than to climb up very steep slopes in search of them, there is little doubt that the native plant collector distributed his energies accordingly. It is for instance incredible that seven species of orchids are a fair representation of the prevalence of that order in the Arracan Yomahs. It is therefore not inadmissible to assume that, if the Arracan-Nwamadaung zone were as fully botanized as the other two zones have probably been that the percentage of the former element in the vegetation of the district would rise considerably and the percentages of the latter two correspondingly fall. Further it is exceedingly probable that a considerable number of species collected in the alluvial belt also occur in the desert zone, but were not re-collected in the latter for the reason that they had been already collected in the alluvial belt. Consequently it must not be forgotten that the figures given are at best but a mere approximation to the true proportions of the various elements in the flora of the district.

Considering the vegetation of the zones in more detail we find that the Arracan-Nwamadaung zone shows a distinct endemic element—amounting to about 5 per cent. of the species collected in that zone—restricted to the Assam-Arracan sub-sub-area. Most of the species comprising this endemic element are new or presumably new and are

*Vitis Aubertiana*, *Indigofera minbuensis*, *Millettia cana*, *Desmodium grande*, *D. teres*, *Derris pulchra*, *Terminalia Oliveri*, *Vernonia* sp. *Diospyros* sp. *Lettsomia campanuliflora*, *Ipomœa lancifolia*, *Justicia khasiana*, *Habenaria yomensis*, *Curcuma sessilis*, *C. parvula*, *Typhonium pedatisectum*. Purely Burmese—including Tenasserim—species form 20·33 per cent. in which a Shan hills contingent is predominant.

Next in importance come those species common to India and Malaya 11·56 per cent. closely followed by species which are found in China as well as in India and Malaya, 10·4 per cent. Indian species come next with 9·4 per cent., then purely Malayan species with 7 per cent. Purely Himalayan species are fairly well represented by 6·56 per cent. which also indicates the force of African to Australian species. The percentage of Deccan species offers a remarkable contrast to the percentage of Deccan species in the desert zone.

The alluvial belt, as might be expected, has a great predominance of general eastern tropical and cosmopolitan tropical species, which are followed a long way behind by Indo-African species. The endemic Upper Burma element is very small.

The desert zone shows a considerable percentage—18·6—of endemic Upper Burma species. The most striking feature, however, in the vegetation of this zone is the preponderance of Deccan and Indo-African species. This preponderance is no doubt exaggerated in the table based on this collection only, but the two elements together probably form at least about a fourth of the whole vegetation of the zone, contrasting strongly with the meagre show they make in the other two zones. How to account for the presence of such a comparatively large percentage of Indo-African species is an interesting problem. One knows that the presence of a considerable African element in the Indian Peninsula is explained by the existence of a land connection with Africa in pre-tertiary times. Whether one can suppose the existence of a similar land connection between Upper Burma and the Western Peninsula before the formation of the Arracan Yomahs in tertiary times is a question for geologists to settle.

Mr. C. B. Clarke explains the presence of the Malayan or Eastern element in the flora of India by a direct connection between the Malay Peninsula and Ceylon and the South Malabar mountains. It is conceivable that the Indo-African element in the Minbu desert zone is but the remnant of a flora once common to both Peninsulas and Africa, but driven northwards by the breaking up of land surfaces in the Eastern Peninsula and the consequent change of climate from dry to moist in the southern half of the Burma-Malaya Peninsula.

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This, however, is mere speculation, but meanwhile the results of the analysis of the collection would appear to justify the separation of the upper Irawaddy valley between the Arracan Yomahs and the Shan Plateau, as a distinct sub-sub-area of distribution.

	Arracan Nwama- daung.	Desert Zone.	Alluvial Belt.	Whole district.
	Per cent.	Per cent.	Per cent.	Per cent.
<i>Distribution areas.</i>				
Endemic to Assam Arracan . . . .	5	...	...	2'28
Distributed to Ava and Pegu . . . .	5	18'60	1'24	4'43
" " the Shan Hills . . . .	0'25	3'93	0'62	3'43
" " Tenasserim . . . .	4'38	...	0'93	2'43
" " the Shan Hills and Tenas- serim . . . .	4'7	...	...	2'14
" " Malaya . . . .	7	...	1'86	4'00
" " China . . . .	...	6'72	'93	1'00
" " China and Malaya . . . .	...	...	1'00	0'43
" " Himalaya and Malaya . . . .	1'56	...	'41	0'86
" " Himalaya and China . . . .	2'5	...	'32	1'30
" " Himalaya, Malaya and China . . . .	1'25	...	...	0'57
" " Himalaya only . . . .	6'56	...	'31	3'14
" " Deccan sub-sub-area . . . .	2'86	18'60	1'55	2'86
" " Deccan, Indus and Gangetic plains . . . .	4'7	...	3'30	4'30
" " Deccan, Gangetic plains and Malaya . . . .	4'38	...	2'58	3'14
" " throughout India . . . .	9'4	8'64	4'66	7'50
" " India and Malaya . . . .	11'56	8'71	4'44	8'00
" " India and Malaya and China . . . .	10'40	1'60	4'66	7'20
" " from India to Australia . . . .	3'44	8'71	5'90	5'30
" " to Africa and India . . . .	...	13'60	7'76	4'70
" " from Africa to Malaya or Australia . . . .	6'56	6'96	30'53	17'56
" " throughout the tropics . . . .	2'5	3'93	27'00	13'43
<b>TOTALS</b> . . . .	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

An analysis of the collection from the systematic standpoint reveals the following results. The proportion of Monocotyledons to Dicotyledons in the three zones and in the whole district is as follows:—

Zones.	Monocots.	Dicots.
Arracan-Nwamadaung zone . . . .	1	6
Desert zone . . . .	1	20
Alluvial Belt . . . .	1	3
Whole district . . . .	1	4'5

The ten most important orders in the three zones and in the district as a whole are as follows, in their order of importance judged by the number of species belonging to each order:—

Arracan-Nwamadaung.	Desert Zone.	Alluvial Belt.	Whole District.
<i>Leguminosæ</i>	<i>Capparidææ</i>	<i>Leguminosæ</i>	<i>Leguminosæ</i>
<i>Acanthaceæ</i>	<i>Asclepiadaceæ</i>	<i>Gramineæ</i>	<i>Gramineæ</i>
<i>Gramineæ</i>	<i>Leguminosæ</i>	<i>Cyperaceæ</i>	<i>Compositæ</i>
<i>Convolvulaceæ</i>	<i>Euphorbiaceæ</i>	<i>Compositæ</i>	<i>Malvaceæ</i>
<i>Compositæ</i>	<i>Tiliaceæ</i>	<i>Euphorbiaceæ</i>	<i>Acanthaceæ</i>
<i>Rubiaceæ</i>	<i>Rhamnaceæ</i>	<i>Malvaceæ</i>	<i>Euphorbiaceæ</i>
<i>Cucurbitaceæ</i>	<i>Malvaceæ</i>	<i>Amarantaceæ</i>	<i>Convolvulaceæ</i>
<i>Verbenaceæ</i>	<i>Solanaceæ</i>	<i>Scrophularineæ</i>	<i>Cyperaceæ</i>
<i>Euphorbiaceæ</i>	<i>Acanthaceæ</i>	<i>Acanthaceæ</i>	<i>Cucurbitaceæ</i>
<i>Labiataæ</i>	<i>Rubiaceæ</i>	<i>Solanaceæ</i>	<i>Rubiaceæ</i>

Of the Arracan-Nwamadaung decad *Verbenaceæ* and *Labiataæ* are unrepresented in the district decad. Of the Alluvial Belt decad *Amarantaceæ*, *Scrophularineæ* and *Solanaceæ* are absent from the district decad. Of the desert zone decad only the 3rd, 4th, 7th, 9th and 10th orders are present in the district decad. Of the collection as a whole *Leguminosæ* is by far the largest order, having 49 genera and 145 species. A long way after it comes *Gramineæ* with 37 genera and 73 species, then *Compositæ* with 25 genera and 37 species, then *Malvaceæ* with only 8 genera but 31 species, followed by *Acanthaceæ* with only 30 species in no fewer than 20 genera; *Euphorbiaceæ* with 16 genera and 28 species, *Convolvulaceæ* with 10 genera and 28 species, *Cyperaceæ* with 9 genera and 21 species, *Cucurbitaceæ* with 15 genera and 18 species, *Rubiaceæ* with 13 genera and 18 species.

Including cultivated species the whole collection comprises 101 Natural orders, 456 genera and 787 Phanerogamic species. 28 orders are represented by one species each, 14 by two genera and two species each, and the rest outside the first decad by genera and species in varying proportions. It is worthy of note that *Melastomaceæ* is entirely unrepresented and *Myrtaceæ* only by one wild species.

#### CHAPTER IV.—SYSTEMATIC CENSUS.

The following list includes all the plants identified whether collected by Mr. Aubert and the writer or by the garden collector, and whether they are indigenous or introduced, wild or cultivated. New species or species not mentioned in the Flora of British India, and new localities or localities not mentioned in the Flora of British India are distinguished by an \* prefixed to them. Where the native collectors' locality is unrecognisable, the term "Minbu district" is given. For unfailing help in identifying troublesome species as well

as for other aid the writer is, as heretofore, under special obligation to Major Prain. He is further indebted to Mr. C. B. Clarke who kindly compared at Kew or had compared by the Herbarium staff there, the new or doubtful species.

### THALAMIFLORÆ:

#### I.—**RANUNCULACEÆ.**

##### 1.—**Clematis** Linn.

##### 1. \***Clematis grewii** DC.

Arracan Yomahs.

DISTRIBUTION.—N.-W., Central and Eastern Himalaya, Burma.

##### 2. **Naravella** DC.

##### 2. \***Naravella zeylanica** DC.

Arracan Yomahs.

DISTRIBUTION.—S. and W. India, Bengal, Assam, Burma, Ceylon, Java.

##### 3. **Ranunculus** Linn.

##### 3. \***Ranunculus sceleratus** Linn.

Burm. *Tanga-ngayok*. Common on moist spots along the Irawaddy bank.

DISTRIBUTION.—N.-W. Frontier, Upper Gangetic plain, Bengal, N.-W. Himalaya, Assam, Burma, China, Central Asia, Europe, N. America.

#### II.—**ANONACEÆ.**

##### 4. **Anona** Linn.

##### 4. **Anona squamosa** Linn.

Cultivated in the district.

DISTRIBUTION.—Cultivated throughout India and Burma, Native to Tropical America.

##### 5. **Milium** Leschenault.

##### 5. **Milium Roxburghiana** Hook. f. & Thomson.

Legain.

DISTRIBUTION.—Sikkim, Assam, Chittagong and Burma, Malay Peninsula.

#### III.—**MENISPERMACEÆ.**

##### 6. **Tinospora** Miers.

##### 6. **Tinospora cordifolia** Miers.

Gwingyin.



DISTRIBUTION.—Peninsular India, Central Provinces, Bengal, Sikkim, Assam, Burma, Andaman Islands, Ceylon.

7. *Tiliacora* Colebrooke.

7.\* *Tiliacora racemosa* Coleb.

Sidoktaya.

DISTRIBUTION.—Peninsular India, Bengal, Burma, Ceylon, Java.

8. *Cocculus* DC.

8. *Cocculus villosus* DC.

Minbu district.

DISTRIBUTION.—N.-W. Frontier, Peninsular and Central India, Upper Gangetic Plain, Bengal, Burma, Tropical Africa.

9. *Cissampelos* Linn.

9. *Cissampelos Pareira* Linn.

Sinbok.

Burm. *Kywet-nabaung*.

DISTRIBUTION.—Throughout the tropics.

IV.—*NYMPHÆACEÆ*.

10. *Nymphæa* Linn.

10. *Nymphæa Lotus* Linn.

Salin lake.

DISTRIBUTION.—Throughout the plains of India and Burma, Africa, Java, Philippines, Australia.

11. *Nymphæa stellata* Willd.

Salin and Paunglin lakes.

Burm. *Kya-u*.

DISTRIBUTION.—Peninsular India, Bengal, Burma, Africa, Malay Peninsula, Australia.

11. *Nelumbium* Juss.

12. *Nelumbium speciosum* Willd.

Salin lake.

DISTRIBUTION.—All over India and Burma, Persia, China, Japan, Malay Peninsula and Archipelago, Australia.

**V.—PAPAVERACEÆ.****12. Argemone Linn.****13. Argemone mexicana Linn.**

Very common except in the desert zone, where, however, it also occurs.

**DISTRIBUTION.**—Throughout India and Burma, West Indies, N. and S. America, Africa, Ceylon, Malay Peninsula and Archipelago, Australia.

**VI.—CRUCIFERÆ.****13. Nasturtium Br.****14. Nasturtium indicum DC.**

Pyogingon.

**DISTRIBUTION.** - Throughout India and Burma, Ceylon, Malay Archipelago, Philippines, China.

**14. Brassica Linn.****15. Brassica juncea Hook. f. & T.**

Mon valley, cultivated.

**DISTRIBUTION.**—Cultivated throughout India and Burma, China, and Western Asia, Africa.

**15. Lepidium Linn.****16. Lepidium sativum Linn.**

Cultivated in the alluvial belt.

Burm. *Samon-hpwe*.

**DISTRIBUTION.**—Cultivated throughout India and Burma, also in Tropical Africa.

**16. Raphanus Linn.****17. Raphanus sativus Linn.**

Cultivated in the alluvial belt.

**DISTRIBUTION.**—Cultivated throughout India and Burma, warm, temperate and Tropical Asia and Africa.

**VII.—CAPPARIDACEÆ.****17. Cleome Linn.****18. Cleome viscosa Linn.**

Sami valley.

**DISTRIBUTION.**—Throughout the tropics.

18. *Gynandropsis* DC.19. *Gynandropsis pentaphylla* DC.

Gwingyin.

DISTRIBUTION.—Throughout the tropics.

19. *Cratæva* Linn.20. *Cratæva religiosa* Forst. VAR. *Roxburghii*.

Gwingyin.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Archipelago, Tropical Africa.

20. \**Boscia* Lamk.21. \**Boscia variabilis* Coll. & Hems.

Desert zone.

DISTRIBUTION.—Upper Burma.

22. \**Boscia prunoides* n. sp.

*Flowers* unknown. A shrub with softly pubescent branches and infrequent small recurved spines often scarcely perceptible. *Leaves* petiolate, petiole about 7 mm. long, pubescent, lamina 1.8-2.5 cm. long, 1.2-1.8 cm. broad, ovate or obovate, margin entire, apex retuse, glabrous on both surfaces or with scattered adpressed minute hairs, very finely dotted, nerves obscure or 5-7 running forward at an acute angle with the midrib. Ripe *fruit* about 1.8-2.5 cm. in diameter, dark brown, smooth almost polished, supported on a glabrous brown stalk about 1.3 cm. long.

Salin, *Shaik Mokim!*

DISTRIBUTION.—Upper Burma.

This same species was also collected in the Shan hills in 1891 by King's collector, unfortunately also only in fruit.

21. *Capparis* Linn.23. \**Capparis grandis* Linn.

Minbu.

DISTRIBUTION.—Rajputana, Peninsular India, Burma, Ceylon.

24. \**Capparis burmanica* Coll. & Hems. (Journ. Linn. Soc.

Gwingyin.

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Burm. *Kaukkwesa*.

DISTRIBUTION.—Upper Burma.

25. \**Capparis orbiculata* Wall.

Minbu, *Aubert & Gage?* Common on dry hillocks near the town of Minbu.

DISTRIBUTION.—Upper Burma.

**26. Capparis horrida** Linn. f.

Minbu.

DISTRIBUTION.—Peninsular and Central India, Upper Gangetic Plain, Bengal, Assam, Chittagong and Burma, Ceylon, Malay Archipelago, Philippines.

**27. Capparis flavicans** Wall.

Gwinyin.

DISTRIBUTION.—Upper Burma and Cochin China.

**28. \*Capparis hastigera** Hance (Journ. Bot., 1868, p. 269 and 1879, p. 8).

Gwinyin.

Burm. *Namane-thanyet-gyi*.

DISTRIBUTION.—Upper Burma and South China.

**29. \*Capparis polymorpha** Kurz (Journ. Asiat. Soc., Bengal, XLII (1873), II 227).

Minbu district.

DISTRIBUTION.—Upper Burma.

**VIII.—BIXINEÆ.****22. \*Taraktogenos** Hassk.**30. Taraktogenos kurzii** King.

Arracan Yomahs near Kan.

Burm. *Kalaw-bin*.

DISTRIBUTION.—Assam, Chittagong, Burma, Malay Peninsula.

**IX.—POLYGALACEÆ.****23. Polygala** Linn.**31. Polygala erioptera** DC.

Sidoktaya.

DISTRIBUTION.—Punjab, Scinde, Peninsular India, Upper Gangetic Plain, Bengal, Upper Burma, Laccadives, Arabia, Africa.

**24. Xanthophyllum** Roxb.**32. Xanthophyllum glaucum** Wall.

Along the bank of the Irawaddy, fringing moist hollows.

DISTRIBUTION.—Chittagong, Burma, Malay Peninsula.

**X.—CARYOPHYLLACEÆ.****25. Polycarpæa Lamk.****33. Polycarpæa corymbosa Lamk.**

Minbu district.

DISTRIBUTION.—Peninsular India, Scinde, Upper Gangetic Plain, North-Western Himalaya, Bengal, Burma, Ceylon, China, Africa, Western Asia.

**XI.—PORTULACEÆ.****26. Portulaca Linn.****34. Portulaca oleracea Linn.**

Minbu district.

DISTRIBUTION.—Throughout the tropics.

**XII.—TAMARISCINEÆ.****27. Tamarix Linn.****35. Tamarix gallica Linn.**

Banks and sandy spits of the Irawaddy and its tributaries.

DISTRIBUTION.—Throughout India and Southern Asia, South and West Europe and North and Tropical Africa.

**XIII.—ELATINEÆ.****28. Bergia Linn.****36. Bergia ammanioides Roxb.**

Pyogingon.

DISTRIBUTION.—Throughout Tropical Asia, Africa and Australia.

**XIV. GUTTIFERÆ.****29. Calophyllum Linn.****37. Calophyllum inophyllum Linn.**

Salin.

DISTRIBUTION.—Peninsular India, Burma, Andaman Islands, Ceylon, Malay Peninsula, East African Islands, Australasia.

**30. Mesua Linn.****38. Mesua ferrea Linn.**

Pyogingon.

DISTRIBUTION.—Peninsular India, Bengal, Assam, Chittagong, Burma, Andaman Islands, Ceylon, Malay Peninsula.

### XV.—DIPTEROCARPEÆ

#### 31. *Dipterocarpus* Gærtn.

39. *Dipterocarpus tuberculatus* Roxb.  
Arracan Yomahs above Kan, very common.  
Burm. *Eng.*  
DISTRIBUTION.—Chittagong, Burma, Siam

#### 32. *Pentacme* A. DC.

40. *Pentacme suavis* A. DC. *Shorea siamensis* Miq.  
Nwamadaung hills, common.  
Burm. *In-gyin* or *Ingen.*  
DISTRIBUTION.—Burma and Siam.

### XVI.—MALVACEÆ

#### 33. *Sida* Linn.

41. *Sida veronicæfolia* Lamk. *S. humilis* Willd.  
Pyogingon.  
DISTRIBUTION.—Throughout the plains of India and Burma.  
Malay Archipelago, Ceylon, Tropical Africa and Tropical America.
42. *Sida mysorensis* W. & A.  
Nwamadaung hills.  
DISTRIBUTION.—Peninsular and Central India, Bengal, Assam,  
Burma, Ceylon, Malay Peninsula and Archipelago.
43. *Sida acuta* Burm. *Sida carpinifolia* Linn.  
Sidoktaya, Nwamadaung Hills.  
DISTRIBUTION.—Throughout the tropics.
44. *Sida rhombifolia* Linn.  
Nwamadaung Hills.  
DISTRIBUTION. Throughout the tropics.  
VAR. *rhomboidea.*  
Minbu district.  
DISTRIBUTION.—N.-W. Himalaya, Sikkim, Bhutan, Upper  
Gangetic plain, Bengal, Assam, Burma, Yunnan.
45. *Sida cordifolia* Linn.  
Salin.  
DISTRIBUTION.—Throughout the tropics.

34. *Abutilon* Gærtn.

46. *Abutilon polyandrum* G. Don,  
Arracan Yomahs.

DISTRIBUTION.—Peninsular and Central India, Upper Gangetic Plain, Chota Nagpur, Java, Tropical Africa.

47. *Abutilon indicum* G. Don.

Throughout the district.

DISTRIBUTION.—Throughout the tropics.

48. \**Abutilon graveolens* W. & A.

Minbu district.

DISTRIBUTION.—Peninsular and Central India, Upper Gangetic Plain, Bengal, Burma, Ceylon, Java, Tropical Africa.

35. *Urena* Linn.

49. *Urena lobata* Linn.

Nwamadaung hills and banks of Mon river.

DISTRIBUTION.—Throughout the tropics.

50. *Urena sinuata* Linn.

Nwamadaung hills.

DISTRIBUTION.—Throughout the tropics.

36. *Pavonia* Cav.

51. *Pavonia glechonifolia* A. Rich.

Salin.

DISTRIBUTION.—North-West Frontier, Peninsular India, Burma, Ceylon, Arabia, Tropical Africa.

52. *Pavonia odorata* Willd.

Gwinyin.

DISTRIBUTION.—North-West Frontier, Peninsular and Central India, Upper Gangetic Plain, Chota Nagpur, Burma, Ceylon, Tropical Africa.

37. *Hibiscus* Medik.

53. *Hibiscus surattensis* Linn.

Minbu district.

DISTRIBUTION.—Throughout the tropics of Asia, Africa and Australia.

54. *Hibiscus radiatus* Willd.

Minbu district.

DISTRIBUTION.—Peninsular India, Bengal cultivated, Assam, Chit-agong, Burma.

**55. *Hibiscus micranthus* Linn.**

Salin.

DISTRIBUTION.—Throughout the plains of India and Burma  
Tropical Africa, Arabia.

**56. *Hibiscus Solandra* L'Her.**

Minbu district.

DISTRIBUTION.—Throughout the plains of India and Burma, Ceylon, Eastern Tropical Africa.

**57. *Hibiscus lunarifolius* Willd.**

Salin.

DISTRIBUTION.—Peninsular India and Burma. Ceylon and Tropical Africa.

**58. *Hibiscus panduræformis* Burm.**

Minbu district.

DISTRIBUTION.—Throughout the plains of India and Burma, Ceylon, Tropical Africa and Tropical Australia.

**59.\* *Hibiscus vitifolius* Linn.**

Minbu district.

DISTRIBUTION.—As the last species.

**60. \* *Hibiscus Sabdariffa* Linn.**

Arracan Yomahs, on deserted village site.

DISTRIBUTION.—Cultivated throughout the tropics.

**61.\* *Hibiscus ficulneus* Linn.**

Mon valley near Sidoktaya.

DISTRIBUTION.—Throughout the plains of India and Burma, also in Ceylon.

**62.\* *Hibiscus pungens* Roxb.**

Nwamadaung hills, below 2,000 ft.

DISTRIBUTION.—N.-W. Himalaya, Nepal, Sikkim, Bhutan, Bengal, Assam, Burma.

**63. *Hibiscus sagittifolius* Kurz. *H. Abelmoschus* L. VAR. *multiformis* of F. B. I.**

Sidoktaya.

DISTRIBUTION.—Manipur, Burma, Malay Archipelago.  
This is a quite good species.

**64. *Hibiscus esculentus* Linn.**

Minbu district.

DISTRIBUTION.—Cultivated throughout the tropics



**65. *Hibiscus schizopetalus* Hooker f. (Bot. Mag. pl. 6524)**

Sinbok, cultivated.

DISTRIBUTION.—Native of Tropical East Africa. Cultivated generally throughout India and Burma.

**88. *Thespesia* Corr.****66. *Thespesia Lampas* Dalz. & Gibs.**

Mon valley near Sidoktaya.

DISTRIBUTION.—North-West Frontier, Peninsular and Central India, N.-W. Himalaya, Bengal, Assam, Burma, Ceylon, Java, East Tropical Africa.

**67. *Thespesia populnea* Corr.**

Pyogingon. A single tree in the village, considered a marvel by the villagers on account of the diurnal changing tints of the corolla.

DISTRIBUTION.—Shores of Bengal and Peninsular India, Andaman islands, also planted in Rajputana, Central India and Burma, Ceylon, Malay Peninsula and Archipelago, Africa, Pacific islands.

**39. *Gossypium* Linn.****68. *Gossypium herbaceum* Linn.**

Arracan Yomahs.

**69. *Gossypium barbadense* Linn. VAR. *acuminata*.**

Nwamadaung hills. Cultivated by the Chins. The above identifications of cotton are provisionally given according to the names in the Calcutta Herbarium.

**40. *Bombax* Linn.****70. *Bombax malabaricum* DC.**

Common along the river valleys.

DISTRIBUTION.—Throughout the plains and low hills of India and Burma and Andaman Islands, Ceylon, Malay Archipelago.

**71. \**Bombax* sp. Fruits only seen. Burm. *Didok-bin*.**

Nwamadaung hills.

This is certainly not *B. malabaricum*, and the writer is of opinion that it cannot very well be *B. insigne* Wall. The fruit of *B. insigne* Wall, is described as "10 inches by 1 inch, elongated, curved at the apex, glabrous." The fully developed fruit of the Nwamadaung hills plant is 5 inches long, with 5 stout rounded ridges, its diameter from one ridge to the opposite one about 2½ inches. Its fruit resembles the fruit of a specimen in the Calcutta Herbarium which Kurz had collected in Pegu, and had named first *B. malabaricum* DC. and then *B. insigne* Wall. The

writer agrees with the remark of Sir George King in his "Materials for a Flora of the Malayan Peninsula" (Journ. Asiat. Soc., Vol. LIX, 1890) wherein he writes, "I have a strong suspicion that what Kurz regarded as *B. insigne* is really an undescribed species." As the seeds brought by the writer to the Calcutta Garden have germinated, it is to be hoped that the elucidation of the identity of this plant is merely a matter of time.

### XVII.—STERCULIACEÆ.

#### 41. *Sterculia* Linn.

##### 72. *Sterculia versicolor* Wall.

Minbu district.

DISTRIBUTION.—Upper Burma.

##### 73. *Sterculia colorata* Roxb.

Arracan Yomahs, lower slopes.

DISTRIBUTION.—Rajputana, Peninsular and Central India, Bengal, Assam, Chittagong, Burma, Andaman Islands, Cocos Islands, Ceylon.

#### 42. *Helicteres* Linn.

##### 74. *Helicteres elongata* Wall.

Sidoktaya.

DISTRIBUTION.—Sikkim, Burma, Yunnan.

#### 43. *Melhania* Forsk.

##### 75. *Melhania Hamiltoniana* Wall.

Salin.

DISTRIBUTION.—Peninsular India and Burma.

#### 44. *Melochia* Linn.

##### 76. *Melochia corchorifolia* Lian.

Nwamadaung hills.

DISTRIBUTION.—Throughout the tropics.

#### 45. *Waltheria* Linn.

##### 77. *Waltheria indica* Linn.

Sagu, Sidoktaya.

DISTRIBUTION.—Throughout the tropics.

## XVIII.—TILIACEÆ.

46. *Grewia* Linn.78 \* *Grewia abutilifolia* Juss.

Minbu district.

DISTRIBUTION.—Peninsular India, Burma, Java.

79.\* *Grewia hirsuta* Vahl.

Minbu district.

DISTRIBUTION.—Peninsular and Central India, Upper Gangetic Plain, Bengal, Burma, Ceylon.

47. *Triumfetta* Linn.80. *Triumfetta rhomboidea* Jacq.

Minbu district.

DISTRIBUTION.—Throughout Tropical Asia and Africa.

81. *Triumfetta rotundifolia* Lamk.

Salin.

DISTRIBUTION.—Peninsular and Central India, Bengal, Burma.

82. *Triumfetta annua* Linn.

Nwamadaung hills.

DISTRIBUTION.—N -W. Himalaya, Nepal, Sikkim, Bengal, Assam, Burma, Andaman Islands, Malay Peninsula and Archipelago, Tropical Africa.

48. *Corchorus* Linn.83. *Corchorus olitorius* Linn.

Gwingyin.

DISTRIBUTION.—Cultivated throughout the tropics.

84. *Corchorus fascicularis* Lamk.

Gwingyin.

DISTRIBUTION.—Throughout the plains of India and Burma, Ceylon, Tropical Africa and Australia.

85. *Corchorus acutangulus* Lamk.

Gwingyin and Myaung-u.

DISTRIBUTION.—Throughout the tropics.

## DISCIFLORÆ.

## XIX.—MALPHIGIACEÆ.

49. *Hiptage* Gærtn.86. *Hiptage candicans* Hook. f.

Nwamadaung hills.

DISTRIBUTION.—Burma, Manipur.

## XX.—ZYGOPHYLLACEÆ.

50. *Tribulus* Linn.87. *Tribulus terrestris* Linn.

Minbu district.

DISTRIBUTION.—Throughout the tropics.

## XXI.—GERANIACEÆ.

51. *Biophytum* DC.88. *Biophytum sensitivum* DC.

Minbu district.

DISTRIBUTION.—Throughout the tropics.

52. *Impatiens* Linn.89. *Impatiens Balsamina* Linn.

Minbu district.

DISTRIBUTION.—India, Burma, Ceylon, Malaya, China.

## XXII.—RUTACEÆ.

53. *Glycosmis* Corr.90. *Glycosmis pentaphylla* Corr.

Pyogingon.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula and Archipelago, Philippine Islands, Australia.

54. *Micromelum* Bl.91. *Micromelum hirsutum* Oliver.

Minbu district.

DISTRIBUTION.—Assam, Burma, Malay Peninsula and Archipelago.

55. *Limonia* Linn.

92. \* *Limonia acidissima* Linn.

Gwingyin.

Burm. *Thanakha*.

DISTRIBUTION.—Peninsular India, Bengal, N.-W. Himalaya, Assam, Burma, Yunnan.

56. *Atalantia* Corr.

93. *Atalantia monophylla* Corr.

Salin.

DISTRIBUTION.—Peninsular India, Bengal, Assam, Burma, Malay Peninsula, and Archipelago, Ceylon.

57. *Citrus* Linn.

94. *Citrus medica* Linn.

Nwamadaung hills, cultivated.

DISTRIBUTION.—Peninsular and Central India, N.-W., Central and Eastern Himalaya, Assam, Chittagong, Burma, Andamans.

58. *Egle* Corr.

95. *Egle Marmelos* Corr.

Minbu.

DISTRIBUTION.—Cultivated throughout India and Burma.

XXIII.—SINARUBACEÆ.

59. *Harrisonia* Brown.

96. *Harrisonia Bennetii* Hook. f.

Minbu district.

DISTRIBUTION.—Burma, Siam, Malay Archipelago, Philippines, China.

60. *Balanites* Del.

97. *Balanites Roxburghii* Planch.

Ngape.

DISTRIBUTION.—N.-W. Frontier, Upper Gangetic Plain, Peninsular and Central India, Burma.

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## XXIV.—BURSERACEÆ.

61. *Garuga* Roxb.98. *Garuga pinnata* Roxb.

Arracan Yomahs near Kau.

DISTRIBUTION.—Throughout India and Burma, Malay Archipelago, Philippine Islands.

## XXV.—MELIACEÆ.

62. *Melia* Linn.99. *Melia Azadirachta* Linn.

Pyogingon and Nwamadaung hills.

DISTRIBUTION.—Throughout India and Ceylon, often planted.

63. *Walsura* Roxb.100. *Walsura villosa* Wall.

Minbu district.

DISTRIBUTION.—Burma and Siam.

64. *Chickrassia* A. Dr. Juss.101. \* *Chickrassia tabularis* A. Dr. Juss. VAR. *velutina*.

Minbu district.

DISTRIBUTION.—Peninsular and Central India, Assam, Burma, Andaman Islands, Malay Peninsula, Ceylon.

65. *Cedrela* Linn.102. *Cedrela Toona* Roxb.

Minbu district.

DISTRIBUTION.—Tropical Himalaya, Peninsular and Central India, Burma, Java, Australia.

## XXVI.—OLACINEÆ.

66. *Ola* Linn.103. *Ola scandens* Roxb.

Minbu district.

DISTRIBUTION.—Peninsular and Central India, Upper Gangetic Plain, Bengal, Burma, Ceylon, Java.

104. \* *Oxalana* Wall.

Arracan Yomahs.

DISTRIBUTION.—N.-W. Himalaya, Punjab, Bengal, Assam, Burma.

67. *Cansjera* Juss.105. *Cansjera Rheedii* Kurz.

Gwiogyin.

DISTRIBUTION.—Peninsular India, Gangetic Plain, Burma, Malaya, Australia.

## XXVII.—CELASTRINEÆ.

68. *Lophopetalum* Wight.106. *Lophopetalum Wallichii* Kurz.

Ngape.

DISTRIBUTION.—Burma.

## XXVIII.—RHAMNACEÆ.

69. *Ventilago* Gaertn.107. *Ventilago calyculata* Tul.Burm. *Thwédét*.

DISTRIBUTION. Throughout India and Burma, Java.

70. *Zizyphus* Juss.108. *Zizyphus Jujuba* Lamk.

Exceedingly common all over the dry zone, cultivated in the irrigated tracts.

Burm. *Zi-bin*, 'wild plum' of the English residents.

DISTRIBUTION.—Throughout Afghanistan, India and Burma, Ceylon, Malay Peninsula and Archipelago, China, Australia, Tropical Africa.

109. *Zizyphus Enoplia* Mill.

Minbu district.

DISTRIBUTION.—Tropical Asia and Australia.

110. *Zizyphus glabra* Roxb.

A climbing shrub. Branches about as thick as a crowquill, glabrous, smooth, pale, armed with infrequent solitary short recurved brown polished prickles. Leaves petiolate, glabrous on both surfaces

drying green, oval, oblique at the base, apex blunt, margin crenulate or crenulate-serrate, main lateral nerve about 9 mm. from the midrib on each side, secondary lateral nerves 7-9 arching forwards to the margin. Length of lamina 3.8-5 cm., breadth 3-4 cm., length of petiole about 1 cm. Inflorescence of short pedunculate axillary cymes 1.2-1.8 cm. long, 5-10-flowered, peduncles about 7 cm. long. Flowers shortly pedicellate, glabrous or with a very sparse pubescence. Calyx obconical five lobed, lobes about equal to depth of calyx cup, keeled internally, acute. Petals minute, cucullate. Disc flat, obscurely 10-lobed, glabrous. Stamens 5, filaments about as long as the calyx lobes, anthers short. Ovary 3-celled, styles 3, united almost to the top, stigmas sub-capitate. Fruit glabrous brown, oval, 1.8 cm. by 1.3 cm., 2-celled and 2-seeded.

Legain, *Shaik Mokim* !

DISTRIBUTION.—Chittagong, Burma, Andaman Islands.

## XXIX.—ANPELIDEÆ

### 71. *Vitis* Linn.

#### 111. *Vitis discolor* Dalz.

Sidoktaya.

DISTRIBUTION.—Peninsular India, Nepal, Sikkim, Assam, Burma, Andaman Islands, Malay Peninsula and Archipelago, Cochin-China.

#### 112. \**Vitis assamica* Laws.

Minbu district.

DISTRIBUTION.—Sikkim, Assam, Chittagong, Burma.

#### 113. \* *Vitis Aubertiana* n. sp.

Branches cylindrical, ridged and furrowed when dry, glabrous. Leaves petiolate, simple, glabrous on both surfaces, drying green, petiole about 4.5 cm. long, lamina 11 to 25 cm. from petiole to apex and about the same transversely, palmatifid into 3-6 long narrow digitations, 10-25 cm. long, 1.3-3 cm. broad, distantly or obscurely serrate or irregular in outline, each with a median nerve prominent below and giving off horizontal secondary nerves to interarch near the margin. Inflorescence of axillary cymes 4.5-8.5 cm. long, glabrous or scurfily pubescent, especially on the pedicels. Flowers minute, on pedicels about 5 mm. long, calyx entire, petals 4, coherent in the bud, stamens 4, style very short, truncate.

Sidoktaya, *Shaik Mokim* !

The extraordinary leaves of this species distinguish it readily from all other Indian species.



72. *Leea* Linn.114. *Leea compactiflora* Kurz.

Arracan Yomahs near Kan.

DISTRIBUTION.—Burma.

Mr. C. B. Clarke considers this a distinct species in this Revision of *Leea* in Journ. Bot., Vol. X, 1881.

## XXX.—SAPINDACEÆ.

73. *Cardiospermum* Linn.115. *Cardiospermum Halicacabum* Linn.

Common in the district.

DISTRIBUTION.—Throughout the tropics.

74. *Sapindus* Plum.116. \**Sapindus Mukorossi* Gærtn.

Arracan Yomahs. Undoubtedly wild.

DISTRIBUTION.—N.-W. Himalaya, Upper Gangetic Plain (cult.), Bengal (cult.), Burma, China, Japan.

## XXXI.—ANACARDIACEÆ.

75. *Rhus* Linn.117. *Rhus paniculata* Wall.

Ngape.

DISTRIBUTION.—Bhutan and Burma, China.

76. *Mangifera* Linn.118. *Mangifera indica* Linn.

Cultivated in the alluvial belts.

DISTRIBUTION.—Cultivated generally in the tropics.

77. *Buchanania* Roxb.119. *Buchanania latifolia* Roxb.

Arracan Yomahs.

DISTRIBUTION.—Throughout India and Burma.

120. *Buchanania glabra* Wall?

Gwingyin.

Burm. *Lun-bin*.

There is unfortunately not an example of *B. glabra* in Calcutta Herbarium, so that the identification is not assured. The Gwingyin

plant, however, agrees fairly well with the description in the Flora of British India. It is certainly near to but not *B. angustifolia* Roxb.

**78. Melanorrhœa Wall.**

**121. Melanorrhœa usitata Wall.**

Minbu district.

DISTRIBUTION.—Assam, Burma.

**79. Odina Roxb.**

**122. Odina Wodier Roxb.**

Nwamadaung hills.

DISTRIBUTION.—Throughout India, Burma, Andaman Islands, Ceylon.

**80. Semecarpus Linn. f.**

**123. Semecarpus albescens Kurz.**

Arracan Yomahs near Kan.

Burm. *Chi-thee*.

DISTRIBUTION.—Burma.

**81. Spondias Linn.**

**124. Spondias mangifera Willd.**

Mon valley near Sidoktaya.

Burm. *Gwe-bin*.

DISTRIBUTION.—Throughout Tropical Asia.

**XXXII.—MORINGÆ.**

**82. Moringa Lamk.**

**125. Moringa pterygosperma Gærtn.**

Pyogingon and elsewhere in the district.

Burm. *Dandalon-bin*.

DISTRIBUTION.—Wild or cultivated throughout the tropics.

**CALYCIFLORÆ.**

**XXXIII.—LEGUMINOSÆ.**

**83. Crotalaria Linn.**

**126. Crotalaria albida Heyne.**

Nwamadaung hills.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula and Archipelago, China, Philippine Islands.

**127. *Crotalaria nana* Burm. VAR. *patula*.**

Minbu district.

DISTRIBUTION.—For the species—Peninsular India and Ceylon.  
For the variety—Burma.**128. *Crotalaria linifolia* Linn. f.**

Sidoktaya.

DISTRIBUTION.—Peninsular and Central India, Bengal, Burma, Java, Ceylon, China, Philippine Islands, Australia.

**129. *Crotalaria sessiliflora* Linn.**

Sidoktaya.

DISTRIBUTION.—N.-W. Himalaya, Nepal, Sikkim, Assam, Burma, Upper Gangetic Plain, Bengal, Andaman and Nicobar Islands, Malay Peninsula and Archipelago, China, Philippine Islands, Japan.

**130. *Crotalaria nerifolia* Wall.**

Arracan Yomabs.

DISTRIBUTION.—Burma.

**131. *Crotalaria retusa* Linn.**Sinbok and Pyogingon. Cultivated in patches all over the alluvial belt. Burm. *Paik-san bin*.

DISTRIBUTION.—Throughout the tropics.

**132. *Crotalaria verrucosa* Linn.**

Common in the alluvial belt.

DISTRIBUTION.—Throughout the tropics.

**133. *Crotalaria tetragona* Roxb.**

Nwamadaung hills.

DISTRIBUTION.—Peninsular India, N.-W. Himalaya, Sikkim, Bhutan, Assam, Burma, Java.

**134. *Crotalaria juncea* Linn.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Archipelago, Australia.

**135. *Crotalaria medicaginea* Lamk.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Afghanistan, Ceylon, Malay Archipelago, Australia.

**136. *Crotalaria quinquefolia* Linn.**

Legain.

DISTRIBUTION.—Peninsular India, Bengal, Burma, Siam, Malay Peninsula and Archipelago, Philippine Islands.

84. *Melilotus* Juss.137. \* *Melilotus alba* Lamk.

On moist sand, bank of Irawaddy near Senion.

DISTRIBUTION.—Peninsular India, N.-W. Himalaya, Upper Gangetic Plain, Bengal, Assam, Burma, Northern and Western Asia, Europe.

85. *Indigofera* Linn.138. \* *Indigofera minbuensis* n. sp.

A shrub with virgate branches, ridged and furrowed, covered with minute adpressed almost scabrid hairs. Leaves pale-green, alternate, simple, subsessile, linear, acute, mucronulate, 3·8-6 cm. long and about 3 mm. broad, with entire margins and covered on both surfaces with minute triangular adpressed scabrid hairs exposing minute oblique pits when rubbed off, midrib prominent beneath, white. Inflorescence of short axillary cymes about 1·2-1·8 cm. long. Flowers small, calyx covered with minute close adpressed white hairs, 5-toothed, 4 posterior minute, setaceous, 1 anterior much larger, lanceolate, corolla small, seen only in a withered state. Pods deflexedly linear cylindrical, mucronulate, about 1·5 cm. long, covered with minute adpressed hairs. Seeds about 6.

Arracan Yomahs 4,000 ft. *Shaik Mokim*!

This species is exceedingly distinct from all other Indian species. It appears to come nearest to the African *I. simplicifolia* Lamk., from which it differs in having considerably larger leaves, and shorter, stouter and deflexed pods.

139. *Indigofera linifolia* Retz.

Minbu district.

DISTRIBUTION.—Throughout India and Burma, in Ceylon, Malay Archipelago, Afghanistan, Africa, Australia.

140. *Indigofera enneaphylla* Linn.

Minbu district.

DISTRIBUTION.—Throughout India and Burma, in Ceylon, Malay Archipelago, Australia, Africa.

141. *Indigofera pentaphylla* Linn.

Sagu.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Tropical Africa.

142. *Indigofera viscosa* Lamk.

Sidoktaya.

DISTRIBUTION.—Throughout the plains of India and Burma, Ceylon, Malay Archipelago, Australia, Afghanistan, Africa.

**143. *Indigofera trifoliata* Linn.**

Sidoktaya.

DISTRIBUTION.—Throughout India and Burma, in Ceylon, Malay Archipelago, Australia, China.

**144. *Indigofera trita* Linn. f.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, in Ceylon, Malay Archipelago, Australia, Tropical Africa.

**145. *Indigofera hirsuta* Linn.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, in Ceylon, Malay Peninsula, Archipelago, Australia, Philippine Islands, tropical Africa and America.

**146. *Indigofera sumatrana* Gærtn.**

Mon valley, cultivated by Burmese and Chins.

DISTRIBUTION.—Cultivated in Peninsular India, Scinde, Upper Gangetic Plain, Bengal, Assam, Burma, Malay Peninsula and Archipelago.

**147. \* *Indigofera Wightii* Grab.**

Nwamadaung hills.

DISTRIBUTION.—Peninsular India, Burma, Ceylon.

**148. *Indigofera arborea* Roxb.**

Arracan Yomahs.

DISTRIBUTION.—Throughout India and Burma.

**149. *Indigofera suffruticosa* Mill. I. Anil Linn.**

Sinbok, cultivated.

Burm. *Mè-bin*.

DISTRIBUTION.—Bengal, Burma, Andaman Islands, Malay Peninsula and Archipelago, Philippine Islands, Pacific Islands, Tropical Africa and America.

**86. *Psoralea* Linn.****150. \* *Psoralea corylifolia* Linn.**

Pyogingon.

DISTRIBUTION.—Throughout India and Burma, Ceylon.

**87. *Millettia* W. & A.****151. *Millettia pendula* Benth.**

Minbu district.

DISTRIBUTION.—Burma, Siam.

- 152. *Millettia cana* Benth.**  
Minbu district.  
DISTRIBUTION.—Burma.
- 153. *Millettia tetraptera* Kurz.**  
Minbu district.  
DISTRIBUTION.—Burma.
- 154. *Millettia cinerea* Benth.**  
Arracan Yomahs near Kan.  
DISTRIBUTION.—Sikkim, Assam, Chittagong, Burma.
- 155. *Millettia ovalifolia* Kurz.**  
Gwingyin and Ngape.  
DISTRIBUTION.—Burma and Siam.
- 156. *Millettia Brandisiana* Kurz.**  
Nwamadaung hills.  
DISTRIBUTION.—Burma and Siam.
- 157. *Millettia auriculata* Baker.**  
Arracan Yomahs near Kau.  
DISTRIBUTION.—Central India, N.-W., Central and Eastern Himalayas, Upper Gangetic Plain, Bengal, Assam, Burma.

#### 88. *Tephrosia* Pers.

- 158. *Tephrosia purpurea* Pers.**  
Exceedingly common all over the district.  
Burm. *Mè-yaing* "wild indigo."  
DISTRIBUTION.—Throughout the tropics.
- 159. *Tephrosia villosa* Pers.**  
Minbu district.  
DISTRIBUTION.—Throughout the plains of India and Burma, Ceylon, Tropical Africa.
- 160. *Tephrosia Grahami* Wall.**  
Sidoktaya.  
DISTRIBUTION.—Burma.

#### 89. *Sesbania* Pers.

- 161. *Sesbania ægyptiaca* Pers.**  
Sinbok and Pyogingon.  
Burm. *Yé-tha-gyi*.  
DISTRIBUTION.—Throughout the Eastern tropics,

**162. *Sesbania aculeata* Pers.**

Arracan Yomahs near Kan.

DISTRIBUTION.—Throughout the Eastern tropics.

**163. *Sesbania grandiflora* Pers.**

Sinbok and Pyogingon. Sinbok plant with a large pale-yellow corolla, Pyogingon plant with a smaller violet corolla.

Burm. *Pauk-pan-byabin*.

DISTRIBUTION.—Peninsular and Central India, Bengal, Assam, Burma, Malay Peninsula and Archipelago, Australia, East African Islands.

**90. *Zornia* Gml.****164. *Zornia diphylla* Pers.**

Sidoktaya.

DISTRIBUTION.—Throughout the tropics.

**91. *Eschynomene* Linn.****165. *Eschynomene indica* Linn.**

Pyogingon.

DISTRIBUTION.—Throughout the Eastern tropics.

**92. *Lourea* Neck.****166. *Lourea obcordata* Desv.**

Minbu district.

DISTRIBUTION.—Burma, Malay Archipelago, Australia, Philippine Islands, China.

**167. *Lourea campanulata* Benth.**

Minbu district.

DISTRIBUTION.—Burma.

**93. *Uraria* Desv.****168. *Uraria picta* Desv.**

Pyogingon.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula and Archipelago, Nicobar and Phillipine Islands, Tropical Africa.

**169. *Uraria hamosa* Wall.**

Arracan Yomahs.

DISTRIBUTION.—Throughout India and Burma, Malay Archipelago.

**170. *Uraria cordifolia* Wall.**

Sidoktaya.

DISTRIBUTION.—Burma.

94. *Alysicarpus* Neck.171. *Alysicarpus montifer* DC.

Pyogingon.

DISTRIBUTION.—Peninsular and Central India, Upper Gangctic Plain, Bengal, Burma, Ceylon, Java, Tropical Africa.

172. *Alysicarpus vaginalis* DC.

Arracan Yomahs.

DISTRIBUTION.—Throughout the Eastern tropics.

173. *Alysicarpus bupleurifolius* DC.

Sidoktaya.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Archipelago, Polynesia, East African Islands, Philippine Islands, China.

174. *Alysicarpus rugosus* DC. VAR. *styracifolia*.

Minbu district.

DISTRIBUTION, of the species.—Eastern tropics, Southern Africa, West Indies; of the variety, India and Burma.

95. *Desmodium* Desv.175. \* *Desmodium Wallichii* Prain. (Journ. Asiat. Soc. Bengal, Vol. LXVI, II, 1897.)

Minbu district.

DISTRIBUTION.—Burma.

176. *Desmodium Cephalotes* Wall. VAR. \* *congesta*, Prain. (Journ. Asiat. Soc. Bengal, Vol LXVI, II, 1897.)

Sidoktaya.

DISTRIBUTION, of variety.—Peninsular India, Chittagong, Burma, Ceylon.

177. *Desmodium pulchellum* Benth.

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula and Archipelago, Philippine Islands, China.

178. *Desmodium grande* Kurz.

Sidoktaya.

DISTRIBUTION.—Burma.

179. *Desmodium teres* Wall.

Sidoktaya.

DISTRIBUTION.—Upper Burma.



**180. *Desmodium oblongum* Wall.**

Minbu district.

DISTRIBUTION.—Upper Burma.

**181. \* *Desmodium Kingianum* Prain. (Journ. Asiat. Soc. Bengal, Vol. LXVI. II, 1897.)**

Sidoktaya.

DISTRIBUTION.—Upper Burma.

**182. *Desmodium diffusum* DC.**

Minbu district.

DISTRIBUTION.—Peninsular and Central India, Bengal, Burma, China.

**183. *Desmodium triflorum* DC.**

Pyogingon.

DISTRIBUTION.—Throughout the tropics.

**184. *Desmodium gyrans* DC.**

Arracan Yomahs.

DISTRIBUTION.—Throughout India and Burma, Malay Archipelago, Philippine Islands.

**96. *Abrus* Linn.****185. *Abrus precatorius* Linn.**

Common in the district.

Burm. *Ywé-galé*.

DISTRIBUTION.—Throughout the tropics.

**97. *Cicer* Linn.****186. *Cicer arietinum* Linn.**

Alluvial belt, cultivated.

DISTRIBUTION.—Throughout the tropics.

**98. *Teramnus* Sw.****187. *Teramnus labialis* Spreng.**

Minbu district.

DISTRIBUTION.—Throughout the tropics.

**99. *Mucuna* Adans.****188. *Mucuna puriens* DC.**

Nwamadaung hills.

DISTRIBUTION.—Throughout the tropics

100. *Erythrina* Linn.189. *Erythrina suberosa* Roxb.

Nwamadaung hills.

DISTRIBUTION.—Throughout India and Burma.

VAR. *glabrescens* *Prain*. (*Journ. Asiat. Soc. Bengal*, Vol. LXVI, II, 1897.)

Minbu.

DISTRIBUTION.—N.-W. Himalaya, Sikkim, Burma.

101. *Galactia* P. Br.190. *Galactia tenuiflora* W. & A. VAR. \**villosa*.

Minbu district.

DISTRIBUTION.—Central and Peninsular India, Bengal, Burma.

102. *Spatholobus* Hassk.191. *Spatholobus Roxburghii* Benth.

Ngape.

DISTRIBUTION.—Throughout India and Burma.

103. *Butea* Roxb.192. *Butea frondosa* Roxb.

Common in the alluvial belt.

DISTRIBUTION.—Throughout India and Burma, Ceylon.

193. *Butea superba* Roxb.

Nwamadaung hills.

DISTRIBUTION.—Peninsular India, Rajputana, Upper Gangetic Plain, Bengal, Burma.

104. *Canavalia* DC.194. *Canavalia ensiformis* DC.

Nwamadaung hills, wild. Cultivated in the alluvial tract.

DISTRIBUTION.—Throughout the tropics.

105. *Pueraria* DC.195. *Pueraria Candollei* Grah.

Mon valley.

DISTRIBUTION.—Chittagong, Burma, Cocos Islands.

VAR. *eriocarpa*. Pods as hairy as those of *P. tuberosa*, Minbu district.196. *Pueraria Wallichii* DC.

Arracan Yomahs.

197. DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Assam, Burma.

**198. Pueraria stricta** Kurz.

Sidoktaya.

DISTRIBUTION.—Burma.

**106. Phaseolus** Linn.**199. Phaseolus lunatus** Linn.

Sinbok and Salin, "Chinese pea," cultivated.

Burm. *Pè-talok*.

DISTRIBUTION.—Throughout the tropics.

**200. Phaseolus adenanthus** G. F. Meyer.

Minbu district.

DISTRIBUTION.—Throughout the tropics.

**201. Phaseolus trilobus** Ait.

Minbu district.

DISTRIBUTION. Throughout India and Burma, Andaman islands, Ceylon, Malay Archipelago, Afghanistan, Northern Africa.

**202. Phaseolus Mungo** Linn.

Sinbok, cultivated.

Burm. *Pè-nauk*.

DISTRIBUTION.—Throughout the Eastern tropics.

**203. Phaseolus calcaratus** Roxb.

Minbu, cultivated.

Burm. *Pè-yin*.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula and Archipelago.

**107. Clitoria** Linn.**204. Clitoria Ternatea** Linn.

Minbu district.

DISTRIBUTION.—Throughout the tropics.

**108. Dolichos** Linn.**205. Dolichos Lablab** Linn.

Cultivated throughout the alluvial belt.

Burm. *Pè-bya*, *Pè-bazon*, *Pè-gyi*, *Pè-lun*.

DISTRIBUTION.—Throughout the Eastern tropics.

**206. Dolichos biflorus** Linn.

Sinbok.

Burm. *Pè-ngapi*.

DISTRIBUTION.—Throughout the Eastern tropics.

**207. Dolichos falcatus Klein.**

Sidoktaya.

DISTRIBUTION.—N.-W. Himalaya, Sikkim, Assam, Burma, Ceylon, Malay Archipelago.

**208. Dolichos subcarnosus W. & A.**

Minbu district.

DISTRIBUTION.—Western India, Assam, Chittagong, Burma.

**109. Atylosia W. & A.****209. Atylosia nivea Benth.**

Minbu district.

DISTRIBUTION.—Burma.

**210. Atylosia scarabæoides Benth.**

Nwamadaung hills.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay-Peninsula, China, Mascarene islands.

**110. Cajanus DC.****211. Cajanus indicus Spreng.**

Sinbok.

Burm. *Pè-singon*.

DISTRIBUTION.—Throughout the tropics.

**111.\* Cyllista Ait.****212. Cyllista scarlosa Ait.**

Nwamadaung hills.

DISTRIBUTION.—Peninsular India, Upper Gangetic plain, Bengal, Burma.

**112. Rhynchosia Lour.****213.\* Rhynchosia suaveolens DC.**

Arracan Yomahs.

DISTRIBUTION.—Peninsular and Central India, Burma, Ceylon.

**214. Rhynchosia minima DC. and VAR. laxiflora.**

Minbu district.

DISTRIBUTION.—Throughout the tropics, S. Africa and North America.

**215. Rhynchosia bracteata Benth.**

Nwamadaung hills.

DISTRIBUTION.—Peninsular and Central India, N.-W. Himalaya, Upper Gangetic Plain, Bengal, Burma.

113. *Flemingia* Roxb.216. *Flemingia strobilifera* R.Br. VAR. *fluminalis*,*F. fluminalis* C. B. Clarke.

Nwamadaung hills.

DISTRIBUTION of variety.—Chittagoong and Burma.

217. *Flemingia lineata* Roxb.

Common in the district.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Siam, Malay Archipelago, N. Australia.

218.\* *Flemingia nana* Roxb.

Arracan Yomahs

DISTRIBUTION.—Peninsular and Central India, Upper Gangetic plain, Bengal, Burma.

114. *Dalbergia* Linn. f.219. *Dalbergia obtusifolia* Prain. *D. ovata* Grah. VAR. *obtusifolia**Baker* of F. B. I.

Minbu district.

DISTRIBUTION.—Burma.

220. *Dalbergia cultrata* Grah.

Arracan Yomahs.

DISTRIBUTION.—Burma and Siam.

221.\* *Dalbergia paniculata* Roxb.

Salin.

DISTRIBUTION.—Peninsular India, Burma.

222.\* *Dalbergia Kurzii* Prain. (Journ. Asiat. Soc. Bengal, Vol. LXVI.

II. 1897).

Nwamadaung hills.

DISTRIBUTION.—Burma.

115. *Pterocarpus* Linn.223. *Pterocarpus macrocarpus* Kurz.

Nwamadaung hills.

Burm. *Padauk*.

DISTRIBUTION.—Burma.

116. *Derris* Lour.224.\* *Derris pulchra* n. sp.

Branches glabrous, cinereous, abundantly lenticellate. Leaves 3-5 foliolate, 11.5-14.5 cm. from base of common petiole to apex

E

of terminal leaflet. Leaflets of 3-foliolate leaves broadly elliptical or oval, glabrous on both surfaces, smooth above, finely reticulate beneath and midrib prominent, lateral leaflets about 6.2 cm. long including petiolule and about 3.5 cm. broad, lateral nerves 5-6, terminal leaflet about 9 cm. long and 5 cm. broad, lateral nerves 6-8. Leaflets of 5-foliolate leaves oval or obovate, rather smaller than those of the 3-foliolate leaves. Inflorescence of axillary panicles, as long as the leaves. Flowers not seen. Pedicels in fruit about 1.2 cm. long. Pod 1-3 seeded, glabrous, smooth, reticulated, elliptical mucronate 5.3-6.8 cm. long 1.5-2.5 cm. broad, winged along both sutures, upper wing 4.6 mm. broad, lower wing about 2.3 mm.

Arracan Yomahs, *Shaik Mokim* !

**225. *Derris scandens* Benth.**

Minbu district.

DISTRIBUTION.—Peninsular India, Bengal, Eastern Himalayas, Chittagong, Burma, Andaman islands, Ceylon, Malay Peninsula and Archipelago, N. Australia, Siam, China.

**117. *Cæsalpinia* Linn.**

**226. *Cæsalpinia Bonducella* Fleming.**

Sinbok.

DISTRIBUTION.—Throughout the tropics.

**227. *Cæsalpinia Sappan* Linn.**

Minbu district.

DISTRIBUTION.—Peninsular India, Bengal, Burma, Malay Peninsula and Archipelago.

**228. *Cæsalpinia digyna* Rottl.**

Gwingyin, and Nwamadaung hills.

Burm. *Sun-let-let-thee*.

DISTRIBUTION.—Peninsular and Central India, Bengal, Chittagong, Burma, Siam, Malay Peninsula and Archipelago, Ceylon.

**118. *Mezoneurum* Desf.**

**229. *Mezoneurum hymenocarpum* W. & A. M. pubescens of *Baker* not of *Desfontaines*.**

Gwingyin and Nwamadaung hills.

DISTRIBUTION.—Ceylon, Andaman islands, Burma.

119. *Parkinsonia*, Linn.230. *Parkinsonia aculeata* Linn.

Common in the alluvial belt.

Burm. *Kwunya-si-bin*.

DISTRIBUTION.—Throughout the tropics cultivated and naturalized.

120. *Cassia* Linn.231. *Cassia renigera* Wall.

Sagu.

DISTRIBUTION.—Burma.

232. *Cassia occidentalis* Linn.

Sinbok.

DISTRIBUTION.—Throughout the tropics.

233. *Cassia Sophera* Linn.

Pyogingon, Salin.

DISTRIBUTION.—Throughout the tropics.

234. *Cassia Tora* Linn.

Minbu district.

DISTRIBUTION.—Throughout the tropics.

235. *Cassia auriculata* Linn.

Minbu district.

DISTRIBUTION.—Rajputana, Peninsular and Central India, Chittagong, Burma, Ceylon.

236. *Cassia alata* Linn.

Pyogingon.

DISTRIBUTION.—Throughout the tropics.

237.\* *Cassia siamea*, Lamk.

Pyogingon.

DISTRIBUTION.—Peninsular and Central India, Bengal, Chittagong, Burma, Andaman islands, Malay Peninsula, Ceylon, Siam.

238. *Cassia timoriensis* DC.

Myaung-u.

DISTRIBUTION.—Peninsular India, Chittagong, Burma, Malay Peninsula and Archipelago, Ceylon, Philippine islands, China, N. Australia.

239. *Cassia glauca* Lamk.

Minbu district.

VAR. *suffruticosa*.

Sinbok and Pyogingon.

Burm. *Pyi-ban-nyo*.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula and Archipelago, China, Pacific islands, N. Australia.

240. *Cassia mimosoides* Linn. VAR. *dimidiata*.

Sidoktaya.

DISTRIBUTION.—Throughout the tropics.

121. *Tamarindus* Linn.

241. *Tamarindus indica* Linn.

Throughout the district.

DISTRIBUTION.—Throughout the tropics.

122. *Bauhinia* Linn.

242.\* *Bauhinia tomentosa* Linn.

Pyogingon.

DISTRIBUTION.—Rajputana, Upper Gangetic plain, Bengal, Peninsular India, Burma, Malay Archipelago, Andaman islands, Ceylon, Siam.

243. *Bauhinia polycarpa* Wall.

Arracan Yomahs near Kan.

DISTRIBUTION.—Arracan and Pegu Yomahs, Shan hills, Martaban, Tennasserim.

244. *Bauhinia racemosa* Lamk.

Gwingyin.

DISTRIBUTION.—N.-W. Himalaya, Upper Gangetic plain, Bengal, Burma, Punjab, Rajputana, Scinde, Central and Peninsular India, Ceylon, Malay Archipelago, China.

What appears to be a distinct variety of this species was found in the Nwamadaung hills in fruit only, the pods being much fuller than those of the type—almost cylindrical.

245. *Bauhinia malabarica* Roxb.

Salin.

DISTRIBUTION.—Throughout India and Burma, Malay Archipelago.

246. *Bauhinia diphylla* Ham.

Nwamadaung hills.

DISTRIBUTION.—Peninsular India, Burma.



**250. *Bauhinia purpurea* Linn.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, China.

**251. *Bauhinia variegata* Linn.**

Arracan Yomahs near Kan.

DISTRIBUTION.—Throughout India and Burma, China.

**123. *Neptunia* Lour.****252. *Neptunia oleracea* Lour.**

Minbu district.

DISTRIBUTION.—Throughout the tropics.

**124. *Xylia* Benth.****253. *Xylia dolabriformis* Benth.**

Nwamadaung hills.

DISTRIBUTION.—Bengal (Orissa), Peninsular India, Burma, Malay Peninsula, Siam, Philippine islands.

**125. *Entada* Adans.****254. *Entada scandens* Benth.**

Arracan Yomahs.

DISTRIBUTION.—Throughout the tropics.

**126. *Adenanthera* Linn.****255.\* *Adenanthera pavonina* Linn.**

Pyogingon.

DISTRIBUTION.—Upper Gangetic plain, Bengal, Assam, Chittagong, Burma, Andaman islands, Peninsular India, Ceylon, Malay Peninsula and Archipelago, Philippine islands, China, Mascarene islands, N. Australia.

**127. *Dichrostachys* DC.****256.\* *Dichrostachys cinerea* W. & A.**

Salin.

DISTRIBUTION.—Rajputana, Peninsular and Central India, Bengal (Orissa), Burma, Ceylon, Malay Archipelago, N. Australia.

128. *Leucæna* Benth.257. *Leucæna glauca* Benth.

Sinbok.

Burm. *Aseik-hpyé-bin*.

DISTRIBUTION.—Throughout the tropics.

129. *Mimosa* Linn.258. *Mimosa pudica* Linn. Common in the alluvial belt.

DISTRIBUTION.—Throughout India, Burma, Ceylon, tropical America.

130. *Acacia* Willd.259. *Acacia Farnesiana* Willd.

Sinbok.

DISTRIBUTION.—Throughout the tropics.

260.\* *Acacia Arabica* Willd.

Common, planted throughout the district.

DISTRIBUTION.—Punjab, Rajputana, Scinde, Peninsular and Central India, Bengal, Burma, Ceylon, Arabia, Africa.

261. *Acacia Kingii* Prain. (Journ. Asiat. Soc. Beugal, Vol. LXVI, 2. 506, 1897.)

Salin.

DISTRIBUTION.—Upper Burma.

262. *Acacia leucophlœa* Willd.

Gwingyin.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Archipelago.

263. *Acacia catechuoides* Benth.

Mon valley near Sidoktaya.

Burm. *Sha-bin*.

DISTRIBUTION.—Bengal, Assam, Burma.

264. *Acacia concinna* DC. VAR. *rugata*.

Minbu district.

DISTRIBUTION of variety.—Nepal, Sikkim, Bengal, Assam, Burma, Andamans, Central India.

265. *Acacia pennata* Willd.

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Archipelago, Africa.

VAR. *arrophula*.

Ngape.

DISTRIBUTION.—Throughout India and Burma.

**266. *Acacia canescens* Grah.**

Minbu district.

DISTRIBUTION.—Peninsular India, Burma.

VAR. *macrocarpa*.

Minbu district.

DISTRIBUTION.—Burma.

**131. *Albizzia Darazz*.**

**267. *Albizzia Lebbek* Benth.**

Common throughout the district in the plains.

DISTRIBUTION.—Throughout the Eastern tropics.

**268. *Albizzia lebbekoides* Benth. (Hook. Lond. Journ. Bot., III, 89.**

Ngape.

DISTRIBUTION.—Burma, Siam, Java.

**269. *Albizzia procera* Benth.**

Arracan Yomahs.

DISTRIBUTION.—N-W. and Eastern Himalaya, Bengal, Central and Peninsular India, Assam, Chittagong, Burma, Andaman islands, Malay Archipelago, Philippine islands.

**270. *Albizzia lucida* Benth.**

Minbu district.

DISTRIBUTION.—Upper Gangetic plain (cult.), Nepal, Sikkim, Assam, Chittagong, Burma, Malay Peninsula and Archipelago.

**132. *Pithecolobium Mart*.**

**271. *Pithecolobium dulce* Benth.**

Minbu district.

DISTRIBUTION.—Planted throughout India and Ceylon, Malay Peninsula, Philippine islands. Indigenous to South America.

**XXXIV.—ROSACEÆ.**

**133. *Pygeum Gært.***

**272.\* *Pygeum acuminatum* Coleb.**

Arracan Yomahs.

DISTRIBUTION.—Sikkim, Assam, Chittagong, Burma, Andaman islands.

**134. Rosa Linn.****273. Rosa involucrata Roxb.**

Common in the alluvial belt.

Burm. *Myit-king*.

DISTRIBUTION.—Upper Gangetic plain, Bengal, Assam, Burma, Circars.

**135. Eriobotrya Lindl.****274. Eriobotrya bengalensis Hook. f.**

Arracan Yomahs.

DISTRIBUTION.—Sikkim, Bengal, Assam, Burma, Malay Peninsula.

**XXV.—CRASSULACEÆ.****136. Kalanchoe Adans.****275. Kalanchoe spathulata DC.**

Minbu district.

DISTRIBUTION.—N.-W. and Eastern Himalayas, Bengal, Assam, Burma, Malay Archipelago, China.

**276. Kalanchoe laciniata DC.**

Minbu district.

DISTRIBUTION.—Peninsular India, Bengal, Burma, Malay Archipelago, China, Tropical Africa.

**XXXVI.—COMBRETACEÆ.****137. Terminalia Linn.****277. Terminalia Catappa Linn.**

Pyogingon.

DISTRIBUTION.—Planted throughout the tropics.

**278. Terminalia Bellerica Roxb.**

Minbu district.

DISTRIBUTION.—Throughout India—except the West—and Burma, Ceylon, Malay Peninsula.

**279. Terminalia tomentosa Bedd.**

Arracan Yomahs, common.

DISTRIBUTION.—Peninsular and Central India, Upper Gangetic plain, Bengal, Nepal, Sikkim, Assam, Burma.

VAR. *crenulata*.

VAR. *macrocarpa*.

The writer is of opinion that there are really two distinct varieties. There are several gatherings of the former collected at Sidoktaya, Ngape and elsewhere all agreeing with each other and differing from the latter in having considerably smaller leaves and fruit. The leaf of VAR. *crenulata* averages  $4\frac{1}{2}$  inches long, that of VAR. *macrocarpa* about 8 inches. The fruit of VAR. *crenulata* is about 2 inches long and  $3-3\frac{1}{2}$  inches in circumference, that of VAR. *macrocarpa*  $2\frac{1}{2}$  inches and  $6-6\frac{1}{2}$  inches in circumference.

**280. Terminalia pyrifolia Kurz.**

Sidoktaya.

DISTRIBUTION.—Burma.

**281. Terminalia Oliveri Brandis.** (Hooker's *Icones Plantarum*, Pl. 2202.)

Minbu district.

DISTRIBUTION.—Burma.

**138. Calycopteris Lamk.**

**282. Calycopteris floribunda Lamk.**

Myaung-u, Nwamadaung hills.

DISTRIBUTION.—Orissa, Peninsular India, Assam, Burma, Malay Peninsula.

**139. Anogeissus Wall.**

**283. Anogeissus acuminata Wall.** VAR. *lanceolata*.

Arracan Yomahs, lower slopes.

DISTRIBUTION of variety.—Chittagong, Burma.

**140. Combretum Linn.**

**284. Combretum apetalum Wall.**

Common all over the district.

DISTRIBUTION.—Burma.

**285. Combretum pyrifolium Kurz.**

Minbu district.

DISTRIBUTION.—Burma.

**286. Combretum trifoliatum Vent.**

Common in the alluvial belt.

Burm. *Hsauk-bin*.

DISTRIBUTION.—Burma, Malay Peninsula and Archipelago.

**287. Combretum chinense Roxb.**

Arracan Yomahs, lower slopes.

DISTRIBUTION.—Assam, Chittagong, Burma, Andaman islands, Malay Peninsula.

**288. *Combretum extensum* Roxb.**

Arracan Yomals, lower slopes.

DISTRIBUTION.—Assam, Chittagong, Burma, Andaman islands, Peninsular India, Ceylon, Malay Peninsula and Archipela\_o.

**141. *Quisqualis* Linn.****289. *Quisqualis indica* Linn.**

Minbu district.

DISTRIBUTION.—Throughout the tropics, cultivated.

**XXXVII.—MYRTACEÆ.****142. *Psidium* Linn.****290. *Psidium Guyava* Linn.**

Cultivated in the alluvial belt.

Burm. *Mankala-bin*.

DISTRIBUTION.—Cultivated throughout the tropics.

**143. *Barringtonia* Forst.****291. *Barringtonia acutangula* Gærtn.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Ceylon, (?) Malay Peninsula.

**XXXVIII.—LYTHRACEÆ.****144. *Ammannia* Linn.****292. *Ammannia peploides* Spreng.**

Minbu district.

DISTRIBUTION.—Throughout the Eastern tropics.

**293. *Ammannia baccifera* Linn.**

Minbu district.

DISTRIBUTION.—Throughout the Eastern tropics.

**294. \**Ammannia salicifolia* Monti.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Tropical Africa.

**145. *Lawsonia* Linn.****295. *Lawsonia alba* Lamk.**

Salin.

DISTRIBUTION.—Cultivated throughout the tropics.

146. *Lagerstroemia* Linn.296. *Lagerstroemia parviflora* Roxb.

DISTRIBUTION.—N.-W. and Eastern Himalayas, Bengal, Central and Peninsular India, Assam, Burma.

297. *Lagerstroemia macrocarpa* Wall.

Minbu district.

DISTRIBUTION.—Chittagong and Burma.

Fruits very large, 5 inches in circumference.

298. *Lagerstroemia villosa* Wall.

Sidoktaya.

DISTRIBUTION.—Burma.

299. *Lagerstroemia tomentosa* Presl.

Arracan Yomahs.

DISTRIBUTION.—Burma.

147. *Duabanga* Ham.300. *Duabanga sonneratioides* Ham.

Arracan Yomahs.

DISTRIBUTION.—Sikkim, Assam, Chittagong, Burma, Andaman islands, Malay Peninsula.

148. *Punica* Linn.301. *Punica Granatum* Linn.

Sinbok, cultivated.

Burm. *Tale-bin*.

DISTRIBUTION.—Cultivated throughout the tropics.

## XXXIX.—ONAGRACEÆ.

149. *Jussiaea* Linn.302. *Jussiaea repens* Linn.

Paunglin and Salin lakes.

DISTRIBUTION.—Throughout the tropics.

303. *Jussiaea suffruticosa* Linn.

Paunglin lake.

DISTRIBUTION.—Throughout the tropics.

**XL.—PASSIFLORACEÆ.****150. Passiflora Linn.****304. Passiflora foetida Linn.**

Minbu district.

DISTRIBUTION.—Upper Gangetic plain, Bengal, Assam, Burma, Malay Peninsula, naturalised, as in most tropical countries. Wild in tropical America.

**XLI.—CUCURBITACEÆ.****151. Hodgsonia Hook. f. & T.****305. Hodgsonia heteroclita Hook. f. & T.**

Nwamadaung hills.

DISTRIBUTION.—Sikkim, Assam, Chittagong, Burma, Malay Peninsula and Archipelago.

**152. Trichosanthes Linn.****306. Trichosanthes palmata Roxb.**

Minbu district.

DISTRIBUTION.—Throughout the Eastern tropics and N. Australia.

**307. Trichosanthes cucumerina Linn.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula and Archipelago.

**153. Gymnopetalum Arn.****308. Gymnopetalum cochinchinense Kurz.**

Sidoktaya.

DISTRIBUTION.—Sikkim, Bengal, Assam, Burma, Malay Peninsula and Archipelago, China.

**154. Lagenaria Seringe.****309. Lagenaria vulgaris Seringe.**

Cultivated in alluvial and irrigated tracts.

Burm. *Bu-thee*.

DISTRIBUTION.—Cultivated throughout the tropics.

**155. Luffa Cav.****310. Luffa ægyptiaca Mill.**

Minbu district, generally cultivated.

DISTRIBUTION.—Cultivated throughout the tropics.



**311. *Luffa acutangula* Roxb.**

Minbu district, generally cultivated.

DISTRIBUTION.—Rajputana, Upper Gangetic plain, Central India, Bengal, Assam, Burma, Laccadive islands, Ceylon.

**156. *Benincasa* Savi.****312. *Benincasa cerifera* Savi.**

Minbu district.

DISTRIBUTION.—Cultivated throughout the Eastern tropics.

**157. *Momordica* Linn.****313. *Momordica Charantia* Linn.**

Alluvial belt and irrigated tracts cultivated.

Burm. *Kyet-hinga*.

DISTRIBUTION.—Cultivated throughout the Eastern tropics.

**314. *Momordica macrophylla* n. sp.**

Branches angled and grooved, sparsely scurfily hairy in the grooves. Leaves petiolate, cordate, mucronate, with base cuneate at the insertion of the petiole, membranous glabrous or with a few scurfy hairs on the nerves, margin entire, basal nerves 3 including the midrib, the lateral ones almost at once dividing into two branches. Petiole 6 cm. long, with one or more warty glands, lamina of fully developed leaf 13·8-16 cm. long, 11-14 cm. broad at its widest part. Tendrils unbranched. Male flowers usually solitary on unbranched peduncles, sometimes three or four on as many pedicels, branching from a main peduncle. Peduncles shorter even than the petioles. Bract broadly reniform entire, about 3 cm. from base to apex, about 3·8 cm. in transverse diameter, at the top of the peduncle completely enclosing the male flower. Flower unexpanded about 2·2 cm. long. Sepals oblong acute, thick and rather fleshy in the bud, twisted, pubescent. Petals not seen expanded but apparently yellowish without a black base. Stamens three, two 2-anthered, one 1-anthered, filaments black. Female flowers not seen. Fruit covered with coarse soft spines about 3 mm. long.

Taepo, Tenasserim, 5,000 ft. *Gallatly!* Minbu district, *Shaik Mokim!*

This was first collected by Gallatly in 1877 in fruit. There is an immature fruit on the single sheet of his gathering in Calcutta Herbarium, and a note stating "the only plant of this met with. A large fruit is in spirit". Unfortunately the large fruit appears to have departed to that limbo where all such things go when there is

no proper museum wherein to preserve them. Since Gattaly collected this in 1877, the species appears never again to have been collected until brought from Minbu district in 1903.

Its nearest affinities appear to be with *Momordica dioica*, from which it differs markedly in having much larger leaves, glandular petioles, considerably shorter peduncles, and coarser fruit spines.

**158. Cucumis Linn.**

**315. Cucumis Melo Linn.**

Cultivated in the alluvial belt.

Burm. *Tha-khwa-thee*.

DISTRIBUTION.—Cultivated throughout the tropics.

**159. Citrullus Schrader.**

**316. Citrullus vulgaris Schrad.**

Cultivated in the alluvial belt.

Burm. *Payé-thee*.

DISTRIBUTION.—Cultivated throughout the tropics.

**160. Cephalandra Schrader.**

**317. Cephalandra indica Naud.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Malaya, Tropical Africa.

**161. Cucurbita Linn.**

**318. Cucurbita maxima Duchesne.**

Cultivated in the alluvial belt and irrigated tracts.

Burm. *Payon thee*.

DISTRIBUTION.—Throughout the tropics.

**162. Mukia Arn.**

**319. Mukia scabrella Arn.**

Minbu district.

DISTRIBUTION.—Throughout the Eastern tropics.

**163. Zehneria Endl.**

**320. Zehneria umbellata Thw.**

Nwamadaung hills.

DISTRIBUTION.—Throughout Tropical Asia and N. Australia.

**164. Thladiantha Bunge.**

**321. Thladiantha calcarata** C.B. Clarke (T. dubia of F. B. I. not of Bunge).

Arracan Yomahs, near Kan.

DISTRIBUTION.—Sikkim, Bengal, Assam, Burma.

**165. Alsomitra Bth. & Hook. f.**

**322. Alsomitra sarcophylla** Hook. f.

Myaung-u, Nwanadaung hills.

DISTRIBUTION.—Burma, Siam.

**XLII.—CACTACEÆ.****166. Cereus Haw.**

**323. Cereus** species.

Gwinyin. Used as a hedge, and grows to a height of 16 feet. Burm. *Tasaung-pyathat*.

**167. Opuntia Mill.**

**324. Opuntia monacantha** Haw.

Sidoktaya. Growing in the police compound. A native of South America, introduced into India and Australia.

**XLIII.—FICOIDEÆ.****168. Trianthes Linn.**

**325. Trianthes crystallina** Vahl.

Legain.

DISTRIBUTION.—Upper Gangetic plain, Punjab, Central and Peninsular India, Burma, Ceylon, Africa.

**326. \* Trianthes decandra** Linn.

Bank of the Irawaddy.

DISTRIBUTION.—Peninsular India, Burma.

**169. Mollugo Linn.**

**327. Mollugo hirta** Thunb.

Minbu district.

DISTRIBUTION.—Throughout the tropics.

**328. Mollugo Spergula** Linn.

Monmyin, Mon riverside.

DISTRIBUTION.—Upper Gangetic plain, Bengal, Central and Peninsular India, Burma, Ceylon, Tropical Africa and Australia.

170. *Gisekia* Linn.329. *Gisekia pharnaceoides* Linn.

Minbu district.

DISTRIBUTION.—Upper Gangetic plain, Punjab, Scinde, Central and Peninsular India, Burma, Ceylon, Afghanistan, Africa.

## XLIV.—UMBELLIFERÆ.

171. *Pimpinella* Linn.330. \* *Pimpinella Leschenaultii* DC.

Arracan Yomahs.

DISTRIBUTION.—Peninsular India, Burma, Ceylon.

172. *Foeniculum* Adans.331. *Foeniculum vulgare* Gærtn.

Cultivated in the alluvial belt and irrigated tracts.

Burm. *Sa-meit*.

DISTRIBUTION.—Cultivated throughout India and Burma and adjacent countries.

173. *Coriandrum* Linn.332. *Coriandrum sativum* Linn.

Cultivated in the alluvial belt and irrigated tracts.

Burm. *Nan-nan-bin*.

DISTRIBUTION.—Cultivated throughout the tropics generally.

## XLV.—ABALIACEÆ.

174. *Tupidanthus* Hook. f. & T.333. \* *Tupidanthus calyptratus* Hook. f. & T.

Arracan Yomahs, near Kan.

DISTRIBUTION.—Assam, Burma, Malay Peninsula and Archipelago.

## COROLLIFLORÆ.

## XLVI.—RUBIACEÆ.

175. *Sarcocephalus* Aitzel.334. *Sarcocephalus cordatus* Miq.

Mon valley, near Sidoktaya.

DISTRIBUTION.—Burma, Ceylon, Cochín-China, Malay Archipelago, N. Australia.

176. *Adina Salisb.*335. *Adina cordifolia* Hook. f.

Gwinyin.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Upper Gangetic plain, Bengal, Peninsular India, Burma, Ceylon, China.

177. *Mitragyna* Korth.336. *Mitragyna parvifolia* Korth.

Minbu district.

DISTRIBUTION.—N.-W. Himalaya, Upper Gangetic plain, Bengal, Central and Peninsular India, Burma, Ceylon.

178. *Hymenodictyon* Wall.337. *Hymenodictyon excelsum* Wall.

Ngape.

DISTRIBUTION.—N.-W. Himalaya, Upper Gangetic plain, Bengal, Assam, Burma, Central and Peninsular India, Malay Archipelago.

179. *Dentella* Forst.338. *Dentella repens* Forst.

Mon valley.

DISTRIBUTION.—Bengal, Assam, Burma, Central and Peninsular India, Ceylon, Malay Peninsula and Archipelago, N. Australia.

180. *Oldenlandia* Linn.339. *Oldenlandia umbellata* Linn.

Pyogingon.

DISTRIBUTION.—Peninsular India, Ceylon, Burma.

340. \* *Oldenlandia alata* Kœn.

Sidoktaya.

DISTRIBUTION.—Peninsular India, Burma, Malay Archipelago.

341. *Oldenlandia nudicaulis* Roxb.

Sidoktaya.

DISTRIBUTION.—Sikkim, Assam, Burma, Upper Gangetic plain, Bengal, Peninsular India, Malay Archipelago.

181. *Randia* Linn.342. *Randia dumetorum* Lamk.

Sidoktaya.

DISTRIBUTION.—Throughout the Eastern tropics.

F

182. *Gardenia* Linn.343. *Gardenia obtusifolia* Roxb.

Nwamadaung hills.

DISTRIBUTION.—Burma.

344. *Gardenia turgida* Roxb.

Desert zone, very common.

Burm. *Thamin-sa-hpya-thee*, name of the fruit.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Upper Gangetic plain, Bengal, Assam, Burma, Peninsular India.

345. *Gardenia erythroclada* Kurz.

Nwamadaung hills.

DISTRIBUTION.—Burma.

183. *Diplospora* DC.346. *Diplospora confusa* Hooker f.

Arracan Yomahs, near Kan.

DISTRIBUTION.—Burma.

184. *Knoxia* Linn.347. *Knoxia plantaginea* Wall. VAR. *glabrescens*.

Sidoktaya.

DISTRIBUTION.—Burma.

This is the only gathering of this species received in Calcutta Herbarium since Wallich collected it in 1826 and Kurz more than 40 years later. The Minbu specimens resemble Kurz's solitary sheet No. 1433, in being almost glabrous, Wallich's specimens being hirsute.

185. *Pavetta* Linn.348. *Pavetta indica* Linn. VAR. *tomentosa*.

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Ceylon, China, Malaya and N. Australia.

186. *Morinda* Linn.349. *Morinda tinctoria* Roxb.

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula and Archipelago.

**350. *Morinda persicæfolia* Ham.**

Sidoktaya.

DISTRIBUTION.—Chittagong, Burma, Siam, Malay Peninsula and Archipelago.

**187. *Rubia* Linn.****351. *Rubia angustissima* Wall.**

Arracan Yomahs, near Kan.

DISTRIBUTION.—Nepal, Sikkim, Burma.

**XLVII.—COMPOSITÆ.****188. *Vernonia* Schreb.****352. *Vernonia teres* Wall.**

Arracan Yomahs.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Bengal, Central India, Assam, Burma.

**353. *Vernonia* sp. ? nov.**

Arracan Yomahs.

DISTRIBUTION.—Upper Burma.

**354. *Vernonia cinerea* Less.**

Pyogingon and Salin.

DISTRIBUTION.—Throughout the Eastern tropics.

**355. *Vernonia anthelmintica* Willd.**

Sagu.

DISTRIBUTION.—Throughout India and Burma, Malay Peninsula, Ceylon.

**356. *Vernonia gymnoclada* Collet & Hemsley (Journ. Linn. Soc. Botany, Vol. XXVIII.)**

Pyogingon.

DISTRIBUTION.—Upper Burma.

**189. *Elephantopus* Linn.****357. *Elephantopus scaber* Linn.**

Nwamadaung hills.

DISTRIBUTION.—Throughout the tropics.

**190. *Ageratum* Linn.****358. *Ageratum conyzoides* Linn.**

Pyogingon.

DISTRIBUTION.—Throughout the tropics.

191. *Cyathocline* Cass.359. *Cyathocline lyrata* Cass.

Nwamadaung hills.

DISTRIBUTION.—Throughout India and Burma.

192. *Grangea* Forsk.360. *Grangea maderaspatana* Poir.

Irawaddy bank.

DISTRIBUTION.—Throughout the Eastern tropics.

193. *Conyza* Less.361. *Conyza semi-pinnatifida* Wall.

Pyogingon.

DISTRIBUTION.—Bengal, Assam, Burma.

194. *Blumea* DC.362. *Blumea glomerata* DC.

Arracan Yomahs.

DISTRIBUTION.—Throughout India and Burma, Malay Archipelago, Philippine islands, China.

363. *Blumea laciniata* DC.

Nwamadaung hills.

DISTRIBUTION.—Throughout India and Burma, Malay Peninsula and Archipelago, Philippine islands, China.

364. *Blumea membranacea* DC.

Arracan Yomahs.

DISTRIBUTION.—Throughout India and Burma, Malay Archipelago.

365. *Blumea balsamifera* DC.

Mon valley, near Sidoktaya.

DISTRIBUTION.—Nepal, Sikkim, Assam, Chittagong, Burma, Malay Peninsula and Archipelago.

195. *Laggera* Sch. Bip.366. *Laggera flava* Benth.

Arracan Yomahs.

DISTRIBUTION.—Throughout India and Burma, Malay Peninsula.

367. *Laggera pterodonta* Benth.

Nwamadaung hills.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Assam, Burma, Peninsular India, Africa.



**368. *Laggera aurita* Sch-Bip.**

Mon river bank at Monmyin.

DISTRIBUTION.—Throughout India and Burma, Africa.

**196. *Sphæranthus* Linn.****369. *Sphæranthus peguensis* Kurz.**

Alluvial belt.

Burm. *Kodu-bin*.

DISTRIBUTION.—Burma.

**370. *Sphæranthus africanus* Linn.**

Alluvial belt and irrigated tracts.

DISTRIBUTION.—Throughout the Eastern tropics.

**371. *Sphæranthus indicus* Linn.**

Alluvial belt and irrigated tracts.

DISTRIBUTION.—Throughout India and Burma, Malay Peninsula and Archipelago, Africa, Australia.

**197. *Pterocaulon* Elliott.****372. *Pterocaulon cylindrostachyum* Clarke.**

Alluvial belt and irrigated tracts.

DISTRIBUTION.—Burma, Malay Peninsula, Philippine islands, Australia.

**198. *Gnaphalium* Linn.****373. *Gnaphalium indicum* Linn.**

Mon river bank at Monmyin.

DISTRIBUTION.—Throughout the Eastern tropics.

**374. *Gnaphalium pulvinatum* Delile.**

Alluvial belt and irrigated tract.

DISTRIBUTION.—Throughout India and Burma, Africa.

**199. *Inula* Linn.****375. *Inula Cappa* DC.**

Arracan Yomahs.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Assam, Burma, Malay Archipelago, China.

**200. *Vicoa* Cass.****376. *Vicoa auriculata* Cass.**

Nwamadaung hills.

DISTRIBUTION.—Throughout India and Burma, Ceylon.

201. *Xanthium* Linn.377. *Xanthium Strumarium* Linn.

Irawaddy banks.

DISTRIBUTION.—Throughout India and Burma, Ceylon.

202. \* *Enhydra* Lour.378. \* *Enhydra fluctuans* Lour.

Minbu district.

DISTRIBUTION.—Bengal, Assam, Chittagong, Burma, Siam, Malay Archipelago, China.

203. *Eclipta* Linn.379. *Eclipta alba* Hassk.

Irawaddy bank.

DISTRIBUTION.—Throughout the tropics.

204. *Wedelia* Jacq.380. *Wedelia Wallichii* Less.

Arracan Yomahs.

DISTRIBUTION.—N.-W. Himalaya, Sikkim, Bengal, Assam, Burma, Malay Archipelago.

205. *Spilanthes* Linn.381. *Spilanthes Acmella* Linn.

Minbu district.

DISTRIBUTION.—Throughout the tropics.

206. *Cosmos* Cav.382. *Cosmos sulphureus* Cav.

Minbu district.

DISTRIBUTION.—Cultivated in Bengal, Assam, Burma.

207. *Bidens* Linn.383. *Bidens pilosa* Linn.

Minbu district.

DISTRIBUTION.—Throughout the tropics.

208. *Artemisia* Linn.384. \* *Artemisia pallens* Wall.

Minbu district, cultivated for its perfume.

DISTRIBUTION.—Peninsular India and Burma.

Placed amongst doubtful species in the Flora of British India, but described fully by Stapf, in Hooker's *Icones Plantarum*, Pl. 2597.

**209. Emilia Cass.****385. Emilia sonchifolia DC.**

Nwamadaung hills.

DISTRIBUTION.—Throughout the tropics.

**210. \* Goniocaulon Cass.****386. \* Goniocaulon glabrum Cass.**

Arracan Yomahs.

DISTRIBUTION.—Bengal, Central and Peninsular India, Burma.

**211. Carthamus Linn.****387. Carthamus tinctorius Linn.**

Minbu district, cultivated.

Burm. *Su-pan*.

DISTRIBUTION.—Cultivated throughout India and Burma.

**212. Launea Cass.****388. Launea asplenifolia DC.**

Irawaddy bank.

DISTRIBUTION.—Throughout India and Burma.

**XLVIII.—CAMPANULACEÆ.****213. Sphenoclea Gærtn.****389. Sphenoclea zeylanica Gærtn.**

Minbu district.

DISTRIBUTION.—Throughout the tropics.

**XLIX.—VACCINIACEÆ.****214. Vaccinium Linn.****390. Vaccinium bancanum Miq.**

Arracan Yomahs near Kan.

DISTRIBUTION.—Burma, Malay Peninsula and Archipelago.

**L.—PLUMBAGINACEÆ.****215. Plumbago.****391. Plumbago zeylanica Linn.**

Legain.

DISTRIBUTION.—Throughout the Eastern tropics.

**LI.—MYRSINACEÆ.****216. *Maesa* Forsk.****392. *Maesa indica* Wall.**

Arracan Yomahs near Kan.

DISTRIBUTION.—Throughout the Eastern tropics.

**217. *Ardisia* Swartz.****393. *Ardisia humilis* Vahl.**

Arracan Yomahs near Kan.

DISTRIBUTION.—Throughout India—exclusive of the western frontier regions—and Burma, Malay Archipelago, China.

**LII.—SAPOTACEÆ.****218. *Mimusops* Linn.****394. *Mimusops Elengi* Linn.**

Salin.

DISTRIBUTION.—Cultivated throughout the tropics.

**LIII.—EBENACEÆ.****219. *Diospyros* Linn.****395. *Diospyros montana* Roxb.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Malay Archipelago, tropical Australia.

**396. *Diospyros burmanica* Kurz.**

Gwingyin and Myaung-u.

Burm. *Te-bin*.

DISTRIBUTION.—Burma.

**397. *Diospyros* sp.**

Arracan Yomahs.

A quite distinct species not represented in Calcutta Herbarium and most probably an undescribed species. Unfortunately it is only in fruit.

**LIV.—OLEACEÆ.****220. *Jasminum* Linn.****398. *Jasminum Sambac* Ait.**

Sinbok, cultivated.

DISTRIBUTION.—Throughout the tropics, cultivated.

**221. Schrebera Roxb.****399. Schrebera swietenioides Roxb.**

Nwamadaung hills.

DISTRIBUTION.—Bengal, Central and Peninsular India, Burma.

**222. Ligustrum Linn.****400. Ligustrum robustum Bl.**

Arracan Yomahs.

DISTRIBUTION.—Bengal, Assam, Chittagong, Burma, Malay Archipelago.

**LV.—SALVADORACEÆ.****223. Azima Lamk.****401. Azima sarmentosa Bth.**

On walls of old pagodas along the Irawaddy bank.

DISTRIBUTION.—Burma, Malay Archipelago, Philippine islands.

**LVI. APOCYNACEÆ.****224. Carissa Linn.****402. Carissa Carandas Linn.**

Gwingyin.

DISTRIBUTION.—Throughout the plains of India and Burma, Ceylon, Malay Peninsula and Archipelago.

**225. Vinca Linn.****403. Vinca rosea Linn.**

Pyogingon, cultivated.

DISTRIBUTION.—Widely cultivated in India and Burma. Indigenous to the West Indies.

**226. Holarrhena Br.****404. Holarrhena antidysenterica Wall.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Malay Peninsula.

**227. Vallaris Burm.****405. Vallaris Heynei Spreng.**

Common in the desert zone.

DISTRIBUTION.—N.-W. Himalaya, Upper Gangetic plain, Bengal, Peninsular India, Assam, Burma, Ceylon.

**228. Wrightia Br.****406. Wrightia tomentosa** Roem. & Schultes.

Arracan Yomahs.

DISTRIBUTION.—Throughout India and Burma, Malay Peninsula.

**229. Thevetia Linn.****407. Thevetia nerlifolia** Juss.

Sinbok, cultivated.

DISTRIBUTION.—Cultivated generally throughout India and Burma.

**230. Ichnocarpus Br.****408. Ichnocarpus frutescens** Br.

Minbu district.

DISTRIBUTION.—N.-W. Himalaya, Upper Gangetic plain, Bengal, Assam, Chittagong, Burma, Central and Peninsular India, Ceylon, Malay Archipelago, Australia.

**LVII.—ASCLEPIADACEÆ.****231. Cryptolepis Br.****409. Cryptolepis Buchanani** Roem. & Schultes.

Nwamadaung hills.

DISTRIBUTION.—Throughout India and Burma, Ceylon.

**232. Atherolepis Hook. f.****410. Atherolepis Wallichii** Hook. f.

Mon valley near Sidoktaya.

DISTRIBUTION.—Burma.

**233. Streptocaulon W. & A.****411. Streptocaulon tomentosum** W. & A.

Common in the desert zone.

DISTRIBUTION.—Burma, China.

**234. Myriopteron Griff.****412. Myriopteron paniculatum** Griff.

Mon valley near Sidoktaya.

DISTRIBUTION.—Assam, Chittagong, Burma, Malay Archipelago.

**235. Oxystelma Br.****413. Oxystelma esculentum Br.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Malay Archipelago.

**236. Calotropis Br.****414. Calotropis procera Br.**

Common throughout the district.

DISTRIBUTION.—Throughout the plains of India and Burma, Afghanistan, Baluchistan, Persia, tropical Africa.

**237. Raphistemma Wall.****415. Raphistemma pulchellum Wall.**

Sidoktaya.

DISTRIBUTION.—Sikkim, Assam, Burma.

**238. Holostemma Br.****416. Holostemma Rheedii Wall.**

Minbu district.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Western and Peninsular India, Bengal, Burma.

**239. Sarcostemma Br.****417. \*Sarcostemma Brunonianum W. & A.**

Road to Salin.

DISTRIBUTION.—Peninsular India, Ceylon, Burma.

**240. Gymnema Br.****418. Gymnema tingens W. & A.**

Arracan Yomahs.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Assam, Burma, Bengal, Peninsular India, China.

**241. Marsdenia Br.****419. Marsdenia tenacissima W. & A.**

Minbu district.

DISTRIBUTION.—N.-W. Himalaya, Sikkim, Upper Gangetic plain, Bengal.

242. *Pergularia* Linn.420. *Pergularia pallida* W. & A.

Minbu district.

DISTRIBUTION.—Throughout India and Burma.

243. *Lygisma* Hook. f.421. *Lygisma angustifolia* Hook. f.

Minbu district.

DISTRIBUTION.—Burma.

244. *Tylophora* Br.422.\* *Tylophora tenerrima* Wight.

Nwamadaung hills.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Burma.

423. *Tylophora asthmatica* W. & A.

Minbu district.

DISTRIBUTION.—Bengal, Assam, Chittagong, Burma, Peninsular India, Ceylon, Siam, Malay Archipelago.

245. *Leptadenia* Br.424. *Leptadenia reticulata* W. & A.

Minbu district.

DISTRIBUTION.—Punjab, Central India and Peninsular India, Burma, Ceylon, Malay Peninsula.

246. *Boucerosia* W. & A.425. *Boucerosia umbellata* W. & A.

Legain.

DISTRIBUTION.—Burma, Peninsular India, Ceylon.

In addition to the plants above enumerated belonging to this order, about half a dozen other species were collected, all in fruit, which have not been matched in the Calcutta Herbarium, and are too incomplete accordingly to describe.

## LVIII.—LOGANIACEÆ.

247. *Buddleia* Linn.426. *Buddleia asiatica* Lour.

Common throughout the district.

DISTRIBUTION.—Throughout India and Burma, Malay Peninsula and Archipelago, China.



**248. *Fagraea* Thunb.**

**427. *Fagraea obovata* Wall.**  
Arracan Yomahs.

DISTRIBUTION.—Peninsular India, Ceylon, Bhutan, Assam, Chittagong, Burma, Malay Peninsula and Archipelago.

**LIX.—GENTIANACEÆ.****249. *Canscora* Lamk.**

**428. *Canscora diffusa* Br.**  
Nwamadaung hills.

DISTRIBUTION.—Throughout the Eastern tropics.

**250. *Limnanthemum* S. P. Gmel.**

**429. *Limnanthemum indicum* Thw.**  
Salin lake.

DISTRIBUTION.—Throughout the Eastern tropics.

The plants in Salin lake showed distinct dimorphism in the styles which were either quite short or absent or long.

**LX.—BORAGINACEÆ.****251. *Cordia* Linn.**

**430. *Cordia Myxa* Linn. VAR. *brunnea*.**  
Irawaddy bank, near Semon.  
Burm. *Thanat-bin*.

DISTRIBUTION.—Throughout the Eastern tropics.

**252. *Coldenia* Linn.**

**431. *Coldenia procumbens* Linn.**  
Throughout the district.

DISTRIBUTION.—Throughout the tropics.

**253. *Heliotropium* Linn.**

**432. \**Heliotropium supinum* Linn. VAR. *malabarica*.**  
Minbu district.

DISTRIBUTION.—Punjab, Upper Gangetic plain, Bengal, Central and Peninsular India, Western Asia, Southern Europe, tropical Africa.

**433. \**Heliotropium ovalifolium* Forsk.**

Sandy bed of Mon river at Monmyin.

DISTRIBUTION.—Bengal, Central and Peninsular India, Burma, tropical Africa and Australia.

**434. *Heliotropium strigosum* Willd. VAR. *brevifolia*.**

Minbu district.

DISTRIBUTION, of the variety.—Throughout India and Burma.

**435 *Heliotropium indicum* Linn.**

Irawaddy bank.

DISTRIBUTION.—Throughout the tropics.

**254. *Trichodesma* Br.****436. *Trichodesma iudicum*, Br.**

Minbu district.

DISTRIBUTION.—Throughout India—including the Bengal plain—and Burma, Western Asia, East African islands.

**LXI. CONVULVACEÆ.****255. *Argyreia* Lour.****437. *Argyreia Burneyi* n. sp.**

A scandent shrub, branches terete, as thick as a goose quill or pencil, covered with a dense soft silky grey tomentum. Leaves petiolate, cordate, entire, apex blunt and basal sinus large, upper surface of lamina sparsely tomentose, lower surface and petiole covered, like the branches, with a dense soft silky grey tomentum. Lateral nerves prominent on lower surface 10-11 pairs. Petiole about 5.6 cm. long, lamina about 13.8—15 cm. from insertion of petiole to apex, and about 20-23.8 cm. broad at its widest part. Flowers in terminal corymbose peduncled cymes, densely tomentose, peduncles 3-flowered. Outer bracts large, petioled, leaf-like, cordate, acute, with base obtuse, exceeding the cymes, inner bracts small, sessile, densely tomentose. Sepals tomentose without and within, 3 outer broadly oval 1.8 cm. long, 1.4 cm. broad, 2 inner smaller 1.2 cm. long and 9 mm. broad, cordate-acuminate with base obtuse. Corolla funnel-shaped 6.5 cm. long, softly hairy externally. Fruit not seen.

Ava, *Mrs. Burney!* Minbu district, *Shaik Mokim!*

This species comes nearest to *Argyreia Roxburghii* Choisy, from which it is, however, easily enough distinguished by the large size of its leaves, its closer denser tomentum all over, its considerably fewer flowered cymes, and its large calyx. The species was first collected by Mrs. Burney, wife of Colonel Henry Burney, resident at the court of Ava from 1830 to 1837, and her specimen was the only one in the Calcutta Herbarium until the present specimens were collected in Minbu in 1903.

**438. *Argyreia* Hooke C. B. Clarke.**

Paunglin.

DISTRIBUTION.—Sikkim, Assam, Burma.

**256. *Lettsomia* Roxb.****439. *Lettsomia campanuliflora* n. sp.**

A scandent shrub, branches slender terete, as thick as a crow-quill, sparsely adpressedly strigose, internodes from about 3·8 to 6 cm. long. Leaves petiolate, entire, ovate, mucronulate, petiole and both surfaces of lamina adpressedly strigose, the upper finely and sparsely. Petiole about 1·8 cm. long, lamina 6·8 cm. long and 4 cm. broad. Flowers axillary, solitary or sometimes in pairs. Peduncle short about 1 cm. long, strigose with three or four small scantily hairy bracts less than half the size of the sepals surrounding the base of the calyx. Sepals glabrous, broadly ovate, outer 1·8 cm. long and 1 cm. broad, inner somewhat narrower and shorter, corolla glabrous, campanulate 2·5 cm. long, 1·8 cm. in diameter. Stamens 5, included. Ovary imbedded in a prominent annular disc, bi-locular, 4-ovuled. Fruit a dry berry the size of a large pea, included in the calyx.

Sidoktaya, base of the Arracan Yomahs, Minbu district, Upper Burma, October 1902, *Shaik Mokim*!

This is quite different from any species of *Lettsomia* in the Calcutta Herbarium. It would appear to come nearest to *L. confusa* Prain.

**440. *Lettsomia setosa* Roxb.**

Arracan Yomahs.

DISTRIBUTION.—Throughout India and Burma, Ceylon.

**441. \**Lettsomia pallida* Prain (Journ. Asiat. Soc., Bengal, Vol. LXIII, II, 1894.**

Minbu district.

DISTRIBUTION.—Burma.

**257. *Blinkworthia* Choisy.****442. *Blinkworthia lycioides* Choisy.**

Nwamadaung hills.

DISTRIBUTION.—Burma.

**258. *Calonyction* Choisy.****443. *Calonyction muricatum* Don.**

Salin.

DISTRIBUTION.—Cultivated generally throughout India and Burma, and distributed throughout the tropics.

259. *Quamoclit* Moench.

444. *Quamoclit phoenicea* Choisy. *Ipomœa coccinea* Linn. of F.B.I.  
Gwinyin.

DISTRIBUTION.—Cultivated throughout India and Burma, native to tropical America.

445. *Quamoclit plinnata* Boj. *Ipomœa Quamoclit* Linn. of F.B.I.  
Minbu district.

DISTRIBUTION.—Like the last.

260. *Pharbitis* Choisy.

446. *Pharbitis Nil* Choisy. *Ipomœa hederacea* Jacq. of F.B.I.  
Arracan Yomabs.

DISTRIBUTION.—Throughout the tropics.

261. *Aniseia* Choisy.

447. \* *Aniseia calycina* Choisy. *Ipomœa calycina* Benth. of F.B.I.  
Minbu district.

DISTRIBUTION.—Bengal, Central and Peninsular India, Burma.

262. *Ipomœa* Linn.

448. *Ipomœa Batatas* Lamk.

Cultivated in the Mon valley and at Salin.  
Burm. *Kasun-u*.

DISTRIBUTION.—Cultivated in places throughout India, Burma and the Malay Peninsula. Native to tropical America.

449. *Ipomœa Pes-tigridis* Linn.

Minbu district.

DISTRIBUTION.—Throughout the Eastern tropics.

450. *Ipomœa tridentata* Roth.

Minbu district.

DISTRIBUTION.—Bengal, Central, West and Peninsular India, Burma, Malay Peninsula and Archipelago.

451. *Ipomœa chryseides* Ker.

Minbu district.

DISTRIBUTION.—Throughout the Eastern tropics.

452. \* *Ipomœa reniformis* Choisy.

Minbu district.

DISTRIBUTION.—Upper Gangetic plain, Bengal, Central and Peninsular India, Ceylon, Burma, Malay Archipelago, tropical Africa.

**453. *Ipomoea obscura* Ker.**

Pyogingon.

DISTRIBUTION.—Throughout the Eastern tropics.

**454. *Ipomoea sepiaria* Koen.**

Salin.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula and Archipelago.

**455. *Ipomoea aquatica* Forsk.**

Paunglin Lake.

DISTRIBUTION.—Throughout the Eastern tropics.

**456. *Ipomoea campanulata* Linn.**

Arracan Yomahs.

DISTRIBUTION.—Peninsular India, Ceylon, Burma, Malay Peninsula and Archipelago.

**457. *Ipomoea petaloidea* Choisy. VAR. *linearifolia* Kurz.**

Arracan Yomahs.

DISTRIBUTION, of the variety.—N.-W. Himalaya, Burma.

**458. *Ipomoea Turpethum* Br.**

Nwamadaung hills.

DISTRIBUTION.—Throughout the Eastern tropics.

**459. *Ipomoea edithæ* n. sp.**

Stems terete, twining, slender, puberulous. Leaves petioled, entire, narrowly lanceolate, acute or acuminate, slightly puberulous or glabrous above, tomentose beneath, midrib prominent beneath, lateral nerves obscure, petiole about 1 cm. long, lamina 5.6—7.5 cm. long, 1.5—2.5 cm. broad. Flowers axillary, solitary or in pairs, seldom in threes on a common peduncle. Peduncle as long as the petiole, sparsely puberulous or glabrescent, with two or more minute subulate bracts surrounding the base of the pedicel. Pedicels as long as the peduncle, puberulous. Calyx 1.8 cm. long, sepals equal, lanceolate-acute, slightly puberulous or glabrous. Corolla funnel-shaped, 8 cm. long, hairy externally. Stamens well-included. Ovary bi-locular, style filiform, longer than the stamens, dividing above into two short arms ending in capitate stigmas. Capsule ovoid, with a hairy apex, otherwise glabrous, 1.4 cm. in diameter, 2-celled, 4-seeded. Seeds glabrous.

Sidoktaya and Arracan Yomahs, *Shaik Mokim*!

This species is very distinct, but would appear to come after *I. Turpethum*, from which it is easily distinguished by its leaves, the greater regularity of its cymes, and its considerably smaller and ovoid capsule.

**460. *Ipomœa vitifolia* Sweet.**

Nwamadaung hills.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Andaman islands, Malay Peninsula and Archipelago.

**461. \* *Ipomœa pulchella* Roth. *I. palmata* of F.B.I., not of Forsk.**

Minbu district.

DISTRIBUTION.—Peninsular India and Burma.

**462. \* *Ipomœa gracillima* Prain (Journ. Asiatic Soc. Bengal, Vol. LXIII, II 1894).**

Minbu district.

DISTRIBUTION.—Burma.

**263. *Jacquemontia* Choisy.****463. *Jacquemontia paniculata* Hallier (Bulletin de L'Herbier Boissier Vol. V, 1897) *Convolvulus parviflorus* Vahl. of F.B.I.**

DISTRIBUTION.—Throughout the Eastern tropics.

**264. *Cuscuta* Linn.****464. *Cuscuta reflexa* Roxb.**

Sinbok.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula and Archipelago.

**LXII. SOLANACEÆ.****265. *Solanum* Linn.****465. *Solanum nigrum* Linn.**

Irawaddy bank.

DISTRIBUTION.—Cosmopolitan.

**466. *Solanum verbascifolium* Linn.**

Arracan Yomahs.

DISTRIBUTION.—Throughout Tropical Asia, Australia and America.

**467. *Solanum torvum* Sw.**

Mon valley, near Sidoktaya.

Burm. *Khayan-kasaw*.

DISTRIBUTION.—Tropical Asia and America.

**468. *Solanum indicum* Linn.**

Common in the alluvial belt.

DISTRIBUTION.—Tropical Asia.

**469. Solanum Melongena Linn.**

Minbu, cultivated.

Burm. *Khayan-thee*.

DISTRIBUTION.—Cultivated throughout the tropics.

**470. Solanum xanthocarpum Schrad. & Wendl.**

Common in the desert zone.

DISTRIBUTION.—Tropical Asia and Australia.

**266. Lycopersicum Miller.****471. Lycopersicum esculentum Miller.**

Cultivated throughout the district, berries quite small.

DISTRIBUTION.—Cultivated throughout India and Burma, native of tropical America.

**267. Capsicum Linn.****472. Capsicum frutescens Linn. C. minimum of F.B.I.**

Salin.

DISTRIBUTION.—Cultivated throughout India and Burma, Malay Peninsula and Archipelago.

**268. Withania Jacq.****473. Withania somnifera Dunal.**

Pyogingon and Legain.

DISTRIBUTION.—Throughout the drier parts of India and Western Asia, Southern Europe and South Africa.

**269. Datura Linn.****474. Datura fastuosa Linn. VAR. alba.**

Alluvial belt, common.

DISTRIBUTION.—Eastern tropics.

**270. Nicotiana Linn.****475. Nicotiana Tabacum Linn.**

Cultivated throughout the district.

DISTRIBUTION.—Cultivated throughout the tropics.

**LXIII.—SCROPHULARIACEÆ.****271. Celsia Linn.****476. Celsia coromandeliana Vahl.**

Alluvial belt.

DISTRIBUTION.—Throughout Afghanistan, India and Burma, Ceylon, China.

**272. *Linaria* Juss.****477. *Linaria ramosissima* Wall.**

Salin, growing on old walls.

DISTRIBUTION.—From Afghanistan to Burma, and from the Punjab to Ceylon.

**273. *Lindenbergia* Lehm.****478. *Lindenbergia philippensis* Benth.**

Irawaddy bank and Gwingyin.

DISTRIBUTION.—Assam, Chittagong, Burma, Siam, China, Philippine islands.

**479. *Lindenbergia urticæfolia* Lehm.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Afghanistan.

**274. *Herpestis* Gærtn.****480. *Herpestis Monniera* H.B.K.**

Salin lake margin and at Sidoktaya.

DISTRIBUTION.—Throughout the tropics.

**275. *Dopatrium* Hamilt.****481. *Dopatrium junceum* Ham.**

Minbu district.

Throughout India and Burma, Ceylon, Malay Archipelago, Australia, China, Philippine islands, Japan.

**276. *Torenia* Linn.****482. *Torenia cordifolia* Roxb.**

Nwamadaung hills.

DISTRIBUTION.—N.W., Central and Eastern Himalayas, Bengal, Peninsular India, Burma, China, Malay Archipelago.

**277. *Vandellia* Linn.****483. *Vandellia crustacea* Benth.**

Minbu district.

DISTRIBUTION.—Eastern tropics.

**484. *Vandellia erecta* Benth.**

Minbu district.

DISTRIBUTION.—From Central Europe to China, Japan, and Polynesia.



**278. *Bonnaya* Link & Otto.****485. *Bonnaya brachiata* Link & Otto.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula and Archipelago, China, Philippine islands.

**279. *Alectra* Thunb.****486. *Alectra indica* Benth.**

Arracan Yomahs.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Bengal, Assam, Burma, Mauritius.

**280. *Buchnera* Linn.****487. *Buchnera cruciata* Ham.**

Arracan Yomahs.

DISTRIBUTION.—Nepal, Assam, Burma, Malay Archipelago, China.

**281. *Striga* Lour.****488. *Striga lutea* Lour.**

Minbu district.

DISTRIBUTION.—Eastern tropics.

**489. *Striga euphrasioides* Benth.**

Sagu.

DISTRIBUTION.—Throughout India (including Bengal) and Burma, Ceylon, Malay Archipelago.

**490. *Striga Masuria* Benth.**

Minbu district.

DISTRIBUTION.—Nepal, Burma, Peninsular India, China, Philippine islands.

**LXIV.—OROBANCHACEÆ****282. *Eginetia* Linn.****491. *Eginetia indica* Roxb.**

Sidoktaya.

DISTRIBUTION.—Throughout Eastern Asia.

**LXV.—LENTIBULARIACEÆ.****283. *Utricularia* Linn.****492. *Utricularia flexuosa* Vahl.**

Salin lake.

DISTRIBUTION.—Tropical Asia and Australia.

**493. *Utricularia exoleta* Br.**

Salin lake.

DISTRIBUTION.—As the last species.

**LXVI.—BIGNONIACEÆ.****284. *Millingtonia* Linn. f.****494. *Millingtonia hortensis* Linn. f.**

Sagu.

DISTRIBUTION.—Burma. Planted generally in the tropics.

**285. *Oroxylum* Vent.****495. *Oroxylum indicum* Vent.**

Nwamadaung hills.

DISTRIBUTION.—Throughout India and Burma, Cochin-China, Malay Archipelago.

**286. *Tecoma* Juss.****496. *Tecoma stans* Juss.**

Minbu district, planted.

DISTRIBUTION.—Cultivated in places throughout India and Burma. Native of tropical America.

**287. *Dolichandrone* Seem.****497. *Dolichandrone stipulata* Benth.**

Nwamadaung hills.

DISTRIBUTION.—Burma.

**498. *Dolichandrone Rheedii* Seem.**

Nwamadaung hills.

DISTRIBUTION.—Peninsular India, Ceylon, Burma, Andaman islands, Malay Peninsula and Archipelago.

**288. *Heterophragma* DC.****499. *Heterophragma sulfureum* Kurz.**

Nwamadaung hills.

DISTRIBUTION.—Burma.

**500. *Heterophragma adenophyllum* Seem.**

Arracan Yomahs.

DISTRIBUTION.—Assam, Chittagong, Burma, Andaman islands.

**289. Stereospermum Cham.****501. Stereospermum chelonoides DC.**

Nwamadaung hills.

DISTRIBUTION.—Throughout India and Burma.

**LXVII.—PEDALINEÆ.****290. Sesamum Linn.****502. Sesamum indicum DC.**

Cultivated in the desert zone.

DISTRIBUTION.—Cultivated throughout the tropics.

**291. Martynia Linn.****503. Martynia diandra Glox.**

Gwingyin.

DISTRIBUTION.—Common throughout India and Burma ; introduced from tropical America.

**LXVIII.—ACANTHACEÆ.****292. Thunbergia Linn. f.****504. Thunbergia laurifolia Lindl.**

Mon valley, Arrakan Yomahs.

DISTRIBUTION.—Burma, Malay Peninsula, Andamans.

**293. Nelsonia Br.****505. Nelsonia campestris Br.**

Nwamadaung hills.

DISTRIBUTION.—Throughout the tropics.

**294. Hygrophila Br.****506. Hygrophila spinosa T. Anders.**

Pyogingon.

DISTRIBUTION.—Throughout India and Burma, Ceylon.

**295. Nomaphila Blume.****507. Nomaphila Parishii T. Anders.**

Minbu district.

DISTRIBUTION.—Burma, Malay Archipelago.

296. *Ruellia* Linn.508. \* *Ruellia prostrata* Lamk.

Salin.

DISTRIBUTION.—Bengal, Central and Peninsular India, Burma.

297. *Dædalacanthus* T. Anders.509. *Dædalacanthus macrophyllus* T. Anders.

Arracan Yomahs.

DISTRIBUTION.—Burma.

510. *Dædalacanthus tetragonus* T. Anders.

Arracan Yomahs.

DISTRIBUTION.—Burma.

511. \* *Dædalacanthus purpurascens* T. Anders.

Nwamadaung hills.

DISTRIBUTION.—Bengal, Central and Peninsular India, Assam, Burma.

298. *Hemigraphis* Nees.512. *Hemigraphis elegans* Nees.

Arracan Yomahs.

DISTRIBUTION.—Burma.

513. *Hemigraphis glaucescens* C. B. Clarke.

Arracan Yomahs.

DISTRIBUTION.—Burma.

299. *Strobilanthes* Blume.514. *Strobilanthes scaber* Nees.

Minbu district.

DISTRIBUTION.—Bengal, Assam, Burma.

515. *Strobilanthes phyllostachyus* Kurz.

Arracan Yomahs.

DISTRIBUTION.—Burma.

300. *Blepharis* Juss.516. *Blepharis boerhaaviæfolia* Pers.

Minbu district.

DISTRIBUTION.—Bengal, Central and Peninsular India, Ceylon, Burma, tropical Africa.

**301. Barleria Linn.****517. Barleria Prionitis Linn.**

Gwinyin. Common in the desert zone.

DISTRIBUTION.—Eastern tropics.

**518. Barleria cristata Linn.**

Arracan Yomahs.

DISTRIBUTION.—Throughout India and Burma, Malaya and China.

**519. Barleria strigosa Willd.**

Sidoktaya.

DISTRIBUTION.—Sikkim, Bengal, Assam, Burma, Malaya, generally cultivated.

**302. Neuracanthus Nees.****520. Neuracanthus tetragonostachyus Nees.**

Nwamadaung hills.

DISTRIBUTION.—Burma.

**303. Eranthemum Linn.****521. Eranthemum album Nees.**

Arracan Yomahs.

DISTRIBUTION.—Chittagong, Burma, Malay Peninsula, Andaman islands.

**304. Andrographis Wall.****522. Andrographis echioides Nees.**

Minbu district.

DISTRIBUTION.—Throughout the dry regions of India and Burma, Ceylon.

**305. Cystacanthus T. Anders.****523. Cystacanthus insignis C. B. Clarke.**

Arracan Yomahs.

DISTRIBUTION.—Burma.

**306. Lepidagathis Willd.****524. Lepidagathis dulcis Nees.**

Sidoktaya.

DISTRIBUTION.—Burma.

**525. Lepidagathis hyalina Nees.**

Arracan Yomahs.

DISTRIBUTION.—N.-W. Himalaya, Upper Gangetic plain, Bengal, Assam, Chittagong, Burma, Malaya, Ceylon, China.

**307. *Justicia* Linn.****526. *Justicia Betonica* Linn.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malaya, tropical Africa.

**527. *Justicia decussata* Roxb.**

Arracan Yomahs.

DISTRIBUTION.—Burma.

**528. \* *Justicia khasiana* C. B. Clarke.**

Arracan Yomahs.

DISTRIBUTION.—Assam, Burma.

**529. *Justicia simplex* Don.**

Nwamadaung hills.

DISTRIBUTION.—Eastern tropics.

**308. *Adhatoda* Nees.****530. *Adhatoda vasica* Nees.**

Minbu district.

DISTRIBUTION.—Tropical Asia.

**309. *Rhinacanthus* Nees.****531. *Rhinacanthus communis* Nees.**

Minbu district.

DISTRIBUTION.—Cultivated generally in the Eastern tropics.

**310. *Dicliptera* Juss.****532. *Dicliptera riparia* Nees.**

Pyogingon.

DISTRIBUTION.—Burma.

**311. *Peristrophe* Nees.****533. *Peristrophe bicalyculata* Nees.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, tropical Africa.

**LXIX.—VERBENACEÆ.****312. *Lippia* Linn.****534. *Lippia nodiflora* Rich.**

Common on river shores and alluvial meadows.

DISTRIBUTION.—Throughout the tropics and warm temperate zone.

**313. Stachytarpheta Vahl.****535. Stachytarpheta indica Vahl.**

Pyogingon.

DISTRIBUTION.—Tropical Asia and America.

**314. Priva Adans.****536. \* Priva leptostachya Juss.**

Minbu district.

DISTRIBUTION.—Peninsular India, Burma, tropical Africa.

**315. Tectona Linn. f.****537. Tectona grandis Linn. f.**

Nwamadaung hills, common.

DISTRIBUTION.—Orissa, Central and Peninsular India, Burma, Malay Peninsula and Archipelago.

**538. Tectona Hamiltoniana Wall.**

Nwamadaung hills, common.

Burm. *Dahat-pin*.

DISTRIBUTION.—Burma.

**316. Premna Linn.****539. \* Premna latifolia Roxb.**

Gwingyin, and base of Arracan Yomahs.

Burm. *Seiknan-gyi*.

DISTRIBUTION.—Bengal, Peninsular India, Burma.

**317. Gmelina Linn.****540. Gmelina arborea Linn.**

Minbu district.

DISTRIBUTION.—General throughout India, Chittagong, Burma, Malay Archipelago, Philippine islands.

**318. Vitex Linn.****541. Vitex limonifolia Wall.**

Minbu district.

DISTRIBUTION.—Burma.

**542. Vitex canescens Kurz.**

Nwamadaung hills.

DISTRIBUTION.—Assam, Burma.

543. *Vitex peduncularis* Wall. VAR. *Roxburghiana*.  
Nwamadaung hills.  
DISTRIBUTION.—Bengal, Assam, Burma.

319. *Clerodendron* Linn.

544. *Clerodendron infortunatum* Gærtn.  
Arracan Yomahs.  
DISTRIBUTION.—Throughout India and Burma, Malaya.

545. *Clerodendron Siphonanthus* Br.  
Pyogingon.  
DISTRIBUTION.—Cultivated generally throughout the tropics.

320. *Hymenopyramis* Wall.

546. *Hymenopyramis brachiata* Wall.  
Minbu district.  
DISTRIBUTION.—Burma, cultivated generally in India.

321. *Symphorema* Roxb.

547. \* *Symphorema involucratum* Roxb.  
Nwamadaung hills.  
DISTRIBUTION.—Bengal, Peninsular India, Ceylon, Burma.

322. *Congea* Roxb.

548. *Congea tomentosa* Roxb.  
Nwamadaung hills.  
DISTRIBUTION.—Assam, Chittagong, Burma, Siam.

LXX.—LABIATE.

323. *Ocimum* Linn.

549. *Ocimum canum* Sims.  
Common in the alluvial belt.  
Burm. *Pin-sein*.  
DISTRIBUTION.—Eastern tropics.
550. *Ocimum Basilicum* Linn.  
Nwamadaung hills and Mon valley.  
DISTRIBUTION.—Eastern tropics.

324. *Moschosma* Reichb.

551. *Moschosma polystachyum* Benth.  
Pyogingon.  
DISTRIBUTION.—Eastern tropics and Australia.



**325. Orthosiphon Benth.****552. Orthosiphon rubicundus Benth.**

Sidoktaya.

DISTRIBUTION.—N.-W. Himalaya, Nepal, Bengal, Peninsular India, Burma.

**553. \* Orthosiphon Parishii Prain.** (Journ. Asiat. Soc., Bengal, Vol. LIX, II, 1890.)

Sidoktaya.

DISTRIBUTION.—Burma.

**326. Plectranthus L'Herit.****554. \* Plectranthus hispidus Benth.**

Arracan Yomahs.

DISTRIBUTION.—Assam, Burma.

**327. Anisochilus Wall.****555. Anisochilus carnosus Wall.** VAR. *purpurascens Benth.*

DISTRIBUTION, of the variety.—Burma.

**328. Anisomeles Br.****556. Anisomeles candicans Benth.**

Arracan Yomahs.

DISTRIBUTION.—Burma.

**329. Colquhounia Wall.****557. Colquhounia elegans Wall.**

Arracan Yomahs.

DISTRIBUTION.—Burma.

**330. Leucas Br.****558. \* Leucas mollissima Wall.**

Salin.

DISTRIBUTION.—Throughout India and Burma, Ceylon, China.

**559. Leucas pilosa Benth.**

Salin.

DISTRIBUTION.—Burma.

**560. Leucas nutans Spreng.**

Arracan Yomahs.

DISTRIBUTION.—Throughout India and Burma.

**561. *Leucas involucrata* Benth. *L. seylanica* of F. B. I.**  
Minbu district.

DISTRIBUTION.—Assam, Chittagong, Burma, Malay Peninsula and Archipelago, Ceylon, China.

**331. *Gomphostemma* Wall.**

**562. *Gomphostemma strobilinum* Wall.**

Sidoktaya.

DISTRIBUTION.—Burma.

INCOMPLETÆ.

LXXI.—NYCTAGINEÆ.

**332. *Berhaavia* Linn.**

**563. *Berhaavia repens* Linn.**

Common throughout the district.

DISTRIBUTION.—Throughout the tropics.

**564. *Berhaavia repanda* Willd.**

Gwingyin, common.

DISTRIBUTION.—Western frontiers, Upper Gangetic plain, Bengal, Peninsular India, Burma.

LXXII.—AMARANTACEÆ.

**333. *Deeringia* Br.**

**565. *Deeringia celosioides* Br.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Malay Archipelago, China, Australia.

**334. *Celosia* Linn.**

**566. *Celosia argentea* Linn.**

Minbu district, cultivated.

DISTRIBUTION.—Throughout the tropics.

**567. *Celosia cristata* Linn.**

Minbu district, cultivated.

DISTRIBUTION.—Throughout the tropics.

**335. *Digera* Forsk.**

**568. *Digera arvensis* Forsk.**

Irawaddy bank.

DISTRIBUTION.—Eastern tropics.

336. *Amarantus* Linn.569. *Amarantus spinosus* Linn.

Irawaddy bank.

DISTRIBUTION.—Throughout the tropics.

570. *Amarantus paniculatus* Linn.

Minbu district, cultivated.

DISTRIBUTION.—Eastern tropics, cultivated or as an escape.

571. *Amarantus gangeticus* Linn.

Minbu district, cultivated.

DISTRIBUTION.—Throughout the tropics, cultivated.

572. *Amarantus viridis* Linn.

Minbu district.

DISTRIBUTION.—Throughout the tropics.

573. *Amarantus Blitum* Linn.

Irawaddy bank.

DISTRIBUTION.—Cosmopolitan.

337. *Pupalia* Juss.574. *Pupalia lappacea* Moq. VAR. *velutina*.

Minbu district.

DISTRIBUTION.—Eastern tropics.

338. *Nothosærna* Wight.575. *Nothosærna brachiata* Wight.

Salin.

DISTRIBUTION.—Throughout India and Burma, Ceylon, tropical Africa.

339. *Ærua* Forsk.576. *Ærua javanica* Juss.

Sinbok and Minbu.

Burm. *On-bwè*.

DISTRIBUTION.—Eastern tropics.

577. *Ærua scandens* Wall.

Myaung-u.

DISTRIBUTION.—Eastern tropics.

578. *Ærua Monsonia* Moq.

Arracan Yomahs.

DISTRIBUTION.—Bengal, Central and Peninsular India, Burma.

**340. Achyranthes Linn.****579. Achyranthes aspera Linn.**

Throughout the district.

DISTRIBUTION.—Throughout the tropics.

**341. Alternanthera Forsk.****580. Alternanthera sessilis Br.**

Irawaddy bank.

DISTRIBUTION.—Throughout the tropics.

**342. Gomphrena Linn.****581. Gomphrena globosa Linn.**

Arracan Yomahs, cultivated by the Chins.

DISTRIBUTION.—Cosmopolitan.

**LXXIII.—CHENOPODIACEÆ.****343. Chenopodium Linn.****582. Chenopodium album Linn.**

Irawaddy bank.

Burm. *Myu.*

DISTRIBUTION.—Cosmopolitan.

**LXXIV.—POLYGONACEÆ.****344. Polygonum Linn.****583. Polygonum plebejum Br.**

Common throughout the district.

DISTRIBUTION.—Eastern tropics.

**584. Polygonum tomentosum Willd.**

Minbu district.

DISTRIBUTION.—Bengal, Central and Peninsular India, Assam, Burma, Malay Peninsula, Andaman islands, tropical Africa.

**585. Polygonum limbatum Meisn.**

Paunglin lake shore.

DISTRIBUTION.—Upper Gangetic Plain, Bengal, Central and Peninsular India, Burma, tropical Africa.

**586. Polygonum glabrum Willd.**

Irawaddy bank.

DISTRIBUTION.—Throughout the tropics.

**587. *Polygonum lapathifolium* Linn.**

Minbu district.

DISTRIBUTION.—Cosmopolitan.

**588. *Polygonum stagninum* Ham.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, China.

**589. *Polygonum barbatum* Linn.**

Mon valley.

DISTRIBUTION.—Throughout India and Burma, China, Malay Peninsula and Archipelago, Australia, Africa.

**590. *Polygonum chinense* Linn. VAR. *ovalifolia*.**

Arracan Yomahs.

DISTRIBUTION.—Throughout India and Burma, Malay Peninsula.

**345. *Rumex* Linn.****591. *Rumex maritimus* Linn.**

Irawaddy bank, common.

DISTRIBUTION.—Cosmopolitan.

**592. *Rumex dentatus* Linn.**

Irawaddy bank.

DISTRIBUTION.—Throughout India and Burma.

**LXXV.—ARISTOLOCHIACEÆ.****346. *Aristolochia* Linn.****593. *Aristolochia indica* Linn.**

Sinbok.

Burm. *Eikthaya-moolee*.

DISTRIBUTION.—Throughout India, Burma, and Ceylon.

**594. *Aristolochia Tagala* Cham. & Schlecht. *A. Roxburghiana* of F.B.I.**

Minbu district.

DISTRIBUTION.—Sikkim, Bengal, Assam, Chittagong, Burma, Central and Peninsular India, Ceylon, Malay Peninsula and Archipelago.

**LXXVI.—PIPERACEÆ.****347. *Piper* Linn.****595. *Piper Betle* Linn.**

Mon valley, cultivated.

DISTRIBUTION.—Cultivated in the hotter regions of India, Burma, Ceylon, and Malay Archipelago.

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## LXXVII.—LAURACEÆ

348. *Cinnamomum* DC.596. \* *Cinnamomum Tamala* Nees.

Arracan Yomahs.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Bengal, Assam, Burma.

597. *Cinnamomum obtusifolium* Nees.

Arracan Yomahs.

DISTRIBUTION.—Central and Eastern Himalayas, Assam, Chittagong, Burma, Andaman islands.

## LXXVIII.—LORANTHACEÆ.

349. *Loranthus* Linn.598. *Loranthus pentapetalus* Roxb.

Arracan Yomahs.

DISTRIBUTION.—Central and Eastern Himalayas, Assam, Chittagong, Burma, Malay Peninsula and Archipelago, China.

599. *Loranthus Scurrula* Linn.

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula.

600. *Loranthus pulverulentus* Wall.Gwingyin. Parasitic upon *Holoptelea integrifolia* Planch.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Bengal, Assam, Burma, Central and Peninsular India.

350. *Viscum* Linn.601. *Viscum orientale* Willd.Gwingyin. Parasitic upon *Acacia leucophloea*,  
Burm. Kyibaung.

DISTRIBUTION.—Bengal, Chittagong, Burma, Central and Peninsular India, Ceylon, Malay Peninsula and Archipelago, Australia, China.

602. *Viscum articulatum* Burm.

Arracan Yomahs.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula and Archipelago.

## LXXIX.—EUPHORBIACEÆ.

351. *Euphorbia* Linn.603. *Euphorbia cristata* Heyne.

Sidoktaya.

DISTRIBUTION.—Bengal, Central and Peninsular India, Burma, Ceylon.

604. *Euphorbia hypericifolia* Linn.

Pyogingon.

DISTRIBUTION.—Throughout the tropics.

605. *Euphorbia pilulifera* Linn.

Minbu district.

DISTRIBUTION.—Throughout the tropics.

606. *Euphorbia thymifolia* Burm.

Minbu district.

DISTRIBUTION.—Throughout the tropics.

607. \* *Euphorbia granulata* Forsk.

Sidoktaya and Legain.

DISTRIBUTION.—Western Asia, Afghanistan, Western Frontier, Punjab, Upper Burma, N. Africa.

608. *Euphorbia antiquorum* Linn.

Common in the desert zone.

Burm. *Tsinganeik-tayung*.

DISTRIBUTION.—Throughout India, Burma, and Ceylon in the hotter parts.

352. *Bridella* Willd.609. *Bridella retusa* Spreng.

Sidoktaya.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula.

610. *Bridella burmanica* Hook. & G.

Arracan Yomahs.

DISTRIBUTION.—Burma.

611. *Bridella stipularis* Bk.

Minbu district.

DISTRIBUTION.—Eastern tropics.

353. *Phyllanthus* Linn.612. *Phyllanthus reticulatus* Poir.

Minbu district.

DISTRIBUTION.—Eastern tropics.

**613. *Phyllanthus albizzioides* Hook. f.**

Sidoktaya.

DISTRIBUTION.—Burma.

**614. *Phyllanthus columnaris* Muell.-Arg.**

Arracan Yomahs.

DISTRIBUTION.—Burma.

**615. *Phyllanthus simplex* Retz.**

Alluvial belt and irrigated areas.

DISTRIBUTION.—Eastern tropics.

**616. *Phyllanthus distichus* Muell.-Arg.**

Sinbok.

DISTRIBUTION.—Throughout India and Burma, Malay Archipelago, Madagascar.

**354. *Flueggia* Willd.****617. *Flueggia microcarpa* Bl.**

Minbu distric .

DISTRIBUTION.—Eastern tropics.

**355. *Putranjiva* Wall.****618. *Putranjiva Roxburghii* Wall.**

Arracan Yomahs.

DISTRIBUTION —Throughout India, Burma and Ceylon.

**356. *Aporosa* Bl.****619. *Aporosa oblonga* Muell.-Arg.**

Arracan Yomahs.

DISTRIBUTION.—Burma.

**357. *Antidesma* Linn.****620. *Antidesma diandrum* Roth.**

Arracan Yomahs.

DISTRIBUTION.—Throughout India and Burma, Ceylon.

**358. *Baccaurea* Lour.****21. *Baccaurea sapida* Muell.-Arg.**

Arracan Yomahs.

DISTRIBUTION.—Eastern Himalaya, Bengal, Assam, Burma, Malay Peninsula and Archipelago, Andaman islands.



**350. *Jatropha* Linn.**

**322. *Jatropha gossypifolia* Linn.**

Common throughout the district.

DISTRIBUTION.—Bengal, Assam, Burma, Malay Peninsula, Peninsular India. Indigenous to Brazil.

**323. *Jatropha Curcas* Linn.**

Minbu district.

DISTRIBUTION.—Throughout the tropics.

**360. *Croton* Linn.**

**324. *Croton oblongifolius* Roxb.**

Alluvial belt and irrigated areas.

Burm. *Thetyin-gyi*.

DISTRIBUTION.—Bengal, Central and Peninsular India, Assam, Burma, Ceylon.

**361. *Chrozophora* Neck.**

**325. *Chrozophora plicata* A. Juss.**

Common in the alluvial belt.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Western Asia, S. Europe, N. Africa.

**362. *Cœlodiscus* Baill.**

**326. *Cœlodiscus lappaceus* Kurz.**

Salin.

DISTRIBUTION.—Burma.

**363. *Mallotus* Lour.**

**327. *Mallotus philippinensis* Muell.-Arg.**

Minbu district.

DISTRIBUTION.—Throughout India, Ceylon, and Burma, China, Malay Peninsula and Archipelago, Australia.

**364. *Homonoia* Lour.**

**328. *Homonoia riparia* Lour.**

Nwamadaung hills.

DISTRIBUTION.—Eastern Himalaya, Bengal, Central and Peninsular India, Ceylon, Assam, Burma, Andaman islands.

**365. *Ricinus* Linn.**

**329. *Ricinus communis* Linn.**

Minbu district.

DISTRIBUTION.—Throughout the tropics.

366. *Baliospermum* Bl.

630. *Baliospermum axillare* Bl.

Nwamadaung hills.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Bengal Central and Peninsular India, Assam, Chittagong, Burma, Malay Peninsula and Archipelago.

367. *Sebastiania* Spreng.

631. *Sebastiania Chamœlea* Muell.-Arg.

Minbu district.

DISTRIBUTION.—Bengal, Central and Peninsular India, Ceylon, Burma, China, Malay Peninsula and Archipelago, Australia, Africa.

LXXX.—URTICACEÆ.

368. *Holoptelea* Planch.

632. *Holoptelea integrifolia* Planch.

Nwamadaung hills.

DISTRIBUTION.—N.-W. Himalaya, Upper Gangetic plain, Bengal, Central and Peninsular India, Ceylon, Burma, Cochin China.

369. *Streblus* Lour.

633. *Streblus asper* Lour.

Pyogingon.

Burm. *On-hnd-bin*.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula and Archipelago, Siam, China.

370. *Ficus* Linn.

634. *Ficus bengalensis* Linn.

Commonly planted in the alluvial belt.

DISTRIBUTION.—Throughout India and Burma.

635. *Ficus Rumphii* Bl.

Salin.

DISTRIBUTION.—Throughout India and Burma, Malay Peninsula and Archipelago.

636. *Ficus religiosa* Linn.

Commonly planted in the alluvial belt.

DISTRIBUTION.—Throughout India and Burma, Ceylon; planted mostly.

**637. Ficus Cunia** Ham.

Arracan Yomahs.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Bengal, Central India, Assam, Chittagong, Burma.

**638. Ficus glomerata** Roxb.

Arracan Yomahs.

Burm. *Thapan-thee*.

DISTRIBUTION.—Throughout India, Burma and Ceylon.

**371. Artocarpus** Forst.**639. Artocarpus integrifolia**.

Commonly cultivated in the alluvial belt.

DISTRIBUTION.—Planted generally in Eastern Asia.

**372. Boehmeria** Jacq.**640. Boehmeria malabarica** Wedd.

Sidoktaya.

DISTRIBUTION.—Sikkim, Assam, Chittagong, Burma, Peninsula India, Ceylon, Malay Archipelago.

**373. Pouzolzia** Gaud.**641. Pouzolzia indica** Gaud. VAR. *angustifolia*.

Minbu district.

DISTRIBUTION.—Throughout India, Burma, and Ceylon, Malay Peninsula and Archipelago, China.

**374. Sarcochlamys** Gaud.**642. Sarcochlamys pulcherrima** Gaud.

Nwamadaung hills.

DISTRIBUTION.—Bengal, Assam, Burma, Malay Archipelago.

**LXXXI.—JUGLANDACEÆ.****375. Engelhardtia** Leschen.**643. Engelhardtia Colebrookiana** Lindl.

Arracan Yomahs

DISTRIBUTION.—Western and Central Himalayas, Assam, Burma, China.

**LXXXII.—CUPULIFERÆ.**376. *Quercus* Linn.644. *Quercus Lindleyana* Wall.

Arracan Yomahs.

DISTRIBUTION.—Burma.

645. \* *Quercus dealbata* Hook. f. & Thoms.

Arracan Yomahs,

DISTRIBUTION.—Bhutan, Assam, Burma.

377. *Castanopsis* Spach.646. *Castanopsis tribuloides* A. DC. VAR. *ferox*.

Arracan Yomahs.

DISTRIBUTION.—Eastern Himalaya, Assam, Chittagong, Burma.

**LXXXIII.—CERATOPHYLLÆ.**378. *Ceratophyllum* Linn.647. *Ceratophyllum demersum* Linn.

Salin lake.

DISTRIBUTION.—Throughout temperate and tropical countries.

**MONOCOTYLEDONES.****LXXXIV.—HYDROCHARIDACEÆ.**379. *Hydrilla* Richard.648. *Hydrilla verticillata* Casp.

Paunglin lake.

DISTRIBUTION.—Central Europe and Eastern tropics.

380. *Vallisneria* Linn.649. *Vallisneria spiralis* Linn.

Paunglin lake.

DISTRIBUTION.—Throughout the tropics.

381. *Boottia* Wall.650. *Boottia cordata* Wall.

Paunglin lake.

DISTRIBUTION.—Burma.

## LXXXV.—ORCHIDACEÆ.

382. *Dendrobium Swartz.*651. *Dendrobium ciliatum* Parish.

Arracan Yomahs.

DISTRIBUTION.—Burma.

652. *Dendrobium chrysotoxum* Lindl.

Arracan Yomahs.

DISTRIBUTION.—Burma.

383. *Pholidota* Lindl.653. \* *Pholidota articulata* Lindl.

Arracan Yomahs.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Assam, Burma.

384. *Calanthe* Br.654. \* *Calanthe puberula* Lindl.

Minbu district.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Assam, Burma.

385. *Zeuxine* Lindl.655. *Zeuxine sulcata* Lindl.

Minbu district.

DISTRIBUTION.—Eastern tropics.

386. *Habenaria* Willd.656. *Habenaria yomensis* n. sp.

Plant about 30 cm. high, leaves three, radical, sessile, membranous, glabrous, broadly ovate, acute, about 9.5 cm. long and about 6.8 cm. broad. Scape slender, with somewhat distant, adpressed, narrowly lanceolate bracts about 1.5 cm. long. Raceme about 11 cm. long, 10-12-flowered. Ovary about 1.8 cm. long, twice as long as its bract, dorsal sepal cucullate, 5-nerved, acute, 6 mm. long, lateral sepals lanceolate, acute, 3-nerved, 7 mm. long and 3 mm. broad. Petals linear, longer than the lateral sepals, 1-nerved. Lip trifid, central segment linear, 1.2 cm. long, lateral segments falcate, 4-nerved, broader and about twice as long as the central segment. Spur curved, twice as long as the ovary. Tubes of anther cells short.

Sidoktaya, Arracan Yomahs, *Shaik Mokim*!

This species appears to come nearest *Habenaria diphylla* Dalz., of the section *Trimeroglossa*. It is readily distinguished from the latter, however, by its much larger size and lesser pubescence and by the spur being much larger than the ovary.

657. *Habenaria constricta* Hook. f.

Arracan Yomahs.

DISTRIBUTION.—Eastern Himalaya, Assam, Burma.

### LXXXVI.—SCITAMINEÆ.

657. *Curcuma* Linn.

658. *Curcuma sessilis* n. sp.

Root-stock large, tubers vertical, ovoid, brown externally, white internally, 5-7.5 cm. long, and about 2.5 cm. thick, rootlets white, as thick as a goose-quill. Leafy tuft few-leaved, less than 60 cm. high, basal leaf-sheaths purple, petiole and sheath together about 15-17.5 cm. long, lamina green, narrowly lanceolate, 17.5-20 cm. long, 2.8-3.8 cm. broad, pubescent on both surfaces. Spike axillary, appearing in June, developed just before the leaves, sessile, about 11.8 cm. long, lower bracts green, those of the coma purple. Flowers smaller than the bracts, calyx very short, obscurely toothed, corolla tube about 2.5 cm. long, white, segments sub-equal, ovate, acute, with margins incurved towards the apex, posterior segment tipped with red. Lateral staminodes oblong, apex incurved, faintly yellow, lip 1.2 cm. broad, oblong, lateral lobes large, faintly yellow, central lobe projecting, retuse or bifid, bright yellow.

Minbu district, *Shaik Mokim*!

The writer would incline to place this species near *Curcuma cæsia* or *C. æruginosa*, from either of which it is distinguished by its much smaller size and practically sessile spike.

659. *Curcuma plicata* Wall.

Nwamadawng hills.

DISTRIBUTION.—Burma.

This plant in the living state is very like the drawings of *Curcuma plicata* in the Calcutta Herbarium, but differs from Wallich's specimens in having glabrous instead of pubescent bracts.

660. *Curcuma parvula* n. sp.

Rootstock small, ovoid, with a few thick white downward directed branches ending in small oval tubers about 2 cm. long and 1.2 cm. thick. Plant dwarf, not much over 20 cm. high. Leaves 5-8 in a

tuft, leaf-sheaths 2.5-4.5 cm. long, equitant, petiole 1.2-1.8 cm. long, lamina narrowly lanceolate, acuminate, tapering gradually into the petiole, glabrous on both surfaces, dark green above, lighter below, 6.5-16.5 cm. long, 1.2-1.8 cm. broad. Spike appearing between the leaves, very shortly peduncled, few-flowered, bracts green, about 1.8 cm. long, those of the coma tinged with pink. Flower 2.8 cm. long, corolla-tube 1.8 cm. long. Calyx white, pubescent, reaching half way up the corolla tube, with 3 small rounded teeth. Lateral corolla segments sub-equal, white translucent, broadly ovate, posterior segment larger and hooded. Lateral stamens oblong yellow, lip yellow, broadly oblong, obscurely three-lobed, lateral lobes feebly developed, central lobe projecting, retuse, anther oblong with inferior incurved horns, stigma spatulate. Flowered in Royal Botanical Garden, Calcutta, in July 1903.

Minbu district, *Shaik Mokim!*

This species would appear to come after *C. plicata*.

### 388. *Zingiber Adams.*

#### 661. *Zingiber Casumunar* Roxb.

Arracan Yomahs.

DISTRIBUTION.—Tropical Asia.

### 389. *Phrynium Willd.*

#### 662. \* *Phrynium parviflorum* Roxb.

Arracan Yomahs.

DISTRIBUTION.—Eastern Himalaya, Assam, Burma, Andaman islands, Peninsular India, Malay Peninsula and Archipelago.

## LXXXVII.—HEMODOACEÆ.

### 390. *Sansevieria Thunb.*

#### 663. *Sansevieria Roxburghiana* Schult. f.

Pyogingon.

DISTRIBUTION.—Peninsular India, Ceylon, Burma.

## LXXXVIII.—DIOSCOREACEÆ.

### 391. *Dioscorea* Linn.

#### 664. *Dioscorea dæmona* Roxb.

Nwamadaung hills.

DISTRIBUTION.—Throughout India and Burma, Malay Peninsula and Archipelago, China.

665. *Dioscorea pentaphylla* Linn.  
Nwamadaung hills.  
DISTRIBUTION.—Eastern tropics.
666. *Dioscorea decipiens* Hook. f.  
Sidoktaya.  
DISTRIBUTION.—Burma.
667. *Dioscorea glabra* Roxb.  
Minbu district.  
DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Bengal, Peninsular India, Burma.
668. *Dioscorea sativa* Linn.  
Minbu district.  
DISTRIBUTION.
669. *Dioscorea alata* Linn.  
Arracan Yomahs and Nwamadaung hills.  
DISTRIBUTION.—Tropical India and Burma.
670. *Dioscorea bulbifera* Linn.  
Minbu district.  
DISTRIBUTION.

## LXXXIX.—ROXBURGHIAEÆ.

392. *Stemona* Lour.

671. *Stemona Griffithiana* Kurz.  
DISTRIBUTION.—Burma.

## XC.—LILIACEÆ.

393. *Chlorophytum* Ker.

672. \* *Chlorophytum orchidastrum* Lindl.  
Sidoktaya.  
DISTRIBUTION.—Peninsular India, Burma, China, tropical Africa.
673. \* *Chlorophytum laxum* Br.  
Minbu district.  
DISTRIBUTION.—Peninsular India, Ceylon, Burma, China, Malay Archipelago, Australia, tropical Africa.

394. *Gloriosa* Linn.

674. *Gloriosa superba* Linn.  
Common in the desert zone.  
DISTRIBUTION.—Eastern tropics.



**XCI.—PONTEDERIACEÆ.****395. Monochoria Presl.****675. Monochoria hastæfolia Presl.**

Salin lake.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Archipelago, China.

**XCII.—COMMELINACEÆ.****396. Commelina Linn.****676. \* Commelina salicifolia Roxb.**

Mon valley near Sidoktaya.

DISTRIBUTION.—Bengal, Peninsular India, Assam, Burma, Malay Archipelago, Hong Kong.

**397. Cyanotis Don.****677. \* Cyanotis papilionacea Schultes f.**

Sidoktaya.

DISTRIBUTION.—Peninsular India, Burma.

**678. Cyanotis cristata Schultes f.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula and Archipelago, tropical Africa.

**XCIII.—PALMACEÆ****398. Phoenix Linn.****679. Phoenix humilis Royle. VAR. Loureiri Becc.**

Gwingyin.

DISTRIBUTION, of the variety.—Assam, Burma, Cochin-China.

**399. Corypha Linn.****680. Corypha (? umbraculifera Linn.)**

A young tree planted near a pagoda at Pyogingon.

DISTRIBUTION.—Peninsular India and Ceylon.

**400. Borassus Linn.****681. Borassus flabellifer Linn.**

Common in the alluvial belt.

DISTRIBUTION.—Cultivated throughout India, Burma and Ceylon, Malay Peninsula and Archipelago, tropical Africa.

**401. Cocos Linn.****682. Cocos nucifera Linn.**

Common in the alluvial belt.

DISTRIBUTION.—Throughout the tropics, cultivate f.

**XCIV.—PANDANACEÆ****402. Pandanus Linn. f.****683. Pandanus fascicularis Lamk.**

Salin.

DISTRIBUTION.—Throughout India and Burma, Malay Archipelago, Polynesia, Mauritius, China.

**XCV.—TPHACEÆ****403. Typha Linn.****684. Typha elephantina Roxb.**

Salin lake.

DISTRIBUTION.—Throughout India and Burma, N. Africa.

**XCVI.—ARACEÆ****404. Pistia Linn.****685. Pistia Stratiotes Linn.**

Paunglin and Salin lakes.

DISTRIBUTION.—Throughout the tropics.

**405. Typhonium Schott.****686. Typhonium trilobatum Schott.**

Mon valley.

DISTRIBUTION:—Bengal, Peninsular India, Ceylon, Burma, Malay Peninsula and Archipelago, Siam.

**687. Typhonium pedatisectum n. sp.**

Plant about 42 cm. high or less. Petiole 21-32.5 cm. long, bright green, lamina bright green, palmate in outline, pedatisect almost to the petiole into 7-11 linear segments, the central one 11-18 cm. long and about 1-2 cm. broad, the lateral successively shorter and narrower to the most posterior segment about 3.8 cm. long and .5 cm. broad, segments at first spreading straight, at length curving backwards. Peduncle 6 cm. long or shorter or spathe sessile. Spathe 18-20 cm. long, and 4-5 cm. broad, limb broadly ovate open, narrowed into a long at length twisted point, bright green externally,

tinged with purple at the base, at first dark blue-green internally, a length a veined or uniform purple. Spadix reaching to about the base of the twisted point, neuter numerous about as many as the female flowers, about 6 mm. long, faintly yellow, subulate recurved sparsely setulosely hairy, spadix between the neuter and male flowers pink or red and 1.5-2 cm. long, male portion of spadix a little shorter. Appendix shortly stalked, slender, dark purple almost black, base lobulated, about 1 or 6 cm. long.

Minbu district, *Shaik Mokim!*

A singular looking plant apparently resembling *T. pedatum* in foliage, but differing in spathe and spadix, according to the description of *T. pedatum* which is all the writer has to guide him, there being no specimen of *T. pedatum* in the Calcutta Herbarium.

#### 406. *Alocasia* Schott.

#### 688. *Alocasia decipiens* Schott.

Arracan Yomahs.

DISTRIBUTION.—Burma.

### XCVII.—LEMNACEÆ.

#### 497. *Lemna* Linn.

#### 689. *Lemna polyrhiza* Linn.

Salin lake.

DISTRIBUTION.—Temperate zones and tropics.

#### 408. *Wolffia* Horkel!

#### 690. *Wolffia arrhiza* Wimm.

Salin lake.

DISTRIBUTION.—Cosmopolitan.

### XCVIII.—ALISMACEÆ.

#### 409.\* *Limnophyton* Miq.

#### 691. \* *Limnophyton obtusifolium* Miq.

Salin lake.

DISTRIBUTION.—Peninsular India, Ceylon, Burma, tropical Africa.

### XCIX.—NAIADACEÆ.

#### 410. *Potamogeton* Linn.

#### 692. *Potamogeton indicus* Roxb.

Paunglin lake.

DISTRIBUTION.—Throughout India, Ceylon and Burma, Malay Archipelago.

**693. *Potamogeton crispus* Linn.**

Irawaddy river.

DISTRIBUTION.—Throughout the temperate and sub-tropical zones.

**C.—CYPERACEÆ.****411. *Pycurus* Beauv.****694. *Pycurus nitens* Nees.**

Minbu district.

DISTRIBUTION.—Eastern tropics.

**412. *Juncellus* Kunth.****695. *Juncellus alopecuroides* C. B. Clarke.**

Salin lake margin.

DISTRIBUTION.—Eastern tropics.

**696. *Juncellus pygmaeus* C. B. Clarke.**

Irawaddy bank.

DISTRIBUTION.—Throughout the tropics.

**413. *Cyperus* Linn.****697. *Cyperus platystylis* R. Br.**

Salin lake.

DISTRIBUTION.—Bengal, Peninsular India, Ceylon, Burma, Malay Peninsula and Archipelago, Australia.

**698. *Cyperus difformis* Linn.**

Sidoktaya.

DISTRIBUTION.—Eastern tropics.

**699. *Cyperus Iria* Linn.**

Minbu district.

DISTRIBUTION.—Eastern tropics.

**700. *Cyperus articulatus* Linn.**

Mon valley.

DISTRIBUTION.—Throughout the tropics.

**701. *Cyperus corymbosus* Rottb.**

Legain.

DISTRIBUTION.—Tropics generally.

**702. *Cyperus rotundus* Linn.**

Minbu district.

DISTRIBUTION.—Throughout the tropics.

**703. *Cyperus radiatus* Vahl.**

Salin lake.

DISTRIBUTION.—Throughout the tropics.

**704. *Cyperus digitatus* Roxb.**

Irawaddy bank.

DISTRIBUTION.—Throughout the tropics.

**414. *Mariscus* Vahl.****705. *Mariscus microcephalus* Presl.**

Minbu district.

DISTRIBUTION.—Throughout India, Burma and Ceylon, China, Malay Peninsula and Archipelago, Mauritius.

**415. *Eleocharis* R. Br.****706. *Eleocharis capitata* Br.**

Salin lake.

DISTRIBUTION.—Tropics generally.

**416. *Fimbristylis* Vahl.****707. *Fimbristylis dipsacea* Benth.**

Irawaddy bank.

DISTRIBUTION.—Eastern tropics.

**708. *Fimbristylis dichotoma* Vahl.**

Mon valley.

DISTRIBUTION.—Eastern tropics.

**709. *Fimbristylis quinqueangularis* Kunth.**

Mon valley near Sidoktaya.

DISTRIBUTION.—Throughout India, Burma, Ceylon, China, Malay Peninsula and Archipelago, Australia, Mauritius.

**710. *Fimbristylis miliacea* Vahl.**

Minbu district.

DISTRIBUTION.—Throughout the tropics.

**417. *Bulbostylis* Kunth.****711. *Bulbostylis barbata* Kunth.**

Minbu district.

DISTRIBUTION.—Throughout the tropics.

418. *Scirpus* Linn.712. *Scirpus articulatus* Linn.

Paunglin lake shore.

DISTRIBUTION.—Eastern tropics.

713. *Scirpus Michelianus* Linn.

Irawaddy bank.

DISTRIBUTION.—Eastern tropics and warm temperate zone.

419. *Carex* Linn.714. \* *Carex baccans* Nees.

Arracan Yomahs.

DISTRIBUTION.—Eastern Himalaya, Assam, Burma, Peainular India, Ceylon, Malay Archipelago, China, Philippine islands.

## CL.—GRAMINEÆ

420. *Paspalum* Linn.715. *Paspalum sanguinale* Lamk. VAR. *extensa*.

Minbu district.

DISTRIBUTION.—Throughout the tropics.

716. *Paspalum longiflorum* Retz.

Minbu district.

DISTRIBUTION.—Eastern tropics and subtropics.

717. *Paspalum pedicellare* Trin.

Sagu.

DISTRIBUTION.—Throughout Upper India and Burma, Nilgiris.

421. *Panicum* Linn.718. *Panicum flavidum* Retz.

Minbu district.

DISTRIBUTION.—Eastern tropics.

719. *Panicum Crus-gaHi* Linn.

Salin.

DISTRIBUTION.—Throughout the tropics.

720. *Panicum colonum* Linn.

Irawaddy bank.

DISTRIBUTION.—Throughout the tropics.

721. *Panicum prostratum* Lamk.

Irawaddy bank.

DISTRIBUTION.—Throughout the tropics.

**722. \* *Panicum setigerum* Retz.**

Arracan Yomahs.

DISTRIBUTION.—Bengal, Peninsular India, Ceylon, Burma.

**723. *Panicum miliaceum* Linn.**

Irawaddy bank, cultivated.

Burm. *Lu*.

DISTRIBUTION.—Throughout the tropics, naturalised or cultivated.

**724. *Panicum millare* Lamk.**

Sagu.

DISTRIBUTION.—Throughout the tropics, cultivated.

**725. *Panicum repens* Linn.**

Salin lake.

DISTRIBUTION.—Tropics and subtropics.

**726. *Panicum proliferum* Lamk.**

Alluvial belt, cultivated.

DISTRIBUTION.—Generally throughout the tropics.

**727. *Panicum sarmentosum* Roxb.**

Arracan Yomahs.

DISTRIBUTION.—Bengal, Assam, Chittagoong, Burma, Malay Peninsula and A chipelago, China.

**422. *Thysanolaena* Nees.****728. *Thysanolaena Agrostis* Nees.**

Arracan Yomahs.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Bengal, Central India, Assam, Burma, Nicobar islands, Malay Peninsula and Archipelago.

**423. *Axonopus* Beauv.****729. *Axonopus cimicinus* Beauv.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Peninsula and Archipelago, China.

**424. *Arundinella* Raddi.****730. \* *Arundinella setosa* Trin.**

Minbu district.

DISTRIBUTION.—N.-W. and Central Himalayas, Bengal, Assam, Burma, Central and Peninsular India, Ceylon, China, Philippine islands.

**425. *Setaria* Beauv.****731. *Setaria italica* Beauv.**

Gwinyin, cultivated.

Burm. *Sat.*

DISTRIBUTION.—Throughout temperate and tropical countries.

**732. *Setaria verticillata* Beauv.**

Paunglin.

DISTRIBUTION.—Throughout the tropics and in the temperate zone.

**426. *Pennisetum* Pers.****733. *Pennisetum typhoideum* Rich.**

Minbu district.

DISTRIBUTION.—Throughout India and Burma, Africa and Southern Europe.

**427. *Oryza* Linn.****734. *Oryza sativa* Linn.**

Minbu district, cultivated.

DISTRIBUTION.—Cultivated throughout the tropics.

**428. *Tragus* Hooker.****735. *Tragus racemosus* Scop.**

Minbu district.

DISTRIBUTION.—Throughout the tropics.

**429. *Perotis* Ait.****736. *Perotis latifolia* Ait.**

Minbu district.

DISTRIBUTION.—Eastern tropics.

**430. *Polytoca* Br.****737. *Polytoca bracteata* Br.**

Paunglin.

DISTRIBUTION.—Sikkim, Assam, Burma, Tonkin.

**738. *Polytoca Wallichiana* Benth.**

Sidoktaya.

DISTRIBUTION.—Burma.



**431. Zea Linn.****739. Zea Mays Linn.**

Alluvial belt, cultivated.

DISTRIBUTION.—Cultivated generally in the tropics.

**432. Imperata Cyrill.****740. Imperata arundinacea Cyrill.**

Alluvial belt, the common savannah grass.

DISTRIBUTION.—Throughout the tropics.

**741. Imperata exaltata Brongn.**

Irawaddy bank.

DISTRIBUTION.—Burma, Malay Peninsula and Archipelago, tropical America.

**433. Pollinia Trin.****742. Pollinia quadrinervis Hack.**

Arracan Yomahs.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Assam, Burma, China.

**743. Pollinia eucnemis Nees.**

Arracan Yomahs.

DISTRIBUTION.—Burma, Malay Archipelago.

**744. \* Pollinia grata Hack.**

Arracan Yomahs.

DISTRIBUTION.—Sikkim, Assam, Burma, China, Malay Archipelago.

**434. Saccharum Linn.****745. Saccharum spontaneum Linn.**

Arracan Yomahs.

DISTRIBUTION.—Southern Europe, Eastern tropics and Australia.

**746. Saccharum fuscum Roxb.**

Sinbok.

DISTRIBUTION.—Upper Gangetic plain, Bengal, Peninsular India, Assam, Burma.

**435. Erianthus Michx.****747. \* Erianthus longisetosus Anderss.**

Arracan Yomahs.

DISTRIBUTION.—Central and Eastern Himalayas, Assam, Chittagong, Burma.

**748. Erianthus Hookeri Hack.**

Arracan Yomahs.

DISTRIBUTION.—Sikkim, Burma, Yunnan.

**436. Ischæmum Linn.****749. Ischæmum rugosum Salisb.**

Sagu.

DISTRIBUTION.—Throughout India, and Ceylon, Burma, Malay Peninsula and Archipelago, Andaman islands, China.

**750. Ischæmum laxum Br.**

Sidoktaya.

DISTRIBUTION.—Eastern tropics.

**437. Eremochloa Buse.****751.\* Eremochloa muricata Hack.**

Legain.

DISTRIBUTION.—Peninsular India, Ceylon, Burma, Australia.

**438. Pogonatherum Beauv.****752. Pogonatherum crinitum Trin.**

Nwamadaung hills.

DISTRIBUTION.—Afghanistan, India and Burma, China, Malay Peninsula and Archipelago, Polynesia.

**439. Arthraxon Beauv.****753. Arthraxon ciliaris Beauv.**

Arracan Yomahs.

DISTRIBUTION.—Throughout the hilly region of India, Burma and Ceylon.

**440. Rottboellia Linn. f.****754. Rottboellia exaltata Linn. f.**

Minbu district.

DISTRIBUTION.—Eastern tropics.

**441. Manisuris Sw.****755. Manisuris granularis Linn. f.**

Sidokktaya.

DISTRIBUTION.—Generally throughout the tropics.

442. *Andropogon Lian.*756. *Andropogon brevifolius* Sw.

Arracan Yomahs.

DISTRIBUTION.—Generally throughout the tropics.

757.\* *Andropogon foveolatus* Del.

Minbu district.

DISTRIBUTION.—Upper Gangetic plain, Bengal, Central and Peninsular India, Burma, Western Asia.

758. *Andropogon fascicularis* Roxb.

Arracan Yomahs.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Bengal, Central India, Assam, Burma, Tonkin.

759. *Andropogon assimilis* Steud.

Arracan Yomahs.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Rajputana, Bengal, Central and Peninsular India, Assam, Burma, Malay Archipelago, China, Japan.

760. *Andropogon halepensis* Brot.

Gwingyin.

DISTRIBUTION.—Throughout the tropics.

761. *Andropogon Sorghum* Brot.

Salin and Gwingyin.

DISTRIBUTION.—Cultivated throughout the tropics.

762. *Andropogon serratus* Thunb.

Minbu district.

DISTRIBUTION.—Tropics of Asia and Australia.

763. *Andropogon squarrosus* Linn. f.

Irawaddy bank.

DISTRIBUTION.—Throughout India, Ceylon, Burma, Malay Archipelago, Tropical Africa.

764. *Andropogon caricosus* Linn.

Sagu.

DISTRIBUTION.—Scinde, Central and Peninsular India, Bengal, Burma, Andaman islands, Ceylon, China, Mauritius.

765. *Andropogon annulatus* Forsk.

Irawaddy bank.

DISTRIBUTION.—Throughout India and Burma, China, tropical Africa and Australia.

**766. *Andropogon contortus* Linn.**

Minbu district.

DISTRIBUTION.—Throughout the tropics.

**767. *Andropogon Schoenanthus* Linn.**

Nwamadaung hills.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Western Asia, tropical Africa.

VAR. *clandestina*.

Minbu district.

DISTRIBUTION.—Burma.

**443. *Anthistiria* Linn.****768. *Anthistiria imberbis* Retz.**

Sagu and Sidoktaya.

DISTRIBUTION.—Eastern tropics.

**444. *Iseilema* Hack.****769. \* *Iseilema laxum* Hack.**

Legain.

DISTRIBUTION.—Bengal, Peninsular India, Burma.

**445. *Aristida* Linn.****770. *Aristida Adscensionis* Linn.**

Gwingyin.

DISTRIBUTION.—Throughout the tropics.

**771. \* *Aristida funiculata* Trin. & Rupr.**

Minbu district.

DISTRIBUTION.—Burma, Bengal, Peninsular and Western India, Western Asia to tropical Africa.

**446. *Sporobolus* Br.****772. *Sporobolus tremulus* Kunth.**

Paunglin lake.

DISTRIBUTION.—Throughout India and Burma, Tonkin.

**773. *Sporobolus coromandellianus* Kunth.**

Minbu district.

DISTRIBUTION.—Throughout India, Burma and Ceylon, Afghanistan, tropical Africa.

447. *Cynodon* Pers.774. *Cynodon dactylon* Pers.

Irawaddy bank.

DISTRIBUTION.—Throughout the tropics.

448. *Chloris* Sw.775. *Chloris barbata* Sw.

Minbu district.

DISTRIBUTION.—Throughout the tropics.

449. *Eleusine* Gærtn.776. *Eleusine indica* Gærtn.

Mon valley.

DISTRIBUTION.—Eastern tropics, introduced into the Western tropics.

777. *Eleusine ægyptiaca* Desf.

Gwingyin.

Burm. *Legwa*.

DISTRIBUTION.—As the last species.

450. *Leptochloa* Beauv.778. *Leptochloa chinensis* Nees.

Paunglin lake shore.

DISTRIBUTION.—Throughout India, Burma, and Ceylon, China, Japan, Malaya, Australia.

451. *Arundo* Linn.779. *Arundo Donax* Linn.

Irawaddy bank.

DISTRIBUTION.—Throughout India and Burma, Western Asia and Northern Asia to Africa and Europe.

452. *Phragmites* Trin.780. *Phragmites Karka* Trin.

Irawaddy bank.

DISTRIBUTION.—Throughout the Eastern tropics.

453. *Neyraudia* Hook. f.781. *Neyraudia madagascariensis* Hook. f.

Arracan Yomahs.

DISTRIBUTION.—N.-W., Central and Eastern Himalayas, Assam, Burma, Malay Peninsula and Archipelago, tropical Africa.

454. *Eragrostis* Beauv.782. *Eragrostis tenella* Roem. & Schult.VAR. *plumosa*.

Gwingyin.

DISTRIBUTION.—Throughout India, Burma and Ceylon.

\* VAR. *riparia*.

Minbu district.

DISTRIBUTION.—Orissa, Peninsular India, Laccadives, Burma.

783. *Eragrostis interrupta* Beauv. VAR. *Koenigii*.

Irawaddy bank.

DISTRIBUTION.—Eastern tropics.

784. *Eragrostis major* Host.

Irawaddy bank.

DISTRIBUTION.—Throughout India, Burma and Ceylon, tropical Asia, and Southern Europe.

785. *Eragrostis cynosuroides* Beauv.

Alluvial belt.

DISTRIBUTION.—Throughout India and Burma, and Western Asia to N. Africa.

455. *Triticum* Linn.786. *Triticum vulgare* Vill.

Alluvial belt, sparing cultivated.

DISTRIBUTION.—Generally in warm and temperate regions.

456. *Dendrocalamus* Nees.787. *Dendrocalamus strictus* Nees.

Nwamadaung hills.

DISTRIBUTION.—Throughout India and Burma, Malay Archipelago.

## CRYPTOGAMIA.

## CII.—FILICES.

457. *Pteris* Linn.788. *Pteris longifolia* Linn.

Arracan Yomahs.

DISTRIBUTION.—Throughout the tropics and warm temperate regions.

**789. *Pteris cretica* Linn.**

Arracan Yomahs.

DISTRIBUTION.—Southern Europe, Africa, Western Asia, Himalayas, Peninsular India, Burma, Philippine islands, Polynesia, tropical America.

**458. *Polypodium* Linn.****790. *Polypodium multilincatum* Wall.**

Arracan Yomahs.

DISTRIBUTION.—Northern India and Burma.

**459. *Lygodium* Sw.****791. *Lygodium flexuosum* Sw.**

Mon valley.

DISTRIBUTION.—Chittagong, Burma, Malay Peninsula and Archipelago, Andaman islands, Ceylon, Philippine islands, China.

**792. *Lygodium microphyllum* R. Br.**

Nwamadaung hills.

DISTRIBUTION.—Sikkim, Bengal, Peninsular India, Assam, Burma, Malay Peninsula and Archipelago, Andaman islands, Ceylon, China, Africa.

**CIII.—SELAGINELLACEÆ.****460. *Selaginella* Spring.****793. *Selaginella prouifera* Baker.**

Arracan Yomahs.

DISTRIBUTION.—Throughout India and Burma, Ceylon, Malay Archipelago, N. Australia.

**CIV.—RHIZOCARPEÆ.****461. *Azolla* Lam.****794. *Azolla pinnata* R. Br.**

Paunglin lake.

DISTRIBUTION.—Tropical Asia, Africa and Australia.

**462. *Marsilea* Linn.****795. *Marsilea quadrifoliate* Linn.**

Paunglin lake.

DISTRIBUTION.—From Central Europe to Japan.

## DISTRIBUTIONAL CONSPECTUS.

## I.—ARRACAN-NWAMADAUNG PLANTS.

- (1) Endemic to the
- Assam-Arracan sub-sub-area.**

*Vitis Aubertiana*, *Indigofera minbuensis*, *Millettia cana*, *Desmodium grande*, *D. teres*, *Derris pulchra*, *Vernonia* sp. *Diospyros* sp. *Lettsomia campanuliflora*, *Ipomœa Edithæ*, *Justicia khasiana*, *Habenaria yomensis*, *Curcuma sessilis*, *C. parvula*, *Typhonium pedatisectum*.

- (2) Distributed to
- Pegu and Ava.**

*Bombax* (?) *insignis*, *Atylosia nivea*, *Flemingia fluminalis*, *Lagerstrœmia macrocarpa*, *Knoxia plantaginea*, *Argyreia Burneyi*, *Lettsomia pallida*, *Neuracanthus tetragonostachyus*, *Lepidagathis dulcis*, *Tectona Hamiltoniana*, *Vitex canescens*, *Bridelia burmanica*, *Phyllanthus albizioides*, *Dioscorea dicipiens*, *Alocasia dicipiens*, *Curcuma plicata*.

- (3) Distributed to the
- Shan Hills.**

*Desmodium oblongum*, *D. Kingianum*, *Terminalia Oliveri*, *Combretum pyrifolium*, *Ipomœa gracillima*, *Plectranthus hispidus*, *Anisochilus carnosus* VAR. *purpurascens*, *Quercus Lindleyana*.

- (4) Distributed to
- Martaban and Tenasserim.**

*Leea compactiflora*, *Momordica macrophylla*, *Diplospora confusa*, *Dendrobium ciliatum*, *D. chrysotoxum*.

- (5) Distributed to
- Pegu, Ava, and the Shan Hills.**

*Hiptage candicans*, *Millettia tetraptera*, *Desmodium Wallichii*, *Dalbergia obtusifolia*, *D. Kurzii*, *Cassia renigera*, *Lagerstrœmia villosa*, *Blinkworthia lycioides*, *Dolichandrone stipulata*, *Dædalacanthus macrophyllus*, *Cystacanthus insignis*, *Hymenopyramis brachiata*, *Anisomeles candicans*, *Colquhounia elegans*.

- (6) Distributed to
- Pegu and Tenasserim.**

*Semecarpus albescens*, *Pueraria stricta*, *Terminalia pyrifolia*, *Gardenia obtusifolia*, *Strobilanthes phyllostachyus*, *Gomphostemma strobilinum*, *Phyllanthus columnaris*, *Aporosa oblonga*, *Stemona Griffithiana*.

- (7) Distributed to the
- Shan Hills**
- and to
- Tenasserim.**

*Lophopetalum Wallichii*, *Melanorrhœa usitata*, *Crotalaria neriiifolia*, *Pueraria Candollei*, *Pterocarpus macrocarpus*, *Bauhinia poly-carpa*, *Anogeissus acuminata* VAR. *lanceolata*, *Lagerstrœmia tomentosa*, *Gardenia erythroclada*, *Heterophragma sulfureum*, *H. adenophyllum*, *Dædalacanthus tetragonus*, *Hemigraphis glaucescens*, *Justicia decussata*, *Orthosiphon Parishii*.



(8) Species distributed to the **Malay Peninsula** or **Archipelago** or **Siam**.

(a) **To Peninsula or Archipelago.**

*Taraktogenos Kurzii*, *Hibiscus sagittifolius*, *Micromelum hirsutum*, *Albizzia lebbekoides*, *Combretum chinense*, *Tupidanthus calyptratus*, *Morinda persicæfolia*, *Vaccinium bancanum*, *Thunbergia laurifolia*, *Nomaphila Parishii*, *Eranthemum album*, *Pollinia eucnemis*.

(b) **To Siam.**

*Dipterocarpus tuberculatus*, *Shorea siamensis*, *Walsura villosa*, *Millettia pendula*, *M. ovalifolia*, *M. Brandisiana*, *Dalbergia cultrata*, *Alsomitra sarcophylla*, *Congea tomentosa*, *Vitex limonifolia*.

(9) Species distributed to the **Himalayas**.

*Clematis grewiæflora*, *Hibiscus pungens*, *Vitis assamica*, *Crotalaria tetragona*, *Millettia cinerea*, *Pueraria Wallichii*, *Albizzia lucida*, *Pygeum acuminatum*, *Thladiantha calcarata*, *Rubia angustissima*, *Raphistemma pulchellum*, *Tylophora tenerrima*, *Ipomœa petaloidea* VAR. *linearifolia*, *Vitex peduncularis*, *Cinnamomum obtusifolium*, *Quercus dealbata*, *Castanopsis tribuloides* VAR. *ferox*, *Pholidota articulata*, *Calanthe puberula*, *Habenaria constricta*, *Erianthus longisetosus*.

(10) **China-Himalayan species.**

*Helicteres elongata*, *Sapindus Mukorossi*, *Rhus paniculata*, *Gymnema tingens*, *Engelhardtia Colebrookiana*, *Polytoca bracteata*, *Pollinia quadrinervis*, *Erianthus Hookeri*.

(11) **Himalayan-Malayan species.**

*Eriobotrya bengalensis*, *Duabanga sonneratioides*, *Hodgsonia heteroclita*, *Blumea balsamifera*, *Wedelia Wallichii*.

(12) Species common to the **Himalayas**, **China** and **Malaya**.

*Inula Cappa*, *Buchnera cruciata*, *Loranthus pentapetalus*, *Pollinia grata*.

(13) Species distributed to **Central and Peninsular** (India, the **Deccan** sub-sub-area.

*Crotalaria nana*, *Indigofera Wightii*, *Desmodium Cephalotes* VAR. *congesta*, *Rhynchosia suaveolens*, *Dalbergia paniculata*, *Bauhinia diphylla*, *Acacia canescens*, *Pimpinella Leschenaultii*, *Ipomœa pulchella*.

(14) Species distributed to the **Deccan, Indus plain, and Western dry half of Gangetic plain.**

*Naravelia zeylanica*, *Sterculia colorata*, *Balanites Roxburghii*, *Buchanania latifolia*, *Butea superba*, *Cylista scariosa*, *Flemingia nana*, *Goniocaulon glabrum*, *Schrebera swietenoides*, *Aniseia calycina*, *Dædalacanthus purpurascens*, *Strobilanthes scaber*, *Symphorema involucreatum*, *Aerua Monsonia*, *Panicum setigerum*.

(15) **Deccan and Malayan species.**

*Sida mysorensis*, *Chickrassia tabularis*, *Cæsalpinia Sappan*, *C. digyna*, *Xylia dolabriformis*, *Calycopteris floribunda*, *Combretum extensum*, *Oldenlandia alata*, *Ligustrum robustum*, *Tylophora asthmatica*, *Ipomœa campanulata*, *Doichandrone Rheedii*, *Tectona grandis*, *Typhonium trilobatum*.

(16) Distributed throughout **India and Malaya.**

*Hibiscus radiatus*, *Garuga pinnata*, *Melia Azadirachta*, *Olax scandens*, *Ventilago calyculata*, *Crotalaria sessiliflora*, *Uraria hamosa*, *Desmodium pulchellum*, *D. gyrans*, *Albizia procera*, *Trichosanthes cucumerina*, *Hymenodictyon excelsum*, *Oldenlandia nudicaulis*, *Blumea membranacea*, *Laggera flava*, *Holarrhena antidysenterica*, *Wrightia tomentosa*, *Fagraea obovata*, *Ipomœa vitifolia*, *Barleria strigosa*, *Clerodendron infortunatum*, *Gmelina arborea*, *Polygonum chinense* VAR. *ovalifolia*, *Aristolochia Tagala*, *Loranthus Scurrula*, *Viscum articulatum*, *Baccaurea sapida*, *Baliospermum axillare*, *Behmeria malabarica*, *Sarcochlamys pulcherrima*, *Phrynium parviflorum*, *Carex baccans*, *Thysanolaena Agrostis*, *Arthraxon ciliaris*, *Dendrocalamus strictus*.

(17) Distributed to **India.**

*Olax nana*, *Odina Wodier*, *Indigofera pulchella*, *Millettia auriculata*, *Alysicarpus vaginalis*, *Erythrina suberosa*, *Spatholobus Roxburghii*, *Rhynchosia bracteata*, *Terminalia tomentosa*, *Lagerstrœmia parviflora*, *Mitragyna parviflora*, *Vernonia teres*, *Cyathocline lyrata*, *Vicoa auriculata*, *Cryptolepis Buchanani*, *Holostemma Rheedii*, *Marsdenia tenacissima*, *Lettsomia setosa*, *Stereospermum chelonoides*, *Orthosiphon rubicundus*, *Leucas nutans*, *Cinnamomum Tamala*, *Putranjiva Roxburghii*, *Antidesma diandrum*, *Homonoia riparia*, *Ficus Cunia*, *Ficus glomerata*, *F. religiosa*, *F. bengalensis*, *Dioseorea glabra*, *D. alata*.

(18) Distributed over **S.-E. Asia.**

*Impatiens Balsamina*, *Spondias mangifera*, *Crotalaria albida*, *Mucuna pruriens*, *Vitis discolor*, *Canavalia ensiformis*, *Bauhinia purpurea*, *B. variegata*, *Entada scandens*, *Kalanchoë spathulata*,

*Gymnopetalum cochinchinense*, *Randia dumetorum*, *Blumea glomerata*, *B. laciniata*, *Ardisia humilis*, *Canscora diffusa*, *Pharbitis Nil*, *Torenia cordifolia*, *Æginetia indica*, *Oroxylum indicum*, *Barleria cristata*, *Lepidagathis hyalina*, *Justicia simplex*, *Adhatoda vasica*, *Leucas involucrata*, *Holoptelea integrifolia*, *Zingiber Casumunar*, *Dioscorea dæmona*, *Panicum sarmentosum*, *Arundinella setosa*, *Pogonatherum crinitum*, *Andropogon fascicularis*, *Andropogon assimilis*.

(19) Distributed from Africa to Malaya.

*Abutilon polyandrum*, *A. graveolens*, *Triumfetta annua*, *Alysicarpus bupleurifolius*, *Atylosia scarabœoides*, *Acacia pennata*, *Kalanchoë laciniata*, *Cephalandra indica*, *Mukia scabrella*, *Emilia sonchifolia*, *Mæsa indica*, *Ipomœa Pes-tigridis*, *I. Turpethum*, *Jacquemontia paniculata*, *Dioscorea pentaphylla*, *Chlorophytum laxum*, *Andropogon brevifolius*, *Neyraudia madagascariensis*.

(20) Distributed from Africa to India.

*Laggera pterodonta*, *Alectra indica*, *Chlorophytum orchidastrum*.

(21) Distributed from India to Australia.

*Cedrela Toona*, *Crotalaria linifolia*, *C. medicaginea*, *Derris scandens*, *Trichosanthes palmata*, *Zehneria umbellata*, *Sarcocephalus cordatus*, *Pavetta indica*, *Diospyros montana*, *Ichnocarpus frutescens*, *Saccharum spontaneum*.

(22) Distributed throughout the tropics.

*Sida acuta*, *S. rhombifolia*, *Urena lobata*, *U. sinuata*, *Melochia corchorifolia*, *Elephantopus scaber*, *Solanum verbascifolium*, *Nelsonia campestris*.

## II.—ALLUVIAL BELT.

(1) Distributed to Pegu and Ava.

*Sterculia versicolor*, *Uraria cordifolia*, *Leucas pilosa*, *Boottia cordata*.

(2) Distributed to Pegu, Ava and the Shan Hills.

*Lourea campanulata*, *Sphæranthus peguensis*.

(3) Distributed to Pegu and Tenasserim.

*Millingtonia hortensis*, *Dicliptera riparia*, *Polytoca Wallichiana*.

(4) Distributed to Malaya.

*Xanthophyllum glaucum*, *Terminalia Catappa*, *Combretum trifoliatum*, *Azima sarmentosa*, *Myriopterum paniculatum*, *Imperata exaltata*.

(5) Distributed to China.

*Lindenbergia philippensis*, *Desmodium diffusum*, *Celsia coromandeliana*.

(6) Distributed to the **Himalayas**.

*Argyreia Hookeri*.

(7) Distributed to **China** and the **Himalayas**.

*Helicteres elongata*.

(8) Distributed to **Malaya** and the **Himalaya**.

*Milusa Roxburghiana*.

(9) Distributed to **China** and **Malaya**.

*Harrisonia Bennetti*, *Lourea obcordata*, *Enhydra fluctuans*.

(10) Distributed to the **Deccan** and **Indus** and **Gangetic plains**.

*Galactia tenuiflora*, *Cassia auriculata*, *Rosa involucreta*, *Trianthema decandra*, *Oldenlandia umbellata*, *Ruellia prostrata*, *Euphorbia cristata*, *Croton oblongifolius*, *Sansevieria Roxburghiana*, *Cyanotis papilionacea*, *Paspalum pedicellare*, *Saccharum fuscum*, *Andropogon foveolatus*, *Iseilema laxum*, *Eragrostis tenella* VAR. *riparia*.

(11) Distributed to the **Deccan** and **Malaya**.

*Tiliacora racemosa*, *Mesua ferrea*, *Atalantia monophylla*, *Crotalaria quinquefolia*, *Cassia siamea*, *Bauhinia tomentosa*, *Ipomœa tridentata*, *Commelina salicifolia*.

(12) Species distributed to **India** and **Malaya**.

*Bombax malabaricum*, *Bauhinia malabarica*, *Terminalia Bellerica*, *Barringtonia acutangula*, *Morinda tinctoria*, *Vernonia anthelmintica*, *Oxystelma esculentum*, *Ipomœa sepiaria*, *Cuscuta reflexa*, *Capsicum frutescens*, *Striga euphrasioides*, *Bridelia retusa*, *Ficus Rumphii*, *Potamogeton indicus*.

(13) Species distributed to **India**, **Malaya** and **China**.

*Nasturtium indicum*, *Butea frondosa*, *Clitoria Ternatea*, *Cassia timoriensis*, *Buddleia asiatica*, *Solanum indicum*, *Datura fastuosa*, *Bonnaya brachiata*, *Striga Masuria* (not to Malaya), *Streblus asper*, *Polygonum stagninum*, *Pouzolzia indica*, *Monochoria hastaefolia*, *Axonopus cimicinus*, *Ischæmum rugosum*, *Sporobolus tremulus* (not to Malaya), *Eragrostis major*.

(14) Species distributed from **India** to **Australia**.

*Nymphaea Lotus*, *Nelumbium speciosum* (also to China), *Glycosmis pentaphylla*, *Crotalaria juncea*, *Indigofera trifoliata* (also to China), *Flemingia lineata*, *Cassia glauca* (also in China), *Dentella repens*, *Pterocaulon cylindrostachyum*, *Ichnocarpus frutescens*, *Dopatrium junceum*, *Utricularia flexuosa*, *U. exoleta*, (all these also to China), *Deeringia celosoides* (also to China), *Mallotus philippinensis* (also to China), *Cyperus platystylis*, *Leptochloa chinensis* (also to China), *Eremochloa muricata*, *Andropogon serratus*.

## (15) Species distributed from Africa to Malaya or Australia.

*Cissampelos Pareira*, *Nymphaea stellata*, *Cleome viscosa*, *Gynandropsis pentaphylla*, *Portulaca oleracea*, *Tamarix gallica*, *Bergia ammanioides* *Calophyllum inophyllum*, *Sida cordifolia*, *Abutilon indicum*, *A. graveolens*, *Hibiscus surattensis*, *H. panduræformis*, *H. vitifolius*, *Thespesia Lampas*, *Waltheria indica*, *Triumfetta rhomboidea*, *Cardiospermum Halicacabum*, *Moringa pterygosperma*, *Crotalaria retusa*, *C. verrucosa*, *Indigofera linifolia*, *I. enneaphylla*, *I. viscosa*, *I. trita*, *Sesbania ægyptiaca*, *S. grandiflora*, *Æschynomene indica*, *Uraria picta*, *Alysicarpus monilifer*, *Desmodium triflorum*, *Cæsalpinia Bonducella*, *Adenanthera pavonina*, *Albizia Lebbek*, *Ammania peploides*, *A. baccifera*, *A. salicifolia*, *Mollugo Spergula*, *Vernonia cinerea*, *Grangea maderaspatana*, *Sphaeranthus africanus*, *S. indicus*, *Gnaphalium indicum*, *Plumbago zeylanica*, *Limnanthemum indicum*, *Cordia myxa*, *Heliotropium ovalifolium*, *Ipomœa chryseides*, *I. reniformis*, *I. obscura*, *Vandellia crustacea*, *Striga lutea*, *Justicia Betonica*, *Rhinacanthus communis*, *Ocimum canum*, *O. Basilicum*, *Moschosma polystachyum*, *Digera arvensis*, *Amarantus paniculatus*, *Pupalia lappacea*, *Aerua javanica*, *A. scandens*, *Polygonum plebejum*, *P. tomentosum*, *P. barbatum*, *Bridelia stipularis*, *Phyllanthus reticulatus*, *P. simplex*, *P. distichus*, *Flueggia microcarpa*, *Sebastiania Chamælea*, *Hydrilla verticillata*, *Zeuxine sulcata*, *Cyanotis cristata*, *Pandanus fascicularis*, *Pycreus nitens*, *Juncellus alopecuroides*, *Cyperus difformis*, *C. Iria*, *Mariscus microcephalus*, *Fimbristylis dipotoma*, *F. quinqueangularis*, *Scirpus articulatus*, *S. Michelianus*, *Paspalum longiflorum*, *Panicum flavidum*, *Perotis latifolia*, *Ischæmum laxum*, *Rottboellia exaltata*, *Andropogon squarrosus*, *A. caricosus*, *A. annulatus*, *Anthistiria imberbis*, *Elusine indica*, *E. ægyptica*, *Phragmitis Karka*, *Eragrostis interrupta*.

## (16) Distributed to India.

*Tinospora cordifolia*, *Hibiscus ficulneus*, *Psoralea corylifolia*, *Alysicarpus rugosus* VAR. *styracifolia*, *Acacia catechuoides*, *Acacia concinna* VAR. *rugata*, *Conyza semi-pinnatifida*, *Xanthium Strumarium*, *Launea asplenifolia*, *Heliotropium strigosum*, *Lindenbergia urticæfolia*, *Hygrophila spinosa*, *Leucas mollissima*, *Rumex dentatus*, *Aristolochia indica*.

## (17) Distributed to Africa and India.

*Cocculus villosus*, *Polygala erioptera*, *Hibiscus micranthus*, *Hibiscus Solandra*, *Indigofera pentaphylla*, *Tephrosia villosa*, *Trianthera crystallina*, *Gisekia pharnaceoides*, *Laggera aurita*, *Gnaphalium pulvinatum*, *Heliotropium supinum*, *Trichodesma indicum*, *Blepharis bærræavifolia*, *Peristrophe bicalyculata*, *Priva leptostachya*, *Nothosærua*

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brachiata, *Polygonum limbatum*, *Typha elephantina*, *Limnophytum obtusifolium*, *Pennisetum typhoideum*, *Andropogon Schœnanthus*, *Aristida funiculata*, *Sporobolus coromandelianus*, *Arundo Donax*, *Eragrostis cynosuroides*.

(18) Distributed throughout the tropics.

*Argemone mexicana*, *Sida veronicæfolia*, *Tribulus terrestris*, *Indigofera hirsuta*, *Rhynchosia minima*, *Tephrosia purpurea*, *Zornia diphylla*, *Abrus precatorius*, *Teramnus labialis*, *Parkinsonia aculeata*, *Cassia occidentalis*, *C. Sophera*, *C. Tora*, *C. alata*, *C. mimosoides*, *Tamarindus indica*, *Neptunia oleracea*, *Leucæna glauca*, *Acacia Farnesiana*, *Jussieua repens*, *J. suffruticosa*, *Passiflora foetida*, *Opuntia monacantha*, *Mollugo hirta*, *Ageratum conyzoides*, *Eclipta alba*, *Spilanthes Acmella*, *Bidens pilosa*, *Sphenoclea zeylanica*, *Mimusops Elengi*, *Coldenia procumbens*, *Heliotropium indicum*, *Solanum nigrum*, *S. torvum*, *Nicotiana Tabacum*, *Herpestis Monniera*, *Lippia nodiflora*, *Stachytarpheta indica*, *Boerhaavia repens*, *Amarantus spinosus*, *A. viridis*, *A. Blitum*, *Achyranthes aspera*, *Alternanthera sessilis*, *Chenopodium album*, *Polygonum glabrum*, *P. lapathifolium*, *Rumex maritimus*, *Euphorbia hypericifolia*, *E. pilulifera*, *E. thymifolia*, *Jatropha gossypifolia*, *J. Curcas*, *Ricinus communis*, *Ceratophyllum demersum*, *Vallisneria spiralis*, *Pistia Stratiotes*, *Lemna polyrhiza*, *Wolffia arrhiza*, *Potamogeton crispus*, *Juncellus pygmæus*, *Cyperus articulatus*, *C. corymbosus*, *C. rotundus*, *C. radiatus*, *C. digitatus*, *Eleocharis capitata*, *Fimbristylis miliacea*, *Bulbostylis barbata*, *Paspalum sanguinale*, *Panicum Crus-galli*, *P. colonum*, *P. prostratum*, *P. miliaceum*, *P. miliare*, *P. repens*, *P. proliferum*, *Setaria verticillata*, *Tragus racemosus*, *Imperata arundinacca*, *Manisuris granularis*, *Andropogon contortus*, *Cynodon dactylon*, *Chloris barbata*.

(19) Distributed to Western Asia and Europe.

*Melilotus alba*, *Chrozophora plicata*, also to Africa.

(20) Distributed from Europe to Malaya.

*Vandellia erecta*.

(21) Distributed to N. Asia, Europe, N. America.

*Ranunculus sceleratus*.

### III.—DESERT ZONE.

(1) Endemic to Upper Burma.

*Boscia variabilis*, *B. prunoides*, *Capparis burmanica*, *C. orbiculata*, *C. polymorpha*, *Buchanania* sp., *Tephrosia Grahami*, *Acacia Kingii*, *Combretum apetalum*, *Vernonia gymnoclada*, *Diospyros burmanica*, *Atherolepis Wallichii*, *Lygisma angustifolia*, *Cœlodiscus lappaceus*.

(2) Distributed to **China**.

*Capparis flavicans*, *C. hastigera*, *Streptocaulon tomentosum*, *Phœnix humilis* VAR. *Loureirii*.

(3) Distributed to the **Deccan**.

*Capparis grandis*, *Melhania Hamiltoniana*, *Grewia hirsuta*, *Triumfetta rotundifolia*, *Zizyphus glabra*, *Mezoneurum hymenocarpum*, *Sarcostemma Brunonianum*, *Boucerosia umbellata*, *Premna latifolia*, *Boerhaavia repanda*, *Euphorbia antiquorum*.

(4) Distributed to **Africa and India**.

*Cratæva religiosa*, *Pavonia odorata*, *P. glechomifolia*, *Hibiscus lunariifolius*, *Acacia arabica*, *Calotropis procera*, *Withania somnifera*, *Euphorbia granulata*.

(5) Distributed to **India and Malaya**.

*Capparis horrida*, *Grewia abutilifolia*, *Acacia leucophlœa*, *Carissa Carandas*, *Leptadenia reticulata*.

(6) Distributed from **India to Australia**.

*Zizyphus Cenoplia*, *Cassia Rheedii*, *Dichrostachys cinerea*.

(7) Distributed from **Africa to Malaya or Australia**.

*Corchorus fascicularis*, *Zizyphus Jujuba*, *Barleria Prionitis*, *Gloriosa superba*.

(8) Distributed from **India to China**.

*Adina cordifolia*.

(9) Distributed to **India**.

*Gardenia turgida*, *Vallaris Heynei*, *Pergularia pallida*, *Andrographis echioides*, *Loranthus pulverulentus*.

(10) Distributed to **tropical Asia and Australia**.

*Solanum xanthocarpum*, *Viscum orientale*.

(11) Distributed **throughout the tropics**.

*Corchorus acutangulus*, *Martynia diandra*.

## CHAPTER V.—ECONOMIC AND MEDICINAL

### Cereal crops.

The principal cereal crops on the alluvial belts of the Irawaddy and its tributaries, on the islands left bare by the Irawaddy when its level falls after the rains cease, and on the irrigated areas are rice and maize. There are innumerable varieties of the former, but

according to Mr. Parsons they may roughly be divided into four classes—

- (1) *Kaukgyi*, grown chiefly in the irrigated areas.
- (2) *Kauklat*, grown chiefly on the alluvial belt.
- (3) *Kaukyin*, grown on irrigated areas and the tail-ends of irrigated areas, and almost entirely dependant on rainfall for their water-supply.
- (4) *Mayin*, grown in the beds of lakes, tanks and marshes, and irrigated.

*Kaukgyi* rice is reaped in December and January, *kauklat* in December, *kaukyin* in November. *Mayin* is planted in February and March and reaped in June. Rice is usually transplanted, only occasionally sown broad-cast on lands flooded late in the season by the Irawaddy.

Maize, Burm. *Pyaung-bu*, is a common crop on the alluvial belt and wheat is also not uncommon, the latter sown in November and reaped in April. It is much liable to be attacked by rust. *Panicum millaceum* (Burmese *Lu*) is a millet not infrequently cultivated along the bank of the Irawaddy).

In the desert zone the chief cereal is *Andropogon Sorghum*, (*Jowar*) or *Andropogon halepense*. *Setaria italica* (Burmese *Sat*) is also cultivated in the desert zone.

These millets are cultivated chiefly as fodder for cattle. *Jowar* is sown in August or September and reaped in January and February.

#### Leguminous crops.

These are cultivated on the alluvial belt and irrigated areas, and are known as *Kaing* crops. They are usually sown in November or December and gathered in March and April.

The following are the more important species with their Burmese names where known.

*Phaseolus lunatus* Linn. Burm. *Pè-talok*, "Chinese pea".

*Phaseolus Mungo* L. Burm. *Pè-nauk*.

*Phaseolus calcaratus* Roxb. Burm. *Pè-yin*.

*Phaseolus trilobus* Ait.

*Dolichos Lablab* L. Many varieties distinguished by different Burmese names, such as *Pè-bya*, *Pè-bazon*, *Pè-lun*, *Pè-gyi*, etc.

*Dolichos biflorus* L. Burm. *Pè-ngapi*.

*Cajanus indicus* Spreng. Burm. *Pè-singon*.

*Canavalia ensiformis* DC. Burm. *Pè-dalet*.

*Cicer arietinum* L. Burm. *Kala-bè*, imported only a few years ago and now much cultivated.



### Cucurbitaceous crops.

These are also very common in the alluvial belt and irrigated areas. The more common species are :—

- Lagenaria vulgaris* Ser. Burm. *Bu-thee*.  
*Luffa aegyptiaca* Mill.  
*Luffa acutangula* Roxb.  
*Benincasa cerifera* Savi.  
*Nomordica Charantia* L. Burm. *Kyet-hinga*.  
*Cucumis melo* L. Burm. *Tha-kkwa-thee*.  
*Citrullus vulgaris* Schrad. Burm. *Payè-thee*.  
*Cucurbita maxima* Duch. Burm. *Payon-thee*.

### Edible tubers.

The plants cultivated for their tubers are chiefly :—

- Ipomœa Batatas*. Burm. *Kasun-u*, the sweet potato.  
*Dioscorea alata*. A yam with several varieties distinguished by the Burmese names *myauk-pyu*, *myauk-gyin*, *myauk-kywe-gyo*.  
 At Sinbok an enterprising peasant had started cultivating the ordinary potato under Mr. Aubert's advice, quite successfully.

### Plants with edible fruits.

- Anona squamosa* L. The custard apple, cultivated on alluvial soil.  
*Hibiscus esculentus* L. Commonly cultivated, its fruits used as a vegetable.  
*Citrus medica* L. Lime, commonly cultivated.  
*Egle Marmelos* Corr. The Bael, commonly cultivated.  
*Mangifera indica* L. "The mango, commonly cultivated. The various varieties in the district are grouped into two main classes, *manaw* and *loubu*, of which the former is the more valuable." So Mr. Parsons in his report.  
*Psidium Guyava* L. Burm. *Mankala-bin*, commonly cultivated.  
*Punica Granatum* L. Burm. *Talè-bin*, the Pomegranate, cultivated.  
*Carica Papaya* L. The Papaya, commonly cultivated.  
*Vaccinium bancanum* Miq. Wild on the Arracan Yomahs, fruit eaten by the Chins.  
*Diospyros burmanica* Kurz. Burm. *Tè-thee*. Wild in the desert zone.  
*Solanum Melongena* L. Burm. *Khayan-thee*. The brinjal, commonly cultivated, fruit used as a vegetable.  
*Lycopersicum esculentum* Miller. Burm. *Khayan-gin-thee*. The Tomato, commonly cultivated. The common Burmese tomato is quite a small thing, the large one being imported from India.

- Baccaurea sapida** Muell. Burm. *Kanaso*, wild.  
**Artocarpus integrifolia** Linn. f. The Jack fruit, commonly cultivated.  
**Musa sapientium** L. The plantain. There are two varieties cultivated known as *yakaing* and *pygyan*.  
**Cocos nucifera** L. The coco-nut, abundantly cultivated in the alluvial belt and river valleys.

**Plants occasionally eaten or used in times of scarcity.**

- Nymphaea stellata** Willd. Burm. *Kya-u*. Tubers boiled and eaten in times of scarcity.  
**Capparis burmanica** Kurz. Burm. *Kauk-kwé-sa*. Fruit eaten in times of scarcity.  
**Zizyphus Jujuba** Lamk. Burm. *Zi-bin*. Fruit eaten in times of scarcity.  
**Buchanania (?) glabra** Wall. Burm. *Lun-bin*. The kernel of the fruit is roasted and eaten. The flavour is quite pleasant.  
**Caesalpinia digyna** Rottl. Burm. *Sun-lethet-thee*. Seeds roasted and eaten, quite palatable.  
**Dioscorea daëmona** Roxb. Burm. *Kywe-u*. Wild yam. Eaten in times of scarcity.  
**Dioscorea bulbifera** L. Burm. *Khadu*. Also a wild edible yam,  
**Elousine ægyptica** Desf. Burm. *Legwa*. Eaten in times of scarcity.  
 Mr. Parsons mentions the Burmese names of several other plants used as food in famine times, but the writer unfortunately did not meet with them, so is unable here to give their botanical identifications.

**Plants used in curries, etc.**

- Ranunculus sceleratus** L. Burm. *Tanga-ngayok*, used in curries.  
**Brassica juncea** Hook. f. & T. Commonly cultivated.  
**Lepidium sativum** L. Burm. *Samon-hpwe*. Commonly cultivated.  
**Raphanus sativus** L. Commonly cultivated.  
**Capparis flavicans** Wall. Leaves eaten in curries.  
**Moringa pterygosperma** Gærtn. Burm. *Dandalon-bin*. Leaves and fruit eaten in curries.  
**Sesbania ægyptiaca** Pers. Burm. *Yé-tha-gyee*. Young leaves, flowers and fruit eaten in curries.  
**Sesbania grandiflora** Pers. Burm. *Pauk-pan-bya-bin*. Young leaves, flowers and fruit eaten in curries.  
**Cassia glauca** Lamk. Burm. *Pyi-ban-nyo*. Tender leaves and flowers eaten in curries.

- Acacia concinna* DC. Young leaves and flowers eaten in curries.
- Foeniculum vulgare* L. Burm. *Sa-meit*. Used as a condiment.
- Coriandrum sativum* L. Burm. *Nan-nan-bin*. Used as a condiment.
- Carthamus tinctorius* L. Burm. *Su-pan*. Young leaves eaten in curries.
- Cordia Myxa* L. Burm. *Thanat-pin*. Young leaves and young fruits eaten in curries.
- Solanum torvum* Sw. Burm. *Khayan-kasaw*. Fruit used as a condiment.
- Capsicum frutescens* L. Commonly cultivated.
- Ocimum canum* Sims. Burm. *Pin-sein*. Used as a condiment.
- Phyllanthus distichus* Muell. Arg. Young leaves eaten in curries.
- Zingiber* sp. Cultivated by the Chins on the Arracan Yomahs.
- Allium Cepa* L. Onions are largely grown in the cold weather, sown in December or January and dug up in March or April.
- Borassus flabellifer* L. The rootlet of the embryo palm is considered a great delicacy, and the seeds are often sown expressly to obtain it.

#### Dye Plants.

- Zizyphus Jujuba* is not itself a dye plant, but it is one of the plants on which lac is deposited, and hence may be mentioned here.
- Indigofera sumatrana* Gærtn. and *Indigofera suffruticosa* Mill (I anil L.), are both cultivated, and appear to be both called *mé-bin*. Sown in June and cut in October. Earthenware pots are used as vats and lime is added to precipitate the dye.
- Parkinsonia aculeata* L. Burm. *Kwunya-si-bin*.  
The leaves and young pods of this species are used by the country people to produce a greenish yellow dye, which, however, is not very fast.
- Butea frondosa* Roxb. Flowers used to produce an 'old gold' colour.
- Combretum trifoliatum* Vent. Burm. *Hsawk-bin*.  
A decoction of the leaves of this plant is used to dye cloth a dirty brown colour, which on soaking the cloth in mud for several days changes into a permanent black.
- Anogeissus acuminata* Wall. VAR. *lanceolata*.  
The bark is cut into chips and boiled in water. The solution resulting dyes cotton yarn or cloth a brownish colour, which deepens to black after soaking in the mud of pools.
- Carthamus tinctorius* L. Burm. *Su-pan*.  
A decoction of the flowers is used by the Burmese to dye cotton yarn a golden yellow colour.

*Morinda tinctoria* and *M. persicifolia* appear both to be used as dye plants, the latter by the Chins.

*Artocarpus integrifolia* Burm. *Paik-hnd-bin*. This plant gives the yellow dye of the Buddhist monk's robes. The wood is cut into chips which are then soaked in water and boiled several times. The cloth is then soaked in the water until properly stained. A vegetable mordant is afterwards used to fix the dye, but the plant yielding it was not met with, at least not recognised as such.

#### Fibre Plants.

*Gossypium* sp. Cotton, though not a fibre, may most conveniently be mentioned here. It is cultivated to a small extent in the desert zone and by the Chins.

*Bauhinia racemosa* Lamk., yields a fibre from its bark, which is employed to make ropes.

*Crotalaria retusa* L. Burm. *Paik-san-bin*.

This species is cultivated in patches all over the alluvial belt for its fibre from which nets and ropes are made.

*Agave* sp. Burm. *Tasaung-let-pat*, a wild species from which fibre is extracted for manufacture of thread and ropes.

#### Oil Plants.

*Sesamum indicum* DC. is, along with *Andropogon Sorghum*, the chief crop of the desert zones. There are two varieties, an early (*hnanyin*) which is sown in June and reaped in September, and a late (*hnangyi*) which is sown in September and reaped in January or February. The oil is extracted in a primitive and wasteful manner in a huge wooden mortar with a correspondingly large wooden pestle, which is worked by a mechanism driven by ox-power.

#### Tobacco.

Tobacco is cultivated on the richest lands. The Burman peasant smokes two kinds of cheroots, one of gigantic proportions, the outer wrapping of which is made of the bracts surrounding the female inflorescence of the maize, the other about the size of an ordinary cigar with a green outer wrapping made from the leaves of *Cordia Myxa*.

#### Betel.

*Piper* sp. is cultivated here and there in the district : the betel vineyards seldom exceed half an acre in extent, and are irrigated from wells.

**Liquor.**

The ordinary country fermented liquor of the district is obtained from the Toddy palm, *Borassus flabellifer*, (Burm. *Htan-bin*), which is so abundant about villages in the alluvial belt. The juice extracted is to a great extent employed to make 'jaggery,' a brownish coloured somewhat toffy-flavoured sweetmeat.

The Chins concoct a most potent nectar, called *Khaung*, for which there are two recipes, in neither of which the writer regrets he can give all the ingredients correctly identified. However they are set down here incomplete as they are.

**1ST RECIPE.**

- (1) Leaf and fruit of *Solanum verbascifolium*.
- (2) Bark of *Aporosa oblonga*.
- (3) Leaf of an unknown climber.
- (4) Pounded rice-flowers.

**2ND RECIPE.**

- (1) Fruit of *Solanum indicum*.
- (2) Bark of *Thit-cho-bin*, a sapotaceous tree not identified.
- (3) Pepper seed.
- (4) Ginger rhizome ground down.
- (5) Pounded rice flowers.

The second recipe is the more commonly used.

**Plants with miscellaneous uses.**

*Abrus precatorius* L. Burm. *Ywe-galé*.

The seeds of this are occasionally used by goldsmiths as weights.

*Gardenia turgida* Roxb. The fruit.—Burm. *Thamin-sa-hpyu-thee*  
—is pounded and used in water as a soap for cleansing clothes.

*Artemisia pallens* Wall. is cultivated for its perfume.

*Brua javanica* Juss. Burm. *On-dwe*. The flowers of this are used for stuffing pillows.

*Celosia cristata* Linn., cultivated for its flowers, which are used by the women to adorn their hair.

*Gomphrena globosa* L. cultivated like the last.

*Cinnamomum Tamala* Nees.

The Chin women undergo about the age of fourteen the ordeal of having the whole face closely tattooed black, which gives them a grotesquely hideous appearance. The legend runs that this curious practice originated in the desire to render the Chin women repulsive

to the Burmese officials who were wont to carry off the more comely amongst the maidens to adorn their harems. Formerly the leaves of *Cinnamomum Tamala* were pounded down and a solution made with water, which was employed to produce this most uncosmetic effect. Now-a-days the more prosaic lamp black is used.

***Gloriosa superba* L.** Burmese women are said to partake of the tubers of this plant as a means of committing suicide under stress of blighted affections.

***Imperata exaltata* Brongn.** Burm. *Thetké*, is used as thatching material.

***Saccharum fuscum* Roxb.** Burm. *Yin-bin*.

The stems of this are used in making fishing nets or rather enclosures for entrapping fish, and in making 'chicks.'

***Phragmites Karka* Trin.** Burm. *Kyu-bin*.

The stems of this are split and woven into mats.

***Borassus flabellifer* L.** The old leaf bases of this palm are utilised as bird scarers, being strung at intervals on strings stretched over growing crops. They are deceptively like dead birds strung up.

#### Medicinal Plants.

In the following list the medicinal properties described are the medicinal properties ascribed to the various plants by the peasantry of the district, and nothing more.

***Cissampelos Pareira* L.** Burm. *Kywet-nabaung*.

A paste is made from all parts of the plant and used as a local application in inflammatory conditions of the eye.

***Capparis hastigera* Hance.** Burm. *Namanee-thanyet-gyi*.

A paste of the root is used as an application to sores.

***Capparis flavicans* Wall.** Leaves are used as a galactagogue.

***Taraktogenos Kurzii* King.** Burm. *Kalaw-bin*.

The oil from the seeds of this plant is used in conjunction with the oil obtained from the seeds of *Semecarpus albescens* Kurz, in the treatment of Leprosy.

***Limonia acidissima* L.** Burm. *Thanakha*.

The bark of this is powdered and made into a paste as a cosmetic application to the face.

***Ventilago calyculata* Tul.** Burm. *Thwé det*.

A paste of the root is employed as a local application to excite granulation in wounds.

**Semecarpus albescens** Kurz. Burm. *Chi-thee*.

Seeds used in the treatment of leprosy as already mentioned under *Taraktogenos Kurzii*.

**Leucæna glauca** Benth. Burm. *Aseik-hpye-bin*.

A paste of the leaves used as an application to poisonous bites or stings.

**Acacia concinna** DC. Ripe fruit used to clean the hair.

**Acacia Farnesiana** Willd. Burm. *Naulongyaing*.

A paste of the root is applied to the hoofs of cattle as a parasiticide or as a preventive of the attacks of parasites.

**Rosa involucrata** Roxb. Burm. *Myit-king*.

A decoction of the root is used as a mouth wash in dental caries.

**Elephantopus scaber** L. A decoction of the stem and leaves is used in menstrual disorders.

**Sphæranthus indicus** L. A decoction of the whole plant pounded down is employed as a tonic drink.

**Sphæranthus peguensis** Kurz. Burm. *Kodu-bin*.

A paste of the leaves is used as a styptic, and is also used in hot fomentations.

**Xanthium Strumarium** L. Burm. *Si-hnè*.

A decoction of the whole plant is used as a tonic for cattle.

**Ardisia humilis** Vahl. Burm. *Shadwé*.

All parts of the plant are used in the treatment of menstrual disorders.

**Buddleia asiatica** Lour. A paste of the root is taken in rice water by the Chins as a tonic.

**Heliotropium indicum** L. Burm. *Hsin-hnamaung-bin*.

A decoction of the whole plant used in treating Gonorrhœa.

**Premna latifolia** Roxb. Burm. *Seiknan-gyi*.

A paste of the root is used as a local application after parturition.

**Ocimum canum**. Sims. Burm. *Pin-sein*, used as a diuretic medicine for horses.

**Erva javanica** Juss. Burm. *On-bwè*.

A paste of the root used as an application in acne-like conditions of the face.

**Chenopodium album** L. Burm. *Myu*.

A paste of the root used in treating the diarrhœa of children.

**Aristolochia indica** L. Burm. *Eikthaya-moolee*.

A preparation of the root used externally and a decoction of the leaves given internally in skin-eruptions of children.

**Polygonum tomentosum** Willd. Burm. *Wetkyien*.

A decoction of the root used in the stomachic troubles of children.

**Viscum orientale** Willd. Burm. *Kyibaung*.

A paste of the powdered leaves used as a local antiphlogistic application.

**Chrozophora plicata** A. Juss. Burm. *Gyo-sagauk*.

A decoction of the whole plant used in treating Gonorrhœa.

**Croton oblongifolius** Roxb. Burm. *Thetyin-gyi*.

Leaves used in hot fomentations to allay inflammation, either strained in a cloth or first made into a paste.

**Euphorbia antiquorum** L. Burm. *Teinganeik-tasaung*.

The branches are sliced, dried and powdered and administered to check profuse lochial discharge.

**Streblus asper** Lour. Burm. *On-hnè-bin*.

A decoction of the dried leaves is administered in dysentery.

**Dioscorea bulbifera** L. Burm. *Khadu*.

Used as a galactagogue.

**Arundo Donax** L. Root used as a diuretic.

#### Timber trees.

The following is rather a selective than an exhaustive list. The names in brackets are the Burmese names, either obtained by the writer on the spot or taken from Gamble's Manual of Indian timbers:—

*Mesua ferrea* (*Gangaw*), *Dipterocarpus tuberculatus* (*Eng.*), *Pentacme suavis* (*Ingen* or *Ingyn*), *Bombax malabaricum* (*Letpan*), *Sterculia colorata* (*Wetshaw*), *Cedrela Toona* (*Thitkado*), *Melanorrhœa usitata* (*Thitsi*), *Odina Wodier* (*Hnabè*), *Millettia pendula* (*Thinwin*), *Butea frondosa* (*Pauk*), *Dalbergia cultrata* (*Yindaik*) *Pterocarpus macrocarpus* (*Padauk*), *Tamarindus indica* (*Magyi*), *Bauhinia purpurea* (*Mahahlegani*), *Bauhinia variegata* (*Bwècheng*), *Xylia dolabrifomis* (*Pyingado*), *Adenantha pavonina* (*Ywegyi*), *Acacia arabica*, *Acacia leucophlœa* (*Tanaung*), *Acacia catechuoides* (*Sha*), *Albizzia Lebbek* (*Kòkko*), *Albizzia procera* (*Sit*), *Terminalia Bellerica* (*Thitsein*), *Terminalia tomentosa* (*Taukkyan*), *Anogeissus acuminata*



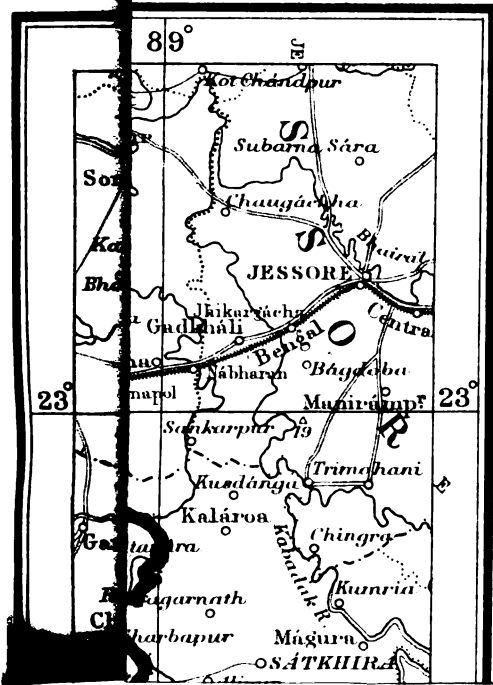
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(*Yón*), *Lagerstroemia parviflora* (*Tsambelay*), *Lagerstroemia tomentosa* (*Lèya*), *Duabanga sonneratioides* (*Myauk-ngo, mau-lettanshe*), *Adina cordifolia* (*Hnaw*), *Mitragyna parvifolia* (*Teinthe*), *Hymenodictyon excelsum* (*Kusan*), *Mimusops Elengi* (*Kaya, Chaya*), *Schrebera swietenioides* (*Thitswèlwè*), *Holarrhena antidysenterica* (*Lettòkkyi, lettòkthein*), *Millingtonia hortensis* (*Egayit*), *Dolichandrone stipulata* (*Mahlwa, paukkyan*), *Heterophragma sulfureum* (*Thitlinda, Kyaungletto*), *Heterophragma adenophyllum* (*Petthan*), *Stereospermum chelonoides* (*Singwe, thakutpo*), *Tectona grandis* (*Kyún*), *Tectona Hamiltoniana* (*Dahat*), *Gmelina arborea* (*Yamane*), *Cinnamomum obtusifolium* (*Lulingyaw*), *Bridelia retusa* (*Seikchi*), *Streblus asper* (*Ohne*), *Castanopsis tribuloides* (*Kyausa*).

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# 24-PARGANAS.



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# THE VEGETATION OF THE DISTRICTS OF HUGHLI-HOWRAH AND THE 24-PERGUNNAHS.

—◆—  
By D. PRAIN.  
—◆—

## I.—INTRODUCTION.

It has often been impressed upon the writer that a concise list of the plants to be met with in the vicinity of Calcutta might be useful to those whom duty or pleasure lead to reside in that city. The present paper is an attempt to supply such a list.

This is by no means the first attempt to do what is required. It appears probable from letters that have been consulted by the writer, written between 1796 and 1823 by Dr. Francis Buchanan (afterwards Hamilton), once Superintendent of the Royal Botanic Garden, that in its original form the *Flora Indica* of Roxburgh only consisted of the brief diagnoses which accompany all the species, and that the long and lucid descriptions which in the work, as we know it, are given for many, but not all, of the plants dealt with, were intercalated subsequently. It further appears that manuscript copies of the original *Flora* were available for use as early as 1798 by at least some of Roxburgh's botanical friends. This, though it certainly covered a wider field than the vicinity of Calcutta, or indeed than the Presidency of Fort William, may be considered the first attempt to provide a list such as is required.

The first serious attempt to provide exactly what is wanted was made in 1839 by J. W. Masters on behalf of the members of the Agricultural and Horticultural Society of India. The title of Masters' paper, *Calcutta Flora, containing a Synopsis of Plants indigenous to or cultivated in the vicinity of Calcutta, arranged according to their natural families; with observations on the properties, and manner of cultivating some of the most interesting*,<sup>1</sup> shows that the design of the author was somewhat ambitious: it is not therefore surprising to

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<sup>1</sup> Transactions of the Agricultural and Horticultural Society of India, vii. 39-85 (1840). The paper was read 12th June 1839.

find that he only succeeded in carrying his synopsis as far as the *Malvaceæ*, and although it appears that he had intended to resume the project at a later date he never did so.<sup>1</sup> The portion actually published was, as he himself explains, only a rough copy of a portion of the projected work, and if one may judge from this portion it is possible that it would have proved less useful than Masters anticipated. The whole list, Masters says, was to have included 3,972 species.

It is probable that one reason why Masters never resumed his *Calcutta Flora* was that about the same time Voigt was engaged in preparing his well-known *Hortus Suburbanus Calcuttensis*, published at Calcutta in 1845. J. O. Voigt, one of the most painstaking botanists who has worked in India, was appointed Surgeon to the Danish Colony of Serampore in 1827, when 29 years of age. Under the influence of the veteran Dr. Carey he gave much of his spare time to botanical study, and in 1834, on Dr. Carey's death, he took charge of Dr. Carey's garden at Serampore, and out of pious regard for Carey's memory set to work almost at once to put into permanent form the results of Carey's botanical and cultural work during the preceding 30 years.

The Serampore Garden, in Carey's and Voigt's day almost as important as the Botanic Garden at Shibpur, worked hand in hand with the latter institution. Thus it was Dr. Carey, and not the Honourable Company, who in 1814 undertook the task of publishing Roxburgh's *Hortus Bengalensis*, in which are catalogued the 3,500 species in cultivation in the Royal Botanic Garden between 1786 and 1814. It is on this invaluable work which, but for the existence of the Serampore Garden, we should never have possessed, that Voigt's larger one was based. Voigt's *Hortus*, however, included the entries in Carey's *Garden Receipt Book*, so that it dealt with all plants that had lived at Serampore, but had succumbed at Shibpur, and all plants introduced at Serampore between 1814 and 1834. It included besides, the catalogue drawn up by Masters to serve as the basis of that writer's abandoned *Calcutta Flora*, showing all the plants introduced into the Shibpur Garden between 1814 and 1836. It included too a list by Dr. Wallich of plants introduced to the Royal Botanic Garden between 1836 and 1840, supplemented by a list made by Voigt himself, while acting in 1842 for Wallich, up to 1843. Voigt's

<sup>1</sup> The paper concludes as follows (*Trans. Agri.-Hort. Soc. India* vii. 85):—  
 "Here I am obliged suddenly to break off being engaged in more important matters; the whole of my time is taken up with them, and I cannot devote any more to this subject at present.—J. W. Masters, May 3, 1830."

superintendence at Serampore enabled him to include all the species introduced there from 1834 to 1843.

The unfortunate illness and death of Voigt in 1843 prevented the issue of the work by the author. His manuscript, as it stood at the end of 1841, was made over to the Agricultural and Horticultural Society, and the printing of the work at the Society's expense was begun. After 16 pages had been printed, some hitch arose and the printing was suspended. However, after Voigt's death, Griffith, who considered the work very valuable, arranged to see it through the press. Before, however, the Indices were commenced Indian Botany had to lament Griffith's untimely death, and Mack who, in consequence, undertook their preparation also died before they were completed, so that it was 1845 before the work was issued.

The scope of the work is hardly completely indicated by its title, which is:—*Hortus Suburbanus Calcuttensis: A Catalogue of the Plants which have been cultivated in the Hon. East India Company's Botanical Garden, Calcutta, and in the Serampore Botanical Garden, generally known as Dr. Carey's Garden, from the beginning of both establishments (1786 and 1800) to the end of August, 1841: drawn up according to the Fussiaean arrangement, and mostly in conformity with the second edition (1836) of Lindley's Natural System of Botany.*<sup>1</sup>

It contains remarks on each natural order, the names of the plants enumerated, the Bengali names of those indigenous to or commonly cultivated in Lower Bengal, the habit, time of flowering and the flower of each individual species; the habitat, properties and uses of each. The number of natural families dealt with is 278, of genera 1,737, of species 5,515.

Of the great merit of the work it is hardly necessary to speak. Yet the value of the *Hortus Suburbanus* has been found, by those who have had to work with Indian plants elsewhere than in Lower Bengal, to be comparatively small. Hooker and Thomson, for example, have pointed out that the *Hortus* is "not available as a work of reference, nor can we refrain from expressing our regret that talents of so high an order should have been devoted to a work of so little practical use." This is in one sense perfectly true, for Voigt's references are not accompanied by adequate descriptions; and when Roxburgh, in whose *Flora Indica* a large proportion of the species are described, has been cited, the subsequent citation of Voigt is supererogatory. There is, however, a sense in which the verdict just quoted is inapplicable. The work, when

<sup>1</sup> Calcutta: Bishop's College Press, 1845, 1 vol., large 8vo.

employed as Voigt intended it to be, as a guide to the plants in cultivation in gardens in and about Calcutta, is not only the best, but, in the estimation of the native inhabitants of our districts, the only guide that is of the slightest use. This, however, is less because of any virtue in the arrangement or any merit in the scientific matter, than because the native names given are not only selected with much care and critical insight but are given in their original characters.

Perhaps the greatest defect in the work is that it goes too far and deals not only, as its title implies, with the plants cultivated in the two gardens at Calcutta and Serampore but includes, as Masters in his venture proposed, the indigenous plants as well. Its chief use is undoubtedly as a guide to the exotic plants cultivated in the neighbourhood of Calcutta; in this respect it still is, and will long continue to be, invaluable. As a guide to the non-exotic plants of the neighbourhood it is much less useful; indeed, as Hooker and Thomson say, it is not in this respect suitable as a work of reference.

In 1862 an attempt was made to utilise the information regarding the indigenous species enumerated in Voigt by R. Anderson in a *Catalogue of Plants indigenous in the neighbourhood of Calcutta with directions for the examination and preserving of plants*.<sup>1</sup> This compilation consists of a bare list of the plants given by Voigt as natives of Serampore with the names brought more or less up to date, but the list is badly printed and abounds with uncorrected printer's errors. Moreover, it does not give the vernacular names so carefully collected by Voigt, so that it is of no practical use except as a check list. The only valuable part of the pamphlet is the portion dealing with the examination and preservation of specimens which is taken from the introduction to the Colonial Floras published by the authority of Government. The number of natural families given is 86, of genera 327, of species 738.

In the present paper an attempt is made to do more thoroughly what was attempted by Anderson. It has not, however, appeared feasible to define the neighbourhood of Calcutta more rigidly than to consider this as including, to the east of the Hughli, the whole of the 24-Pergunnahs in which Calcutta lies, and on the west of the Hughli, the two districts of Howrah—where we have Shibpur and the Royal Botanical Garden, and Hughli—which includes Serampore. The list therefore enumerates all species hitherto collected within these three districts. But the district of the 24-Pergunnahs includes the Western Sundribuns where we have typical mangrove-swamp forests;

<sup>1</sup> Calcutta : Bishop's College Press : 1862.



at the same time the most westerly sub-division (Goghat) of the Hughli district, lies beyond the Dwarkeswar river and outside the limits of the deltaic alluvium on which Calcutta is built, so that its flora is to a considerable extent that characteristic of drier districts like Bardwan and Birbhum. On either side of the river Hughli therefore we find, within the districts with which we have to deal, types of vegetation that are very distinctive, each including a number of species that are not to be met with in the immediate vicinity of Calcutta. But the actual number of species of each class, as compared with the total number of species in the list, is not very great and it is hardly worth while, for the sake of excluding them, to have recourse to the unnatural step of proposing arbitrary boundary lines for the 'neighbourhood' of Calcutta.

In drawing up the systematic list an enumeration has been made of all the flowering plants hitherto collected in our districts and of all the cryptogams, except the Fungi, of which named specimens are preserved in the Calcutta herbarium. It is, however, certain that, except as regards the Pteridophyta and Bryophyta, these cryptogamic lists are quite incomplete. As regards the Fungi, though the Calcutta material is fairly extensive, it has been so inadequately studied that a list of its named species would serve little useful purpose.

In the case of the Phanerogams all plants that are certainly wild in the districts are included. That a plant is wild in these districts is, however, no indication that it is indigenous. There is a sense in which, except perhaps in the Goghat sub-division of the Hughli district, no species *can* be indigenous in our area; the whole or nearly the whole tract consists of land laid down by the great river Ganges or its distributaries, and therefore all the plants growing on its surface *must* be immigrants from elsewhere. Even, however, if we admit this to be the case, the fact is not altered that a considerable number of species, some of which have certainly been originally deliberately introduced, (*Bryophyllum calycinum*, *Turnera ulmifolia*, *Opuntia Dillenii*, *Passiflora suberosa* are examples), though not even originally natives of India, are now absolutely established as *wild* plants in our area. But besides wild plants, whether native in the sense that they may have spread to these alluvial tracts from the adjacent higher ground of West Bengal or that they may have been brought by ocean currents, by rivers, by winds, or by living creatures other than man, the list includes all the crops cultivated in fields or gardens in the districts; and such trees or shrubs or herbs as are to be found in native gardens, or in village-

shrubberies or by roadsides. Trees or shrubs or herbs that are only to be found in large public gardens or are only to be met with, as a rule, in the gardens of Europeans, are excluded except in the few cases, such as those of *Browallia elata*, *Hymenanthem tenuifolium*, *Torenia Fournieri*, and *Helianthus argyrophyllus* which habitually, or such as those of *Phlox Drummondii*, *Petunia nyctaginifolia*, and *Alyssum maritimum* which occasionally occur as self-sown plants in garden plots or in waste corners where the soil is good.

The question of showing whether a species is or is not wild, or whether it is or is not native, by the use of distinctive types in the systematic list, therefore appears neither to be practically useful nor to be altogether possible. All that it has appeared advisable to do has been to distinguish by means of an asterisk such species as may be certainly deemed *native* in the sense that (1) they are not cultivated plants; (2) they are thoroughly established plants; (3) they have been either introduced by other than human agency, or, if they have been introduced by man, the introduction has been inadvertent and they have been obviously introduced from some part of South-Eastern Asia. On the other hand, plants that are not distinguished by an asterisk, and among phanerogams these are about as numerous as plants of the preceding class, include species that cannot be certainly deemed native, because (1) they are only to be found in cultivation; (2) they are weeds that only occur associated with *cold-weather* crops, and that do not re-appear unless their seeds are re-sown with these crops; (3) they are plants that, even if now spontaneous, have clearly been originally purposely introduced by man, or, if their original introduction was inadvertent, have as their natural habitat some country other than India, Indo-China or Malaya. With this class are necessarily included such species as have been recorded from our area by previous botanical writers, such as Roxburgh, Wallich, Griffith, and Voigt, but which have not been met with in recent years. The omission of the distinguishing asterisk, it is hardly necessary to remark, does not imply doubt as to the accuracy of the record; when there is a doubt as to this, the fact is mentioned in the text. The probability is that, in most instances, the old records which have not been repeated are records of species which have appeared only as casuals in our area. A considerable number of recent records belong obviously to the same class; these are similarly shown in the subjoined list without an asterisk.

As one of the uses to which it is hoped those who may employ it will put the present list, is the verification of some at least of these

former records the entries of all the species in the *Hortus Suburbanus Calcuttensis* have been cited. At the same time, with a view to assisting those who may employ the list in identifying the various species, references are also given to the writer's work entitled *Bengal Plants* in which will be found definitions of all the natural families and genera, accompanied by a series of keys to the great majority of the genera and species here enumerated. If in any case further reference is required to full specific descriptions or to figures, the necessary information will be found either in Roxburgh's *Flora Indica* to which both the *Hortus Suburbanus* and *Bengal Plants* will guide the student; or in Hooker's *Flora of British India* and Beddome's *Ferns of India and Ceylon*, to which references are made in *Bengal Plants*.

The present list deals with 120 natural families of phanerogams including 670 genera and 1,316 species. Of these 1,316 species about 120 are staple field or garden crops; 260 are plants that for one reason or another have been deliberately introduced, and 21 are species that have been certainly, though inadvertently, introduced by human agency. The remaining species may be considered native in a qualified sense; they include about 700 species fairly widely spread in South-Eastern Asia; 30 that are only to be found in the extreme north-west portion of our area (the Gohat sub-division of Hughli); 85 that are either confined to the Sundribuns or only extend a little way north from the Sundribuns into the Gangetic delta; and about 100 that extend from the northern part of our area into the Sundribuns.

The cryptogamic portion of the list deals with 37 natural families, including 92 genera and 175 species.

## II.—TOPOGRAPHY AND VEGETATION.

The whole of the area included in the three districts around Calcutta is, in appearance and almost in reality, a level plain, though there is, as a matter of fact, a very gentle and gradual rise from the Sundribuns sea-face in the south-east of the 24-Pergunnahs to Gohat in the north west of Hughli, and about Badanganj—the extreme western portion of the Gohat sub-division—a slight amount of natural undulation in the ground is perceptible. Except this Gohat sub-division, which lies west of the Dwarkeswar river and as already explained belongs really to West Bengal; the rest of the Hughli district and the whole of the Howrah district belong to the rice swamp of Central

Bengal. The same is true of a considerable portion of the 24-Pergunnahs from the river Hughli eastward and southward to a line running roughly from Mud Point north-westward to Basirhát. The large irregularly triangular slice of territory bounded on the west by the Hughli from Saugor light-house to Mud Point and from Mud Point to Basirhát by the arbitrary line just mentioned, on the east by the Raimangal river, and on the south by Bay of Bengal, which completes our area, forms the western portion of the Sundribuns.

The Hughli-Howrah districts, with the exception of the Goghat sub-division west of the Dwarkeswar, and the non-Sundribun portion of the 24-Pergunnahs may be taken together. They form part of Central Bengal and are typically representative of the great alluvial rice-plain of the Gangetic delta. The only natural high ground is along the banks of the main streams, and the only other high lands met with are the more or less artificial patches around villages and towns and the obvious mounds and embankments thrown up around ponds and along canals, or as means of communication by road or rail.

The greater portion of the area is under cultivation, all the low land being under rice-cultivation. Along the banks of the chief waterways where these are under tidal influence, we find a narrow hedge, or scattered patches of species that are characteristic of the Sundribun region, while on the mounds or embankments that have been artificially raised, and in the immediate vicinity of most villages and towns, we find groves and thickets of trees and shrubs, many of them subsponaneous only, a large proportion of them more or less economically useful, and a considerable number of them natives of countries other than India.

There is nothing that could possibly be termed genuine forest in the whole of this area, though in the north-eastern corner of Hughli in the Balagarh thana there is a certain amount of jungle including genuine forest trees as apart from the trees more characteristic of village and suburban shrubberies. Along the Damodar river there extends to the west a narrow strip, five or six miles wide, which is heavily flooded during every rainy season and is mostly uncultivated. This tract, which begins two or three miles west of the river bank,—for a narrow band along the western bank of the Damodar is highly cultivated during the cold weather—is under coarse grass and is practically uninhabited. In a few localities, where places formerly inhabited have been abandoned, as for instance, on the site of Satgaon, a little jungle, approaching to a true forest in character and appearance, may be met with.

The Gohat sub-division which, as has been explained, belongs to Western rather than Central Bengal, is as closely cultivated as the main portion of our area. The village-shrubberies are, however, less extensive and the species characteristic of roadsides and such waste places as exist include not a few that are unknown elsewhere in our area; *Cissampelos Pareira*, *Polycarpæa corymbosa*, *Salomonina oblongifolia*, *Ventilago maderaspatana*, *Desmodium heterophyllum*, *Cassia Absus*, *Drosera Burmanni*, *Wendlandia exserta*, *Morinda citrifolia*, *Cyathocline lyrata*, *Gnaphalium pulvinatum*, *Holarrhena antidysenterica*, *Mitrasacme alsinoides*, *Heliotropium ovalifolium*, *Striga lutea*, *Striga euphrasioides*, *Gmelina arborea*, *Moschosma polystachyum*, *Leucas mollissima*, *Commelina attenuata*, *Funcus prismatocarpus*, *Courtoisia cyperoides*, *Fimbristylis argentea*, *Panicum psilopodium*, *Digitaria pedicellaris*, *Tragus racemosus*, *Andropogon brevifolius*, *A. pertusus*, *Iseilema laxum*, *Aristida Adscencionis*, *Polypogon monspeliensis*, *Arundinella Wallichii*, *Eragrostis coarctata*, *Chloris virgata*; also as cultivated species, *Papaver somniferum*, *Guisotia abyssinica* and *Hordeum vulgare* exhaust the list of species that are only known from Gohat.

It has, however, to be remarked that a very considerable number of species which are only certainly known to the writer to occur, within our area, in Gohat west of the Dwarakeswar river have been reported from Serampore by Voigt. We know, however, from various passages in Voigt's *Hortus* that some at least of the plants he records were obtained, not by Voigt but by native collectors sent out by Carey or by himself, and it is, therefore, not improbable that these collectors in their search for additional species at times visited the corresponding country further south. This is rendered still more probable from the fact that Voigt's Serampore list includes not a few plants that have not been obtained even in Gohat and that we know to be strangers to or only casuals in the Gangetic delta.

A very noticeable feature in the list of these western, dry country species from Gohat is the number of species of grasses to be found there that do not grow on the mud of the delta. The vegetation of Gohat is in fact that characteristic of South Behar or Western Bengal, with which it is proposed to deal in a subsequent paper, and is quite different from that of the Delta.

The Western Sundribuns, or the swamp forest region of the 24-Pergunnahs, is covered throughout with a rather low forest for the most part unbroken, though here and there patches covered with tall grasses are interspersed, and towards the sea-face there occur at intervals considerable stretches of muddy shore sparingly wooded

with mangroves and occasionally with patches of salt-worts. At other times the sea-face ends in a line of sand hills with a true dune vegetation.

The plants characteristic of the mangrove belt, or of these sand-dunes do not extend into the central portion of our area; nor to any considerable extent do the species that are characteristic of the interior of the swamp forests. The species that throughout the Sundriban region are characteristic of the banks of creeks and rivers do, however, in a rather marked degree continue along the banks of many nullahs and along those of all the larger streams to the north and west of the Sundriban area. On this account while we have, especially to the west of the Hughli, a considerable number of species that are truly wild in our districts which are really characteristic of the drier western parts of India, we also have, especially to the east of the Hughli, a considerable number of species that are truly wild in our area which are really characteristic of the Sundribans.

The majority of the Sundriban species, however, are peculiar and are confined to that region, and but for the accident that the district of the 24-Pergunnahs extends to the sea and so includes a portion of the Sundribans, they would find no place in this list. The following list, corresponding to the similar list for Goghat, includes all the species that are confined to the Sundriban portion of our area: the Sundri itself, *Heritiera minor*, also *Hibiscus tortuosus*, *Brownlowia lanceolata*, *Amoora cucullata*, *Carapa obovata*, *Salacia prinoides*, *Canavalia lineata*, *Dalbergia spinosa* and *D. torta*, *Desmodium umbellatum*, *Cæsalpinia Nuga*, *Rhizophora mucronata* and *R. conjugata*, *Ceriops Roxburghiana*, *Kandelia Rheedii*, *Bruguiera gymnorrhiza* and *B. parviflora*, *Lumnitzera racemosa*, *Barringtonia racemosa*, *Sonneratia acida*, *Sesuvium Portulacastrum*, *Pluchea indica*, *Launea pinnatifida*, *Ægialitis rotundifolia*, *Ægiceras majus*, *Cerbera Odollam*, *Parsonsia spiralis*, *Fraxinaria obovata*, *Sarcobolus globosus* and *S. carinatus*, *Merremia convolvulacea*, *Ipomœa Pes-capræ*, *Solanum trilobatum*, *Acanthus volubilis*, *Avicennia officinalis*, *Suaeda maritima*, *Arthrocnemum indicum*, *Salicornia brachiata*, *Sapium indicum*, *Nipa fruticans*, *Phœnix paludosa*, *Calamus tenuis*, *Mariscus albescens*, *Elæocharis spiralis*, *Fimbristylis halophila* and *F. subbispicata*, *Scirpus trigueter* and *S. littoralis*, *Oryza coarctata*, *Myriostachya Wightiana*, *Nephrodium aridum*. There are also a few species that are only wild in our area because they occur as epiphytes on trees in the Western Sundriban forests, such as *Hoya parasitica*, *Dendrobium anceps* and *D. Pierardi*, *Luisia brachystachys*, *Sarcanthus insectifer*, *Polypodium*

*adnascens* and *Vittaria elongata*. These, however, are in no way distinctive of the Sundribuns; their presence is due to the fact that it is only in the Sundribun part of our area that the forest conditions suitable for their growth are really to be found. A full account of the Sundribun flora will be found in Vol. II of these Records.

The rest of the species included in the list belong to four distinct groups:—(1) Species that are common to the Gangetic delta north of the Sundribuns and to the Sundribuns; (2) Species that are common to the Gangetic delta and Western Bengal, but that do not go into the Sundribuns; (3) Species that are neither to be found in the Sundribun forests nor in Western Bengal or beyond; and (4) a residuum of species that are cultivated or are manifestly introduced plants.

The species of the first group include plants that have either been left behind as the conditions of our districts became altered from their former swamp forest state, or that have, under the influence of the tides which affect the various rivers and creeks, invaded our area from the Sundribuns. They, however, include a few that on the other hand have obviously invaded the Sundribuns from the north; these in some cases at least are common to Western Bengal and to the deltaic area. Taking first the plants of this latter sub-group we find that they include *Naravelia zeylanica*, *Cratæva religiosa*, *Capparis sepiaria*, *Flacourtia sepiaria*, *Tamarix gallica*, *Vitis quadrangularis*, *Vitis trifolia*, *Allophylus Cobbe*, *Odina Wodier*, *Crotalaria Saltiana*, *C. retusa* and *C. verrucosa*, *Derris scandens*, *Flemingia congesta*, *Cæsalpinia Bonducella*, *Cassia Fistula* and *C. Sophera*, *Acacia tomentosa* and *A. concinna*, *Barringtonia acutangula*, *Zehneria umbellata*, *Randia dumetorum*, *Vangueria spinosa*, *Ixora parviflora*, *Wedelia calendulacea*, *Diospyros Embryopteris*, *Hemidesmus indicus*, *Calotropis gigantea*, *Dregea volubilis*, *Cordia Myxa*, *Ipomœa paniculata*, *Ipomœa sepiaria*, *Cuscuta reflexa*, *Hygrophila phlomoïdes*, *Lippia nodiflora*, *Vitex trifolia* and *V. Negundo* *Clerodendron Siphonanthus*, *Alternanthera sessilis*, *Aristolochia indica*, *Cassytha filiformis*, *Loranthus Scurrula*, *L. longiflorus* and *L. globosus*, *Viscum monoicum*, *Bridelia stipularis*, *Breynia rhamnoides*, *Croton oblongifolius* and *C. caudatus*, *Mallotus repandus*, *Strebilus asper*, *Ficus retusa*, *Saccolabium papillosum*, *Aneilema nudiflorum*, *Pandanus fœtidus*, *Typha elephantina* and *T. angustata*, *Cryptocoryne ciliata*, *Juncellus inundatus*, *Cyperus malaccensis* and *C. exaltatus*, *Fimbristylis ferruginea*, *Scirpus grossus* and *S. articulatus*, *Panicum repens*, *Oryza sativa*, *Saccharum spontaneum*,

*Sporobolus tremulus*, *Phragmites Karka*, *Ceratopteris thalictroides*, *Polypodium quercifolium*, *P. adnascens* and *P. irioides*. The species in this list are exclusively plants that have extended into the Sundribuns and are established in the swamp-forests or at the sea-face. One or two of the species, such as *Cordia Myxa* and *Diospyros Embryopteris* may be plants that were originally deliberately introduced and that have persisted in abandoned clearings; all are, however, truly wild species in the Sundribun region. The species that occur as weeds or cultivated plants in existing Sundribun clearings are here dealt with along with the other species of the Lower Gange-tic plain.

The species that extend northward into the Central Bengal rice-plain from the Sundribuns, especially along river banks, are less numerous. They include *Hibiscus tiliaceus*, *Thespesia populnea*, *Aphania Danura*, *Erythrina indica*, *Canavalia turgida*, *Phaseolus adenanthus*, *Vigna luteola*, *Pongamia glabra*, *Derris uliginosa*, *Sonneratia apetala*, *Morinda bracteata*, *Blumea amplexens*, *Sphæranthus africanus*, *Wedelia scandens*, *Azima tetracantha*, *Pentatropis microphylla*, *Tylophora tenuis*, *Stictocardia tiliæfolia*, *Acanthus ilicifolius*, *Premna integrifolia*, *Clerodendron inerme*, *Psilotrichum ferrugineum*, *Agynceia bacciformis*, *Trewia nudiflora*, *Excoecaria Agallocha*, *Ficus Rumphii*, *Crinum asiaticum*, *Alpinia Allughas*, *Flagellaria indica*, *Pandanus fascicularis*, *Ruppia rostellata*, *Pycneus polystachyus*, *Cyperus scariosus*, *Scirpus triqueter* var., *Paspalum distichum*, *Zoysia pungens*, *Acrostichum palustre* and *A. aureum*.

Turning now to the species that are common to Northern Bengal or to Western Bengal, of which the somewhat outlying Goghat sub-division of the Hughli district is an integral portion, or to the drier parts of India further west still, and to the deltaic alluvial portion of our area, but that do not enter the Sundribuns though in many cases they extend eastward to Indo-China and Malaya, we find that we have to deal with a considerable list, though it may be remarked that a remarkable proportion of these are species recorded as occurring near Serampore or Calcutta by Roxburgh, Carey, and Voigt, but not seen from our districts, except from Goghat, and by no means in all cases from that sub-division, since 1845. For this there are two possible explanations. In some cases it is certain that Voigt's "Serampore" plants were brought in by native collectors who probably went sufficiently far west in their journeys to reach the drier, and though still practically level, yet non-alluvial tract just south of Goghat. In other cases the species were collected



at or near Serampore, not impossibly even in Dr. Carey's garden, but were only casuals in our area, accidentally sown with the seeds, or brought in the soil about the roots, of purposely introduced species. This remark applies equally to a very considerable number of species seen by the writer, some indeed of these being species not met with either by Roxburgh or by Voigt. In the list now given all species of the kind are marked with an asterisk. The list is as follows:—

\**Nigella sativa*, *Ranunculus sceleratus*, *Cocculus villosus*, *Tinospora tomentosa* and *T. cordifolia*, *Tiliacora racemosa*, *Stephania hernandifolia*, *Fumaria parviflora*, *Nasturtium palustre* and *N. indicum*, \**Cardamine debilis*, *Cochlearia flava*, \**Capsella Bursa-Pastoris*, *Cleome viscosa*, *Gynandropsis pentaphylla*, *Capparis horrida* and \**C. ceylanica*, *Ionidium suffruticosum*, *Flacourtia sapida*, *Polygala chinensis*, \**Saponaria Vaccaria*, \**Stellaria media*, \**Spergula pentandra*, *Polycarpon Loefflingiæ*, *Portulaca oleracea*, and *P. quadrifida*, *Tamarix dioica*, *Bergia verticillata* and *B. ammannioides*, *Sida veronicæfolia*, *S. acuta*, *S. cordifolia*, *S. rhombifolia* and *S. rhomboidea*, *Urena lobata* and *U. sinuata*, *Abutilon indicum* and *A. hirtum*, *Hibiscus ficulneus*, \**H. tetraphyllus*, *H. vitifolius*, \**H. panduriformis*, \**H. hirtus* and \**H. Abelmoschus*, *Bombax malabaricum*, *Helicteres Isora*, *Pentapetes phænicea*, *Melochia corchorifolia*, *Waltheria indica*, \**Grewia asiatica*, \**G. polygama*, *G. lævigata*, \**G. multiflora* and *G. hirsuta*, *Triumfetta rhomboidea*, *Corchorus acutangulus*, \**C. fascicularis*, and \**C. trilocularis*, \**Hiptage Madagblota*, *Tribulus cistoides* and *T. terrestris*, *Oxalis corniculata*, *Biophytum sensitivum*, \**Acronychia laurifolia*, *Glycosmis pentaphylla*, *Clausena heptaphylla*, \**Feronia elephantum*, *Ægle Marmelos*, \**Garuga pinnata*, \**Melia Asadirachta*, \**Amoora Rohituka*, *Cedrela Toona*, \**Olax phænicarpa*, *Zizyphus Ænopia*, \**Gouania leptostachya*, *Vitis latifolia*, *V. adnata*, \**V. lanata*, *V. repanda*, \**V. indica*, *V. pedata* and \**V. elongata*, *Leea macrophylla*, *L. crispa*, *L. robusta*, *L. aequata* and *L. sambucina*, *Cardiospermum Halicacabum*, \**Erioglossum edule*, *Vicia hirsuta*, \**Lathyrus Aphaca*, *Abrus precatorius*, \**Crotalaria quinquefolia*, \**C. laburnifolia*, \**C. medicaginea*, \**C. alata*, \**C. sericea*, *C. mysorensis*, \**C. calycina*, *C. prostrata* and *C. acicularis*, *Cylista scariosa*, *Rhynchosia rufescens*, *R. viscosa*, *R. sericea*, *Atylosia scarabæoides*, *Phaseolus trilobus* and *P. sublobatus*, *Vigna pilosa*, *Teramnus labialis* and *T. debilis*, *Canavalia virosa*, *Mucuna pruriens*, \**Butea frondosa*, *Sesbania aculeata* and *S. uliginosa*, *Tephrosia Hookeriana* and *T. purpurea*,

*\*Dalbergia Sissoo*, *\*D. lanceolaria* and *\*D. latifolia*, *Melilotus indica* and *\*M. alba*, *\*Trigonella corniculata*, *Smithia sensitiva*, *Uraria picta* and *U. lagopoides*, *\*Lourea vespertilionis*, *Desmodium triflorum*, *D. diffusum*, *\*D. pulchellum*, *D. Cephalotes*, *D. polycarpum*, *D. gangeticum* and *D. gyrans*, *Alysicarpus vaginalis*, *A. bupleurifolius* and *A. rugosus*, *Psoralea corylifolia*, *Indigofera linifolia*, *I. trifoliata*, *I. viscosa* and *\*I. trita*, *\*Cassia auriculata*, *C. Tora*, and *\*C. mimosoides*, *\*Bauhinia racemosa*, *\*Cæsalpinia Sappan* and *\*C. sepiaria*, *Mimosa rubricaulis*, *Acacia Suma*, *A. catechuoides*, *\*A. Farnesiana* and *\*A. arabica*, *Kalanchoe laciniata*, *\*Eugenia caryophyllifolia*, *Ammannia rotundifolia*, *A. peploides*, *A. pygmaea*, *A. pentandra*, *A. baccifera*, and *A. multiflora*, *\*Woodfordia floribunda*, *Fussiaea suffruticosa*, *Ludwigia parviflora*, *Trichosanthes cucumerina* and *T. palmata*, *Gymnopetalum cochinchinense*, *Luffa graveolens*, and *L. amara*, *Momordica dioica* and *M. cochinchinensis*, *Cucumis trigonus*, *Cephalandra indica*, *Mukia scabrella*, *Bryonia laciniata*, *Trianthema monogynum*, *Mollugo stricta*, *M. Spergula*, and *M. hirta*, *Hydrocotyle rotundifolia* and *H. asiatica*, *Ænanthe stolonifera* and *Æ. benghalensis*, *Seseli indicum*, *Alangium Lamarokii*, *\*Adina cordifolia*, *Stephegyne parvifolia*, *Dentella repens*, *Oldenlandia crystallina*, *O. diffusa*, *O. corymbosa*, and *O. paniculata*, *\*Randia uliginosa*, *Hyptianthera stricta*, *Pavetta indica*, *\*Coffea bengalensis*, *Ixora undulata*, *Pæderia fætida*, *\*Knoxia corymbosa*, *Spermacoca hispida*, *\*Centrantherum anthelminticum*, *Vernonia cinerea*, *Elephantopus scaber*, *Adenostemma viscosum*, *Grangea maderaspatana*, *Blumea bifoliata*, *B. Wightiana*, *B. glomerata*, *B. lacera*, *B. laciniata* and *B. membranacea*, *Laggera flava* and *L. aurita*, *Sphæranthus indicus*, *Athroisma laciniatum*, *Gnaphalium luteo-album* and *G. indicum*, *Cæsulia axillaris*, *Emilia sonchifolia*, *Xanthium strumarium*, *Eclipta alba*, *\*Spilanthes Acmella*, *\*Galinsoga parviflora*, *Cotula hemispherica*, *Contipeda orbicularis*, *Onicus arvensis*, *Cretis japonica* and *C. acaulis*, *Sonchus asper*, *\*S. oleraceus* and *\*S. arvensis*, *Launea asplenifolia*, *\*Lobelia trigona*, *Sphenoclea zeylanica*, *Wahlenbergia gracilis*, *Stylidium tenellum*, *\*Androsace saxifragæfolia*, *\*Anagallis arvensis*, *Ardisia humilis*, *Diospyros cordifolia*, *Fasminum pubescens* and *\*F. elongatum*, *\*Carissa spinarum*, *Rauwolfia serpentina*, *\*Alstonia scholaris*, *Vallaris Heynei*, *Ichnocarpus frutescens*, *Cryptolepis Buchananii*, *Oxystelma esculentum*, *Calotropis gigantea*, *Cynanchum Callialata*, *Dæmia extensa*, *\*Sarcostemma brevistigma*, *Gymnema hirsutum*, *Perularia pallida* and *\*P. minor*, *Tylophora asthmatica*, *Exacum*

*tetragonum* and *B. pedunculatum*, *Erythraea Roxburghii*, *Hoppea dickotoma*, *Canscora diffusa* and *C. decussata*, \**Enicostema littorale*, *Hydrolea seylanica*, \**Ekretia laevis*, *Heliotropium strigosum* and *H. indicum*, *Coldenia procumbens*, *Cynoglossum lanceolatum*, *Trichodesma indicum* and \**T. seylanicum*, \**Cuscuta chinensis*, \**C. capitata* and \**C. europæa*, *Evolvulus alsinoides*, \**Hewittia bicolor*, *Merremia vitifolia*, \**Merremia tridentata*, \**M. hastata*, and *M. emarginata*, \**Ipomæa hispida*, *I. Pestigridis*, and *I. obscura*, *Calonyction Boma-nox*, \**Rivea hypocrateriformis*, *Argyreia speciosa* and *A. argentea*, *Lettsonia strigosa*, *Solanum verbascifolium*, *S. nigrum*, *S. ferox*, *S. torvum*, *S. indicum* and *S. xanthocarpum*, *Physalis minima*, \**Withania somnifera*, *Celsia coromandeliana*, *Linaria ramosissima*, *Morus rugosus*, *Lindenbergia urticifolia*, \**Limnophila Roxburghii*, *L. conferta*, *L. diffusa*, *L. heterophylla*, *L. gratissima*, *L. racemosa* and *L. gratioloides*, *Herpestis Monnieria* and \**H. Hamiltoniana*, *Dopatrium junceum*, \**Torenia cordifolia* and \**T. asiatica*, *Vardellia crustacea*, *V. multiflora*, *V. pedunculata*, *V. angustifolia*, and *V. pyxidaria*, *Ilysanthes parviflora*, \**I. hyssopoides* and *I. rotundifolia*, *Bonnaya brachiata*, *B. veronicæfolia*, *B. tenuifolia* and \**B. oppositifolia*, \**Veronica Anagallis* and *V. agrestis*, *Centranthera hispida* and *C. humifusa*, \**Æginetia pedunculata*, *Orobanche indica*, \**Utricularia racemosa* and *U. bifida*, \**Thunbergia grandiflora*, *Nelsonia campestris*, *Ebermaiera glutinosa*, *Cardanthera triflora*, *Hygrophila polysperma*, *H. quadrivalvis* and *H. spinosa*, *Ruellia prostrata*, *Hemigraphis hirta*, *Phayloopsis parviflora*, *Andrographis paniculata*, \**Barleria Prionitis* and *B. cristata*, *Asystasia gangetica*, *Ecboium Linneanum*, *Justicia Gendarussa*, *J. quinqueangularis* and *J. simplex*, *Adhatoda Vasica*, *Peristrophe bicalyculata*, *Rungia parviflora*, *Dicliptera Roxburghiana*, *Verbena officinalis*, *Callicarpa macrophylla* and *C. longifolia*, *Clerodendron infortunatum*, \**Ocimum adscendens*, *Pogostemon plectranthoides*, *Dysophylla verticillata*, *Anisomeles ovata*, \**Leonurus sibiricus*, *Leucas aspera*, *L. linifolia*, *L. Cephalotes* and *L. procumbens*, \**Leonotis nepetifolia*, *Salvia plebeja*, *Boerhaavia repens*, \**Pisonia aculeata*, *Deeringia celosioides*, *Digera arvensis*, *Amarantus spinosus*, *A. mangostanus*, *A. fasciatus*, *A. viridis*, *A. polygamus* and *A. tenuifolius*, \**Pupalia atropurpurea*, *Ærua lanata* and \**Æ. scandens*, *Achyranthes aspera*, *Chemopodium album*, *Polygonum plebejum*, \**P. lapathifolium*, \**P. tomentosum*, \**P. lanigerum*, *P. barbatum*, *P. orientale*, *P. glabrum*, *P. serrulatum*, *P. Hydropiper*, and *P. flaccidum*, *Rumex maritimus* and *R. dentatus*, \**Piper longum*, *Litsæa sebifera* and *L. polyantha*,

*\*Euphorbia antiquorum*, *\*E. neriifolia*, *\*E. Nivulia*, *E. dracunculoides*, *E. hypericifolia*, *E. pilulifera*, *E. thymifolia* and *E. microphylla*, *Bridelia tomentosa*, *\*Glochidion multiloculare*, *Flueggea microcarpa*, *Phyllanthus reticulatus*, *\*P. maderaspatensis*, *P. Urinaria*, *P. Niruri*, and *P. simplex*, *Antidesma Ghæsembhilla* and *A. diandrum*, *Chrosophora plicata*, *Gelonium multiflorum* and *\*G. lanceolatum*, *Baliospermum axillare*, *Acalypha indica* and *A. ciliata*, *Tragia involucrata* and *\*T. cannabina*, *Trema orientalis*, *Fleurya interrupta*, *Pousolsia indica*, *Ficus bengalensis*, *F. religiosa*, *F. insectoria*, *F. hispida* and *F. glomerata*, *Pachystoma senile*, *Eulophia graminea*, *Geodorum dilatatum* and *\*G. purpureum*, *Vanda Roxburghii*, *\*Cleisostoma micranthum*, *Didymoplexis pallens*, *Pogonia plicata*, *P. juliana* and *P. carinata*, *Zeuxina sulcata*, *Habenaria digitata*, *\*H. commelinifolia*, *H. marginata* and *H. viridiflora*, *\*Hedychium coronarium*, *Curcuma aromatica*, *\*C. cæsia*, *C. ferruginea* and *C. rubescens*, *Costus speciosus*, *Curculigo orchoides*, *Crinum defixum* and *C. pratense*, *Dioscorea pentaphylla*, *D. bulbifera*, *D. spinosa*, *D. anguina* and *D. glabra*, *Asparagus racemosus*, *Smilax prolifera* and *\*S. macrophylla*, *Gloriosa superba*, *\*Asphodelus tenuifolius*, *Monochoria hastæfolia* and *M. vaginalis*, *Xyris pauciflora*, *Commelina nudiflora*, *C. salicifolia*, *C. Hasskarlii*, *C. bengalensis*, *C. obliqua* and *C. suffruticosa*, *Ancilema spiratum* and *A. vaginatum*, *\*Cyanotis cristata* and *C. axillaris*, *Calanus viminalis*, *Typhonium trilobatum*, *T. cuspidatum* and *\*T. divaricatum*, *Amorphophallus bulbifer*, *Plesmonium margaritifera*, *Alocasia fornicata*, *Colocasia nymphaefolia*, *Scindapsus officinalis*, *Lasia heterophylla*, *Alisma reniforme* and *A. oligococcum*, *Limnophyton obtusifolium*, *Sagittaria sagittifolia* and *S. guayanensis*, *Butomopsis lanceolata*, *Eriocaulon truncatum*, *E. Sieboldianum*, *E. luzulifolium*, *E. quinqueangulare* and *E. trilobum*, *Scleria biflora* and *S. lithosperma*, *Kyllinga monocephala*, *K. brevifolia* and *K. triceps*, *Pycreus sanguinolentus* and *P. nitens*, *Funcellus pygmaeus*, *Cyperus cuspidatus*, *\*C. castaneus*, *C. flavidus*, *C. difformis*, *C. Haspan*, *C. niveus*, *C. compressus*, *C. aristatus*, *C. Iria*, *C. pilosus*, *C. procerus*, *C. distans*, *C. nutans*, *C. articulatus*, *C. tegetiformis*, *C. corymbosus*, *\*C. tegetum*, *C. rotundus*, *C. tuberosus*, *C. radiatus* and *\*C. platyphyllus*, *Mariscus Dregeanus*, *M. squarrosus*, *M. paniceus*, *M. Sieberianus* and *M. microcephalus*, *Eleocharis plantaginea*, *E. fistulosa*, *E. capitata* and *E. palustris*, *Fimbristylis monostachya*, *F. acuminata*, *F. schænoides*, *F. squarrosa*, *F. dichotoma*, *F. diphylla*, *F. æstivalis*, *F. tenera*, *F. globulosa*, *F. quinqueangularis*, *F. miliacea* and *F. complanata*, *Echinolytrum*

*dipsaceum*, *Bulbostylis barbata*, *Lipocarpa argentea*, *Fuirena glomerata*, *Scirpus Michelianus*, *S. squarrosus*, *S. supinus*, \**S. Isolepis*, *S. erectus* and *S. mucronatus*, \**Pennisetum setosum*, *Setaria glauca*, *S. intermedia* and *S. verticillata*, \**Isachne miliacea*, *Oplismenus compositus* and *O. Burmanni*, *Axonopus cimicinus*, *Panicum flavidum*, *P. punctatum*, *P. Crus-Galli*, *P. stagninum*, *P. colonum*, *P. prostratum*, *P. javanicum*, *P. setigerum*, *P. distachyum*, *P. Kursii*, *P. myosuroides*, *P. indicum*, *P. trypheron*, *P. humile* and \**P. trigonum*, *Digitaria sanguinalis*, *D. tenuiflora* and *D. puberula*, *Paspalum scrobiculatum*, *Eriochloa polystachya*, *Perotis latifolia*, \**Dimeria ornithopoda*, *Imperata arundinacea*, \**Saccharum arundinaceum*, *Pollinia argentea*, *Manisuris granularis*, *Rottboellia compressa*, *R. protensa* and *R. exaltata*, *Mnesithea laevis*, *Apluda varia*, \**Ischæmum aristatum*, *I. rugosum*, \**I. semisagittatum*, \**I. conjugatum* and \**I. ciliare*, \**Arthraxon microphyllum*, *Andropogon intermedius*, \**A. halepensis*, \**A. squarrosus*, *A. aciculatus*, \**A. contortus*, *A. caricosus* and *A. annulatus*, \**Pseudanthistiria heteroclita*, \**Anthistiria ciliata* and \**A. gigantea*, *Polytoca barbata*, *Coix Lachryma-Jobi* and \**C. gigantea*, *Sporobolus diander* and *S. tremulus*, *Arundo Donax*, \**Eragrostis aspera*, *E. tenella*, *E. interrupta*, *E. amabilis*, *E. gangetica*, *E. stenophylla*, *E. major*, *E. minor*, *E. tremula*, *E. pilosa* and *E. cynosuroides*, \**Diplachne fusca*, *Leptochloa filiformis* and *L. chinensis*, *Microchloa setacea*, *Cynodon dactylon*, *Chloris barbata*, *Eleusine indica* and *E. ægyptiaca*, \**Davallia multiflora*, *Adiantum lunulatum* and \**A. caudatum*, *Pteris longifolia*, *Neprodium unitum* and *N. molle*, \**Nephrolepis cordifolia*, *Polypodium proliferum*, \**Drymoglossum piloselloides*, *Hemionitis arifolia*, \**Lyzodium flexuosum* and *L. japonicum*, *Ophioglossum reticulatum*, *Helminthostachys seylanica*, *Marsilea quadrifoliata* and *M. minuta*, \**Lycopodium Phlegmaria*, *Selaginella prouiflora*, *Fissidens bengalensis*, *Calymperes tenerum*, *Barbula orientalis* and *B. gangetica*, *Splachnobryum indicum*, *Physcomitrium cyathocarpum*, *Cyathodium albonitens*, and possibly *Athalamia pinguis*.

In the foregoing list are included all the species of drier places that occur in Northern or Western Bengal or in parts of India further west than West Bengal even when the species has not yet been collected there. But besides these all the species of rice-fields and marshy places which have an erect habit are also enumerated. There are, however, a number of the submerged or floating aquatic plants so characteristic of our area that also occur in rice-fields, ponds and marshes throughout the regions to the west or north of our districts.

These it seems more satisfactory to enumerate separately; they are therefore given in the following list:—*Nymphæa Lotus*, *N. rubra* and *N. stellata*, *Nelumbium speciosum*, *Hydrocera triflora*, *Æschynomena indica* and *Æ. aspera*, *Neptunia oleracea*, *Aldrovanda vesiculosa*, *Myriophyllum tuberculatum* and *M. indicum*, *Fussiaea repens*, *Trapa bispinosa*, *Enhydra fluctuans*, *Limnanthemum cristatum* and *L. indicum*, *Ipomœa reptans*, *Utricularia stellaris*, *U. flexuosa*, *U. exoleta* and \**U. reticulata*, *Ceratophyllum de mersum*, *Hydrilla verticillata*, *Lagarosiphon Roxburghii*, *Vallisneria spiralis*, *Blyxa Roxburghii*, *Hydrocharis cellulosa*, *Ottelia alismoides*, *Pistia Stratiotes*, *Cryptocoryne spiralis*, *Lemna paucicostata*, *L. trisulca*, *L. polyrrhiza* and *L. oligorrhiza*, *Wolffia arrhiza* and *W. microscopica*, *Aponogeton monostachya*, *A. echinatum* and *A. crispum*, *Polomogeton indicus*, *P. crispus* and *P. pectinatus*, *Najas indica*, *N. minor*, *N. foveolata* and *N. graminea*, *Eriocaulon Capillus-maiadis*, *Cyperus Cephalotus*, *Chamæraphis spinescens*, *Panicum Myurus*, *P. interruptum* and *P. proliferum*, *Leersia hexandra*, *Hygrorrhiza aristata*, *Coix aquatica*, *Salvinia cucullata*, *Asolla pinnata*, *Isoetes coromandeliana*.

The species that are not to be found to the west of the Gangetic plain are strikingly few in number. Of those that are either plants of dry places or, if they occur in or near ponds or marshes, are erect we find the following:—*Brassica agrestis*, \**Spondias mangifera*, *Rhynchosia bracteata*, \**Erythrina ovalifolia*, *Sesbania paludosa*, *Ammannia salicifolia*, *Blumea amplexens*, *Bothriospermum tenellum*, *Cressa cretica*, *Merremia chryseides*, *Operculina Turpethum*, *Limnophila erecta*, *Lantana indica*, *Lippia geminata*, *Litsea salicifolia*, *Acalypha fallax*, *Pilea microphylla*, *Ficus heterophylla*, *Commelina appendiculata*, *Typhonium Schottii*, \**Alocasia cucullata*, \**Cyperus digitatus*, *Mariscus ferax*, *Scirpus affinis*, \**Saccharum fuscum*, *Pollinia conjugata*. The only floating or submerged aquatic species which do not extend westward from our districts are *Euryate ferox* and *Chamæraphis spinescens*.

In considering the residual species it is most convenient to deal separately with the staple crops grown in the districts; with the species that are systematically planted or that have been purposely introduced for various reasons; and finally with the species that have been accidentally or inadvertently introduced.

The crops cultivated are largely Indian, though a fair proportion are originally of foreign origin. They include *Brassica juncea*, Rai, probably originally Chinese, *Brassica Rapa*, the Turnip, probably originally Central Asiatic; *Brassica Sarson*, the Indian Colza, prob-

ably originally Indian; *Brassica dichotoma*, Indian Rape, probably originally Central Asian; *Brassica oleracea*, the Cabbage, originally Mediterranean; *Eruca sativa*, possibly originally Central Asian; *Lepidium sativum*, originally Mediterranean; *Raphanus sativus*, the Radish, originally Central Asian; *Hibiscus cannabinus*, native; *Hibiscus Sabdariffa*, originally African; *Gossypium herbaceum*, native; *Abroma augusta*, Indo-Chinese; *Corchorus olitorius*, Jute, native; *Corchorus capsularis*, Jute, Chinese; *Linum usitatissimum*, Flax, Mediterranean; *Cicer arietinum*, Chick-pea, Mediterranean; *Vicia sativa*, Tare, Mediterranean; *Lens esculenta*, Lentil, Mediterranean; *Lathyrus sativus*, Vetch, Mediterranean; *Pisum sativum*, Pea, Mediterranean; *Pisum arvense*, Field Pea, Western Asiatic; *Crotalaria juncea*, Sunn, native; *Cajanus indicus*, Pigeon Pea, African; *Phaseolus lunatus*, Lima Bean, S. American; *Phaseolus vulgaris*, French Bean, Mediterranean; *Phaseolus multiflorus*, Scarlet Runner, American; *Phaseolus Mungo*, native; *Phaseolus radiatus*, native; *Vigna Catjang*, Chinese; *Pachyrhizus angulatus*, American; *Dolichos Lablab*, African; *Dolichos biflorus*, native; *Psophocarpus tetragonolobus*, American; *Canavalia ensiformis*, native; *Mucuna utilis*, African; *Mucuna nivea*, native; *Sesbania cannabina*, native; *Arachis hypogæa*, American; *Trigonella Fœnum-græcum*, Mediterranean; *Cyamopsis psoraloides*, African; *Trichosanthes dioica*, native; *Trichosanthes anguina*, native; *Lagenaria vulgaris*, native; *Luffa ægyptiaca*, African; *Luffa acutangula*, native; *Benicasa cerifera*, native; *Momordica Charantia*, native; *M. muricata*, native; *Cucumis Melo*, Mediterranean, *Cucumis sativus*, Mediterranean; *Citrullus vulgaris*, Mediterranean; *Cucurbita Pepo*, Mediterranean; *Cucurbita maxima*, Mediterranean; *Cucurbita moschata*, Mediterranean; *Carum Roxburghianum*, native; *Carum copticum*, native; *Fœniculum vulgare*, Mediterranean; *Peucedanum Sowa*, native; *Coriandum sativum*, Mediterranean; *Daucus Carota*, Mediterranean; *Helianthus tuberosus*, S. American; *Chrysanthemum coronarium*, Chinese; *Lactuca sativa*, Mediterranean; *Carthamus tinctorius*, native; *Lycopersicum esculentum*, American; *Solanum tuberosum*, American; *Solanum Melongena*, native; *Capsicum annum*, American; *Capsicum frutescens*, American; *Nicotiana rustica*, American; *Nicotiana Tabacum*, American; *Sesamum indicum*, Western Asiatic; *Amarantus gangeticus*, native; *Amarantus tristis*, native; *Amarantus Blitum*, native; *Beta vulgaris*, Central Asian; *Spinacea oleracea*, African; *Basella rubra*, native; *Rumex vesicarius*, African; *Piper Chaba*, Malayan; *Piper Betle*, Malayan; *Piper nigrum*, native; *Ricinus communis*, African; *Bœhmeria nivea*, Chinese; *Kæmpferia Galanga*, Malayan; *Kæmpferia*

*rotunda*, Indo-Chinese; *Curcuma Zedoaria*, native; *Curcuma longa*, native; *Curcuma Amada*, native; *Zingiber Zerumbet*, Indo-Chinese; *Zingiber Casumunar*, native; *Zingiber officinale*, native; *Maranta arundinacea*, American; *Musa sapientum*, native; *Sansevieria Roxburghiana*, doubtfully native; *S. trifasciata*, African; *Dioscorea fasciculata*, native; *Dioscorea alata*, native; *Allium Ascalonicum*, Mediterranean; *Allium Cepa*, Mediterranean; *Allium tuberosum*, native; *Allium Ampeloprasum*, Mediterranean; *Allium sativum*, Mediterranean; *Amorphophallus campanulatus*, native; *Alocasia indica*, native; *Alocasia macrorrhiza*, Indo-Chinese; *Colocasia antiquorum*, native; *Pennisetum typhoideum*, African; *Setaria italica*, Mediterranean; *Panicum miliaceum*, native; *Panicum miliare*, native; *Panicum maximum*, African; *Oryza sativa*, native; *Saccharum Sara*, native; *Saccharum officinarum*, native; *Andropogon Schœnanthus*, native; *Andropogon Nardus*, native; *Andropogon Sorghum*, native; *Eleusine Coracana*, native; *Triticum vulgare*, Central Asiatic; *Zea Mays*, American.

Of the crops grown in our districts about 50 are almost certainly natives of India itself, but of these four-fifths are crops of the monsoon season, only one-fifth are cold-weather crops. On the other hand, 35 crops or so are natives of Central or Western Asia or of the Mediterranean region; with hardly an exception these are crops of great antiquity in India and from the situation of their native countries it is almost certain that they were originally brought with them to India by early invaders from the north-west. In this case, with, perhaps, one or two exceptions, the crops are crops of the cold weather only. About 15 of our crops are of African origin and the majority of these are introductions of later date, many of them not going beyond the period of Mussalman invasions. A few of these African crops, however, like *Guisotia abyssinica*, are very interesting because their cultivation is as old as, or older than, that of the crops probably introduced by Aryan invaders, and because their use is practically confined to peoples of Central Indian affinity. Of these African crops two-thirds are monsoon crops. Crops introduced from America, and therefore mostly, if not wholly, introductions that date from the discovery of the New World, are almost as numerous as the African ones. In this case, however, two-thirds of the crops are cold season ones. Some of the American crops like the Potato, and various vegetables, have obviously been introduced by way of Europe. Others, however, like the Tobaccos, the Chillies and Maize would appear to have come by the Eastern route, and perhaps, by way of China and independent of, if not prior to, European intercourse with America. About a dozen crops have clearly come to India



by eastern and north-eastern channels from Malaya, Indo-China or China. Of these, nearly one-half are Chinese and all of these are cold-weather crops, the rest from Indo-China or Malaya are crops of the rainy season.

Of the crops about 70 consist of vegetables of various kinds, half of these being rains' crops and half of them cold-weather ones. Of the remaining 50 crops, 12 are cereals, as many are pulses, 11 are fibre plants, 9 are oil-seed crops, the rest are food accessories, dyes, etc. Of the cereals three-fourths are rains' crops; of the pulses two-thirds are cold-weather crops; the fibre plants are almost all crops of the rainy season.

In considering the species that are not staple crops but that have nevertheless been purposely introduced or planted for various reasons we may most conveniently commence by considering those shrubs and trees that are natives of South-Eastern Asia or Polynesia. A very considerable number of these only occur as planted trees or shrubs—others, however, are frequently self-sown and still others are so thoroughly established that they may be looked on as naturalized in our area. These last in the following list are marked by an asterisk:—\* *Dillenia indica*, *Michelia Champaca*, *Artabotrys odoratissimus*, *Cananga odorata*, *Polyalthia longifolia*, *P. cerasoides* and \* *P. suberosa*, *Calophyllum inophyllum*, *Garcinia Xanthochymus*, *Hibiscus mutabilis*, *Eriodendron anfractuosum*, *Sterculia alata*, *S. colorata* and *S. fætida*, *Kleinhovia Hospita*, *Pterospermum acerifolium*, \* *Averrhoa Carambola* and \* *A. Bilimbi*, \* *Murraya exotica* and *M. Kænigii*, *Citrus decumana* and *C. medica*, *Elæodendron glaucum*, *Zizyphus Fuzuba*, *Sapindus trifoliatus* and *S. Mukorossi*, *Nephelium Longana*, *Mangifera indica*, *Spondias dulcis*, *Moringa pterygosperma*, *Sesbania grandiflora*, *Cassia glauca* and *C. siamea*, \* *Bauhinia acuminata*, *B. tomentosa*, *B. variegata* and \* *B. purpurea*, \* *Saraca indica*, *Cæsalpinia pulcherrima*, *Parkia biglandulosa*, *Albizzia Lebbek*, *A. procera* and *A. lucida*, *Rosa involucrata*, *Terminalia Catappa*, *Quisqualis indica*, *Eugenia malaccensis*, *E. javanica*, *E. Fambos*, *E. æquea*, and *E. Fambolana*, *Lagerstræmia indica* and *L. Flos-Reginæ*, *Panax fruticosum*, \* *Anthocephalus Cadamba*, *Ixora coccinea*, \* *Canthium parvifolium*, \* *Mimusops Etengi*, *Diospyros discolor*, *Jasminum auriculatum*, *Nyctanthes Arbor-tristis*, \* *Carissa Carandas*, *Kopsia fruticosa*, \* *Alstonia macrophylla*, \* *Tabernæmontana coronaria*, *Wrightia coccinea*, *Vallis Pergulana*, *Beaumontia grandiflora*, *Porana paniculata*, *Ipomæa Nil*, *Ipomæa Learii*, *Ipomæa pulchella*, \* *Oroxylum indicum*, \* *Millingtonia hortensis*, \* *Callicarpa cana*, *Tectona*

*grandis*, *Gmelina asiatica*, *Premna esculenta*, *Cinnamomum Tamala*, *Bischofia javanica*, *Phyllanthus Emblica* and *P. distichus*, \* *Putranjiva Roxburghii*, \* *Aleurites moluccana*, \* *Croton Tiglium*, *Codiaeum variegatum*, *Mallotus philippinensis*, \* *Morus indica*, *Artocarpus integrifolia* and *A. Lakoocha*, \* *Ficus comosa*, *Casuarina equisetifolia*, *Corypha umbraculifera*, *C. Talliera* and *C. elata*, *Phoenix sylvestris*, *Cocos nucifera*, *Areca Catechu*, *Bambusa Tulda*, *B. vulgaris*, *B. Balcooa* and \* *B. arundinacea*.

Perhaps the most striking facts in connection with this list are that, although the species as a class belong to plants that one would expect to be readily naturalized in our area, hardly more than 20 per cent. readily reproduce themselves without human assistance; and that in spite of what is so often said to the contrary, over 50 per cent. of these species must have been introduced on purely æsthetic grounds, as there is no obvious economic quality associated with fully one-half of the plants in this list. About 25 per cent. have edible fruits or foliage, other 25 per cent. have useful timbers or are valuable as hedge-plants.

Herbaceous species, natives of South-Eastern Asia that have been deliberately introduced, include the following:—\* *Wissadula rostrata*, *Hibiscus radiatus*, \* *Impatiens Balsamina*, \* *Clitoria Ternatea*, \* *Bryophyllum calycinum*, \* *Plumbago rosea* and \* *P. zeylanica*, \* *Datura fastuosa*, \* *Torenia Fournieri*, *Crossandra undulæfolia*, *Justicia Betonica*, *Rhinacanthus communis*, \* *Peristrophe tinctoria*, \* *Ocimum sanctum*, \* *O. gratissimum* and \* *O. Basilicum*, *Coleus aromaticus* and *C. scutellarioides*, \* *Celosia argentea* and \* *C. cristata*, \* *Globba sessiliflora*, \* *Canna indica*, *Crinum latifolium*, \* *Typhonium Roxburghii*, \* *Selaginella tenera*. The high proportion of species in this list that readily reproduce themselves means very little, because, as regards species of this kind, only those have been admitted into the systematic census which show a tendency to perpetuate themselves in our districts, or which are of economic interest or both.

The number of species purposely introduced from China or Japan is not very great; it includes the following, those that show a tendency to naturalise themselves being again distinguished by an asterisk; in this case it is not necessary to distinguish herbaceous from woody plants:—\* *Hibiscus Manihot* and *H. Rosa-sinensis*, \* *Triphasia Aurantiola*, *Nepheium Litchi*, *Rosa indica*, *Eriobotrya japonica*, *Gardenia florida*, *Ixora stricta*, *Diospyros Kaki*, *Nerium odorum*, \* *Clerodendron fragrans*, *Cinnamomum Camphora*, \* *Sapium sebiferum*, \* *Broussonetia papyrifera*, *Ficus pumila*, *Thuja orientalis*,

*Cycas revoluta*, *Belamcanda chinensis*, *Hemerocallis fulva*, *Bambusa fnana*. Not very many of these Chinese species, which are all very amiliar plants in Indian gardens and shrubberies, tend to reproduce themselves unaided.

As might be expected, the number of perennial species, introduced from Central or Western Asia or the Mediterranean littoral is remarkably small. A considerable number of herbaceous species from these regions are included among the plants sown annually during the cold weather, but very few of them appear as self-sown species and none of them do so regularly. The list is as follows:—  
 \* *Alyssum maritimum*, very occasionally spontaneous; *Hibiscus syriacus*; *Melia Asedarach*, not common; *Vitis vinifera*, very occasionally planted and practically only as a curiosity; *Parkinsonia aculeata*; *Rosa centifolia*; *Lawsonia alba*, as a hedge but thrives very indifferently; *Silybum Marianum*, practically only in European gardens as an annual; \* *Jasminum Sambac*; \* *Cannabis sativa*, *Cupressus sempervirens*.

The number of purposely introduced African species is not remarkably large. It includes the following:—*Hibiscus schizopetalus*, *Sesbania ægyptiaca*, *Bauhinia monandra*, \* *Tamarindus indica*, *Poinciana regia*, *Colvillea racemosa*, *Punica Granatum*, *Vangueria edulis*, *Roupellia grata*, *Cryptostegia grandiflora*, *Jacquemontia cœrulea*, \* *Thunbergia alata*, *Ocimum viride*, *Meriandra bengalensis*, \* *Euphorbia Tirucalli*, \* *Borassus flabellifer*, \* *Pennisetum borbonicum* \* *Panicum muticum*, \* *Panicum flavescens*. The percentage of species in the list that have established themselves as an integral part of the flora of the Gangetic delta is unexpectedly small.

When now we turn to the American species that have been deliberately introduced we find a quite different state of affairs. The list is here sufficiently long to render it advisable to separate the herbaceous species from the trees and shrubs, which are as follows:—\* *Anona squamosa* and \* *A. reticulata*, \* *Bixa Orellana*, \* *Malvastrum tricuspidatum* and \* *M. spicatum*, \* *Guasuma tomentosa*, \* *Malpighia coccifera*, *Blighia sapida*, *Swietenia Mahagoni* and *S. macrophylla*, \* *Anacardium occidentale*, \* *Cassia bicapsularis*, *Cæsalpinia coriaria*, \* *Desmanthus virgatus*, \* *Leucæna glauca*, \* *Pithecolobium dulce*, \* *Enterolobium Saman*, \* *Psidium Guyava*, \* *Carica Papaya*, \* *Cereus pterogonus*, \* *Opuntia Dillenii*, \* *Hamelia patens*, *Achras Sapota*, *Allamanda cathartica*, \* *Thevetia neriifolia*, *Plumeria acutifolia*, *Cordia Sebestena*, \* *Lantana Camara*, \* *Duranta Plumieri*, *Bougainvillea glabra* and *B. spectabilis*, *Antigonon leptopus*, \* *Pedilanthus tithymaloides*, \* *Jatropha multifida* and \* *J. Curcas*, \* *Agave Vera Crus*.

Over 60 per cent. of the species in this list, which is largely composed of plants introduced for economic reasons, have already become so completely naturalised as to form an integral portion of the wild vegetation of our districts. In some cases it will be seen the species have become so familiar to the inhabitants that they have received distinct vernacular names; some of them, indeed, like the *Agave*, one species at least of which was introduced over three hundred years ago, and like *Thvetia*, which was introduced a century ago, enjoy in other parts of India, if not in our districts, the distinction and dignity of having had Sanscrit names evolved to designate them!

But if the extent to which woody species that are natives of the New World have acclimatised themselves in Lower Bengal is very striking, still more striking is the extent to which herbaceous species have accommodated themselves to our deltaic conditions. The following list of American plants that are very familiar in the Calcutta neighbourhood shows that out of 50 species, 80 per cent. have become quite naturalised:—\**Talinum paens*, \**Crotalaria Brownei* and \**C. incana*, \**Phaseolus semierectus*, \**Cassia alata*, \**Neptunia plena*, \**Turnera ulmifolia*, \**Passiflora suberosa* and \**P. fœtida*, \**Eupatorium Ayapana* and \**E. odoratum*, \**Hymenanthemum tenuifolium*, \**Tagetes patula* and \**T. erecta*, \**Zinnia pauciflora*, \**Tithonia tagetiflora*—this species is not self-sown but propagates itself by its rootstocks, \**Helianthus annuus* and \**H. argyrophyllus*, \**Cosmos sulfureus*, \**Vinca rosea*, \**Asclepias Curassavica*, \**Phlox Drummond*; — only occasionally self-sown, \**Merremia umbellata*, \**Ipomœa purpurea* and \**I. tricolor*, \**Quamoclit phœnicea* and \**Q. pinnata*, \**Solanum glaucum* and \**S. sisymbriifolium*, \**Physalis peruviana*, \**Petunia nyctaginiflora*—only occasionally, \**Browallia elata*, \**Martynia diandra*, \**Ruellia tuberosa*, \**Stachytarpheta indica*, \**Hyptis capitata*—only occasionally, \**Salvia coccinea*, \**Mirabilis Jalapa*, \**Gomphrena globosa*, \**Rivina humilis*, \**Euphorbia pulcherrima*, \**E. geniculata*—only occasionally, and \**E. heterophylla*, \**Ananassa sativa*, \**Cipura paludosa*, \**Zephyranthes tubispatha*—occasionally, \**Polygonum tuberosum*, \**Tradescantia discolor*—occasionally, \**Pteris cretica*.

In addition, however, to these intentionally introduced species there are a considerable number of inadvertently introduced plants in our districts. To what extent the species in our districts which are undoubtedly natives of Northern or Western Bengal belong to this category is a matter that hardly repays speculation. Some there certainly are, such as *Andropogon contortus*, *Saponaria Vaccaria*, *Cardamine debilis*, *Lathyrus Aphaca*, *Melilotus alba*, that

not only belong to this class but that only appear in our districts owing to repeated introductions, and could no more survive under the conditions prevalent during the south-west monsoon that could many of the cold-weather crops. But, as already explained, there is one point of view from which every species growing on the deltaic alluvium is an introduced species, and nothing can be learned from an examination of the plants with reference to this question that could not be better learned elsewhere and by other means. When, however, it is a question of the species known to be natives of countries other than India, a brief examination of these repays the trouble. The list includes the following:—*Argemone mexicana*, American; *Senebiera pinnatifida*, Mediterranean; *Malachra capitata*, American; *Crotalaria patula*, Indo-Chinese; *Cassia occidentalis*, American; *Mimosa pudica*, American; *Ageratum conyzoides*, American; *Xanthium spinosum*, Mediterranean; *Lagascea mollis*, American; *Synedrella nodiflora*, American; *Tridax procumbens*, American; *Evolvulus nummularifolius*, American; *Nicotiana plumbaginifolia*, American; *Herpestis chamædroides*, American; *Scoparia dulcis*, American; *Peperomia pellucida*, American; *Euphorbia graminea*, American; *Croton sparsiflorus*, American; *Fatropa gossypifolia*, American; *Typhonium inopinatum*, Indo-Chinese; *Paspalum conjugatum*, American.

Of these species one-tenth are of Mediterranean and one-tenth of Indo-Chinese origin, while four-fifths are originally American; these American species include in *Ageratum conyzoides*, *Tridax procumbens*, *Cassia occidentalis*, *Scoparia dulcis*, *Peperomia pellucida*, some of the very commonest species in the neighbourhood of Calcutta.

There is, however, another very interesting feature in connection with these introduced weeds. Their presence indicates a process that is steadily going on; year by year new species become added to the flora of the neighbourhood of Calcutta. Of the species in the list we know that *Argemone mexicana*, *Ageratum conyzoides*, *Cassia occidentalis*, *Mimosa pudica*, *Tridax procumbens* were already members of the flora in 1795. But we also know that as late as 1814 none of the others were yet introduced and naturalised. By 1845, however, *Scoparia dulcis*, *Senebiera pinnatifida*, *Lagascea mollis*, *Malachra capitata*, *Nicotiana plumbaginifolia* had all become established. By 1885 *Evolvulus nummularius*, *Crotalaria patula*, *Fatropa gossypifolia*, *Peperomia pellucida*, *Paspalum conjugatum*, *Synedrella nodiflora* and *Euphorbia graminea* had become established as members of the Calcutta flora. The period

since 1885 has seen the introduction and thorough establishment of *Xanthium spinosum*, *Typhonium inopinatum*, *Herpestis chamædroides* and *Croton sparsiflorus*.

### III.—SYSTEMATIC CENSUS.

#### PHANEROGAMIA

#### THALAMIFLORÆ.

#### I.—RANUNCULACEÆ.

##### 1. Naravelia DC.

- \* *Naravelia zeylanica* DC.; H. S. 2; B. P. 193.  
v. *Chagal-bati*, *murcha*.  
Hedges, thickets; everywhere.

##### 2. Ranunculus Linn.

- \* *Ranunculus sceleratus* Linn.; H. S. 3; B. P. 193.  
Banks of nalas and rivers; general.

##### 3. Nigella Linn.

- Nigella sativa* Linn.; H. S. 4; B. P. 194.  
v. *Mugréla*, *kaljira*.  
A crop; also a weed in fields; native of S. Europe.

#### II.—DILLENIACEÆ.

##### 4. Dillenia Linn.

- Dillenia indica* Linn.; B. P. 195, *D. speciosa* H. S. 18.  
v. *Chalta*, *chalita*.  
Planted generally; native of S. E. Asia.

#### III.—MAGNOLIACEÆ.

##### 5. Michelia Linn.

- Michelia Champaca* Linn.; H. S. 12; B. P. 197.  
v. *Champá*, *champaka*.  
Planted near villages and temples; native of S. E. Asia.

#### IV.—ANONACEÆ.

##### 6. Artabotrys R. Br.

- Artabotrys odoratissimus* R. Br.; H. S. 15; B. P. 202.  
v. *Kantali-champ*.  
Planted in gardens; native of S. E. Asia.

7. *Cananga* Rumph.

*Cananga odorata* H. f. & T.; B. P. 202. *Uvaria odorata* H. S. 14.  
Planted in avenues; native of Malaya.

8. *Polyalthia* Bl.

*Polyalthia longifolia* Bth. & Hk. f.; B. P. 204. *Guatteria longifolia* H. S. 16.

v. *Debdáru*.

Planted, roadsides and avenues; native of S. E. Asia.

*Polyalthia cerasoides* Bth. & Hk. f.; B. P. 204. *Guatteria cerasoides* H. S. 16.

In village-shrubberies, occasionally; native of India.

*Polyalthia suberosa* Bth. & Hk. f.; B. P. 204. *Guatteria suberosa* H. S. 16.

v. *Bara cháli*.

In village-shrubberies, frequent; native of India.

9. *Anona* Linn.

*Anona squamosa* Linn.; H. S. 14; B. P. 206.

v. *Ata*.

In village-shrubberies, common; also cultivated; native of tropical America.

*Anona reticulata* Linn.; H. S. 14; B. P. 206.

v. *Nona*.

In village-shrubberies, self-sown, very common; also cultivated; native of tropical America.

## V.—MENISPERMACEÆ.

10. *Tinospora* Miers.

\* *Tinospora tomentosa* Miers; B. P. 209. *Cocculus tomentosus* H. S. 331.

v. *Padma gulancha*.

Hedges and thickets, general, but rather rare.

\* *Tinospora cordifolia* Miers; B. P. 209. *Cocculus cordifolius* H. S. 330.

v. *Gulancha*.

Hedges and thickets, general and common.

11. *Tiliacora* Colebr.

- \* *Tiliacora racemosa* Colebr. ; B. P. 210. *Cocculus acuminatus* H. S. 331.  
 v. *Tiliacora, bhága lata*.  
 Hedges and shrubberies, general.

12. *Cocculus* DC.

- \* *Cocculus villosus* DC. ; H. S. 331 ; B. P. 210.  
 v. *Huyer*.  
 Waste places, Hughli district, rare.

13. *Stephania* Lour.

- \* *Stephania hernandifolia* Walp. ; B. P. 208. *Clypea hernandifolia* H. S. 330.  
 v. *Ákanádi nimukha*.  
 Hedges and thickets, general.

14. *Cissampelos* Linn.

- \* *Cissampelos Pareira* Linn. ; B. P. 203. *C. convolvulacea* H. S. 330.  
 v. *Ekleja*.  
 Waste ground, Goghat (Western Hughli district).

## VI.—NYPHÆACEÆ.

15. *Nymphæa* Linn.

- \* *Nymphæa Lotus* Linn. ; B. P. 213. *N. pubescens* H. S. 8. *N. edulis* H. S. 8.  
 v. *Kambal*.  
 Ponds and ditches, everywhere.
- \* *Nymphæa rubra* Roxb. ; H. S. 8 ; B. P. 213.  
 v. *Rakto kambal*.  
 Ponds and ditches, general.
- \* *Nymphæa stellata* Willd. ; H. S. 9 ; B. P. 213.  
 v. *Nil padma*.  
 Ponds and ditches, general.  
 VAR. \* *major* Voigt ; H. S. 9 ; B. P. 213.  
 v. *Bara nil padma*.  
 Ponds and ditches, general.



16. *Euryale* Salisb.\* *Euryale ferox* Salisb.; H. S. 8; B. P. 214.v. *Makāna*.

Ponds and jhils, 24-Pergunnahs.

17. *Nelumbium* Juss.\* *Nelumbium speciosum* Willd.; H. S. 9; B. P. 214.v. *Padma*.

Ponds, everywhere.

## VII.—PAPAVERACEÆ

18. *Papaver* Linn.*Papaver somniferum* Linn.; H. S. 5; B. P. 215.v. *Posto*.

In fields, Goghat (Western Hughli district).

19. *Argemone* Linn.*Argemone mexicana* Linn.; H. S. 6; B. P. 216.v. *Bara shil kanta*.

Waste places, general; native of West Indies.

## VIII.—FUMARIACEÆ

20. *Fumaria* Linn.\* *Fumaria parviflora* Lamk; H. S. 7; B. P. 217.v. *Ban salpha*.

A weed of cultivated ground in the cold weather, general.

## IX.—CRUCIFERÆ

21. *Nasturtium* R. Br.\* *Nasturtium palustre* DC.; B. P. 219.

A field weed, 24-Pergunnahs; rare.

\* *Nasturtium indicum* DC.; B. P. 219. *Sinapis divaricata* H. S. 72.

A field weed, general.

VAR. \* *benghalense* H. f. & T.; B. P. 219.v. *Bil rai*.

A field weed, everywhere.

22. *Cardamine* Linn.*Cardamine debilis* Don; B. P. 219.

A garden weed about Calcutta in cold weather, rare; native of most temperate countries.

23. *Brassica* Linn.

*Brassica juncea* H. f. & T.; B. P. 220. *Sinapis ramosa* H. S. 71.

v. *Rai sarisha, chanchi, jhuni.*

A field crop of cold season, sometimes also an escape. Indian mustard.

VAR. \* *agrestis*; B. P. 220. *Sinapis patens* H. S. 72.

v. *Bil rai, keel rai.*

Shady places and drier fields; a rains' weed.

*Brassica campestris* Linn. VAR. *Rapa*. *B. Rapa* H. S. 71.

v. *Shalgám.*

Cultivated about Calcutta; the Turnip.

VAR. *Sarson*; B. P. 220.

v. *Swet rai, swet sarisha, depo.*

A field crop of cold season. Indian Colza or Sarson crop.

*Brassica Napus* Linn. VAR. *dichotoma*; B. P. 221. *Sinapis dichotoma* H. S. 71.

v. *Sarisha.*

A field crop of cold season. Indian Rape or Tori crop.

*Brassica oleracea* Linn.; H. S. 70.

v. *Kopi.*

Cultivated especially near Calcutta. The Cabbage. The only variety with a distinctive vernacular name is the Cauliflower, *Phuk kopi.*

24. *Eruca* Linn.

*Eruca sativa* Lamk; H. S. 72; B. P. 221.

v. *Swet sarisha.*

A cold-weather crop on a small scale about Hughli.

25. *Cochlearia* Linn.

\* *Cochlearia flava* Ham.; B. P. 222.

Banks of river Hughli, very rare.

26. *Alyssum* Linn.

*Alyssum maritimum* Linn.; B. P. 222. *Koniga maritima* H. S. 68.

In gardens of Europeans in cold weather; occasionally spontaneous on rubbish heaps towards close of rainy season; native of S. Europe.

27. *Capsella* Linn.

*Capsella Bursa-pastoris* Moench ; H. S. 68 ; B. P. 222.

A garden weed of cold weather near Calcutta, very rare ; native of most temperate countries.

28. *Lepidium* Linn.

*Lepidium sativum* Linn. ; H. S. 70 ; B. P. 223.

v. *Halm.*

Occasionally cultivated in Hughli district ; native of the Orient.

29. *Senebiera* DC.

*Senebiera pinnatifida* DC. ; H. S. 69 ; B. P. 223.

A weed of garden ground and waysides ; very plentiful about Port Canning ; native of S. Europe.

30. *Raphanus* Linn.

*Raphanus sativus* Linn. ; H. S. 72 ; B. P. 224.

v. *Mula.*

A cold-weather crop. The Radish.

## X.—CAPPARIDEE.

31. *Cleome* Linn.

\* *Cleome viscosa* Linn. ; B. P. 225. *Polanisia icosandria* H. S. 74.

v. *Hurhuria.*

Waste places, fields ; general.

32. *Gynandropsis* DC.

*Gynandropsis pentaphylla* DC. ; H. S. 73 ; B. P. 225.

v. *Ansarisha, sada hurhuria.*

In gardens, everywhere ; also in waste places naturalised, general ; cosmopolitan in the Tropics.

33. *Capparis* Linn.

\* *Capparis horrida* Linn. f. ; H. S. 74 ; B. P. 226.

v. *Asaria, bagnai.*

Hedges and thickets, mostly west of river Hughli.

*Capparis zeylanica* Linn. ; B. P. 226. *C. brevispina* H. S. 74.

v. *Kalu kera.*

Recorded from Serampore by Voigt ; wants confirmation. The species is in the Midnapore jungles and may occur in the western part of the Hughli district.

\* *Capparis sepiaria* Linn.; H. S. 75; B. P. 227.

v. *Kanta gur kamai*.

Hedges and thickets, everywhere; Sundribuns, sea-face.

34. *Cratæva* Linn.

*Cratæva religiosa* Forst.; B. P. 227. *C. Roxburghii* H. S. 74.

v. *Tikta shak*.

Village gardens and shrubberies, planted; native of S. E. Asia.

XI.—VIOLACEÆ.

35. *Ionidium* Vent.

\* *Ionidium suffruticosum* Ging.; H. S. 77; B. P. 228.

v. *Nunbora*.

Open grassy places, on drier ground, general.

XII.—BIXINEÆ.

36. *Bixa* Linn.

*Bixa Orellana* Linn.; H. S. 85; B. P. 230.

v. *Latkan*.

Cultivated generally, sometimes as if wild near villages; native of tropical America. The Anatto, Arnotto or Rocou.

37. *Flacourtia* Comm

\* *Flacourtia Ramontchi* L'Herit. VAR. *sapida*; B. P. 231. *F. sapida*

H. S. 83.

v. *Bénchi, katai tambat*.

Hughli district.

\* *Flacourtia sepiaria* Roxb.; H. S. 84; B. P. 231.

v. *Bénchi*.

Everywhere; extends into Northern Sundribuns.

XIII.—POLYGALACEÆ.

38. *Salomonis* Lour.

\* *Salomonis oblongifolia* DC.; B. P. 233.

Hughli district, Gohat sub-division, scarce.

39. *Polygala* Linn.

\* *Polygala chinensis* Linn.; B. P. 235. *P. ciliata* H. S. 98.

v. *Meradu*.

Pasture-land and roadsides, general.

## XIV.—CARYOPHYLLACEÆ.

40. *Saponaria* Linn.

*Saponaria Vaccaria* Linn. ; B. P. 237. *Gypsophila Vaccaria* H. S. 175.

v. *Sabuni*.

In fields, a cold-weather weed, Hughli district, occasional ; east of the Hughli, rare and casual.

41. *Stellaria* Linn.

*Stellaria media* Linn. ; H. S. 178 ; B. P. 237.

Occasionally in gardens near Calcutta as a cold-weather weed ; does not persist and probably is always introduced with garden seeds from Europe ; native of Asiatic and northern temperate countries.

42. *Spergula* Linn.

*Spergula pentandra* Linn. ; H. S. 180 ; B. P. 238.

In gardens near Calcutta ; like the preceding species, but never seen except by Roxburgh ; native of Europe.

43. *Polycarpon* Linn.

\* *Polycarpon Loefflingiæ* Bth. & Hk. f. ; B. P. 238. *Hapalesia Loefflingiæ* H. S. 180.

v. *Ghima*.

Fields and waste places, general.

44. *Polycarpæa* Lamk.

\* *Polycarpæa corymbosa* Lamk ; B. P. 239.

Hughli district, Gohat sub-division.

## XV.—PORTULACACEÆ.

45. *Portulaca* Linn.

\* *Portulaca oleracea* Linn. ; H. S. 173 ; B. P. 240.

v. *Bara laniya*.

Waste ground, everywhere.

\* *Portulaca quadrifida* Linn. ; H. S. 173 ; B. P. 240. *P. meridiana* H. S. 173.

v. *Chhota laniya*.

Waste ground, general but never very common.

C

46. *Talinum* Adans.

*Talinum patens* Willd.; B. P. 240. *T. cuneifolium* H. S. 174, at least in part.

In gardens, very rarely cultivated, but near Calcutta not infrequent as a naturalised weed; native of America. *T. cuneifolium*, a native of Asia and wild in some parts of India, is also occasionally cultivated, but the writer has never seen it occurring spontaneously.

## XVI.—TAMARICACEÆ.

47. *Tamarix* Linn.

\**Tamarix gallica* Linn.; H. S. 179; B. P. 242.

v. *Jhau, ban jhau, jaura*.

Banks of rivers and edges of marshes.

\**Tamarix dioica* Roxb.; H. S. 179; B. P. 242.

v. *Lal jhau*.

Banks of rivers and edges of marshes.

## XVII.—ELATINACEÆ.

48. *Bergia* Linn.

\**Bergia verticillata* Willd.; H. S. 99; B. P. 243.

v. *Lal keshuriya*.

Rice-fields and river-banks, general but not common.

\**Bergia ammannioides* Roxb.; H. S. 99; B. P. 243.

v. *Lal keshuriya*.

Rice-fields and river-banks, common and general.

## XVIII.—GUTTIFERÆ.

49. *Calophyllum* Linn.

*Calophyllum inophyllum* Linn.; H. S. 87; B. P. 246.

v. *Kâth champa, sultana champa*.

Planted occasionally about Calcutta; native of coasts of S. E. Asia.

50. *Garcinia* Linn.

*Garcinia Xanthochymus* Hook. f.; B. P. 247.

v. *Dampel*.

Planted occasionally in native gardens; native of S. E. Asia.

XIX.—MALVACEÆ.

51. *Malvastrum* A. Gray.

*Malvastrum tricuspidatum* A. Gray ; B. P. 257. *Malva americana*  
H. S. 111.

Hedges and waste places, general ; native of America.

*Malvastrum spicatum* A. Gray ; B. P. 257.

Waste places near Calcutta, occasional ; native of America.

52. *Sida* Linn.

\* *Sida veronicæfolia* Lamk ; B. P. 258. *S. humilis* H. S. 113.  
v. *Funka*.

Waste places, everywhere.

\* *Sida cordifolia* Linn. ; H. S. 113 ; B. P. 258.

v. *Beréla, barjala*.

Waste ground, Gohat ; also reported from Serampore by Voigt.

\* *Sida acuta* Burm. ; H. S. 113 ; B. P. 259.

v. *Kuréta*.

Waste places, everywhere.

\* *Sida rhombifolia* Linn. ; H. S. 113 ; B. P. 259.

v. *Lal beréla, lal barjala*.

Fields and waste places, common, everywhere.

\* *Sida rhomboidea* Roxb. ; H. S. 113. *S. rhombifolia* VAR.  
*rhomboidea* B. P. 259.

v. *Swet beréla, swet barjala*.

Fields and waste places, general but not common.

53. *Abutilon* Gærtn.

\* *Abutilon indicum* G. Don ; H. S. 114 ; B. P. 260. *A. populifolium*  
H. S. 114. *A. asiaticum* H. S. 114.

v. *Petari jhampi*.

Waste places, everywhere.

\* *Abutilon hirtum* G. Don ; B. P. 1271. *A. graveolens* H. S. 114.

v. *Jhampi, kangani*.

Waste places, general but not common.

54. *Wissadula* Medik.

*Wissadula rostrata* Planch. ; B. P. 260. *Abutilon periplocifolium*  
H. S. 114.

Sometimes cultivated and often spontaneous ; native of Malaya.

55. *Urena* Linn.

- \* *Urena lobata* Linn. ; H. S. 112 ; B. P. 261.

v. *Ban okra*.

Waste places, everywhere.

- \* *Urena sinuata* Linn. ; H. S. 112 ; B. P. 261.

v. *Kunguiya*.

Waste places, western parts, rare.

56. *Malachra* Linn.

- Malachra capitata* Linn. ; H. S. 112 ; B. P. 262.

v. *Ban bhindi*.

Waste places, everywhere ; native of West Indies.

57. *Hibiscus* Medik.

- \* *Hibiscus ficulneus* Linn. ; B. P. 265. *Abelmoschus ficulneus* H. S. 119.

v. *Ban dhéras, jangli bhindi*.

Waste places, Hughli district, rare.

- Hibiscus esculentus* Linn. ; B. P. 265. *Abelmoschus esculentus* H. S. 118.

v. *Bhindi, dhéras*.

In gardens ; cultivated throughout the Tropics.

- Hibiscus Abelmoschus* Linn. ; B. P. 265. *Abelmoschus moschatus* H. S. 119.

v. *Kalkastári, mushak-dhana*.

Near villages, very rare, perhaps only an escape ; native of S. E. Asia.

- Hibiscus Manihot* Linn. ; B. P. 266. *Abelmoschus Manihot* H. S. 120.

In gardens, also naturalised near Calcutta ; native of China.

- Hibiscus tetraphyllus* Roxb. ; B. P. 266. *Abelmoschus tetraphyllus* H. S. 119.

Thickets near Calcutta ; reported by Roxburgh but not met with since ; wild in Concan and Canara.

- Hibiscus hirtus* Linn. ; H. S. 118 ; B. P. 266.

v. *Lal surgumuni*.

Waste places, occasionally ; probably almost always only as an escape ; native of India.

- \* *Hibiscus vitifolius* Linn. ; H. S. 117 ; B. P. 267.

v. *Ban kapás*.

Margins of fields and village-shrubberies, everywhere.



- Hibiscus panduriformis** Burm. ; H. S. 117 ; B. P. 267.  
Serampore ; reported by Voigt, but not met with since ; wild in India.
- Hibiscus radiatus** Willd., H. S. 116 ; B. P. 267.  
In gardens, often ; native of Indo-China and Malaya.
- Hibiscus cannabinus** Linn. ; H. S. 117. B. P. 267.  
v. *Mesta pát, Ambya pát.*  
In fields, cultivated, but very seldom.
- Hibiscus Sabdariffa** Linn. ; H. S. 118 ; B. P. 267.  
v. *Mesta.*  
In gardens, general ; cultivated throughout the Tropics.
- Hibiscus syriacus** Linn. H. S. 117 ; B. P. 268.  
v. *Sada juva.*  
In gardens, everywhere : native of the Orient.
- Hibiscus Rosa-sinensis** Linn. ; H. S. 116 ; B. P. 268.  
v. *Juva.*  
In gardens, everywhere ; native of China.
- Hibiscus schizopetalus** Hook. f.  
In gardens, general ; native of Africa.
- Hibiscus mutabilis** Linn. ; H. S. 118 ; B. P. 268.  
v. *Thalpadma.*  
In gardens, everywhere ; native of Malaya.
- \* **Hibiscus tortuosus** Wall. ; B. P. 268.  
Estuary of the Hughli, collected by Wallich.
- \* **Hibiscus tiliaceus** Linn. ; B. P. 269. *Paritium tiliaceum* H. S. 120.  
*P. tortuosum* H. S. 120.  
v. *Bola.*  
Sundribuns ; also river banks as far north as Calcutta.

#### 58. *Gossyplum* Linn.

- Gossyplum herbaceum** Linn. ; H. S. 121 ; B. P. 269.  
v. *Kapás, tula, rui.*  
Cultivated ; native of India.

#### 59. *Thespesia* Corr.

- \* **Thespesia populnea** Corr. ; H. S. 120 ; B. P. 270.  
v. *Parás, parás pipal.*  
Sundribuns ; also planted about Calcutta.

**60. Bombax Linn.**

- \***Bombax malabaricum** DC. ; B. P. 271. *Salmalia malabarica*  
H. S. 106.  
v. *Simal*.  
Wild and planted, everywhere.

**61. Eriodendron L.C.**

- Eriodendron anfractuosum** DC. ; B. P. 271. *Gossampinus Rumphii*  
H. S. 105.  
v. *Swet simal*.  
Planted and very occasionally spontaneous, near Calcutta chiefly ;  
native of S. E. Asia.

**XX.—STERCULIACEÆ.****62. Sterculia Linn.**

- Sterculia alata** Roxb. ; B. P. 274. *Pterygota Roxburghii* H. S. 103.  
v. *Buddha ki narikel*,  
Planted in avenues ; native of Indo-China.
- Sterculia colorata** Roxb. ; B. P. 274. *Erythropsis Roxburghiana*  
H. S. 104.  
v. *Samarri*.  
Planted occasionally near Calcutta ; native of India.
- Sterculia foetida** Linn. ; H. S. 108 ; B. P. 274.  
v. *Fangli badám*.  
Planted, roadsides and near temples ; native of S. E. Asia.

**63. Heritiera Ait.**

- \***Heritiera minor** Roxb. ; H. S. 103 ; B. P. 274.  
v. *Sundri*.  
Sundribuns.

**64. Kleinhovia Linn.**

- Kleinhovia hospita** Linn. ; H. S. 109 ; B. P. 272.  
v. *Bola*.  
Planted about Calcutta ; native of S. E. Asia.

**65. Helicteres Linn.**

- \***Helicteres isora** Linn. ; B. P. 275. *Isora corylifolia* H. S. 102.  
v. *Atmora*.  
Hughli district, in the drier parts, not uncommon.

**66. Pterospermum** Schub.**Pterospermum acerifolium** Willd.; H. S. 107; B. P. 276.v. *Kanak champa*.

Planted very often on roadsides and in native enclosures; native of S. E. Asia.

**67. Pentapetes** Linn.**\* Pentapetes phœnicea** Linn.; H. S. 107; B. P. 277.v. *Kat lata, bāndhuli*.

Waste places and wet rice-fields, general.

**68. Melochia** Linn.**\* Melochia corchorifolia** Linn.; B. P. 277. *Lochnenia corchorifolia*  
H. S. 109.v. *Tiki okra, bil pata*.

Waste places, dry fields and grassy glades, everywhere.

**69. Waltheria** Linn.**\* Waltheria indica** Linn.; H. S. 110; B. P. 278.v. *Khar dudhi*.

Waste places, general but scarce.

**70. Abroma** Jacq.**Abroma augusta** Linn.; H. S. 108; B. P. 278.v. *Ulat kambal*.

Occasionally cultivated, frequent as an escape; native of Eastern Asia.

**71. Guazuma** Plum.**Guazuma tomentosa** Kunth; H. S. 108; B. P. 278.v. *Nipāl tunth*.

Planted, but more often self-sown, everywhere, and very plentiful; native of tropical America.

**XXI.—TILIACEÆ.****72. Brownlowia** Roxb.**\* Brownlowia lanceolata** Benth.; B. P. 281.v. *Bola sundri, kedar sundri*.

Sundribuns.

**73. Grewia** Linn.**Grewia asiatica** Linn.; H. S. 128; B. P. 283.v. *Phalsa*.

Serampore, according to Voigt, but almost certainly only planted as it occasionally is in native gardens elsewhere ; native of India.

**Grewia polygama** Roxb. ; H. S. 127.

Also stated by Voigt to occur at Serampore, but more certainly only as a planted species ; native of India.

\* **Grewia lævigata** Vahl ; H. S. 127 ; B. P. 283.

v. *Káth bimla*.

Village shrubberies, west of the river Hughli, occasional.

**Grewia multiflora** Juss. ; B. P. 284. *G. sepiaria* H. S. 128.

v. *Pani sara*.

A favourite hedge-plant, sometimes also self-sown ; native of India.

\* **Grewia hirsuta** Vahl ; B. P. 284. *G. trichodes* H. S. 127.

Waste places in Goghat, Western Hughli district ; also at Serampore, according to Voigt.

#### 74. *Triumfetta* Linn.

\* **Triumfetta rhomboidea** Jacq. ; B. P. 285. *T. angulata* H. S. 127.

*T. trilocularis* H. S. 127.

v. *Ban okra*.

Waste places, everywhere.

#### 75. *Corchorus* Linn.

\* **Corchorus acutangulus** Lamk ; H. S. 127 ; B. P. 286.

v. *Tita pát*.

Waste places and dry fields, everywhere.

\* **Corchorus fascicularis** Lamk ; H. S. 126 ; B. P. 286.

v. *Fangli pát, bil nalita*.

Serampore, according to Voigt ; needs verification.

\* **Corchorus trilocularis** Linn. ; H. S. 126 ; B. P. 286.

Serampore, according to Voigt ; needs verification.

\* **Corchorus oltorius** Linn. ; H. S. 126 ; B. P. 286.

v. *Pát*.

An annual crop in the rains ; native of Bengal. Jute.

**Corchorus capsularis** Linn. ; H. S. 127 ; B. P. 286.

v. *Pát, ghi nalita pát*.

An annual crop in the rains ; native of China. Jute.

## XXII.—LINACEÆ.

76. *Linum* Linn.

*Linum usitatissimum* Linn. ; H. S. 100 ; B. P. 289.

v. *Masina, tisi*.

A cold-weather crop ; native of the Orient.

## XXIII.—MALPIGHIACEÆ.

77. *Malpighia* Linn.

*Malpighia coccifera* Linn. ; H. S. 170.

Planted as a hedge, but sometimes also as if wild, e.g. near Rajapur (*Kurs*).

78. *Hiptage* Gærtn.

*Hiptage Madablota* Gærtn. ; H. S. 170 ; B. P. 290.

v. *Basanti, mahadeo lata*.

Planted frequently ; recorded by Voigt from Serampore, but almost certainly only as a garden species ; native of S. E. Asia.

## XXIV.—ZYGOPHYLLACEÆ.

79. *Tribulus* Linn.

*Tribulus cistoides* Linn. ; H. S. 184 ; B. P. 292.

Collected once near Calcutta by Edgeworth, most probably only a garden escape ; native of the Tropics.

*Tribulus terrestris* Linn. ; B. P. 292. *T. lanuginosus* H. S. 184.

Serampore, according to Voigt ; needs confirmation.

## XXV.—GERANIACEÆ.

80. *Oxalis* Linn.

\* *Oxalis corniculata* Linn. ; H. S. 191 ; B. P. 294.

v. *Amrûl, chuka-tripati*.

Fields, gardens and waste places, everywhere.

81. *Biophytum* DC.

\* *Biophytum sensitivum* DC. ; H. S. 191 ; B. P. 295.

v. *Ban naranga*.

Fields, gardens and waste places, everywhere.

**82. Averrhoa Linn.**

**Averrhoa Carambola** Linn. ; H. S. 191 ; B. P. 296.

v. *Kamaranga*, *kamarak*.

Near villages, often, cultivated ; occasionally as if wild ; native of Malaya.

**Averrhoa Bilimbi** Linn. ; H. S. 191 ; B. P. 296.

v. *Bilimbi*.

Near villages, everywhere, cultivated ; often as if wild ; native of Malaya.

**83. Impatiens Linn.**

**Impatiens Balsamina** Linn. ; H. S. 189 ; B. P. 296.

v. *Dúpati*.

In gardens, everywhere ; often also as an escape ; native of S. E. Asia.

**84. Hydrocera Bl.**

\* **Hydrocera triflora** W. & A. ; H. S. 189 ; B. P. 297.

v. *Domuti*.

Ditches, 24-Pergunnahs, rare.

**XXVI.—RUTACEÆ****85. Acronychia Forst.**

**Acronychia laurifolia** Bl. ; B. P. 300. *Cyminosma pedunculata* H. S. 183.

In scrub jungles near Matla (*Kurz!*) ; probably an escape from cultivation ; native of Indo-China and Malaya.

**86. Glycosmis Corr.**

\* **Glycosmis pentaphylla** Corr. ; H. S. 139 ; B. P. 330.

v. *Ashhoura*.

Thickets and village-shrubberies, everywhere.

**87. Clausena Burm.**

\* **Clausena heptaphylla** W. & A. ; H. S. 141 ; B. P. 301.

v. *Karan phál*.

Village-shrubberies, general, but not plentiful.

**88. Murraya Linn.**

**Murraya exotica** Linn. ; H. S. 139 ; B. P. 302. *M. paniculata* H. S. 140.

v. *Kamini*.

A common hedge; often also in village-shrubberies, but neither the shrubby nor the arboreous form truly wild in our districts; native of S. E. Asia.

**Murraya Koenigii** Spreng.; B. P. 302. *Bergera Koenigii* H. S. 139.  
v. *Barsanga*.

Planted near villages. Curry leaf; native of India and Indo-China.

#### 89. *Triphasia* Lour.

**Triphasia Aurantiola** Lour.; B. P. 303. *T. trifoliata* H. S. 138.  
v. *Chini narangi*,

In gardens, but also not infrequently as if wild in village-shrubberies; native of China.

#### 90. *Feronia* Gaertn.

**Feronia Elephantum** Corr.; H. S. 141; B. P. 305.  
v. *Káth bél*.

In village-shrubberies planted and occasionally self-sown; considered by Voigt wild at Serampore; native of drier parts of India.

#### 91. *Egle* Corr.

\* **Egle Marmelos** Corr.; H. S. 141; B. P. 305.  
v. *Bél, vilva*.

Near villages, everywhere; often planted, but so frequently as if wild that it may almost be considered native generally; is truly native in Western Hughli district (Goghat).

#### 92. *Citrus* Linn.

**Citrus decumana** Linn.; H. S. 141; B. P. 307.  
v. *Batavi-nimbu*.

Cultivated everywhere, but occasionally as if wild in village shrubberies; native of Malaya and Polynesia.

**Citrus medica** Linn.; B. P. 306. VAR. *typica*. *C. medica* H. S. 142.

v. *Beg pura*.

Occasionally cultivated. The Citron; native of Eastern Asia.

VAR. **Limonum**. *C. Limonum* H. S. 142.

v. *Karna-nimbu*.

Cultivated fairly generally. The Lemon; native of India.

VAR. **acida**. *C. Bergamia* H. S. 142.

v. *Pati-nimbu, kaggi-nimbu, gora-nimbu, kamarali-nimbu*.

Cultivated everywhere in many varieties, the two chief forms being the *Pati* or "common, round" and the *Kaggi* or "long, small" and particularly the latter. The Acid Lime; native of S. E. Asia.

### XXVII.—BURSERACEÆ.

#### 93. *Garuga* Roxb.

*Garuga pinnata* Roxb.; H. S. 150; B. P. 311.

v. *Júm, túm. kharpat, nil bhádi.*

Planted occasionally and perhaps sometimes self-sown; given by Voigt as occurring at Serampore, but certainly not truly wild; native of India and Indo-China.

### XXVIII.—MELIACEÆ.

#### 94. *Melia* Linn.

*Melia Azedarach* Linn.; H. S. 133; B. P. 313.

v. *Bakarjan, gora nim, maha ném.*

Planted on roadsides and in avenues; native of the Orient and perhaps wild in Upper India.

\* *Melia Azadirachta* Linn.; B. P. 314. *Asadirachta indica* H. S. 133.

v. *Nim.*

In village-shrubberies, everywhere; so often spontaneous that it may almost be considered native. The Margosa. Voigt is almost certainly correct in considering that the *Nim* is not a *Melia*.

#### 95. *Amoora* Roxb.

*Amoora Bohituka* W. & A.; H. S. 134; B. P. 316.

v. *Tikta-ráj.*

Planted very often; given by Voigt as occurring at Serampore, but certainly not truly wild in our districts; native of India and Indo-China.

\* *Amoora cucullata* Roxb.; H. S. 134; B. P. 316.

v. *Amúr latmi.*

Sundribuns.

#### 96. *Carapa* Aubl.

\* *Carapa obovata* Bl.; B. P. 318. *Xylocarpus Granatum* H. S. 136.

v. *Dhundol, posher, pussur.*

Sundribuns.

There is another species of *Carapa* to which the name *Pussur* more properly belongs; it is also met with in the Sundribuns, but it



is not certain that it occurs in the western or 24-Pergunnahs portion of that region.

97. *Swietenia* Linn.

*Swietenia Mahagoni* Linn. ; H. S. 137 ; B. P. 319.

v. *Mahagni* (the American name).

Planted in avenues.

*Swietenia macrophylla* King ; B. P. 319.

v. *Bara mahagni*.

Largely planted in avenues and on roadsides.

98. *Cedrela* Linn.

*Cedrela Toona* Roxb. ; H. S. 137 ; B. P. 320.

v. *Tún*.

Planted everywhere, and often self-sown near villages ; given by Voigt as occurring at Serampore, but probably not truly wild in our districts ; native of India.

XXIX.—OLACINEÆ.

99. *Olax* Linn.

*Olax phœnicarpa* Roxb. ; H. S. 31.

v. *Moicha*.

Serampore, *Voigt* ; an altogether doubtful plant ; it may be a form of *Olax scandens* which has not, however, been collected within our districts, though it occurs both in the damp forests of the North-Eastern Sundribuns and in the drier parts of Western Bengal and Behar just beyond their borders : the plant ought, therefore, to be carefully looked for.

XXX.—CELASTRINEÆ.

100. *Elæodendron* Jacq.

*Elæodendron glaucum* Pers. ; H. S. 167 ; B. P. 329.

Planted about Calcutta ; native of India.

101. *Salacia* Linn.

\* *Salacia prinoides* DC. ; H. S. 168 ; B. P. 331.

v. *Modhu phál*.

Western Sundribuns.

## XXXI.—RHAMNACEÆ.

102. *Zizyphus* Juss.

*Zizyphus Jujuba* Linn.; H. S. 145; B. P. 333.

v. *Bér, kul gachh.*

Planted, everywhere; native of S. E. Asia.

\* *Zizyphus Cœnoplla* Mill.; H. S. 145; B. P. 334.

v. *Shiakol.*

Village-shrubberies, everywhere.

103. *Ventilago* Gærtn.

\* *Ventilago maderaspatana* Gærtn.; H. S. 146; B. P. 334.

v. *Ruktu pita.*

Western Hughli district, Goghat.

104. *Gouania* Linn.

\* *Gouania leptostachya* DC.; H. S. 147; B. P. 335.

Serampore, according to Voigt; not met with by others in our districts.

## XXXII.—AMPELIDÆÆ.

105. *Vitis* Linn.

\* *Vitis latifolia* Roxb.; H. S. 29; B. P. 337.

v. *Govila.*

Woods and thickets, everywhere.

\* *Vitis quadrangularis* Wall.; H. S. 27; B. P. 338.

v. *Harjora.*

Woods and thickets, general.

\* *Vitis adnata* Wall.; H. S. 38; B. P. 338.

Village-shrubberies, everywhere.

*Vitis lanata* Roxb.; H. S. 29.

Serampore, according to Voigt; not impossibly, but needs verification; is plentiful in West Bengal.

\* *Vitis repanda* W. & A.; B. P. 338. *V. pallida* H. S. 28. *V.*

*glauca* H. S. 28.

v. *Goáliya lata, gar goáliya.*

Hedges and thickets, Hughli district.

*Vitis indica* Linn.; H. S. 29.

v. *Amclouka.*

Serampore, according to Voigt, needs verification. Probably some other species is intended, *V. indica*, being apparently confined to S. India.

*Vitis vinifera* Linn. ; H. S. 29.

v. *Angúr gachh*.

Very occasionally cultivated in our districts.

\* *Vitis trifolia* Linn. ; B. P. 338. *V. carnosá* H. S. 28.

v. *Amal lata, somé kesar*.

Thickets, hedges and forests, everywhere, is very plentiful in the Western Sundribuns.

\* *Vitis pedata* Vahl ; H. S. 28 ; B. P. 339.

v. *Goáli lata*.

Hedges and thickets, general.

*Vitis elongata* Wall. ; H. S. 28.

Serampore, according to Voigt ; not impossibly, but needs verification ; is plentiful in the submontane forests of Sikkim.

#### 106. *Leea* Linn.

\* *Leea macrophylla* Roxb. ; H. S. 29 ; B. P. 341.

v. *Dhól samudra*.

Village-shrubberies, general, but not plentiful.

\* *Leea crispa* Linn. ; H. S. 29 ; B. P. 340.

v. *Ban chálita*.

Village-shrubberies, rare.

\* *Leea robusta* Roxb. ; H. S. 29 ; B. P. 340.

v. *Haramada*.

Village-shrubberies, rare.

\* *Leea æquata* Linn. ; B. P. 340. *L. hirta* H. S. 30.

v. *Kák jhanga*.

Village-shrubberies, not uncommon, general.

\* *Leea sambucina* Willd. ; B. P. 340. *L. Staphylea* H. S. 30.

v. *Kukur jhiwa*.

Village-shrubberies, general.

#### XXXIII.—SAPINDACEÆ.

##### 107. *Cardiospermum* Linn.

\* *Cardiospermum Halicacabum* Linn. ; H. S. 93 ; B. P. 342.

v. *Shibjhul, nayaphutki*.

Hedges, thickets and waste places, everywhere.

108. *Allophylus* Bl.

- \* *Allophylus* Cobbe Linn. VAR. *serrata*; B. P. 343. *Schmiedelia serrata* H. S. 93.  
v. *Rakhal phul*.  
Village-shrubberies, general.

109. *Sapindus* Linn.

- Sapindus trifoliatus* Linn.; B. P. 344. *S. emarginatus* H. S. 94.  
v. *Bor ritha*.  
Planted near villages; native of India.
- Sapindus Mukorossi* Gærtn.; B. P. 344. *S. detergens* H. S. 94.  
v. *Ritha*.  
Planted near villages; native of India.

110. *Erioglossum* Bl.

- Erioglossum edule* Bl.; B. P. 344. *Sapindus rubiginosus* H. S. 94.  
Village-shrubberies and about tanks, not very general, but usually as if wild; native of S. E. Asia.

111. *Aphania* Bl.

- \* *Aphania Danura* Radlk.; B. P. 345. *Sapindus Danura* H. S. 94.  
v. *Danúra*.  
Western Sundribuns; village-shrubberies south of Calcutta and Howrah.

112. *Blighia* Koen.

- Blighia sapida* Koen. *Cupania sapida* H. S. 94.  
In gardens near Calcutta, occasionally; native of America.

113. *Nephelium* Linn.

- Nephelium Litchi* Camb.; H. S. 95; B. P. 346.  
v. *Litchi*.  
Planted generally; native of China. The Lichi.
- Nephelium Longana* Camb.; H. S. 95; B. P. 346.  
v. *Ashphál*.  
Planted occasionally; native of Malaya. The Longan.

## XXXIV.—ANACARDIACEÆ

114. *Mangifera* Linn.

- Mangifera indica* Linn.; H. S. 272; B. P. 352.  
v. *Am, ámb*.  
Planted everywhere; native of Indo-China. The Mango.

115. *Anacardium* Linn.

*Anacardium occidentale* Linn.; H. S. 270; B. P. 354.

v. *Hidgli badám, kaju.*

Planted occasionally; native of America.

116. *Odina* Roxb.

\* *Odina Wedier* Roxb.; H. S. 275; B. P. 354.

v. *Fiyal.*

Village-shrubberies, everywhere.

117. *Spondias* Linn.

*Spondias mangifera* Willd.; H. S. 143; B. P. 356.

v. *Ámra.*

In village-shrubberies, everywhere; often planted, still oftener self-sown; native of S. E. Asia.

*Spondias dulcis* Willd.; H. S. 144; B. P. 356.

v. *Bilati ámra.*

Occasionally planted; native of Polynesia.

## XXXV.—MORINGACEÆ.

118. *Moringa* Lamk.

*Moringa pterygosperma* Gærtn.; H. S. 78; B. P. 357.

v. *Sajina.*

Planted, everywhere, but often also self-sown near villages; cultivated throughout the Tropics.

## CALYCIFLORÆ.

## XXXVI.—LEGUMINOSÆ.

119. *Cicer* Linn.

*Cicer arietinum* Linn.; H. S. 226; B. P. 366.

v. *Channa.*

A cold-weather crop, not much grown in our districts; native of countries bordering on the Mediterranean. The Chick-Pea.

120. *Vicia* Linn.

*Vicia sativa* Linn.; H. S. 226; B. P. 366.

v. *Ankári.*

A cold-weather crop, rarely met with in our districts; also in one form, a cold-weather field weed, general; native of Europe and the Orient. The Tare.

\* *Vicia hirsuta* Linn.; B. P. 367. *Ervum hirsutum* H. S. 226.  
v. *Masúr-channa*.

A cold-weather field weed, everywhere; very occasionally also a fodder crop.

121. *Lens* Gren. & Godr.

*Lens esculenta* Moench; B. P. 367. *Ervum Lens* H. S. 226.  
v. *Masúr, masuri*.

A cold-weather field crop, mostly in Hughli district; native of Europe. The Lentil.

122. *Lathyrus* Linn.

*Lathyrus Aphaca* Linn.; H. S. 227; B. P. 368.  
v. *Jangli mâtár, masúr channa*.

A cold-weather field weed, general, also often in grassy places where cattle feed; has no claim to be a native of our districts; native of Europe.

*Lathyrus sativus* Linn.; H. S. 227; B. P. 368.  
v. *Kesári, kassúr*.

A cold-weather field crop; native of S. Europe. The Vetch.

123. *Pisum* Linn.

*Pisum sativum* Linn.; H. S. 226; B. P. 369.  
v. *Mâtár, kabuli mâtár*.

In gardens about Calcutta and occasionally as a field crop in the Hughli district; native, probably, of the Orient.

*Pisum arvense* Linn.; B. P. 369. *P. sativum* VAR. *quadratum* H. S. 227.

v. *Mâtár, chhoto mâtár*.

A field crop of the cold weather, general; native, probably, of Western Asia.

124. *Abrus* Linn.

\* *Abrus precatorius* Linn.; H. S. 228; B. P. 369.  
v. *Kunch, chun-hati*.

Hedges and thickets, general.

125. *Crotalaria* Linn.

*Crotalaria quinquefolia* Linn., H. S. 208; B. P. 373.

Serampore, according to Voigt.; by no means impossible, but needs verification; native of India and Indo-China.

**Crotalaria Brownei** Bert. ; H. S. 207 ; B. P. 373.

In gardens occasionally, and sometimes as an escape in the neighbourhood of Calcutta, introduced from the West Indies.

**Crotalaria incana** Linn. ; H. S. 207 ; B. P. 373.

In gardens occasionally, and frequent as an escape in the neighbourhood of Calcutta ; introduced from the West Indies.

**Crotalaria Saltiana** Andr. ; B. P. 373. *C. striata* H. S. 207.

v. *Ban çan*.

Waysides and waste places, everywhere ; especially common in Sundribuns cleanings. Though now one of our most plentiful weeds, this is not mentioned by Roxburgh and is probably an introduction to Bengal of less than 100 years' standing ; now cosmopolitan in the Tropics ; probably originally native of Africa.

**Crotalaria laburnifolia** Linn. ; H. S. 207 ; B. P. 373.

v. *Múna*.

Serampore, according to Voigt ; not improbably, as it is fairly abundant in East Bengal, but needs verification for our districts ; native of Eastern Asia.

**Crotalaria medicaginea** DC. ; B. P. 373. *C. trifoliatum* H. S. 207.

Serampore, according to Voigt ; not altogether impossible, as it is plentiful in Chota Nagpur, but needs verification for our districts ; native of the drier parts of India.

**Crotalaria alata** Ham. ; H. S. 203 ; B. P. 373.

Waste places near Calcutta and Howrah, but rare and certainly introduced in our districts ; native of S. E. Asia.

\* **Crotalaria verrucosa** Linn. ; H. S. 206 ; B. P. 373.

v. *Ban çan*.

Waste places and fairly dry fields, everywhere.

**Crotalaria juncea** Linn. ; H. S. 206 ; B. P. 374.

v. *Çan*.

A field crop, everywhere. The Sunn or Indian Hemp ; native of S. E. Asia.

\* **Crotalaria retusa** Linn. ; H. S. 206 ; B. P. 374.

v. *Bhil jhanjhan*.

Waste places, everywhere.

**Crotalaria sericea** Retz ; H. S. 206 ; B. P. 374.

v. *Pipali jhanjhan*.

Waste places, but only about Calcutta, Howrah, Chinsura and Serampore ; hardly native in our districts ; native of S. E. Asia.

\* *Crotalaria mysorensis* Roth ; B. P. 374.

Drier grassy glades and fields, west of the Hughli only, and not very common.

*Crotalaria nana* Burm. VAR. *patula* B. P. 374.

Dry grassy glades about Shibpur, introduced ; native of Burma.

*Crotalaria calycina* Schrank ; B. P. 375. *C. anthylloides* H. S. 205.

Serampore, according to Voigt ; not at all impossibly, but needs verification for our districts ; native of S. E. and E. Asia.

\* *Crotalaria prostrata* Roxb. ; H. S. 207 ; B. P. 375.

v. *Chhota jhanjhan*.

Drier grassy glades and fields, everywhere.

\* *Crotalaria acicularis* Ham. ; B. P. 375.

v. *Chhota jhanjhan*.

Drier grassy glades and fields, general ; often confused with *C. prostrata*.

126. *Flemingia* Roxb.\* *Flemingia congesta* Roxb. ; H. S. 229 ; B. P. 378.

v. *Bara salphan, bhalia*.

Sundribuns, Calcutta, Serampore, according both to Roxburgh and Voigt, but evidently rare ; no example from our districts exists in the Calcutta Herbarium, and the writer has never succeeded in meeting with the plant : it is common in North Bengal.

127. *Cyllista* Ait.\* *Cyllista scariosa* Ait. ; H. S. 236 ; B. P. 379.

Hedges and thickets, but not very common.

128. *Rhynchosia* Lour.\* *Rhynchosia rufescens* DC. ; B. P. 380.

Waste places, rare.

\* *Rhynchosia viscosa* DC. ; B. P. 380. *Dolichos glutinosus* H. S. 231.

v. *Shim bhatráji*.

Hedges and thickets, general, but not plentiful.

\* *Rhynchosia sericea* Span. ; B. P. 381.

Hedges and thickets, general, but not common.

\* *Rhynchosia bracteata* Benth. ; B. P. 381.

Hedges and thickets, rare.



129. *Atylosia* W. & A.

\* *Atylosia scarabæoides* Benth.; B. P. 383. *Cantharospermum pauciflorum* H. S. 236.

v. *Banúr kalai*.

Hedges and thickets, everywhere.

130. *Cajanus* DC.

*Cajanus indicus* Spreng.; H. S. 236; B. P. 383.

v. *Arhar*.

A field crop, everywhere. The Pigeon Pea; native possibly of Africa; certainly nowhere wild in India; probably nowhere wild in Asia.

131. *Phaseolus* Linn.

*Phaseolus semierectus* Linn.; H. S. 230; B. P. 386.

In village-shrubberies and waste places, near Calcutta and Howrah only; introduced; native of America.

\* *Phaseolus adenanthus* G. F. Mey.; B. P. 386. *P. rostratus* H. S. 230.

v. *Ban barbati*.

Western Sundribuns, on river banks; banks of the Hughli as far north as Serampore; occasionally in village-shrubberies near the river Hughli.

*Phaseolus lunatus* Linn.; H. S. 250; B. P. 386.

In gardens, cultivated; native of S. America. The Lima Bean.

*Phaseolus vulgaris* Linn.; H. S. 229; B. P. 386.

In gardens, cultivated; native of S. Europe and the Orient. The French Bean.

*Phaseolus multiflorus* Willd.; H. S. 230; B. P. 389.

In gardens of European residents, cultivated; native of America. The Scarlet Runner.

*Phaseolus trilobus* Ait.; H. S. 231; B. P. 387.

v. *Mugáni*.

Fields and waste places, everywhere.

\* *Phaseolus sublobatus* Roxb.; H. S. 230; B. P. 387.

v. *Ghora mung*.

Serampore, according to Voigt.; not impossibly, as it is plentiful in Behar and Chota Nagpur, but it needs verification for our districts.

*Phaseolus Mungo* Linn.; B. P. 387.

v. *Tikuri kalai*.

Cultivated, everywhere; native of India.

There is some confusion in the H. S. as regards this plant; the vernacular name *Tikari* is always applied to this plant, which has yellow flowers, whereas Voigt associates the name with *Dolichos pilosus*, which is a *Vigna* with blue flowers; this plant is in fact omitted by Voigt though it is the commonest of the five allied forms cultivated in our districts. The confusion has, however, been shared by the majority of those who have dealt with these pulses.

VAR. *Roxburghii* B. P. 387. *Phaseolus Roxburghii* H. S. 221.

v. *Másh kalai, urid.*

Cultivated, mainly in the Hughli district; native of India.

*Phaseolus radiatus* Linn.; B. P. 387. *P. Mungo* H. S. 230.

v. *Mung, háli mung.*

A field crop, everywhere; native of India.

VAR. *aurea* B. P. 388. *P. aureus* H. S. 231.

v. *Sona mung.*

A field crop, about Calcutta; native of China.

VAR. *grandis* B. P. 388. *P. Mungo* VAR. *melanosperma* H. S. 230.

v. *Krishna mung, kála mung.*

An occasional field crop; native of China.

### 132. *Vigna Savi.*

\* *Vigna pilosa* Bak.; B. P. 389. *Dolichos pilosus* H. S. 232.

v. *Jhikrai, malkonia.*

Hedges and thickets, rare.

\* *Vigna luteola* Benth.; B. P. 389. *Dolichos gangeticus* H. S. 232.

Western Sundributs on river banks, banks of the Hughli as far north as Uluberia.

*Vigna Catjang* Endl.; B. P. 389. *Dolichos sinensis* VAR. *orthocarpus* H. S. 232.

v. *Barbati.*

Cultivated everywhere; native of China.

VAR. *sinensis* B. P. 389. *Dolichos sinensis* VAR. *eccremocarpus* H. S. 232.

Cultivated generally; native of China.

### 133. *Pachyrhizus Rich.*

*Pachyrhizus angulatus* Rich.; H. S. 234; B. P. 390.

v. *Sankálu.*

Cultivated generally; sometimes as if wild in village-shrubberies; native of America.

134. *Dolichos* Linn.

***Dolichos Lablab*** Linn.; B. P. 391. *Lablab cultratum* H. S. 233.

v. *Shim*.

Cultivated everywhere, in many different races; native of Africa.

VAR. ***ignosus*** B. P. 391. *Lablab vulgare* H. S. 233.

v. *Shim*.

Cultivated everywhere, in several distinct races; native of Africa.

***Dolichos biflorus*** Linn.; B. P. 391. *D. uniflorus* H. S. 232.

v. *Kurti kalai*.

Cultivated sparingly in the Hughli district; native of India.

135. *Psophocarpus* Neck.

***Psophocarpus tetragonolobus*** DC.; H. S. 234; B. P. 391.

v. *Chari kona shim*.

In native gardens about Calcutta, occasionally; native of Africa.

136. *Teramnus* Sw.

\* ***Teramnus labialis*** Spreng.; B. P. 393. *Glycine labialis* H. S. 214.

v. *Ban kalai*.

Hedges, thickets and waste places, everywhere.

\* ***Teramnus debilis*** Prain; B. P. 393. *Glycine debilis* H. S. 214.

v. *Masháni*.

Hedges and thickets, general.

137. *Canavalia* DC.

***Canavalia ensiformis*** DC.; B. P. 394. *C. gladiata* H. S. 234.

v. *Makhan sim*.

Cultivated, in several varieties, generally throughout the Tropics; nowhere really wild.

\* ***Canavalia virosa*** W. & A.; H. S. 235; B. P. 394.

v. *Kath sim*, *kala sim*.

Hedges and thickets, not common, and not met with in 24-Pergunnahs: if the fruits are not seen this is very easily mistaken for *C. obtusifolia*.

\* ***Canavalia lineata*** DC.; B. P. 394. *C. obtusifolia* H. S. 235.

Western Sundribuns, sea-face in sandy places, rather rare.

\* ***Canavalia obtusifolia*** DC.; B. P. 394. *C. turgida* Grah.

Western Sundribuns, on river banks, very common; also plentiful on the banks of the river Hughli as far north as Calcutta. This is the only wild *Canavalia* at all common in our districts; in literature it is

very much confused with *C. lineata*, perhaps from the fact that both are essentially sea-shore plants. In the field it is more often confused with *C. virosa* owing to their great similarity except as regards fruit. The name *C. obtusifolia*, though it *belongs* to this plant, is not particularly appropriate; it would be much more convenient if it were possible to employ Graham's name *C. turgida* which is most suitable to its pods. For *C. lineata*, on the other hand, the name *C. obtusifolia* would, had its use been permissible, have been quite appropriate.

### 138. *Erythrina* Linn.

\* *Erythrina indica* Lamk ; H. S. 237 ; B. P. 398.

v. *Palita mandar.*

Western Sundribuns, along the sea-face, wild ; not met with in the swamp forests ; often elsewhere in our districts, but only planted as a support for climbing vegetables or as a native hedge.

*Erythrina ovalifolia* Roxb. ; H. S. 237 ; B. P. 398.

v. *Hari kákra.*

In village-shrubberies, especially to the south of Calcutta and Howrah ; probably not wild in our districts ; used by the inhabitants as they do the preceding species ; native of S. E. Asia and Polynesia.

### 139. *Mucuna* Adans.

\* *Mucuna pruriens* DC. ; B. P. 400. *M. pruritus* H. S. 235.

v. *Alkúshi.*

Hedges, thickets and village-shrubberies, everywhere.

The cowhage ; pods covered with intolerably stinging hairs.

*Mucuna utilis* Wall. ; H. S. 235 ; B. P. 400.

v. *Alkúshi, bilati alkúshi, kála khamach.*

In native gardens, often ; introduced from Africa ; most probably derived originally from *M. pruriens* ; but pods only velvety and devoid of stinging hairs.

*Mucuna nivea* DC. ; H. S. 236 ; B. P. 400.

v. *Khamach.*

In native gardens, everywhere ; also most probably derived originally from *M. pruriens*, but evolved in India ; pods only velvety and devoid of stinging hairs. In this plant the flowers are white, in *M. pruriens* and *M. utilis* they are dark purple.

140. *Butea* Roxb.

*Butea frondosa* Roxb.; H. S. 238; P. B. 401.

v. *Palás*.

Planted occasionally on roadsides and in avenues; given by Voigt as occurring at Serampore but there almost certainly not wild; native of the drier parts of India and Indo-China.

141. *Clitoria* Linn.

*Clitoria Ternatea* Linn.; H. S. 213; B. P. 402.

v. *Aparajita*.

In gardens, everywhere, also often self-sown and spontaneous in hedges and thickets; introduced from Malaya.

142. *Sesbania* Pers.

*Sesbania ægyptiaca* Pers.; B. P. 403. *S. cegyptiaca* H. S. 216.

v. *Fainti*.

Planted, but only occasionally; native of Africa.

VAR. *picta*; B. P. 403. *S. cegyptiaca* VAR. *concolor* H. S. 216.

Planted generally; native of Africa.

VAR. *bicolor* W. & A.; H. S. 216; B. P. 404.

Planted everywhere, and often spontaneous in village-shrubberies; native of Africa.

\* *Sesbania paludosa* Prain; B. P. 404. *Æschynomene paludosa* H. S. 219.

v. *Káth-sola*.

In ditches and marshes, in deep water, during the rainy season everywhere; never cultivated.

*Sesbania cannabina* Pers.; B. P. 404. *S. aculeata* H. S. 216.

v. *Dhunchi*.

A regular field crop in the rainy season, everywhere; not known wild; possibly evolved from *S. aculeata*.

\* *Sesbania aculeata* Pers.; B. P. 404. *S. procumbens* H. S. 216.

Edges of wet rice-fields, general. Voigt has confused this species, which is not uncommon in our districts nominally with the commonly cultivated *S. cannabina*, but really with the not very dissimilar *S. procumbens*; which he gives as occurring at Serampore. *S. procumbens* has never, however, been found anywhere except in the Madras and Bombay Presidencies.

\* *Sesbania uliginosa* Sweet; H. S. 216; B. P. 404.

Wet fields, very rare.

Both Roxburgh and Voigt have found this species in our districts; from Roxburgh's figure of the plant it is clearly very different from *S. aculeata*; no one has gathered it since Voigt wrote. Mr. Baker, indeed, unites *S. paludosa* and *S. uliginosa*; the latter is, however, prostrate with stems that measure fewer inches than those of the former, which is erect, do in feet.

**Sesbania grandiflora** Pers.; B. P. 404. *Agati grandiflora* H. S. 216.

v. *Agati, agasthi*.

Planted everywhere, as a support for climbing vegetables; native of Malaya.

#### 143. *Tephrosia* Pers.

\* ***Tephrosia Hookeriana*** W. & A.; B. P. 405. *T. villosa* H. S. 215.

Waste places and roadsides, rare.

\* ***Tephrosia purpurea*** Pers.; H. S. 215; B. P. 405.

v. *Sarphonka, ban nil*.

Waste places and roadsides, general.

#### 144. *Pongamia* Vent.

\* ***Pongamia glabra*** Vent.; H. S. 239; B. P. 407.

v. *Karanja*.

Western Sundribuns; banks of Hughli as far north as Chinsura.

#### 145. *Derris* Lour.

\* ***Derris scandens*** Benth.; B. P. 408. *Brachypterum scandens*.  
H. S. 240.

v. *Noa lata*.

Woods and thickets, everywhere.

\* ***Derris uliginosa*** Benth.; B. P. 408. *Pongamia uliginosa* H. S. 239.

v. *Pan lata*.

Western Sundribuns; banks of Hughli as far north as Chinsura.

#### 146. *Dalbergia* Linn. f.

***Dalbergia lanceolaria*** Linn. f.; B. P. 411. *D. frondosa* H. S. 241.

Planted on roadsides and in avenues occasionally.

***Dalbergia Sissoo*** Roxb.; H. S. 241; B. P. 411.

v. *Sissoo*.

Roadsides and avenues, and near villages, often planted; given by Voigt as occurring at Serampore, but not wild though sometimes self-sown in our districts; native of submontane (Himalayan) forests.

**Dalbergia latifolia** Roxb. ; H. S. 240 ; B. P. 411.

v. *Swet sál, sit sál.*

Occasionally planted on roadsides and in avenues, not infrequently so near villages ; given by Voigt as occurring at Serampore, but certainly not wild in our districts ; native of India.

\* **Dalbergia spinosa** Roxb. ; H. S. 241 ; B. P. 411.

v. *Amanta.*

Western Sundribuns, very plentiful.

\* **Dalbergia torta** Grah. *D. candenatensis* B. P. 411.

v. *Panchioli.*

Western Sundribuns.

#### 147. **Melilotus** Linn.

\* **Melilotus indica** All. ; B. P. 413. *M. parviflora* H. S. 209.

v. *Ban méthi.*

A field weed in the cold season, everywhere.

\* **Melilotus alba** Lamk. ; B. P. 413. *M. leucantha* H. S. 209.

v. *Safed ban méthi, ban piring.*

A field weed in the cold season, general.

#### 148. **Trigonella** Linn.

**Trigonella Fœnum-græcum** Linn. ; H. S. 209 ; B. P. 414.

v. *Méthi, bara méthi.*

In native gardens, occasionally ; native of S. Europe.

**Trigonella corniculata** Linn. ; H. S. 209 ; B. P. 414.

v. *Piring.*

Sometimes cultivated, but usually in our districts only a cold-weather field weed, rare and with no claim to be a native ; native of Europe.

#### 149. **Arachis** Linn.

**Arachis hypogæa** Linn. ; H. S. 243 ; B. P. 415.

v. *At ke kalai, mat kalai, belati mung, chiné badam, mung phuli.*

In fields, but not at all commonly cultivated, and only near Calcutta ; native of America.

#### 150. **Smithia** Ait.

\* **Smithia sensitiva** Ait. ; H. S. 220 ; B. P. 417.

v. *Nala kashina, kalkashonda.*

In waste places, general.

151. *Æschynomene* Linn.

- \* *Æschynomene indica* Linn. ; B. P. 418. *A. Roxburghii* H. S. 219.  
v. *Sola*, *bhâth sola*.  
In ditches and marshes, everywhere.
- \* *Æschynomene aspera* Linn. ; H. S. 219 ; B. P. 418.  
v. *Bhâth sola*, *phul sola*.  
In ditches and marshes, general.

152. *Uraria* Desv.

- \* *Uraria picta* Desv. ; H. S. 220 ; B. P. 420.  
v. *Sankar jata*.  
In grassy glades and fields, general.
- \* *Uraria lagopoides* DC. ; B. P. 420. *U. lagopodioides* H. S. 220.  
v. *Golak chakúliya*, *gurkiya chakúliya*.  
In grassy open spaces, general.

153. *Lourea* Neck.

*Lourea vespertilionis* Desv., H. S. 220 ; B. P. 421.

v. *Cham chika*.

Sometimes in gardens ; occasionally in waste places in our districts ; given by Voigt as occurring at Serampore, but with little, if any, claim to be native in our districts ; native of S. E. Asia.

154. *Desmodium* Desv.

- \* *Desmodium triflorum* DC. ; H. S. 223 ; B. P. 424.  
v. *Kudaliya*.  
Grassy open places and roadsides, everywhere.
- \* *Desmodium heterophyllum* DC. ; H. S. 223 ; B. P. 424.  
Gohat, Western Hughli district ; also Serampore, according to Voigt.
- \* *Desmodium diffusum* DC. ; B. P. 424. *D. elongatum* H. S. 222.  
Grassy open places, very rare in our districts, and only west of the river Hughli.
- Desmodium pulchellum* Benth. ; B. P. 424. *Dicerma pulchellum*  
H. S. 223.  
v. *Futa salpani*.  
Given by Voigt as occurring at Serampore ; not impossibly, but requires verification ; native of S. E. Asia.
- \* *Desmodium umbellatum* DC. ; H. S. 221 ; B. P. 424.  
Western Sundribuns.



- \* **Desmodium Cephalotes** Wall. ; H. S. 221 ; B. P. 424.  
Village-shrubberies and hedges, rare in our districts.
- \* **Desmodium polycarpum** DC. ; H. S. 221 ; B. P. 425.  
Waste places ; very rare in our districts.
- \* **Desmodium gangeticum** DC. ; H. S. 221 ; B. P. 425.  
v. *Salpani*.  
Open glades, dry grassy fields and waste places, everywhere.
- \* **Desmodium gyrans** DC. ; H. S. 222 ; B. P. 426.  
v. *Gora chand, ban charal*.  
Grassy glades and waste places, general but nowhere common.  
The Semaphore Plant.

#### 155. **Alysicarpus** Neck.

- \* **Alysicarpus vaginalis** DC. ; H. S. 224 ; B. P. 428.  
v. *Kurila*.  
Drier grassy glades and fields, general.  
VAR. \* *nummularifolia* Bak. ; B. P. 428.  
v. *Kurila*.  
Drier grassy glades and fields, everywhere.
- \* **Alysicarpus bupleurifolius** DC. ; H. S. 224 ; B. P. 428.  
Drier grassy glades and fields, general.
- \* **Alysicarpus rugosus** DC. ; B. P. 428.  
Drier grassy glades and fields ; west of the river Hughli only  
and not common.  
VAR.\* *minor* Prain ; B. P. 428.  
Drier grassy glades ; very rare in our districts.

#### 156. **Psoralea** Linn.

- \* **Psoralea corylifolia** Linn. ; H. S. 211 ; B. P. 429.  
v. *Barachi, hakuchi*.  
Waste places, sides of fields, roadsides, everywhere.

#### 157. **Cyamopsis** DC.

- Cyamopsis psoraloides** DC. ; H. S. 210 ; B. P. 429.  
Occasionally cultivated in our districts, but not a general crop ;  
native of Africa.

#### 158. **Indigofera** Linn.

- \* **Indigofera linifolia** Retz ; H. S. 211 ; B. P. 431.  
v. *Bhángra*.

Drier grassy glades and fields, roadsides and waste places, everywhere.

\* *Indigofera trifoliata* Linn.; B. P. 431.

Waste places, not at all common in our districts, and only west of the river Hughli.

\* *Indigofera viscosa* Lamk; H. S. 211; B. P. 432.

Grassy glades and waste places, west of the river Hughli; rare in our districts.

*Indigofera trita* Linn. f.; H. S. 212; B. P. 432,

Given by Voigt as occurring at Serampore, but almost certainly by mistake; the species occurs in Chota Nagpur but is rare even there; native of the drier parts of India.

#### 150. *Cassia* Linn.

*Cassia Fistula* Linn.; B. P. 437. *Cathartocarpus Fistula* H. S. 247.  
v. *Amaltás, sonálu, bandar lathi gach,*

In village-shrubberies, planted and self-sown; Western Sundrins, but only in abandoned settlements; given by Voigt as occurring at Serampore, but hardly wild in our districts; native of S. E. Asia.

*Cassia glauca* Lamk; H. S. 249; B. P. 437.

In gardens generally; native of India and Indo-China.

*Cassia occidentalis* Linn.; H. S. 250; B. P. 437.

v. *Kalkashonda.*

In waste places, everywhere; native of America.

\* *Cassia Sophera* Linn.; H. S. 248; B. P. 438.

v. *Kalkashonda.*

In waste places, everywhere.

VAR. \* *purpurea* Voigt; H. S. 248; B. P. 438.

v. *Lal kalkashonda.*

In waste places; very rare.

*Cassia bicapsularis* Linn.; H. S. 248; B. P. 438.

In village-shrubberies and waste places, mostly nearly Calcutta; native of America.

*Cassia auriculata* Linn.; H. S. 250; B. P. 248.

In hedges often, sometimes in village-shrubberies; native of drier parts of India.

\* *Cassia Tora* Linn.; H. S. 250; B. P. 438.

v. *Chakúnda.*

In waste places, everywhere.

**Cassia alata** Linn. ; H. S. 249 ; B. P. 438.

v. *Dád mardán*.

In waste places, occasional ; native of America.

**Cassia siamea** Lamk ; B. P. 438.

In avenues, planted everywhere ; native of Indo-China and Malaya.

\* **Cassia mimosoides** Linn. ; B. P. 439. *C. Wallichiana* H. S. 251.  
*C. angustissima* H. S. 251. *C. Leschenaultiana* H. S. 251. *C. tenella* H. S. 251.

Serampore according to Voigt ; not collected by others.

\* **Cassia Absus** Linn. ; H. S. 251 ; B. P. 438.

Goghat, Western Hughli district.

#### 160. **Bauhinia** Linn.

**Bauhinia acuminata** Linn. ; H. S. 253 ; B. P. 441.

v. *Kanchan*.

Planted in gardens and elsewhere, but often in village-shrubberies and neglected gardens as if wild ; native of S. E. Asia generally.

**Bauhinia racemosa** Lamk ; H. S. 253 ; B. P. 441.

v. *Ban-ráj*.

Given by Voigt as occurring at Serampore, but almost certainly only planted, and very rarely so, anywhere in our districts ; native of the drier parts of S. E. Asia.

**Bauhinia tomentosa** Linn. ; H. S. 253 ; B. P. 441.

A favourite shrub in gardens ; occasionally an escape ; native of India,

**Bauhinia variegata** Linn. ; H. S. 253 ; B. P. 442.

v. *Rakto kamhar*, *swet kanchan*, according to the colour of the flowers, which vary a good deal but are never either entirely red or wholly white : *Swet kanchan* is also termed *kana ráj*.

A favourite tree in gardens ; native of India, the Himalayas, and Indo-China.

**Bauhinia purpurea** Linn. ; H. S. 254 ; B. P. 442. *B. triandra* H. S. 254.

v. *Deva kanchan*, *koiral*.

Often planted, but also very readily self-sown ; native of India and Indo-China.

**Bauhinia monandra** Kurz ; B. P. 442.

Occasionally planted ; native of Madagascar.

161. *Saraca* Linn.

*Saraca indica* Linn.; B. P. 444. *Jonesia Asoca* H. S. 246.

v. *Asóka*.

Planted in gardens and near temples; occasionally self-sown; native of Indo-China.

Somewhat similar in appearance are *Amherstia nobilis* native of Indo-China, and several species of *Brownea*, American, planted by Europeans in gardens and on lawns, but not met with about villages or near temples.

162. *Tamarindus* Linn.

*Tamarindus indica* Linn.; H. S. 247; B. P. 444.

v. *Tintuli, tinturi, imli*.

Planted everywhere about villages and on roadsides; often self-sown; native of Africa.

163. *Parkinsonia* Linn.

*Parkinsonia aculeata* Linn.; H. S. 246; B. P. 446.

v. *Belati kīkar*.

In native gardens and in village-shrubberies as if wild, everywhere.

164. *Poinciana* Linn.

*Poinciana regia* Boj.; H. S. 245; B. P. 446.

Planted on roadsides and in avenues everywhere; introduced from Mauritius.

165. *Colvillea* Boj.

*Colvillea racemosa* Boj.; H. S. 245; B. P. 447.

Planted occasionally in avenues; introduced from Mauritius.

166. *Cæsalpinia* Linn.

\* *Cæsalpinia Bonducella* Flem.; B. P. 449. *Guilandina Bonduc* H. S. 244.

v. *Nata karanj*.

Western Sundribuns; village-shrubberies and hedges generally.

\* *Cæsalpinia Nuga* Ait.; B. P. 449.

v. *Natua shingri lata*.

Western Sundribuns; plentiful.

*Cæsalpinia pulcherrima* Sw.; B. P. 449. *Poinciana pulcherrima* H. S. 245.

v. *Krishna chúra*.

In gardens everywhere, also as if wild in neglected gardens and village-shrubberies; native of S. E. Asia.

*Cæsalpinia Sappan* Linn.; H. S. 244; B. P. 449.

v. *Bakám, patang*.

Planted occasionally in our districts; given by Voigt as occurring at Serampore, but certainly not native; native of S. E. Asia.

*Cæsalpinia coriaria* Willd.; H. S. 245.

v. *Debi-dibi* (from the American name).

Sometimes planted, but not on a large scale, in our districts; native of West Indies.

*Cæsalpinia septaria* Roxb.; H. S. 245; B. P. 449.

A favourite hedge-plant near villages, especially west of the river Hughli; now often quite naturalized; native of the drier parts of India and Indo-China.

#### 167. *Parkia* R. Br.

*Parkia biglandulosa* W. & A.; H. S. 257; B. P. 451.

Planted in avenues; native of S. E. Asia.

#### 168. *Neptunia* Lour.

\* *Neptunia oleracea* Lour.; B. P. 454. *Desmanthus natans* H. S. 258.

v. *Pani najak*.

In marshes, general.

*Neptunia plena* Benth.; B. P. 454. *Desmanthus punctatus* H. S. 259.

v. *Belati pani najak*.

In gardens, occasionally; on foreshores of river Hughli near Calcutta and Howrah, naturalized, rare; native of America.

#### 169. *Desmanthus* Willd.

*Desmanthus virgatus* Willd.; H. S. 258; B. P. 455.

In waste places about Calcutta, rather uncommon, but quite naturalized; native of America.

#### 170. *Mimosa* Linn.

*Mimosa pudica* Linn.; H. S. 257; B. P. 456.

v. *Najak*.

Roadsides and waste places, everywhere: looks as if a native, but probably originally introduced from America.

\* *Mimosa rubricaulis* Lamk; H. S. 257; B. P. 456.

v. *Kuchi kanta, shiah kanta*.

Goghat, western part of Hughli district; also given by Voigt as occurring at Serampore.

171. *Acacia* Willd.

\* *Acacia Suma* Ham. ; H. S. 260 ; B. P. 458.

v. *Sau kanta, shai kanta.*

.Hughli district, in village shrubberies, occasional.

\* *Acacia catechuoides* Wall. B. P. 458. *A Catechu* H. S. 260. *A. Sundra* H. S. 260.

v. *Khayar.*

In village-shrubberies, general.

*Acacia Farnesiana* Willd. ; B. P. 458. *Vachellia Farnesiana* H. S. 264.

v. *Guhiya babul.*

Planted very generally ; given by Voigt as occurring at Serampore, but certainly not wild in our districts ; native of Western India and the Orient.

\* *Acacia arabica* Willd. ; H. S. 262 ; B. P. 458.

v. *Babul.*

In fields and about villages, everywhere ; sometimes planted.

\* *Acacia tomentosa* Willd. ; H. S. 262 ; B. P. 458.

v. *Salsain babul.*

In village-shrubberies, general.

*Acacia conchua* DC. ; B. P. 458. *A. rugata* H. S. 263.

v. *Ban ritha, ritha.*

Given by Voigt as occurring at Serampore ; but probably only planted, which it occasionally is near villages throughout our districts ; native of S. E. Asia.

172. *Albizzia* Dufar

*Albizzia Lebbek* Benth. ; B. P. 461. *Acacia Sirissa* H. S. 261.

v. *Sirissa.*

In avenues, on roadsides, and near villages ; everywhere planted ; native of Sub-Himalayan forests and of Indo-China.

*Albizzia procera* Benth. ; B. P. 461.

v. *Koroi.*

Planted in avenues, now quite naturalized in village-shrubberies near Calcutta ; native of drier parts of India and Indo-China.

*Albizzia lucida* Benth. ; B. P. 461.

v. *Sil koroi.*

Planted, but also often self-sown in village-shrubberies near Calcutta ; native of lower Himalayan slopes and of moister parts of Indo-China.

173. *Leucæna* Benth.

*Leucæna glauca* Benth.; B. P. 455. *Mimosa glauca* H. S. 262.

Hedges, river banks, thickets and village shrubberies, everywhere; native of America.

In Voigt's time only planted in gardens; now one of the commonest shrubs in the neighbourhood of Calcutta.

174. *Pithecolobium* Mart.

*Pithecolobium dulce* Benth.; B. P. 462. *Inga dulcis* H. S. 257.

v. *Belati amli, dekhani babul*.

Planted everywhere, but also self-sown and very plentiful in village-shrubberies; native of America.

In Voigt's time only cultivated; now a very common denizen of village woods, almost as plentiful as *Guazuma tomentosa*: introduced to India by way of the Philippines and Malaya.

175. *Enterolobium* Mart.

*Enterolobium Saman* Prain; B. P. 463.

v. *Belati sirissa*.

Planted in avenues and on roadsides, everywhere; occasionally self-sown; native of America. The Rain Tree,

## XXXVII.—ROSACEÆ.

176. *Rosa* Linn.

*Rosa involucreta* Roxb.; H. S. 194; B. P. 466.

v. *Ban guláb*.

In gardens, not common: not wild apparently within our districts, but plentiful, wild, in marshes in North and East Bengal,

*Rosa centifolia* Linn.; H. S. 194; B. P. 467.

v. *Basaraiya guláb*.

In gardens, general; native of Europe.

*Rosa indica* Linn.; H. S. 194; B. P. 467.

v. *Kanta guláb*.

In gardens, everywhere; native of China.

177. *Eriobotrya* Lindl.

*Eriobotrya japonica* Lindl.; H. S. 198; B. P. 468.

Cultivated, sparingly, in gardens; native of China. The Loquat.

The Peach is also sparingly cultivated but does not produce fruit so freely as the Loquat.

## XXXVIII.—CRASSULACEÆ.

178. *Bryophyllum* Salisb.

*Bryophyllum calycinum* Salisb. ; H. S. 268 ; B. P. 470.

v. *Kop-pata*.

In waste places and thickets, everywhere ; native of Moluccas, first brought to Calcutta in 1799.

179. *Kalanchoë* Adans.

\* *Kalanchoë laciniata* DC. ; H. S. 268 ; B. P. 471.

v. *Hem ságar*.

Hughli district, in waste places, rare.

## XXXIX.—DROSERACEÆ.

180. *Drosera* Linn.

\* *Drosera Burmanni* Vahl ; H. S. 79 ; B. P. 472.

Goghat, Western Hughli district.

181. *Aldrovanda* Linn.

\* *Aldrovanda vesiculosa* Linn. ; H. S. 79 ; B. P. 472.

v. *Malacca jhángi*.

Jhils south of Calcutta, very rare ; has been collected by Roxburgh, T. Thomson, and Kurz.

## XL.—HALORAGÆ.

182. *Myriophyllum* Linn.

\* *Myriophyllum tuberculatum* Roxb. ; H. S. 35 ; B. P. 474. *M. verticillatum* H. S. 35, not of Linn.

v. *Jhángi*.

In marshes east of the river Hughli, very common ; west of the Hughli, very rare.

\* *Myriophyllum indicum* Willd. ; H. S. 35 ; B. P. 474. *M. tetrandrum* H. S. 35.

v. *Jhángi*.

In marshes and ditches ; everywhere.

## XLI.—RHIZOPHORACEÆ.

183. *Rhizophora* Linn.

\* *Rhizophora mucronata* Lamk ; H. S. 41 ; B. P. 475.

v. *Khamo, bhora*.

Western Sundribuns.



\* *Rhizophora conjugata* Linn.; H. S. 41; B. P. 475.

v. *Khamo, bhora*.

Western Sundribuns.

184. *Cerriops* Arn.

\* *Cerriops Roxburghiana* Arn.; H. S. 41; B. P. 476.

v. *Gorán*.

Western Sundribuns.

185. *Kandelia* W. & A.

\* *Kandelia Rheedei* W. & A.; H. S. 41; B. P. 476.

v. *Gória*.

Western Sundribuns.

186. *Bruguiera* Lamk.

\* *Bruguiera gymnorrhiza* Lamk; B. P. 477. *B. Rheedei* H. S. 41.

v. *Kankra*.

Western Sundribuns.

*Bruguiera parviflora* W. & A.; H. S. 41.

Sundribuns, according to Roxburgh and Voigt, but needs confirmation; native of other S. E. Asian shores.

**XLII.—COMBRETACEÆ.**

187. *Terminalia* Linn.

*Terminalia Catappa* Linn.; H. S. 36; B. P. 481.

v. *Deshi badám*.

Planted on roadsides and in avenues; native of Malaya.

188. *Lumnitzera* Willd.

*Lumnitzera racemosa* Willd.; H. S. 39; B. P. 484.

v. *Kripa*.

Western Sundribuns.

189. *Quisqualis* Linn.

*Quisqualis indica* Linn.; H. S. 39; B. P. 484.

In gardens, everywhere; native of Malaya.

**XLIII.—MYRTACEÆ.**

190. *Psidium* Linn.

*Psidium Guyava* Linn.; B. P. 487. *P. pyriferum* H. S. 46. *P.*

*pomiferum* H. S. 46.

v. *Piyár*.

Planted, and semi-spontaneous in village-shrubberies, everywhere; native of America.

### 191. *Eugenia* Linn.

*Eugenia malaccensis* Linn.; H. S. 47; B. P. 490.

v. *Malacca jamrúl*.

In native gardens, frequent; native of Malaya.

*Eugenia javanica* Lamk.; *E. alba* H. S. 48.

v. *Jamrúl*.

In native gardens, frequent; native of Malaya. Voigt by an oversight gives the vernacular name as *Amrúl*, which is in our districts, used only for *Oxalis corniculata*.

*Eugenia Jambos* Linn.; H. S. 47; B. P. 490.

v. *Goláb jámb*.

In native gardens, often; native of India.

*Eugenia aquea* Roxb.; H. S. 47; B. P. 490.

v. *Jambo*.

In gardens, often; native of Malaya.

*Eugenia Jambolana* Lamk.; H. S. 49; B. P. 491.

v. *Kála jámb, jámb*.

Planted generally, occasionally semi-spontaneous; native of India.

VAR. *caryophyllifolia* B. P. 491. *E. caryophyllifolia* H. S. 49.

v. *Chhota jámb*.

Given by Voigt as occurring at Serampore, not impossibly, but needs verification; is plentiful to the west of our districts; native of India.

### 192. *Barringtonia* Forst.

\* *Barringtonia racemosa* Bl.; H. S. 51; B. P. 493.

v. *Samundra*.

Western Sundribuns.

\* *Barringtonia acutangula* Gærtn.; H. S. 51; B. P. 493.

v. *Hidjal*.

Near river banks, general.

## XLIV.—LYTHRACEÆ.

### 193. *Ammannia* Linn.

\* *Ammannia rotundifolia* Ham.; B. P. 500. *Ameletia rotundifolia* H. S. 130.

Edges of wet rice-fields, sides of ditches; very rare.

- \* *Ammannia peploides* Spreng.; B. P. 500. *Ameletia indica* H. S. 130.  
Edges of wet rice-fields, sides of ditches; frequent.
- \* *Ammannia pygmaea* Kurz; B. P. 500.  
Damp paths and open waste places, general.
- \* *Ammannia pentandra* Roxb.; B. P. 500. *Rotala Roxburghiana*. H. S. 129.  
A weed of wet places; general.  
VAR. \* *fimbriata* Wight; B. P. 500.  
A weed of wet places; general.
- \* *Ammannia baccifera* Linn.; B. P. 500. *A. vesicatoria* H. S. 130.  
*A. indica* H. S. 130.  
v. *Dád mári*.  
A weed of wet places; everywhere.
- \* *Ammannia salicifolia* Monti; B. P. 501.  
v. *Dád mári*.  
A weed of wet places; 24-Pergunnahs only.
- \* *Ammannia multiflora* Roxb.; H. S. 130; B. P. 501.  
A weed of wet places, general.

194. *Woodfordia* Salisb.

*Woodfordia floribunda* Salisb.; B. P. 502. *Grislea tomentosa* H. S. 131.

v. *Dhai phul, dhás, dhani*.

Given by Voigt as occurring at Serampore, but there certainly only planted; it may occur in the extreme west of Hughli district; native of S. E. Asia.

195. *Lawsonia* Linn.

*Lawsonia alba* Lamk; H. S. 131; B. P. 502.

v. *Mehndi*.

Planted in hedges, chiefly in Hughli district; native of the Orient. The Henna.

196. *Lagerstroemia* Linn.

*Lagerstroemia indica* Linn.; H. S. 131; B. P. 504.

v. *Telinga china*.

In gardens everywhere, in hedges or on lawns; native of S. E. Asia.

*Lagerstroemia Flos-Reginæ* Retz; B. P. 504. *L. Reginæ* H. S. 131.

v. *Jarúl*.

Planted on roadsides and in avenues; native of Indo-China and India.

197. *Sonneratia* Linn. f.

\* *Sonneratia apetala* Ham. ; H. S. 50 ; B. P. 505.

v. *Keóra*.

Western Sundribuns and banks of river and creeks as far north as Uluberia and the Salt-lakes of Calcutta.

\* *Sonneratia acida* Linn. f. ; H. S. 50 ; B. P. 505.

v. *Óra*.

Western Sundribuns.

198. *Punica* Linn.

*Punica Granatum* Linn. ; H. S. 50 ; B. P. 505.

v. *Dalim*.

Occasionally in native gardens about Calcutta ; native of Africa. The Pomegranate.

## XLV.—ONAGRACEÆ

199. *Jussiaea* Linn.

\* *Jussiaea repens* Linn. ; H. S. 33 ; B. P. 507.

v. *Kesara-dám*.

Floating on ponds or ditches, or creeping on their muddy margins ; everywhere.

\* *Jussiaea suffruticosa* Linn. ; B. P. 507. *J. villosa* H. S. 33.

v. *Lál banlanga*.

A weed of moist places ; general.

200. *Ludwigia* Linn.

\* *Ludwigia parviflora* Roxb. ; H. S. 34 ; B. P. 507.

v. *Banlanga*.

A weed of wet rice-fields, Hughli district.

201. *Trapa* Linn.

\* *Trapa bispinosa* Roxb. ; H. S. 35 ; B. P. 508.

v. *Singhára, pani phál*.

Floating on ponds, everywhere. The Water Chestnut.

## XLVI.—TURNERACEÆ

202. *Turnera* Linn.

\* *Turnera ulmifolia* Linn. ; B. P. 511. *T. ulmifolia* VAR. *angustifolia* H. S. 85.

In waste places, everywhere; originally an escape from gardens, but now thoroughly established throughout our districts; native of America.

Voigt gives *T. trioniflora* as similarly domesticated about Serampore, but though there are parts of India, e.g. Tenasserim, where this species also is quite naturalized, the writer has never met with it in a wild state in our districts.

#### XLVII.—PASSIFLORACEÆ.

##### 203. *Passiflora* Linn.

*Passiflora suberosa* Linn.; H. S. 80; B. P. 512.

In hedges and thickets throughout our districts; thoroughly naturalized everywhere; native of America.

*Passiflora foetida* Linn.; H. S. 81; B. P. 512.

In hedges and thickets about Shibpur, Serampore, Chandernagore, Hughli; apparently quite naturalized; native of America.

Both these species are originally escapes from gardens; both appear to have become domesticated since Voigt's time, but the first of the two, which is now invading the Sundribuns, must certainly be reckoned one of the wild plants of our area. Various other species of *Passiflora* are cultivated; at least two of them have been found by the writer naturalized in hedges and thickets in Northern Bengal and no doubt in time others will establish themselves in our districts, and may, indeed, have already casually done so.

##### 204. *Carica* Linn.

*Carica Papaya* Linn.; H. S. 83; B. P. 514.

v. *Pippiya* (from the American name).

Generally cultivated, but often also subsponaneous in village-shrubberies. The Papaw.

#### XLVIII.—CUCURBITACEÆ.

##### 205. *Trichosanthes* Linn.

*Trichosanthes dioica* Roxb.; H. S. 58; B. P. i. 517.

v. *Patal*.

Cultivated and occasionally as if wild in village-shrubberies; native of India.

\**Trichosanthes cucumerina* Linn.; H. S. 57; B. P. i. 518. *T. lobata* H. S. 58.

v. *Ban chichinga*.

In hedges and thickets; sometimes also cultivated.

**Trichosanthes anguina** Linn.; H. S. 57; B. P. i. 518.

v. *Chichinga*.

Cultivated everywhere; native of S. E. Asia.

\* **Trichosanthes palmata** Roxb.; B. P. i. 518. *T. bracteata* H. S. 58.

v. *Makal*.

In village-shrubberies and hedges, common.

#### 206. **Gymnopetalum** Arn.

\* **Gymnopetalum cochinchinense** Kurz; B. P. i. 518.

Hedges and thickets near Calcutta; not common.

#### 207. **Lagenaria** Ser.

**Lagenaria vulgaris** Ser.; H. S. 57; B. P. i. 519.

v. *Kaddu, kodu, laú*.

Cultivated about villages; sometimes as if wild; native of India.

#### 208. **Luffa** Cav.

\* **Luffa graveolens** Roxb.; H. S. 57; B. P. i. 520.

North-Western Sandribuns, at Jatta.

**Luffa aegyptiaca** Mill.; B. P. i. 520; *L. pentandra* H. S. 56. *L. clavata* H. S. 57.

v. *Dhundul*.

Cultivated about villages, but often also as if wild; native of Eastern Hemisphere.

**Luffa acutangula** Roxb.; B. P. i. 520. *L. foetida* H. S. 56.

v. *Jhinga*.

Cultivated generally, near villages; native of India.

\* **Luffa amara** Roxb.; H. S. 57; B. P. i. 520.

v. *Tita-jhinga, tita dhundul*.

Serampore, according to Voigt; not improbably, but the record needs confirmation.

#### 209. **Benincasa** Savi.

**Benincasa cerifera** Savi; H. S. 57; B. P. i. 521.

v. *Chal kamra*.

Cultivated generally, near villages; native of S. E. Asia.

#### 210. **Momordica** Linn.

**Momordica Charantia** Linn.; H. S. 56; B. P. i. 521.

v. *Karéla*.

Cultivated everywhere; sometimes as if wild in village-shrubberies; native of S. E. Asia.

VAR. *muricata* W. & A.; H. S. 56.

v. *Úchhiya*.

Cultivated everywhere; much more plentiful than the *karéla*; native of S. E. Asia.

\* *Momordica dioica* Roxb.; H. S. 56; B. P. i. 521.

In hedges and thickets, everywhere.

\* *Momordica cochinchinensis* Spreng.; H. S. 56; B. P. i. 522.

v. *Gol kákra*.

Hedges and thickets, especially about Calcutta.

### 211. *Cucumis* Linn.

\* *Cucumis trigonus* Roxb.; H. S. 59; B. P. i. 522. *C. pubescens*.  
H. S. 59.

v. *Ban-gamak*.

Waste places, especially west of river Hughli.

*Cucumis Melo* Linn.; H. S. 58; B. P. i. 522. *C. utilissimus* H. S. 58.

v. *Karbús* (*C. Melo*, the sweet); *Kákri* (*C. utilissimus*, the vegetable).

Cultivated everywhere; native of the Orient.

*Cucumis sativus* Linn.; H. S. 58; B. P. i. 523.

v. *Khirá*.

Cultivated about Calcutta; native of the Orient.

### 212. *Citrullus* Schrad.

*Citrullus vulgaris* Schrad.; B. P. i. 523. *C. cucurbita* H. S. 55.

v. *Tarbús*.

Cultivated about Calcutta; native of the Orient.

### 213. *Cephalandra* Schrad.

\* *Cephalandra indica* Naud.; B. P. i. 523. *Coccinia grandis* H.  
S. 59.

v. *Tela kucha*, *bhimba*.

Hedges and thickets, everywhere.

### 214. *Cucurbita* Linn.

*Cucurbita Pepo* DC.; B. P. i. 524.

v. *Kúmra*.

Cultivated occasionally; native of the Orient.

*Cucurbita maxima* Dach.; B. P. i. 524.

v. *Mitha kaddu*.

Cultivated occasionally; native of the Orient.

**Cucurbita moschata** Duch. ; B. P. i. 524. *C. maxima* H. S. 59.  
v. *Safra kúmra*.

Cultivated fairly generally ; native of the Orient.

**215. Mukia Arn.**

\* **Mukia scabrella** Arn. ; H. S. 55 ; B. P. i. 525.  
v. *Agu makhi, bilári*.

Hedges, thickets and waste places, everywhere.

**216. Bryonia Linn.**

\* **Bryonia laciniosa** Linn. ; H. S. 55 ; B. P. i. 526.  
v. *Mala*.

Village-shrubberies, not common.

**217. Zehneria Endl.**

\* **Zehneria umbellata** Thev. ; B. P. i. 527. *Karivia umbellata* H. S.  
55.

v. *Kudári, rakkhal susa*.

Hedges and thickets, general, but not very common.

**XLIX.—CACTACEÆ.**

**218. Cereus DC.**

**Cereus pterogonus** Lemaire.

Planted as a fence, especially in the Hughli district ; occasionally as if wild in waste places, e.g. in the Goghat sub-division ; native of America.

**219. Opuntia Mill.**

**Opuntia Dillenii** Haw. ; H. S. 62 ; B. P. i. 531.

v. *Nág phana*.

In waste places and by roadsides, quite naturalised in many places ; native of America.

**L.—FICOIDEÆ.**

**220. Sesuvium Linn.**

\* **Sesuvium Portulacastrum** Linn. ; B. P. i. 532. *S. repens* H. S. 323.  
Western Sundribuns, on muddy river banks, general.

**221. Trianthema Linn.**

\* **Trianthema monogynum** Linn. ; B. P. i. 533. *T. obtordatum*  
H. S. 173.

v. *Sabuni ; gada-bani*.



Waste places and garden ground, general.

Voigt records also *T. decandrum* from Serampore, but says it is rare; he restricts the name *gada-bani* to *T. decandrum*. The writer has never found any 2-styled species of *Trianthema* in our area and believes that the two vernacular names are applied to *T. monogynum*. There is nothing, however, to prevent the occurrence of both *T. decandrum* and *T. pentandrum* alongside of *T. monogynum* in Lower Bengal and they should be looked for; they are quite like *T. monogynum* but may be at once distinguished by their 2 styles, *T. monogynum* having but 1 style.

Voigt further reports *T. crystallinum* from Serampore, but Clarke in Hooker's *Flora of British India* says that this species does not occur in Bengal: in this it is almost certain that Clarke is right and that Voigt's supposed *T. crystallinum* was only a state of *T. monogynum*.

### 222. Mollugo Linn.

\* *Mollugo stricta* Linn.; B. P. i. 533. *M. pentaphylla* H. S. 180.  
*M. triphylla* H. S. 180.

v. *Khét papara, jul papara.*

A weed of river-foreshores and sand-banks.

\* *Mollugo Spergula* Linn.; H. S. 180; B. P. i. 533.

v. *Ghimi shák.*

A field weed; everywhere, common.

\* *Mollugo hirta* Thunb.; B. P. i. 533. *Glinus dictamnoides* H. S. 65.

Waste places and dry fields, everywhere.

This appears to have no distinctive vernacular name in spite of its being a common plant; both by Roxburgh and by Voigt, it is quoted simply as *Dusera-sag* or *Dusra-sak*, "another pot-herb."

## II.—UMBELLIFERÆ.

### 223. Hydrocotyle Linn.

\* *Hydrocotyle rotundifolia* Roxb.; H. S. 20; B. P. i. 535.

A weed of gardens about Calcutta.

\* *Hydrocotyle asiatica* Linn.; H. S. 20; B. P. i. 535.

v. *Brahma manduki, thalkuri.*

Grassy glades and moist shady places, general.

### 224. Carum Linn.

*Carum Roxburghianum* Benth.; B. P. i. 536. *Pimpinella involu-  
crata* H. S. 21.

v. *Chanu, rajani, radhani.*

Everywhere cultivated; native of India.

*Carum copticum* Benth.; B. P. i. 536. *Ptychotis, Ajowan* H. S. 21.  
v. *Furáni, buro-jowán.*  
Everywhere cultivated; native of India.

225. *Foeniculum* Adans.

*Foeniculum vulgare* Gaertn.; H. S. 22; B. P. i. 537. *F. Panmori*  
H. S. 22.  
v. *Pan mohuri.*  
Sparingly cultivated, mostly in Hughli district; native of the  
Orient.

226. *Seseli* Linn.

\* *Seseli indicum* W. & A.; B. P. i. 533. *Cnidium diffusum* H. S. 22.  
v. *Ban jowán.*  
A field weed, occasional only.

227. *Enanthe* Linn.

\* *Enanthe stolonifera* Wall.; H. S. 21; B. P. i. 539.  
v. *Pan turási.*  
In and around ponds and ditches, general.  
\* *Enanthe benghalensis* Benth.; B. P. i. 539. *Dasyloma bengalense*  
H. S. 22.  
Moist shady spots near water, common.

228. *Peucedanum* Linn.

*Peucedanum Sowa* Kurz; B. P. i. 540. *Anethum Sowa* H. S. 22.  
v. *Salpha, sowa.*  
Cultivated generally; native of India.

229. *Coriandrum* Linn.

*Coriandrum sativum* Linn.; H. S. 23; B. P. i. 540.  
v. *Dhané.*  
Cultivated sparingly, especially in the Hughli district; native of  
the Orient.

230. *Daucus* Linn.

*Daucus Carota* Linn.; H. S. 23; B. P. i. 541.  
v. *Gájar.*  
Cultivated occasionally; native of Europe and the Orient.

## LII.—ARALIACEÆ.

231. *Panax* Linn.

*Panax fruticosum* Linn.; H. S. 24; B. P. i. 543.  
In gardens generally; native of Malaya.

## LIII.—CORNACEÆ.

232. *Alangium* Lamk.

\* *Alangium Lamarckii* Thw.; B. P. i. 543. *A. decapetalum* H. S. 40.  
v. *Ankúra*.  
In village-shrubberies, general.

## COROLLIFLORÆ.

## LIV.—RUBIACEÆ.

233. *Anthocephalus* A. Rich.

*Anthocephalus Cadamba* Miq.; B. P. i. 551. *Nauclea Cadamba*  
H. S. 375.  
v. *Kadam*.

Planted in avenues, on roadsides and near villages; sometimes spontaneous in village-shrubberies; native of S. E. Asia.

234. *Adina* Salisb.

*Adina cordifolia* Hook. f.; B. P. i. 552. *Nauclea cordifolia* H. S.  
375.  
v. *Káli kadam, da kóm, petpuria, banka*.

Planted occasionally on roadsides and about village tanks; native of drier parts of India and Indo-China.

235. *Stephegyne* Korth.

\* *Stephegyne parvifolia* Korth.; B. P. i. 552. *Nauclea parvifolia*  
H. S. 375.

Hughli district, Goghat sub-division, wild; also reported by Voigt from Serampore but there probably only planted, as it occasionally is in other places west of the Hughli.

236. *Wendlandia* Bartl.

\* *Wendlandia exserta* DC.; H. S. 383; B. P. i. 554.  
v. *Chilkiya*.

Hughli district, Goghat sub-division, wild.

237. *Dentella* Forst.

- \* *Dentella repens* Forst.; H. S. 383; B. P. i. 555.  
 v. *Bhumi pát.*  
 Damp foot-paths and shady places, general.

238. *Oldenlandia* Linn.

- \* *Oldenlandia crystallina* Roxb.; B. P. i. 559. *Hedyotis pumila*  
 H. S. 384.  
 v. *Panki.*  
 Waste places, general.
- \* *Oldenlandia diffusa* Roxb.; B. P. i. 559. *Hedyotis dichotoma*  
 H. S. 384.  
 Waste places and thickets, general.
- \* *Oldenlandia corymbosa* Linn.; B. P. i. 559. *Hedyotis Burmaniana*  
 H. S. 384.  
 v. *Khet pápra.*  
 Waste places, not uncommon.
- \* *Oldenlandia paniculata* Linn.; B. P. i. 560. *Hedyotis racemosa* H.  
 S. 384.  
 v. *Gándha bhaduli.*  
 Edges of rice-fields and moist places, general.

239. *Hamelia* Jacq.

- Hamelia patens* Jacq.; H. S. 385; B. P. i. 563.  
 In gardens and on lawns; also now often sub-spontaneous near  
 villages about Calcutta; native of America.

240. *Gardenia* Linn.

- Gardenia florida* Linn.; H. S. 377; B. P. i. 565.  
 v. *Gándha ráj.*  
 In gardens everywhere; native of China.

241. *Randia* Linn.

- Randia uliginosa* DC.; H. S. 381; B. P. i. 566.  
 v. *Pirálo.*  
 Planted occasionally; given by Voigt as occurring at Serampore,  
 but almost certainly not wild anywhere in our districts; native of  
 India and common in West Bengal beyond our limits.
- \* *Randia dumetorum* Lamk; H. S. 381; B. P. i. 567.  
 v. *Menphál, madan.*  
 Hughli district, Gohat sub-division, wild; Western Sundribuns,  
 in old cleanings, naturalized; sometimes also in native gardens, planted.

242. *Hyptianthera* W. & A.

- \* *Hyptianthera stricta* W. & A.; H. S. 382; B. P. i. 568.  
In thickets, west of the river Hughli; rare.

243. *Pavetta* Linn.

*Pavetta indica* Linn.; H. S. 391; B. P. i. 569.

v. *Kukur chûra*.

Reported by Voigt as occurring at Serampore, but almost certainly only planted, as it sometimes is elsewhere.

VAR. \* *tomentosa* B. P. i. 570. *Pavetta tomentosa* H. S. 392.

v. *Jui*.

Hedges, village-shrubberies and waste places, general.

244. *Ixora* Linn.

- \* *Ixora parviflora* Vahl; H. S. 390; B. P. i. 571.

v. *Gandhal rangan*.

Hughli district, Goghat sub-division, in waste places; elsewhere general in village-shrubberies.

- \* *Ixora undulata* Roxb.; H. S. 390; B. P. i. 571.

v. *Palaka jui*.

In village-shrubberies, general.

*Ixora coccinea* Linn. VAR. *Bandhuca*; B. P. i. 571. *I. Bandhuca* H. S. 389

v. *Rangan*.

In gardens and on lawns, everywhere; native of India and Indo-China.

*Ixora stricta* Roxb.; H. S. 389; B. P. i. 571.

In gardens, generally; native of China.

245. *Coffea* Linn.

*Coffea bengalensis* Roxb.; H. S. 392; B. P. i. 572.

Recorded by Voigt from Serampore, but almost certainly not wild in our districts; plentiful in Chota Nagpur.

246. *Morinda* Linn.

- \* *Morinda braacteata* Roxb.; H. S. 386; B. P. i. 573. *M. exserta* H. S. 386.

v. *Haldi kunch, ronch, hardi, ban ách*.

Western Sundribuns and along the banks of the Hughli as far north as Calcutta; occasionally also in village-shrubberies near the river.

F

\* *Morinda citrifolia* Linn.; H. S. 385; B. P. i. 573. *M. tinctoria?*  
H. S. 386.

v. *Ach.*

Goghat sub-division, Hughli district. *M. tinctoria* is reported by Voigt from Serampore, but this record is doubtful; possibly *M. citrifolia* may have been the species seen; in any case it was probably only planted.

#### 247. *Canthium* Lamk.

*Canthium parvifolium* Roxb.; H. S. 388; B. P. i. 574.

Village-shrubberies, but only near Calcutta and only occasionally; this was introduced from Chittagong in 1814 and had not flowered up to 1845; it is interesting to find it now becoming naturalized.

#### 248. *Vangueria* Juss.

*Vangueria edulis* Vahl; H. S. 386; B. P. i. 575.

Cultivated occasionally in native gardens; introduced from Madagascar.

\* *Vangueria spinosa* Roxb.; H. S. 386; B. P. i. 575.

v. *Moyena.*

In village-shrubberies, not uncommon.

#### 249. *Pæderia* Linn.

\* *Pæderia fetida* Linn.; H. S. 388; B. P. i. 578.

v. *Gándha bhadulia.*

Hedges and thickets, general.

#### 250. *Knoxia* Linn.

*Knoxia corymbosa* Willd.; H. S. 395; B. P. i. 578.

Reported from Serampore by Voigt; the record requires verification.

#### 251. *Spermacoce* Linn.

\* *Spermacoce hispida* Linn.; H. S. 394; B. P. i. 580.

Waste places, but only west of the Hughli river; not uncommon.

### LV.—COMPOSITE.

#### 252. *Centratherum* Cass.

\* *Centratherum anthelminticum* O. Kuntze; B. P. i. 589. *Vernonia anthelmintica* H. S. 405.

v. *Somráj.*

Rubbish heaps, rare, possibly not truly native of our area; plentiful to the west of our districts.

**253. Vernonia Schreb.**

\* *Vernonia cinerea* Less. ; H. S. 405 ; B. P. i. 590.

v. *Kok-shim, kála jhira.*

Fields, roadsides and waste places, everywhere.

**254. Elephantopus Linn.**

\* *Elephantopus scaber* Linn. ; H. S. 406 ; B. P. i. 590.

v. *Samdulun.*

Waste places, open glades and dry fields, general.

**255. Adenostemma Forst.**

\* *Adenostemma viscosum* Forst. ; B. P. i. 591. *A. leiocarpum* H. S. 406.

v. *Buro keshuti.*

Waste places and rubbish heaps, occasional.

**256. Ageratum Linn.**

*Ageratum conyzoides* Linn. ; H. S. 406 ; B. P. i. 591.

v. *Oochunti.*

Fields, open glades, waste places, everywhere ; originally American.

**257. Eupatorium Linn.**

*Eupatorium Ayapana* Vent. ; B. P. i. 592. *E. triplinerve* H. S. 407.

v. *Ayapana* (from its American name).

Commonly cultivated in native gardens about Calcutta ; native of Brazil.

*Eupatorium odoratum* Linn. ; B. P. i. 592.

Occasionally in native gardens about Calcutta ; introduced from West Indies.

**258. Cyathocline Cass.**

\* *Cyathocline lyrata* Cass. ; B. P. i. 593.

Hughli district, Gohat sub-division, in waste places.

**259. Grangea Forsk.**

\* *Grangea maderaspatana* Poir. ; H. S. 409 ; B. P. i. 593.

v. *Namúti.*

Roadsides, dry fields and waste places, general.

**260. Blumea DC.**

\* *Blumea amplexans* DC. ; B. P. i. 597.

Moist fields east of the Hughli and south of Calcutta, also in cleanings in the North-Western Sundribuns.

- \* **Blumea bifoliata** DC. ; H. S. 410 ; B. P. i. 597.  
Dry grassy places and hedges, mostly about Calcutta, Howrah, and other towns near the Hughli.
- \* **Blumea Wightiana** DC. ; B. P. i. 597.  
Drier grassy glades, everywhere.
- \* **Blumea glomerata** DC. ; B. P. i. 598.  
Waste places, occasional only and possibly not truly native in our districts ; plentiful in most parts of Bengal.
- \* **Blumea lacera** DC. ; H. S. 410 ; B. P. i. 598.  
*v. Kukur sunga, bara koksing, buro kukshim, bara suksunga.*  
Drier grassy glades, general.
- \* **Blumea laciniata** DC. ; H. S. 410 ; B. P. i. 598.  
Drier grassy glades, especially west of the river Hughli.
- \* **Blumea membranacea** DC. ; B. P. i. 598. *Conyza diffusa* H. S. 409.  
Grassy places, everywhere.

#### 261. *Laggera* Sch.-Bip.

- \* **Laggera flava** Benth. ; B. P. i. 599.  
Dry grassy places, but only west of the Hughli river, and rare in our districts.
- \* **Laggera aurita** Sch.-Bip. ; B. P. i. 599. *Blumea aurita* H. S. 410.  
Dry fields, roadsides, hedges, general.

#### 262. *Pluchea* Cass.

- \* **Pluchea indica** Less. ; H. S. 410 ; B. P. i. 600.  
*v. Munjhu rukha, kukronda.*  
Western Sundribuns, plentiful.

#### 263. *Sphæranthus* Linn.

- \* **Sphæranthus africanus** Linn. ; B. P. i. 601. *S. hirtus* H. S. 409.  
*v. Mundi.*  
Swampy places and rice-fields especially south of Calcutta and in cleanings in the North-Western Sundribuns ; very rare west of the Hughli.
- \* **Sphæranthus indicus** Linn. ; B. P. i. 601. *S. mollis* H. S. 409.  
*v. Chaggul nadi, ghák-nunti, murmuria.*  
Dry rice-fields, very plentiful west of the river Hughli ; east of the river rather rare.

#### 264. *Athroisma* DC.

- \* **Athroisma laciniatum** DC. ; B. P. i. 601,  
Dry rice-fields, occasional,



265. *Gnaphalium* Linn.

- \* *Gnaphalium luteo-album* Linn. VAR. *pallidum* B. P. i. 602.  
Dry fields west of the Hughli and north of Calcutta.
- \* *Gnaphalium indicum* Linn.; H. S. 421; B. P. i. 602.  
Dry fields, gardens, and places where water has lodged during the rains, general.
- \* *Gnaphalium pulvinatum* DC.; B. P. i. 603.  
Hughli district, Goghat sub-division.

266. *Cæsulia* Roxb.

- \* *Cæsulia axillaris* Roxb.; H. S. 411; B. P. i. 603.  
Rice-fields and wet places, everywhere.

267. *Emilia* Cass.

- \* *Emilia sonchifolia* DC.; H. S. 421; B. P. i. 605.  
v. *Sadi modi*.  
Shady places, general.

268. *Hymenanthrum* Cass.*Hymenanthrum tenuifolium* Cass.

In gardens general, readily self-sown on dry paths and in dry waste places; native of Mexico.

269. *Tagetes* Linn.

- Tagetes patula* Linn.; H. S. 416; B. P. i. 607.  
v. *Chhota genda*.  
In gardens everywhere, often also as an escape; native of Mexico.
- Tagetes erecta* Linn.; H. S. 417.  
v. *Buro genda*.  
In gardens generally, sometimes also as an escape; native of Mexico.

270. *Xanthium* Linn.

- \* *Xanthium strumarium* Linn.; B. P. i. 607. *X. orientale* H. S. 413.  
v. *Ban okra, chhota gokhru*.  
River banks, sides of ponds and ditches, waste places and rubbish heaps, general.
- Xanthium spinosum* Linn.; B. P. i. 608.  
Waste places, occasional; very abundant at Canning Town along the Matla river; introduced from S. Europe.

**271. Lagascea Cav.**

**Lagascea mollis** Cav. ; H. S. 406 ; B. P. i. 608.

Garden ground, waste places and river banks about Calcutta, a very frequent weed ; introduced from the West Indies.

**272. Zinnia Linn.**

**Zinnia pauciflora** Linn. ; H. S. 413 ; B. P. i. 609.

In gardens everywhere ; sometimes also sub-spontaneous ; native of Mexico.

Other species of *Zinnia*, and especially *Z. elegans*, are generally cultivated in gardens both Native and European, but the writer has not observed this tendency to become naturalised in any save *Z. pauciflora*.

**273. Enhydra Lour.**

\* **Enhydra fluctuans** Lour. ; B. P. i. 610. *E. Hingcha* H. S. 416.  
v. *Hingcha*.

Edges of ponds and ditches and sometimes partly floating ; everywhere.

**274. Eclipta Linn.**

\* **Eclipta alba** Hassk. ; B. P. i. 610. *E. erecta* H. S. 411.  
v. *Kesari, keshuti*.

Fields, roadsides, waste places everywhere.

**275. Wedelia Jacq.**

\* **Wedelia calendulacea** Less. ; H. S. 414 ; B. P. i. 611.  
v. *Kesaráj, bhimráj*.

Wet places, banks of ponds, ditches and khals ; general.

\* **Wedelia scandens** Clarke ; B. P. i. 612. *Wollastonia scandens* H. S. 414.  
v. *Bhimráj*.

Western Sundribuns, climbing on bushes along river banks and at sea-face, very common ; extends along banks of Hughli almost to Calcutta.

**276. Tithonia Desf.**

**Tithonia tagetiflora** Desf. ; B. P. i. 612.

In gardens and on lawns, general ; native of America.

**277. Helianthus Linn.**

**Helianthus annuus** Linn. ; H. S. 415 ; B. P. 613.

v. *Suraj mukhi, shuriya mukti*.

In gardens everywhere ; native of S. America.

**Melianthus argyrophyllus** Torr. & Gr.; B. P. i. 613.

v. *Safed suraj mukhi*, *sweet shuriya mukti*.

In gardens generally, and freely sub-spontaneous in cultivated ground and waste places; native of N. America.

**Melianthus tuberosus** Linn.; H. S. 415; B. P. i. 613.

v. *Brahmokha*.

In vegetable and market gardens, especially near Calcutta; native of Brazil.

#### 278. **Guizotia** Cass.

**Guizotia abyssinica** Cass.; H. S. 414; B. P. i. 614.

v. *Surguja*, *ram tila*.

A field crop in Goghat sub-division of Hughli district; native of Africa.

#### 279. **Synedrella** Gærtn.

**Synedrella nodiflora** Gærtn.; B. P. i. 615.

In cultivated ground and waste places about Calcutta; occasional; native of tropical America.

#### 280. **Cosmos** Cav.

**Cosmos sulfureus** Cav.; H. S. 416; B. P. i. 616.

In gardens; also not infrequent as a weed in waste places near Calcutta (quite naturalised in the drier districts to the west of our area); native of Mexico.

#### 281. **Spilanthes** Linn.

**Spilanthes Acmella** Linn.; H. S. 416; B. P. i. 614.

v. *Marhata tiga*.

Reported by Voigt from Serampore, but the record requires verification; the species occurs in Chota Nagpur, North Bengal, and Chittagong, but is probably only a casual on the deltaic alluvium.

#### 282. **Galinsoga** Ruiz & Pav.

**Galinsoga parviflora** Cav.; B. P. i. 618.

A not uncommon weed in cultivated ground in the cold weather but not persisting; probably always a casual introduction from the Himalaya where it is abundant; originally introduced from America.

#### 283. **Tridax** Linn.

**Tridax procumbens** Linn.; H. S. 417; B. P. i. 618.

Grassy glades, dry roadsides, old walls, everywhere; native of Mexico.

284. *Chrysanthemum* Linn.

*Chrysanthemum coronarium* Linn.; B. P. i. 619. *C. Roxburghii* H. S. 419.  
v. *Gúl-dandi*.

Reported by Voigt from Serampore, but possibly only from Carey's Garden; it is a staple cold-weather crop in Northern Bengal and the Assam Valley, but is not grown in Central Bengal; native certainly of China and, it is said, also of the Mediterranean region. Voigt refers the vernacular name only to the garden *Chrysanthemum* (*C. indicum*) which is also a native of China, introduced to general horticulture by way of Japan.

285. *Cotula* Linn.

\* *Cotula hemisphærica* Wall.; B. P. i. 620. *Machlis hemisphærica* H. S. 420.

A weed of cultivated ground and waste places, west of the river Hughli.

286. *Centipeda* Lour.

\* *Centipeda orbicularis* Lour.; B. P. i. 620. *Myriogyne minuta* VAR. *lanuginosa* H. S. 420.  
v. *Mechista, hachuti*.

Damp ground, everywhere.

287. *Cnicus* Linn.

\* *Cnicus arvensis* Hoffm.; B. P. i. 622. *Aplotaxis cirsioioides* H. S. 424.  
v. *Tikbhuma, silkánta*.

Cultivated ground, everywhere.

288. *Silybum* Gærtn.

*Silybum Marianum* Gærtn.; H. S. 425; B. P. i. 623.

In gardens, mostly, however, of European residents; native of the Mediterranean region, the Orient and the Western Himalaya.

289. *Carthamus* Linn.

*Carthamus tinctorius* Linn.; H. S. 425; B. P. i. 625.  
v. *Kusumb*.

A cold-weather field crop, general; native of India.

290. *Crepis* Linn.

\* *Crepis japonica* Benth.; B. P. i. 627. *Youngia procumbens* H. S. 432 (not *Prenanthes procumbens* Roxb.)

Hedges, waste places, margins of partially dried ponds, general.

- \* *Crepis acaulis* Hook. f.; B. P. i. 627. *Youngia acaulis* H. S. 432.  
*Y. linifolia* H. S. 432.

Waste places, margins of paths, west of river Hughli, rare.

291. *Lactuca* Linn.

*Lactuca sativa* Linn.; H. S. 430; B. P. i. 628.

v. *Káhú, salad.*

In vegetable and market gardens about Calcutta and other towns.

292. *Sonchus* Linn.

- \* *Sonchus asper* Vill.; B. P. i. 629. *S. ciliatus* H. S. 432.

In fields and waste places, quite common.

*Sonchus oleraceus* Linn.; B. P. i. 629.

In gardens an occasional weed; native of Europe.

*Sonchus arvensis* Linn.; B. P. i. 629. *S. orixensis* H. S. 432.

v. *Ban palang.*

In gardens and waste places, rather rare. This in the writer's experience is the rarest of the three Sow-thistles that are to be met with in our area; it is common in various parts of India but can hardly be considered a native of these districts.

293. *Launea* Cass.

- \* *Launea asplenifolia* Hook. f.; B. P. i. 630. *Microrhynchus asplenifolius* H. S. 431.

v. *Tik-chana.*

In grassy glades and open fields, everywhere.

- \* *Launea pinnatifida* Cass.; B. P. i. 630.

Western Sundribuns, creeping on sand at the sea-face.

LIVII.—CAMPANULACEÆ.

294. *Lobelia* Linn.

*Lobelia trigona* Roxb.; B. P. i. 633. *L. triangulata* H. S. 367.

Reported by Voigt from Serampore; quite possibly, but the record requires confirmation; native of India, common in wet pastures in Western Bengal.

295. *Sphenoclea* Gærtn.

- \* *Sphenoclea zeylanica* Gærtn.; B. P. i. 635. *Pongatium indicum* H. S. 371.

v. *Fhil mirich.*

Edges of pools and ditches and rice-fields, general.

296. *Wahlenbergia* Schrad.

- \* *Wahlenbergia gracilis* DC. ; B. P. i. 636. *W. dehiscens* H. S. 369.  
Dry fields west of the river Hughli, general, but not anywhere common; has been collected near Shibpur (*Kurs*), Serampore (*Voigt*), and Chandernagore (*Praïn*).

## LVI.—STYLIDEEÆ.

297. *Stylidium* Sw.

- \* *Stylidium tenellum* Sw. ; H. S. 372 ; B. P. i. 631.  
Ditches about Serampore (*Voigt*) ; should be looked for again as it has not been collected, since *Voigt*'s record, in our districts.

## LVIII.—PLUMBAGINEÆ.

298. *Egialitis* R. Br.

- \* *Egialitis rotundifolia* Roxb. ; H. S. 439 ; B. P. i. 638.  
v. *Sátári*.  
Western Sundribuns, plentiful.

299. *Plumbago* Linn.

- Plumbago zeylanica* Linn. ; H. S. 438 ; B. P. i. 639.  
v. *Chita, chitra*.

In gardens ; also occasionally as a weed in waste places but with no claim to be a native of our districts ; native of S. E. Asia.

- Plumbago rosea* Linn. ; H. S. 439 ; B. P. i. 639.  
v. *Rakto-chita, Rakto-chitra*.

In gardens, generally, also sometimes as a weed in waste places ; native of S. E. Asia.

## LIX.—PRIMULACEÆ.

300. *Androsace* Linn.

- \* *Androsace saxifragæfolia* Bunge ; B. P. i. 640.  
Sides of moat round Fort William.

This was once collected by Dr. T. Anderson, but has not been met with again in our districts.

301. *Anagallis* Tournef.

- Anagallis arvensis* Linn. ; H. S. 335 ; B. P. i. 641.

A cold-weather weed of fields and gardens near Calcutta ; generally to be met with if looked for, but always very rare, and

apparently not persisting, so that it probably has no claims to be a native of our districts. Only the blue-flowered form, characteristic of Upper India, is to be found; possibly it is annually re-introduced with up-country seed.

### LX.—MYRSINÆÆ.

#### 302. *Ardisia* Sw.

\* *Ardisia humilis* Vahl.; H. S. 337; B. P. i. 645.

v. *Bāñ jám*.

Village shrubberies, chiefly east of the river Hughli.

#### 303. *Egiceras* Gærtn.

\* *Egiceras majus* Gærtn.; B. P. i. 645. *A. fragrans* H. S. 336.

v. *Halsi, khalsi, koilsha*.

Western Sundribuns, common; salt-lakes near Calcutta.

### LXI.—SAPOTACEÆ.

#### 304. *Achras* Linn.

*Achras Sapota* Linn.; H. S. 339; B. P. i. 648.

v. *Sapota* (the American name adapted).

Cultivated in orchards about Calcutta; native of S. America.

#### 305. *Mimusops* Linn.

*Mimusops Elengi* Linn.; H. S. 341; B. P. i. 649.

v. *Bakul*.

Planted generally near villages, occasionally also self-sown; native of S. E. Asia.

### LXII.—EBENACEÆ.

#### 306. *Diospyros* Linn.

\* *Diospyros Embryopteris* Pers.; H. S. 345; B. P. i. 653.

v. *Gáb*.

Village-shrubberies general; also in Western Sundribuns, e.g. at Jatta.

\* *Diospyros cordifolia* Roxb.; H. S. 344. *D. montana* VAR. *cordifolia* B. P. i. 653.

v. *Ban gáb*.

Village-shrubberies, general; also in Western Sundribuns, e.g. at Jatta.

**Diospyros Kaki** Linn. f. ; H. S. 345 ; B. P. i. 653.

In gardens and orchards ; native of China.

**Diospyros discolor** Willd. ; H. S. 345 ; B. P. i. 654.

In gardens, occasionally ; native of the Philippines.

### LXIII.—OLEACEÆ.

#### 307. *Jasminum* Linn.

\* *Jasminum pubescens* Willd. ; H. S. 550 ; B. P. i. 659.

v. *Kundá.*

Goghat sub-division, Hughli district ; also reported by Voigt from Serampore, but this last record needs confirmation.

*Jasminum Sambac* Ait. ; H. S. 549 ; B. P. i. 659.

v. *Bél, ban mallika.*

In gardens generally ; occasionally in village-shrubberies ; native of the Orient.

*Jasminum auriculatum* Vahl ; H. S. 551 ; B. P. i. 659.

v. *Jui, ju'hi.*

In gardens occasionally ; native of India.

*Jasminum elongatum* Vahl ; H. S. 550. *J. Roxburghianum* H. S. i. 658, partly.

Reported by Roxburgh from Hidguli, and reported by Voigt from the Sundribuns ; is a plant that should be looked in the southern part of our districts.

#### 308. *Nyctanthes* Linn.

*Nyctanthes Arbor-tristis* Linn. ; H. S. 552 ; B. P. i. 660.

v. *Singhar, septalika.*

Sometimes planted about tanks and near villages ; native of India.

### LXIV.—SALVADORACEÆ.

#### 309. *Azima* Lamk.

\* *Azima tetraantha* Lamk. ; B. P. i. 663. *Monetia tetraantha* H. S. 348.

v. *Trikanta gati.*

Western Sundribuns (*Prain*) ; Serampore (*Voigt*) ; Chandernagore and Hughli (*Prain*).



## LXV.—APOCYNACEÆ.

310. *Allamanda* Linn.

*Allamanda cathartica* Linn. ; H. S. 528 ; B. P. ii. 667.

v. *Har-kakra*.

In gardens generally ; introduced from Guiana.

311. *Carissa* Linn.

*Carissa Carandas* Linn. ; H. S. 529 ; B. P. ii. 668.

v. *Karamcha*.

In gardens, and sometimes sub-spontaneous in village-shrubberies ; native of S. E. Asia.

*Carissa spinarum* A. DC. ; B. P. ii. 669. *C. diffusa* H. S. 529.

Reported by Voigt from the Sundribuns, but this is very doubtful ; there are no specimens from our area at Calcutta ; the species is very common in the western parts of Bengal.

312. *Thevetia* Juss.

*Thevetia nerifolia* Juss. ; H. S. 531 ; B. P. ii. 669.

v. *Kokla phul, haldi korubi*.

In gardens everywhere, but also often sub-spontaneous in village-shrubberies and now occasionally found also in waste places ; has been found as if wild even in the Goghat sub-division of the Hughli district ; native of tropical America.

313. *Cerbera* Linn.

\* *Cerbera Odollam* Gært. ; H. S. 531 ; B. P. ii. 670.

v. *Dákúr*.

Western Sundribuns, on river banks, common.

314. *Plumeria* Linn.

*Plumeria acutifolia* Poir. B. P. ii. 670. *P. acuminata* H. S. 528.

v. *Gorur champa, goburiya champa*.

Planted everywhere about villages and near temples but shows little tendency to appear spontaneously ; native of S. America.

315. *Rauwolfia* Linn.

\* *Rauwolfia serpentina* Benth. ; B. P. ii. 671. *Ophioxylon serpentinum* H. S. 532.

v. *Chandrá, chhota chand*.

Shady groves, general ; but doubtfully a native of our districts.

**Rauwolfia canescens** Linn.; H. S. 532; B. P. ii. 671.

In gardens, also quite naturalized in village-shrubberies and, at least about Calcutta, commoner than the preceding species; native of the West Indies.

**316. Kopsia** Bl.

**Kopsia fruticosa** A. DC.; B. P. ii. 671. *Calpicarpum Roxburghii* H. S. 531.

In gardens and on lawns, often; native of Tenasserim and the Andamans.

**317. Vinca** Linn.

**Vinca rosea** Linn.; H. S. 526; B. P. ii. 672.

v. *Gul feringhi*.

In gardens and near shrines and temples everywhere; also often sub-spontaneous on rubbish heaps; native of West Indies.

**318. Alstonia** R. Br.

**Alstonia scholaris** R. Br.; H. S. 525; B. P. ii. 672.

v. *Chhattin*.

Reported by Voigt from Serampore, but in our districts is almost certainly only planted; it is, however, wild in Western Bengal.

**Alstonia macrophylla** Wall.; H. S. 526.

Occasionally planted, and about Calcutta and Howrah also appearing spontaneously in village thickets; native of Malaya and one of the few Malayan species that show a tendency to become naturalized in Lower Bengal.

**319. Tabernæmontana** Linn.

**Tabernæmontana coronaria** R. Br.; H. S. 527; B. P. ii. 673.

v. *Vagúr*.

In gardens everywhere; but sometimes also sub-spontaneous, e.g. at Mátla; native of India.

**320. Holarrhena** R. Br.

\* **Holarrhena antidysenterica** Wall.; H. S. 524; B. P. ii. 674.

v. *Kurchi*.

Goghat, Western Hughli district.

**321. Wrightia** R. Br.

**Wrightia coccinea** Sims; H. S. 526; B. P. ii. 674.

In gardens, general.

**322. Vallaris Burm.**

- \* **Vallaris Heynei** Spreng.; B. P. ii. 675. *V. dichotoma* H. S. 524.  
v. *Hápar mali*.

Village-shrubberies; apparently quite entitled to be considered native, though it is sometimes also found in gardens.

- Vallaris Pergulana** Burm.; H. S. 524; B. P. ii. 675.

In gardens, occasionally; native of S. E. Asia.

**323. Parsonsia R. Br.**

- \* **Parsonsia spiralis** Wall.; H. S. 524; B. P. ii. 676.  
Western Sundribuns.

**324. Nerium Linn.**

- Nerium odorum** Soland.; H. S. 524; B. P. ii. 676.

v. *Karabi*.

In gardens everywhere; native of China.

**325. Roupellia Wall.**

- Roupellia grata** Wall.; B. P. ii. 677.

In gardens and on lawns, rather common; native of Madagascar.

**326. Beaumontia Wall.**

- Beaumontia grandiflora** Wall.; H. S. 524; B. P. ii. 678.

Grown on trellises and porches in gardens about Calcutta; native of Eastern Himalaya and Indo-China.

**327. Ichnocarpus R. Br.**

- \* **Ichnocarpus frutescens** R. Br.; H. S. 523; B. P. ii. 680.

v. *Siama lata*.

Hedges, thickets and waste places, everywhere.

**LXVI.—ASCLEPIADACEÆ.****328. Cryptostegia R. Br.**

- Cryptostegia grandiflora** R. Br.; H. S. 544; B. P. ii. 684.

In gardens, general; native of Madagascar.

**329. Cryptolepis R. Br.**

- \* **Cryptolepis Buchanani** R. & S.; B. P. ii. 685. *C. reticulata* H. S. 544.

v. *Karanta*.

Hedges and village-shrubberies, general.

330. *Hemidesmus* R. Br.

- \* *Hemidesmus indicus* R. Br. ; H. S. 544 ; B. P. ii. 686.  
v. *Ananta mul.*  
Hedges, thickets and waste places, everywhere.

331. *Finlaysonia* Wall.

- \* *Finlaysonia obovata* Wall. ; B. P. ii. 686. *Gurua obovata* H. S. 544.  
v. *Dudhi-lata.*  
Western Sundribuns.

332. *Oxystelma* R. Br.

- \* *Oxystelma esculentum* R. Br. ; H. S. 541 ; B. P. ii. 683.  
v. *Kirni.*  
Waste places, general but never common.

333. *Calotropis* R. Br.

- \* *Calotropis gigantea* R. Br. ; H. S. 540 ; B. P. ii. 683.  
v. *Akanda, gurtakand.*  
Roadsides and waste places, everywhere.

334. *Asclepias* Linn.

- Asclepias Curassavica* Linn. ; H. S. 539 ; B. P. ii. 689.  
Waste places near villages, everywhere ; native of America.

335. *Cynanchum* Linn.

- \* *Cynanchum Callialata* Ham. ; B. P. ii. 690. *C. pauciflorum* H. S.  
541.  
v. *Chagulbati.*  
Hedges and thickets, general.

336. *Pentatropis* R. Br.

- \* *Pentatropis microphylla* W. & A. ; H. S. 540 ; B. P. ii. 601.  
Hedges and thickets or banks of khals and rivers, from Calcutta  
salt-lakes southwards.

337. *Dæmia* R. Br.

- \* *Dæmia extensa* R. Br. ; H. S. 541 ; B. P. ii. 692.  
v. *Chagul-bati.*  
Hedges and thickets, everywhere.

338. *Sarcostemma* R. Br.

- Sarcostemma brevistigma* Wight ; B. P. ii. 692. *S. acida* H. S. 542.  
v. *Soma lata.*

Reported by Voigt to have been once obtained by Dr. Carey at Serampore; probably only a casual in our districts: it is wild in South-West Chota Nagpur (Singbhum).

**339. Sarcolobus R. Br.**

\* *Sarcolobus globosus* Wall.; H. S. 538; B. P. ii. 693.

v. *Baoli-lata*.

Western Sundribuns.

\* *Sarcolobus carinatus* Wall.; H. S. 538; B. P. ii. 693.

v. *Baoli-lata*.

Western Sundribuns.

**340. Gymnema R. Br.**

*Gymnema hirsutum* W. & A.; B. P. ii. 694. *G. sylvestre* H. S. 538.

v. *Chhoto dudhi lata*.

Reported by Voigt from Serampore and should be looked for; it is common in Behar and Chota Nagpur.

**341. Pergularia Linn.**

\* *Pergularia pallida* W. & A.; H. S. 538; B. P. ii. 696.

Goghat, Western Hughli district in low jungles; reported also by Voigt from Serampore, this last recorded locality needs confirmation.

*Pergularia minor* Andr.; H. S. 537; B. P. ii. 697. *P. odoratissima* H. S. 537.

v. *Kanja lata*.

In gardens, generally; reported by Voigt from Serampore but probably there only sub-spontaneous; native of S. E. Asia.

**342. Dregea E. Mey.**

\* *Dregea volubilis* Benth.; B. P. ii. 697. *Hoya viridiflora* H. S. 537.

v. *Tita-kunga*.

Hedges and thickets, general.

**343. Tylophora R. Br.**

\* *Tylophora tenuis* Bl.; B. P. ii. 698. *T. tenuissima* H. S. 539.

Hedges, thickets and banks of creeks, from salt-lakes near Calcutta southwards.

G

- \* *Tylophora asthmatica* W. & A.; B. P. ii. 698. *T. vomitoria* H. S. 539.  
v. *Anta-mal*.  
Waste places and hedges, general.

344. *Hoya* R. Br.

- \* *Hoya parasitica* Wall.; B. P. ii. 700. *H. pallida* H. S. 536.  
v. *Pargátcha*.  
Western Sundribuns.

## LXVII.—LOGANIACEÆ

345. *Mitrasacme* Labill.

- \* *Mitrasacme alsinoides* R. Br.; B. P. ii. 702.  
Waste places, Goghat, Western Hughli.

## LXVIII.—GENTIANACEÆ

346. *Exacum* Linn.

- \* *Exacum tetragonum* Roxb.; H. S. 520; B. P. ii. 706.  
v. *Kuchári*.  
Wet meadows, occasional.

*Exacum pedunculatum* Linn.; H. S. 520; B. P. ii. 706.  
Reported by Voigt from Serampore, but the record needs verification; is found in Behar and Chota Nagpur.

347. *Erythraea* L. C. Rich.

- \* *Erythraea Roxburghii* G. Don; B. P. ii. 707. *E. centauroides* H. S. 520.  
v. *Gima, girmi*.  
Grassy places, occasional.

348. *Hoppea* Willd.

- \* *Hoppea dichotoma* Willd.; B. P. ii. 707. *Canscora ? pusilla* H. S. 520.  
Damp meadows and drying rice-fields, everywhere.

349. *Canscora* Lamk.

- \* *Canscora diffusa* R. Br.; H. S. 520; B. P. ii. 708.  
Grassy places and sides of paths, everywhere.  
\* *Canscora decussata* R. & S.; H. S. 520; B. P. ii. 708.  
v. *Dānkuni*.  
Grassy places, paths and waste ground, everywhere.

350. *Enicostema* Bl.

*Enicostema littorale* Bl. *Slevogtia verticillata* H. S. 520.

v. *Chhota-kirata*.

Reported by Voigt from Serampore and should therefore be looked for; the record is not a very probable one, and no other botanist has ever reported the species from Bengal.

351. *Limnanthemum* S. P. Gmel.

\* *Limnanthemum cristatum* Griseb.; B. P. ii. 709. *Villarsia cristata* H. S. 521.

v. *Pan-chuli, chand malla, chhota pan chuli*.

Floating on ponds and jhils, everywhere.

\* *Limnanthemum indicum* Thw.; B. P. ii. 709. *Villarsia indica* H. S. 321.

v. *Pan-chuli, chand malla, bara pan chuli*.

Floating on ponds and jhils, everywhere.

## LXIX.—POLEMONIACEÆ.

352. *Phlox* Linn.

*Phlox Drummondii* Hook.; B. P. ii. 710.

In gardens in the cold weather; occasionally sub-spontaneous on rubbishy places near Calcutta, but only the white-flowered kinds, so far as the writer's observations go, and not every year: native of Texas. It may be noted that, though now so general a favourite, this species, according to Voigt, had not been introduced up to 1845.

## LXX.—HYDROPHYLLACEÆ.

353. *Hydrolea* Linn.

\* *Hydrolea zeylanica* Vahl.; H. S. 366; B. P. ii. 711.

v. *Kasschra* or (*vide* Voigt) *kankra*.

Marshy places and edges of rice-fields, general.

## LXXI.—BORAGINÆÆ.

354. *Cordia* Linn.

\* *Cordia Myxa* Linn.; H. S. 440; B. P. ii. 714.

v. *Bohnari, lashora*.

In hedges and village-shrubberies, but sometimes also planted.

*Cordia Sebestena* Linn.; H. S. 440; B. P. ii. 714.

In gardens; native of West Indies.

355. *Ehretia* Linn.

*Ehretia laevis* Roxb. ; H. S. 445 ; B. P. ii. 718.

Reported by Voigt from Serampore, but the record needs confirmation ; is common everywhere west of our districts.

356. *Heliotropium* Linn.

\* *Heliotropium ovalifolium* Forsk. ; B. P. ii. 716. *H. coromandelianum* H. S. 444.

v. *Naga phuli*.

Goghat, Western Hughli ; reported also from Serampore by Voigt.

\* *Heliotropium strigosum* Willd. VAR. *brevifolia* B. P. ii. 716. *H. brevifolium* H. S. 445.

v. *Chiti phuli*.

Dry fields and waste places, principally west of the Hughli.

\* *Heliotropium indicum* Linn. ; B. P. ii. 716. *Tiaridium indicum* H. S. 445.

v. *Hati sura*.

Rubbish heaps and waste places, everywhere.

Voigt records *H. curassavicum* as naturalised about Serampore prior to 1843, it does not appear to have persisted.

357. *Coldenia* Linn.

\* *Coldenia procumbens* Linn. ; H. S. 445 ; B. P. ii. 718.

v. *Triphunki*.

Dry rice-fields, everywhere.

358. *Bothriospermum* Barge.

*Bothriospermum tenellum* F. & M. ; B. P. ii. 719. *Cynoglossum diffusum* H. S. 443.

Reported by Voigt from Serampore ; quite possibly, but the record needs confirmation ; plentiful in E. Bengal.

359. *Cynoglossum* Linn.

\* *Cynoglossum lanceolatum* Forsk. ; B. P. ii. 719. *C. canescens* H. S. 443.

Waste places, especially about Calcutta.

360. *Trichodesma* R. Br.

\* *Trichodesma indicum* R. Br. ; H. S. 444 ; B. P. ii. 720.

v. *Chhoto kulpa*.

Fields and waste places, everywhere.



*Trichodesma zeylanicum* R. Br. ; H. S. 444 ; B. P. ii. 720.  
v. *Buro kulpa*.

Reported by Voigt from Serampore, but the record needs confirmation ; it is wild throughout the drier parts of India and Ceylon.

## LXXII.—CONVOLVULACEÆ.

### 361. *Cuscuta* Linn.

\* *Cuscuta reflexa* Roxb. ; H. S. 349 ; B. P. ii. 723.

v. *Haldi algusi*.

Parasitic on trees and shrubs, everywhere ; attaches itself to very many species.

*Cuscuta chinensis* Lamk. *C. sulcata* H. S. 349.

Reported by Voigt from Serampore ; also reported by Roxburgh as occurring on *Amarantus oleraceus*, etc.; not at all improbably, but the record needs verification ; occurs in Chota Nagpur.

*Cuscuta capitata* Roxb. ; H. S. 349.

v. *Algusi*.

Reported by Roxburgh as occurring on *Crotalaria juncea*, also by Voigt as appearing at Serampore on the same species ; probably only a casual introduced also with seed of *Çan* from outside Bengal ; occurs throughout the North-West Himalaya.

*Cuscuta europæa* Linn. *C. aggregata* H. S. 349.

Roxburgh records this as having once appeared on *Flax* the seeds of which were imported from Bagdad ; no doubt a mere casual ; native of the Orient, Central Asia, and Europe.

### 362. *Porana* Burm.

*Porana paniculata* Roxb. ; H. S. 363 ; B. P. ii. 724.

In gardens on trellises or on trees ; native of India.

### 363. *Cressa* Linn.

\* *Cressa cretica* Linn. ; B. P. ii. 725. *C. indica* H. S. 363.

Salt-lakes near Calcutta, in dried up muddy places.

### 364. *Evolvulus* Linn.

\* *Evolvulus alsinoides* Linn. ; H. S. 363 ; B. P. ii. 725.

Dry grassy places west of the Hughli.

*Evolvulus nummularius* Linn. ; B. P. ii. 726.

Grassy glades around Calcutta, Howrah, etc., quite naturalised ; a recent introduction from the West Indies.

**365. Hewittia W. & A.**

**Hewittia bicolor** W. & A. ; H. S. 362 ; B. P. ii. 727.

v. *Farad-kalmi*.

Recorded from Serampore by Voigt ; quite possibly, but requires to be verified ; native of India.

**366. Jacquemontia Choisy.**

**Jacquemontia cœrulea** Choisy ; B. P. ii. 728.

In gardens generally ; native of Africa.

**367. Merremia Dennst.**

**Merremia umbellata** Hallier f. ; B. P. ii. 730. *Ipomœa platensifolia*  
H. S. 359.

A form of this species not distinguishable from the American variety of the plant, VAR. **occidentalis**, has been reported by Voigt from Serampore and met with by Kurz climbing on bushes on the banks of the Hughli, near Calcutta, probably, however, only as an escape from cultivation that has not persisted, for there is no recent gathering of the plant ; the Indian variety, VAR. **orientalis** = *Ipomœa cymosa* (H. S. 358) has not been found in our districts.

\* **Merremia vitifolia** Hallier f. ; B. P. ii. 730. *Ipomœa vitifolia* H. S. 361.

Occasionally in village-shrubberies.

**Merremia tridentata** Hallier f. ; B. P. ii. 730. *Ipomœa tridentata*  
H. S. 355.

Reported by Voigt from Serampore, but the record requires confirmation ; common in Western Bengal and Behar.

**Merremia hastata** Hallier f. ; B. P. ii. 730. *Ipomœa filiformis*  
H. S. 356.

Reported by Voigt from Serampore, but the record is not very probable ; nearest authentic locality Orissa.

\* **Merremia chryseides** Hallier, f. ; B. P. ii. 730. *Ipomœa dentata* H. S. 359.

Banks of the Hughli, below Calcutta, rare ; Serampore, according to Voigt ; perhaps only an escape in our districts ; native of Eastern Asia.

\* **Merremia convolvulacea** Dennst. *M. hederacea* B. P. ii. 730.  
Sundribuns.

\* **Merremia emarginata** Hallier f. ; B. P. ii. 730. *Ipomœa gangetica*  
H. S. 356.

v. *Bhui kamri*.

In grassy glades and open sandy places, everywhere.

368. *Operculina* Manso.

*Operculina Turpethum* Manso ; B. P. ii. 731. *Ipomœa Turpethum*  
H. S. 357.

v. *Tôhri, dudh-kalmi.*

Hedges, thickets and river banks, general.

369. *Ipomœa* Linn.

*Ipomœa hispida* R. & S. ; H. S. 357 ; B. P. ii. 734.

Reported by Voigt from Serampore, and found by the writer at Shibpur, but by the latter only in plots where seeds from Central or Upper India had been sown ; the species is probably not entitled to rank as a native of our districts ; it is not uncommon in the drier parts of India.

\* *Ipomœa Pes-tigridis* Linn. ; H. S. 361 ; B. P. ii. 734.

v. *Kanguli lata.*

Occasional in hedges and thickets.

*Ipomœa Learii* Paxt. ; B. P. ii. 734.

In gardens, on trellises, general.

*Ipomœa Nil* Roth. ; B. P. ii. 734. *Pharbitis Nil* H. S. 354.

v. *Nil kalmi.*

In gardens everywhere and occasionally in waste places as if wild ; cosmopolitan now in the Tropics, but true native place uncertain.

*Ipomœa purpurea* Lamk. ; B. P. ii. 735. *Pharbitis purpurea* H. S. 354.

In gardens generally ; native of S. America.

\* *Ipomœa paniculata* R. Br. ; B. P. ii. 735. *Batatas paniculata*  
H. S. 353.

v. *Bilsi kand, bhui kamra.*

Hedges and thickets everywhere.

*Ipomœa Batatas* Lamk ; B. P. ii. 735. *Batatas edulis* H. S. 353.

v. *Mita álu, shakarband.*

Cultivated generally in gardens and market gardens ; native of America.

\* *Ipomœa Pes-Capræ* Sw. ; H. S. 356 ; B. P. ii. 736.

v. *Chhagal kuri.*

Western Sundribans on sandy shores.

\* *Ipomœa reptans* Poir. ; H. S. 355 ; B. P. ii. 736.

v. *Kalmi sák.*

In ponds and marshes, everywhere.

- \* *Ipomœa seplaria* Koen.; B. P. ii. 736. *Ipomœa striata* H. S. 358.  
*I. stipulacea* H. S. 359.  
 v. *Ban kalmi*.

Hedges, thickets and waste places, everywhere, in two not very distinct forms or varieties.

- \* *Ipomœa obscura* Ker; H. S. 359; B. P. ii. 736.  
 Hedges, thickets and waste places, general.

*Ipomœa tricolor* Cav.; B. P. ii. 736.

In gardens generally, on trellises; native of Mexico.

*Ipomœa pulchella* Roxb.; B. P. ii. 737. *I. heptaphylla* H. S. 360.

In gardens on trellises, general; native of India and Indo-China.

### 370. *Quamoclit* Mœnch.

*Quamoclit phœnicea* Choisy; H. S. 353; B. P. ii. 737.

In waste places, general, sometimes also in gardens; originally doubtless a garden escape but now completely naturalised; native of America.

*Quamoclit pinnata* Boj.; H. S. 353; B. P. ii. 738.

v. *Taru-lata, kan lata*.

In gardens everywhere; sometimes also in waste places as an escape; native of America.

### 371. *Calonyction* Choisy.

\* *Calonyction Bona nox* Boj.; B. P. ii. 738. *C. Roxburghii* H. S. 355.  
 v. *Dudh kalmi, dal kalmi*.

In hedges and village-shrubberies, everywhere; occasionally, but very rarely, cultivated. This species is so general that it appears to have a good claim to be considered a native.

### 372. *Rivea* Choisy.

*Rivea hypocateriformis* Choisy; B. P. ii. 739. *R. Bona nox*  
 H. S. 351.

v. *Kalmi lata*.

Reported by Voigt from Serampore, but the record is not very probable; nearest known locality Midnapore.

### 373. *Stictocardia* Hallier. f.

\* *Stictocardia tiliæfolia* Hallier f.; B. P. ii. 740. *Rivea tiliæfolia*  
 H. S. 350.

Banks of Hughli river, Salt-lakes, Sundribuns.

374. *Argyreia* Lour.

- \* *Argyreia speciosa* Sw. ; H. S. 351 ; B. P. ii. 741.

v. *Bich tarak, guguli.*

In village-shrubberies, occasional.

- \* *Argyreia argentea* Choisy ; H. S. 352 ; B. P. ii. 741.

v. *Chhota bich-tarak.*

Serampore, *Voigt* ; Chandernagore, *Prain's collector* ; Hughli, *Prain*. Apparently very rare in our area.

375. *Lettsomia* Roxb.

- \* *Lettsomia strigosa* Roxb. ; B. P. ii. 742. *Argyreia capitata* H. S. 352.

In village-shrubberies and hedges.

## LXXIII.—SOLANACEÆ.

376. *Lycopersicum* Mill.

- Lycopersicum esculentum* Mill. ; H. S. 513 ; B. P. ii. 743.

v. *Gur-bagun.*

Cultivated and sometimes on rubbish heaps as an escape ; native of America.

377. *Solanum* Linn.

- Solanum tuberosum* Linn. ; H. S. 510 ; B. P. ii. 745.

v. *Bilati alu.*

Cultivated, especially in Hughli district.

- \* *Solanum nigrum* Linn. ; B. P. ii. 745. *S. rubrum* H. S. 511.

v. *Gurki, gurkamai.*

Shady places, garden ground and waste spots ; general.

- \* *Solanum verbascifolium* Linn. ; H. S. 511 ; B. P. ii. 746.

v. *Arasa.*

Village-shrubberies, roadsides and waste places ; general.

- Solanum glaucum* Dun.

Naturalised and very abundant at Canning Town ; native of America.

- Solanum sisymbriifolium* Lamk. ; B. P. ii. 746.

Occasionally as if wild about Shibpur and on the banks of the river Hughli ; native of America.

- \* *Solanum ferox* Linn. ; H. S. 512 ; B. P. ii. 746.

v. *Ram-begun.*

Waste places, not very common.

- \* *Solanum torvum* Sw. ; H. S. 511 ; B. P. ii. 746.  
 v. *Gota begun*.  
 Village-shrubberies, roadsides and waste places ; everywhere.
- \* *Solanum indicum* Linn. ; H. S. 512 ; B. P. ii. 746.  
 v. *Byakur*.  
 Waste places near villages, general.
- Solanum Melongena* Linn. ; H. S. 512 ; B. P. ii. 746.  
 v. *Begun*.  
 In gardens and market gardens, everywhere.  
 VAR. *esculenta* H. S. 512 ; B. P. ii. 746.  
 v. *Kuli begun*.  
 In gardens and market gardens, everywhere.  
 VAR. *insana* H. S. 512 ; B. P. ii. 746.  
 In village-shrubberies and waste places, general. This is rather a state of the cultivated *Begun* become general after escape than a truly wild stock ; native of India.
- \* *Solanum xanthocarpum* Schr. & Wendl. ; B. P. ii. 746. · *S. Jacquini* H. S. 513.  
 v. *Kantee kari*.  
 Waste places and dry fields, everywhere.
- \* *Solanum trilobatum* Linn. ; H. S. 513 ; B. P. ii. 747.  
 Western Sundribuns.

378. *Capsicum* Linn.

- Capsicum annum* Linn. VAR. *abbreviata* ; B. P. ii. 748. *C. frutescens* H. S. 510.  
 v. *Lanka mirich*.  
 In fields and market gardens, everywhere ; native of America.  
 VAR. *grossa* B. P. ii. 748. *C. grossum* H. S. 510.  
 v. *Kápkari mirich*.  
 In gardens of natives and Europeans, general ; native of America.
- Capsicum frutescens* Linn. ; B. P. ii. 749. *C. fastigiatum* H. S. 510.  
 v. *Dhan mirich*.  
 In gardens occasionally ; as if wild in waste places, general ; native of S. America.

379. *Physalis* Linn.

- \* *Physalis minima* Linn. ; H. S. 514 ; B. P. ii. 750.  
 v. *Ban-tipariya*.  
 A weed of garden ground, everywhere.

**Physalis peruviana** Linn. ; H. S. 514 ; B. P. ii. 750.

v. *Tipariya*.

In gardens and market gardens, general ; native of S. America.

**380. Withania** Paug.

**Withania somnifera** Dun. ; B. P. ii. 750. *Physalis somnifera* H. S.

513.

v. *Ashva gandha*.

Reported from Serampore by Voigt, but almost certainly not wild ; it is cultivated in small gardens in Northern Bengal and may perhaps be met with in our provinces in the gardens of native herbalists ; native of Western India.

**381. Datura** Linn.

**Datura fastuosa** Linn. ; H. S. 515 ; B. P. ii. 751.

v. *Kala Dhutra*.

In gardens generally, sometimes as if wild ; native of India.

VAR. *alba* B. P. ii. 751. *D. alba*, H. S. 515.

v. *Dhutra*.

In gardens everywhere, and in waste places, as if wild, generally ; native of India.

**382. Petunia** Juss.

**Petunia nyctaginiflora** Juss. ; H. S. 516.

In gardens of Europeans ; occasionally sub-spontaneous in garden beds and on rubbish heaps.

**383. Nicotiana** Linn.

**Nicotiana rustica** Linn. ; H. S. 516 ; B. P. ii. 752.

v. *Tamaku*, *angresi tamaku*.

Cultivated sparingly in fields ; native of America.

**Nicotiana Tabacum** Linn. ; H. S. 516 ; B. P. ii. 752.

v. *Tamaku*.

In fields, fairly generally ; native of America.

**Nicotiana plumbaginifolia** Viv. ; H. S. 516 ; B. P. ii. 752.

v. *Ban tamaku*.

A weed of shady places, general ; native of America.

**384. Browallia** Linn.

**Browallia elata** Linn. ; H. S. 500 ; B. P. ii. 753.

In gardens of Europeans, general, but often also occurring spontaneously in garden beds and on rubbish heaps.

## LXXIV.—SCROPHULARINEÆ.

385. *Celsia* Linn.

- \* *Celsia coromandeliana* Vahl. ; H. S. 497 ; B. P. ii. 757.

v. *Koksima*.

A weed of fields and gardens, general.

386. *Linaria* Jus.

- \* *Linaria ramosissima* Wall. ; H. S. 498 ; B. P. ii. 757.

Waste places, west of the Hughli, rare.

387. *Mazus* Lour.

- \* *Mazus rugosus* Lour. ; B. P. ii. 759.

In grassy glades and on garden paths about Calcutta, not very common, and possibly an introduction from elsewhere, not recorded by Voigt though it was known previously to Roxburgh.

388. *Lindenbergia* Lehm.

- \* *Lindenbergia urticifolia* Lehm. ; B. P. ii. 760. *L. ruderalis* H. S. 501.

v. *Haldi basanta*.

Old walls and sloping banks, everywhere.

389. *Limnophila* R. Br.

- Limnophila Roxburghii* G. Don. ; H. S. 502 ; B. P. ii. 763.

v. *Kala karpur*.

In native gardens occasionally ; recorded from Serampore by Voigt but very doubtfully wild in our area ; is wild in Chota Nagpur and North Bengal.

- \* *Limnophila conferta* Benth. ; B. P. ii. 764.

Damp places, occasional.

- Limnophila diffusa* Benth. ; B. P. ii. 764. *L. albiflora* H. S. 502.

Damp places, occasional.

- \* *Limnophila erecta* Benth.

Serampore, *Griffith*. Not referred to either by Roxburgh or by Voigt, but once collected at Serampore by Griffith. The species is plentiful in Tenasserim and the Malay Peninsula, and it may have been only as a casual, introduced with plants from Southern Burma or Malaya to Dr. Carey's garden, that Griffith met with it.

- \* *Limnophila heterophylla* Benth. ; H. S. 502 ; B. P. ii. 764.

Rice-fields and swampy places, general.



- \* *Limnophila gratissima* Bl. ; B. P. ii. 764.  
Western Sundribuns at Jatta, in a sweet water tank.
- \* *Limnophila racemosa* Benth. ; H. S. 502 ; B. P. ii. 764.  
Rice-fields and swamps, occasional.
- \* *Limnophila gratioloides* R. Br. ; H. S. 502 ; B. P. ii. 764. *L. gratioloides* VAR. *myriophylloides* H. S. 502.  
v. *Karpur*.  
Rice-fields, swamps and damp places everywhere.

390. *Herpestis* Gärtn. f.

- \* *Herpestis Monnieria* H. B. & K. ; H. S. 502 ; B. P. ii. 765.  
v. *Adha birni*.  
Marshes, rice-field borders, and wet places everywhere.

*Herpestis chamædroides* Linn. ; B. P. ii. 765.

A fairly common weed of garden paths about Calcutta ; a quite recent introduction from America.

*Herpestis Hamiltoniana* Benth. ; B. P. ii. 765. *H. sessiliflora* H. S. 502.

Reported by Voigt from Serampore, quite a probable record as the species occurs both to the west and to the east of our districts ; the record for this area, however, requires verification.

391. *Dopatrium* Ham.

- \* *Dopatrium junceum* Ham. ; (H. S. 503) ; B. P. 766. *D. nudicaule* H. S. 503.

Rice-fields and swamps, mostly west of the Hughli.

Voigt in H. S. appears to have reversed the incidence of the two names cited confining *D. junceum* to Coromandel and recording *D. nudicaule* from Bengal. The experience of all subsequent collectors has been that it is *D. junceum* which occurs in our districts.

392. *Torenia* Linn.

*Torenia cordifolia* Roxb. ; H. S. 505 ; B. P. ii. 767.

Reported from Serampore by Voigt, but certainly not a native of our districts, though it may quite possibly have been met with by him as a casual, introduced with seeds from other parts of India ; native of the higher parts of India and of the lower Himalayan spurs.

*Torenia asiatica* Linn. ; H. S. 505.

Reported from Serampore by Voigt, but certainly not a native of our districts. From his citations it would appear that Voigt refers to

two other species, *T. vagans* and *T. peduncularis* and not to the true *T. asiatica* at all. But in any case the plant he refers to can only have occurred as an escape from cultivation (if he means the true *T. asiatica*) or as possibly a casual (if he means either of the others). All three occur both in India and in Malaya.

**Torenia Fournieri** Linden; B. P. ii. 767.

In gardens of European residents, general; but also coming up spontaneously on rubbish heaps and in waste ground; native of Cochin-China.

This plant shows every sign of becoming quite domesticated in our districts; none of the Indian or Malayan species.

### 393. *Vandellia* Linn.

\* ***Vandellia crustacea*** Benth.; H. S. 504; B. P. ii. 768. *V. varians* H. S. 505.

Fields, gardens and paths, everywhere.

\* ***Vandellia multiflora*** G. Don; B. P. ii. 768.

A field and garden weed, general.

\* ***Vandellia pedunculata*** Benth.; B. P. ii. 769. *V. Roxburghii* H. S. 504.

Damp places and rice-fields, occasional.

\* ***Vandellia angustifolia*** Benth.; B. P. ii. 769.

Rice-fields in Western Hughli district, rare.

\* ***Vandellia pyxidaria*** Maxim.; B. P. ii. 769. *Bonnaya integrifolia* H. S. 504.

Gardens, fields and path-ways, everywhere.

### 394. *Ilysanthes* Raf.

\* ***Ilysanthes parviflora*** Benth.; B. P. ii. 769. *Bonnaya parviflora* H. S. 504.

Rice-fields, west of the Hughli, occasional.

***Ilysanthes hyssopoides*** Benth.; B. P. ii. 1277. *Bonnaya hyssopoides* H. S. 504.

Recorded by Voigt from Serampore, but not a likely record; the nearest known localities are Silhet and Southern Chota Nagpur; possibly it was the preceding species that Voigt met with.

***Ilysanthes rotundifolia*** Benth. *Bonnaya rotundifolia* H. S. 504.

Recorded by Voigt from Serampore, but a less likely record than the preceding, as the species is apparently confined to Southern India and Ceylon, Mauritius and Madagascar.

Voigt does not report *I. parviflora* from Bengal though that species does certainly occur in our area.

### 395. *Bonnaya* Link & Otto.

\* *Bonnaya brachiata* Link & Otto; B. P. ii. 770. *B. serrata* H. S. 503.

v. *Bhumi-nim*.

A weed of fields, gardens and path-ways.

\* *Bonnaya veronicaefolia* Spreng.; H. S. 503; B. P. ii. 770.

Wet places, everywhere.

VAR. \* *verbenæfolia* B. P. ii. 770. *B. verbenæfolia* H. S. 503.

Wet places, general.

VAR. \* *grandiflora* B. P. ii. 771. *B. grandiflora* H. S. 504.

Fields, gardens and path-ways, everywhere.

\* *Bonnaya tenuifolia* Spreng.; H. S. 504; B. P. ii. 771.

Wet places, occasional.

*Bonnaya oppositifolia* Spreng.; H. S. 504.

Reported by Voigt from Serampore, but the record is very doubtful, since the species is apparently confined to the Deccan.

### 396. *Scoparia* Linn.

*Scoparia dulcis* Linn.; H. S. 507; B. P. ii. 772.

Fields, paths and waste places everywhere; not mentioned by Roxburgh though now one of the commonest and most troublesome of weeds; native of America.

### 397. *Veronica* Linn.

*Veronica Anagallis* Linn.; H. S. 507; B. P. ii. 773.

Reported from the banks of the Hughli about Serampore by Voigt, a very probable record but one that should be confirmed; the species is quite plentiful in North Bengal.

*Veronica agrestis* Linn.; H. S. 507; B. P. ii. 773.

An occasional weed in gardens about Calcutta in the cold season; probably, however, only a casual and always reintroduced with seed from Upper India or from Europe.

### 398. *Striga* Lour.

\* *Striga lutea* Lour.; H. S. 505; B. P. ii. 775.

Goghat, Western Hughli district.

\* *Striga euphrasitoides* Benth.; H. S. 506; B. P. ii. 775.

Goghat, Western Hughli district.

399. *Centranthera* R. Br.

- \* *Centranthera hispida* R. Br. ; H. S. 507 ; B. P. ii. 776.

Goghat, Western Hughli district ; also recorded by Voigt from Serampore.

- \* *Centranthera humifusa* Wall. ; H. S. 508 ; B. P. ii. 776.

Goghat, Western Hughli district ; also recorded by Voigt from Serampore.

## LXXV.—OROBANCHACEÆ.

400. *Egnetia* Linn.

- \* *Egnetia pedunculata* Wall. ; H. S. 496 ; B. P. ii. 778. *Orobanche acaulis* H. S. 496.

On roots of grasses at Shibpur (*Roxburgh*) and Serampore (*Voigt*) ; probably, however, only casual in our area : is common in Northern Bengal.

401. *Orobanche* Tournef.

- \* *Orobanche indica* Ham. ; H. S. 496 ; B. P. ii. 779.

On roots of *Brassica*, occasional.

## LXXVI.—LENTIBULARIACEÆ.

402. *Utricularia* Linn.

- \* *Utricularia stellaris* Linn. f. ; H. S. 494 ; B. P. ii. 780.

v. *Jhangi*.

Floating in pools and marshes, general.

VAR. *reflexa* B. P. ii. 780.

Floating in pools and marshes, general.

- \* *Utricularia flexuosa* Vahl ; B. P. ii. 780. *U. fasciculata* H. S. 494.

v. *Jhangi*.

Floating in pools and marshes, everywhere.

- \* *Utricularia exoleta* R. Br. ; B. P. ii. 781. *U. diantha* H. S. 494.

v. *Chhota jhangi*.

Marshes, ditches and wet places, occasional.

- Utricularia reticulata* Sw. VAR. *uliginosa* B. P. ii. 781. *U. reticulata* H. S. 494.

v. *Nil jhangi*.

Reported by Voigt from Serampore ; the record needs confirmation but is a quite probable one ; the species occurs in Burdwan.

- Utricularia racemosa* Wall. ; B. P. ii. 781. *U. nivea* also *U. nivea*

VAR. *cœrulea* H. S. 494.

Both varieties of this species are recorded from Serampore by Voigt, but both records need verification; the blue-flowered variety is common in Chota Nagpur and West Bengal, the white flowered one also occurs there.

\* *Utricularia bifida* Linn.; B. P. ii. 781.

v. *Chhota jhangi*.

Rice-fields near Hughli, and possibly elsewhere.

### XXVII.—BIGNONIACEÆ.

#### 403. *Oroxylum* Vent.

*Oroxylum indicum* Vent.; B. P. ii. 787. *Calosanthès indica* H. S. 477.

Occasionally planted and sometimes self-sown about Calcutta; native of India.

#### 404. *Millingtonia* Linn. f.

*Millingtonia hortensis* Linn. f.; B. P. ii. 783. *Bignonia suberosa* H. S. 476.

In avenues, general, sometimes sub-spontaneous; native of Burma.

### LXXVIII.—PEDALINEÆ.

#### 405. *Martynia* Linn.

*Martynia diantra* Glox.; H. S. 475; B. P. ii. 791.

v. *Bagh noki*.

In waste places and on rubbish heaps not uncommon; native of America.

#### 406. *Sesamum* Linn.

*Sesamum indicum*. DC.; H. S. 475; B. P. ii. 792.

v. *Til*.

A field crop; probably native of Asia.

### LXXIX.—ACANTHACEÆ.

#### 407. *Thunbergia* Linn. f.

*Thunbergia alata* Boj.; H. S. 481; B. P. ii. 795.

In gardens, but occasionally as if wild on rubbish heaps near Calcutta.

*Thunbergia grandiflora* Roxb.; H. S. 481; B. P. ii. 796.

v. *Nil lata*.

Recorded by Voigt from Serampore; occasionally as if wild in village-shrubberies near Calcutta, but probably only as an escape

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from gardens in our area; often grown on trellises; nearest locality where wild, Western Bengal.

408. *Nelsonia* R. Br.

- \* *Nelsonia campestris* R. Br.; B. P. ii. 797. *N. tomentosa* H. S. 482.  
v. *Parámul*.  
Grassy glades, general.

409. *Ebermaiera* Nees.

- \* *Ebermaiera glutinosa* Wall.; B. P. ii. 798.  
A weed of rice-fields, general.

410. *Cardanthera* Ham.

- \* *Cardanthera triflora* Ham.; H. S. 482; B. P. ii. 799.  
v. *Kala*.  
A weed of wet places and margin of ponds and ditches, general.

411. *Acanthus* Linn.

- \* *Acanthus ilicifolius* Linn.; B. P. ii. 800. *Dilivaria ilicifolia* H. S. 487.  
v. *Harkuch kanta*, *hargosa*.  
Sundribuns, and banks of Hughli as far north as Calcutta.
- \* *Acanthus volubilis* Wall.; B. P. ii. 800.  
Western Sundribuns.

412. *Hygrophila* R. Br.

- \* *Hygrophila polysperma* T. And.; B. P. ii. 801. *Hemiadelphia polysperma* H. S. 483.  
v. *Chhota mechitta*.  
Dampish spots, general.
- \* *Hygrophila quadrivalvis* Nees; B. P. ii. 802.  
Moist places, general.
- \* *Hygrophila phlomoides* Nees VAR. *Roxburghii* B. P. ii. 802. *H. obovata* H. S. 483.  
Western Sundribuns, in wet swampy places in cleanings, rare elsewhere.
- \* *Hygrophila spinosa* T. And.; B. P. ii. 802. *Asteracantha longifolia* H. S. 485.  
v. *Kantu kalika*, *kúliakhara*.  
Wet or swampy places, everywhere.

413. *Ruellia* Linn.

- \* *Ruellia prostrata* Lamk, VAR. *dejecta* B, P. ii. 803. *Dipteracanthus dejectus* H. S. 483.

v. *Burigopana*.

Waste places ; general.

*Ruellia tuberosa* Linn. ; B. P. ii. 803.

In gardens and often as an escape ; not yet introduced in 1845 ; native of America.

414. *Hemigraphis* Nees.

- \* *Hemigraphis hirta* T. And. ; B. P. ii. 805. *Ruellia sarmentosa* H. S. 484.

Grassy glades, occasional.

415. *Phayloopsis* Willd.

- \* *Phayloopsis parviflora* Willd. ; B. P. ii. 806. *Ætheilema reniforme* H. S. 486.

Grassy glades, general.

416. *Andrographis* Wall.

- \* *Andrographis paniculata* Nees. ; H. S. 493 ; B. P. ii. 809.

v. *Mahatita, kálmegh*.

Roadsides and waste places, everywhere.

417. *Crossandra* Salisb.

- \* *Crossandra undulæfolia* Salisb. ; B. P. ii. 811.

In gardens, generally ; native of India.

418. *Barleria* Linn.

- Barleria Prionitis* Linn. ; H. S. 486 ; B. P. ii. 812.

v. *Kánta játi*.

A common hedge plant ; reported by Voigt from Serampore ; it is wild in West Bengal, but can hardly be claim ed as wild in our area.

- \* *Barleria cristata* Linn. ; H. S. 485 ; B. P. ii. 812.

v. *Játi*.

Hedges and thickets, occasional.

VAR. \* *dichotoma* B. P. ii. 812. *B. dichotoma* H. S. 485.

v. *Sada játi*.

Hedges and thickets, general.

419. *Asystasia* Bl.

- \* *Asystasia gangetica* T. And.; B. P. ii. 813. *A. coromandeliana* H. S. 484.

River banks and hedges, occasional.

420. *Ecbolium* Kurz.

- \* *Ecbolium Linneanum* Kurz VAR. *dentata*; B. P. ii. 816. *Justicia dentata* H. S. 490.

v. *Udu játi*.

Hedges and thickets, general.

421. *Justicia* Linn.

- Justicia Betonica* Linn.; B. P. ii. 817. *Adhatoda Betonica* H. S. 488.

In gardens, general; native of India.

- \* *Justicia Gendarussa* Linn. f.; B. P. ii. 818. *Gendarussa vulgaris* H. S. 489.

v. *Jagat madun, gandho-rusa*.

Hedges and thickets, everywhere, as an escape from cultivation; often also cultivated, but it may perhaps be accepted as wild in our area.

- \* *Justicia quinqueangularis* Koen.; B. P. ii. 818. *Rostellularia quinqueangularis* H. S. 488.

Goghat sub-division, Hughli district; also reported by Voigt from Serampore.

- VAR. \* *peplodes* B. P. ii. 818. *Rostellularia glaberrima* H. S. 488.

Damp waste places, general.

- \* *Justicia simplex* D. Don; B. P. ii. 818. *Rostellularia mollissima* H. S. 488.

Grassy glades, everywhere.

422. *Adhatoda* Nees.

- \* *Adhatoda Vasica* Nees; H. S. 488; B. P. ii. 819.

v. *Bakás, Vásaka*.

Hedges and village-shrubberies, everywhere.

423. *Rhinacanthus* Nees.

- Rhinacanthus communis* Nees; H. S. 490; B. P. ii. 819.

v. *Palak jui, jui pana*.

In gardens generally; native of India.



424. *Peristrophe* Nees.

- \* *Peristrophe bicalyculata* Nees; H. S. 492; B. P. ii. 820.

v. *Nasa bhaga*.

Dry waste places and fields, west of the river Hughli only.

- \* *Peristrophe tinctoria* Nees; H. S. 492; B. P. ii. 820.

v. *Bet rang, chatia rang*.

Village-shrubberies near Calcutta; occasionally also in native gardens, cultivated; no doubt originally an introduced plant, but where truly wild is not now known.

425. *Rungia* Nees.

- \* *Rungia parviflora* Nees. VAR. *pectinata*; H. S. 491; B. P. ii. 821.

Drier sloping banks, earth weels and waste places, general.

426. *Dicliptera* Juss.

- \* *Dicliptera Roxburghiana* Nees; H. S. 492; B. P. ii. 822.

Waste places about Calcutta, occasional; probably not truly wild in our area; it is plentiful in Northern and Eastern Bengal.

## LXXX.—VERBENACEÆ.

427. *Lantana* Linn.

- \* *Lantana indica* Roxb.; H. S. 472; B. P. ii. 824. *L. gogchana* H. S. 472.

Banks of river and nálás everywhere.

*Lantana Camara* Linn.; B. P. ii. 825. *L. aculeata* H. S. 472.

Village-shrubberies and hedges, general; native of Central America.

428. *Lippia* Linn.

- \* *Lippia nodiflora* Rich.; B. P. ii. 825. *Zapan'a nodiflora* H. S. 472.

v. *Bhui-okra, chhota okra*.

Wet places, everywhere.

*Lippia geminata* H. B. & K.; B. P. ii. 825.

Banks of river and nálás, general; native of America.

429. *Stachytarpheta* Vahl.

*Stachytarpheta indica* Vahl.; B. P. ii. 826. *S. jamaicensis* H. S. 471.

In native gardens; also sometimes as an escape; seems wild in many parts of India, but probably was originally introduced from America.

430. *Verbena* Linn. ♀

\* *Verbena officinalis* Linn. ; H. S. 471 ; B. P. ii. 826.

A weed in gardens and waste places, frequent.

Though not claimed by Voigt as being wild in our area, it has quite as much right to be so considered as many of the other common weeds.

431. *Duranta* Jacq.

*Duranta Plumieri* Jacq. ; H. S. 471 ; B. P. ii. 827.

Planted in hedges and on lawns ; also sometimes sub-spontaneous in abandoned gardens and, rarely, in village-shrubberies.

432. *Callicarpa* Linn.

*Callicarpa cana* Linn. ; H. S. 467 ; B. P. ii. 828.

v. *Arusha*.

Often planted in native gardens ; sometimes as if wild in village-shrubberies ; native of Malaya.

\* *Callicarpa macrophylla* Vahl. ; B. P. ii. 828. *C. incana* H. S. 467.

v. *Mathara*.

Village-shrubberies and roadsides, general.

\* *Callicarpa longifolia* Lamk. VAR. *lanceolaria* ; B. P. ii. 828.

*C. lanceolaria* H. S. 467.

Village-shrubberies and roadsides, rare.

433. *Tectona* Linn. f.

*Tectona grandis* Linn. f. ; H. S. 470 ; B. P. ii. 828.

v. *Sagun*.

Planted occasionally in avenues ; native of drier parts of India and Indo-China.

434. *Gmelina* Linn.

\* *Gmelina arborea* Roxb. : H. S. 470 ; B. P. ii. 829.

v. *Gámbár*.

Goghat sub-division of Hughli district ; elsewhere often planted or semi-wild in village-shrubberies.

*Gmelina asiatica* Linn. ; H. S. 470 ; B. P. ii. 829.

v. *Badhára*.

In gardens generally ; native of India.

435. *Premna* Linn.

- \* *Premna integrifolia* Linn. ; B. P. ii. 830. *P. barbata* H. S. 468.  
*P. spinosa* H. S. 463. *P. hircina* H. S. 468.  
 v. *Bhút biravi, goniari*.  
 Banks of rivers and village-shrubberies, especially plentiful in the Sundribuns.

*Premna esculenta* Roxb. ; H. S. 467 ; B. P. ii. 831.  
 Cultivated near villages.

436. *Vitex* Linn.

- \* *Vitex trifolia* Linn. ; H. S. 468 ; B. P. ii. 833.  
 v. *Pani sanbhaki*.  
 Hedges and thickets, general.
- \* *Vitex Negundo* Linn. ; H. S. 469 ; B. P. ii. 833.  
 v. *Sanbhalu, nishinda*.  
 Hedges and thickets, general ; Western Sundribuns, common.

437. *Clerodendron* Linn.

- \* *Clerodendron inerme* Gærtn. ; H. S. 465 ; B. P. ii. 835.  
 v. *Ban jai, ban jumat, bat raj*.  
 Western Sundribuns ; salt-lakes near Calcutta.
- \* *Clerodendron infortunatum* Gærtn. ; B. P. ii. 835. *C. viscosum*  
 H. S. 465.  
 v. *Bhánt*.  
 Roadsides, waste places, village-shrubberies ; everywhere.
- Clerodendron fragrans* Vent. ; H. S. 466 ; B. P. ii. 835.  
 In gardens everywhere, but often as an escape ; native of China.
- \* *Clerodendron Siphonanthus* R. Br. ; H. S. 465 ; B. P. ii. 836.  
 v. *Bamun-hatti*.  
 Waste places, everywhere.

438. *Avicennia* Linn.

- \* *Avicennia officinalis* Linn. ; B. P. ii. 838. *A. tomentosa* H. S. 473.  
 v. *Báen, Bina*.  
 Western Sundribuns, very common.

## LXXXI.—LABIATÆ.

439. *Ocimum* Linn.

- Ocimum sanctum* Linn. ; H. S. 448 ; B. P. ii. 843.  
 v. *Tulsi, kala tulsi, krishna tulsi*.

Near temples and shrines everywhere, planted or as an escape; native of India.

**Ocimum gratissimum** Linn.; H. S. 448; B. P. ii. 843.

v. *Ram tulsi*.

In gardens and sometimes as an escape; native of S. E. Asia.

**Ocimum Basilicum** Linn.; H. S. 447; B. P. ii. 843.

v. *Babui tulsi, gulál tulsi*.

In gardens and also in waste places as if wild; native of S. E. Asia.

**Ocimum viride** Willd.

v. *Belati Tulsi*.

In gardens, recently introduced owing to its reputed property of keeping off mosquitoes; native of Africa.

**Ocimum adscendens** Willd.; H. S. 448.

v. *Ban tulsi*.

Reported by Voigt from Serampore, not at all a likely record as the species seems naturally confined to the Deccan and C. India; examples may of course have been met with at Serampore; but, if so, they are almost certain to have been casuals introduced with seed of other plants from the drier parts of India.

#### 440. **Moschosma** Reichb.

\* **Moschosma polystachyum** Reichb.; H. S. 449; B. P. ii. 845.

Goghat sub-division, Hughli district.

#### 441. **Coleus** Lour.

**Coleus aromaticus** Benth.; B. P. ii. 847. *C. amboinicus* H. S. 450.

v. *Pathorchur*.

In gardens everywhere.

**Coleus scutellarioides** Benth.; H. S. 450; B. P. ii. 847.

In gardens generally.

#### 442. **Hyptis** Jacq.

**Hyptis capitata** Jacq.; B. P. ii. 848.

In gardens, and sometimes self-sown.

#### 443. **Pogostemon** Desf.

\* **Pogostemon plectranthoides** Desf.; H. S. 451; B. P. ii. 849.

v. *Fui lata, bil lata*.

Hedges and thickets, general.

444. *Dysophylla* Bl.

- \* *Dysophylla verticillata* Benth.; H. S. 452; B. P. ii. 851.

v. *Pani kala*.

Rice-fields and ditches, general.

445. *Anisomeles* R. Br.

- \* *Anisomeles ovata* R. Br.; H. S. 460; B. P. ii. 853.

v. *Gobura*.

Hedges, thickets and waste places, everywhere.

446. *Leonurus* Linn.

- Leonurus sibiricus* Linn.; H. S. 460; B. P. ii. 854.

v. *Gúma*.

A weed of roadsides and waste places, and one of the commonest plants in such localities, but obviously only naturalised; native of temperate Asia.

447. *Leucas* R. Br.

- \* *Leucas aspera* Spreng.; H. S. 461; B. P. ii. 855.

v. *Chhota halkúsa*.

A weed of fields and waste places, general.

- \* *Leucas linifolia* Spreng.; H. S. 462; B. P. ii. 856.

v. *Halkúsa*.

A weed of fields and waste places, everywhere.

- \* *Leucas Cephalotes* Spreng.; H. S. 461; B. P. ii. 856.

v. *Bara halkúsa*.

A weed of field and waste places, fairly general.

- \* *Leucas mollissima* Wall.; H. S. 461; B. P. ii. 856.

Goghat sub-division, Hughli district.

- \* *Leucas procumbens* Desf.; H. S. 461; B. P. ii. 857.

v. *Basantá*.

A weed of gardens, fields and grassy glades, general.

448. *Leonotis* R. Br.

- Leonotis nepetifolia* R. Br.; H. S. 462; B. P. ii. 857.

v. *Khajur churi, hejurchi*.

Roadsides and waste places, general; associated with but always less common than *Leonurus sibiricus*, and like the *Leonurus* doubtless only a naturalised species anywhere in India; native of Africa.

449. *Meriandra* Benth.

*Meriandra bengalensis* Benth. ; H. S. 453 ; B. P. ii. 858.

v. *Kafur-ka-pat*.

In native gardens, generally ; native of Africa.

450. *Salvia* Linn.

\* *Salvia plebeja* R. Br. ; H. S. 455 ; B. P. ii. 859.

v. *Koka buradi*, *bhu-tulsi*.

In fields and gardens, a general weed.

*Salvia coccinea* Linn. ; H. S. 455 ; B. P. ii. 859.

In gardens, generally ; sometimes also self-sown.

## INCOMPLETÆ.

## LXXXII.—NYCTAGINEÆ.

451. *Mirabilis* Linn.

*Mirabilis Jalapa* Linn. ; H. S. 328 ; B. P. ii. 862.

v. *Krishno káli*.

In gardens everywhere, and often as an escape ; native of S. America.

452. *Boerhaavia* Linn.

\* *Boerhaavia repens* Linn. VAR. *procumbens* B. P. ii. 863. *B. erecta*

H. S. 328.

v. *Purna*.

Waste places, fields and roadsides, everywhere.

453. *Bougainvillea* Comm.

*Bougainvillea glabra* Choisy ; B. P. ii. 863.

In gardens generally ; native of Brazil.

*Bougainvillea spectabilis* Willd. ; H. S. 329 ; B. P. ii. 864.

In gardens, often ; native of Brazil.

454. *Pisonia* Linn.

*Pisonia aculeata* Linn. ; B. P. ii. 864. *P. villosa* H. S. 328.

v. *Baghachura*.

Recorded by Voigt from Serampore ; it is occasionally used as a hedge in our area but is not with us a wild plant ; native of India and Indo-China.

## LXXXIII.—AMARANTACEÆ.

455. *Deeringia* R. Br.

- \* *Deeringia celosioides* R. Br. ; B. P. ii. 866. *D. indica* H. S. 315.

v. *Gola mohani*.

Hedges and thickets, occasional.

456. *Celosia* Linn.

- Celosia argentea* Linn. ; H. S. 318 ; B. P. ii. 867.

v. *Swet murgha phul*.

In gardens, also self-sown, everywhere ; native of S. E. Asia.

- Celosia cristata* Linn. ; H. S. 318 ; B. P. ii. 869.

v. *Lalmurgha phul*.

In gardens, generally, occasionally also as an escape ; native of S. E. Asia.

457. *Digera* Forsk.

- \* *Digera arvensis* Forsk. ; B. P. ii. 868. *D. muricata* H. S. 314.

v. *Luta mahauria, gungatiya*.

Fields and roadsides, everywhere.

458. *Amarantus* Linn.

- \* *Amarantus spinosus* Linn. ; H. S. 317 ; B. P. ii. 869.

v. *Kanta nuti, kanta miris*.

Fields and roadsides, everywhere.

- \* *Amarantus gangeticus* Linn. ; H. S. 316 ; B. P. ii. 870.

v. *Lal shak, rakna shak*.

Cultivated in many races and varieties, the chief of these, apart from the type, being the *bans pati nati* (*A. lanceolatus*) ; the *lal bans pati nati* (*A. atropurpureus*) ; and the *gobura nati* (*A. lividus*).

- \* *Amarantus tristis* Linn. ; H. S. 315. *A. gangeticus* VAR. *tristis* ;

B. P. ii. 870. *A. polygamus* H. S. 870.

v. *Champa nati*.

Cultivated in many races and varieties.

- \* *Amarantus mangostanus* Linn. ; B. P. ii. 871.

v. *Shak*.

A weed of fields and gardens, everywhere.

- \* *Amarantus viridis* Linn. ; H. S. 316 ; B. P. ii. 871.

v. *Ban nati*.

A weed of fields and gardens, general.

- \* **Amarantus fasciatus** Roxb.; H. S. 316. *A. viridis* VAR. *fasciata*  
B. P. ii. 871.  
v. *Tun-tuni nati*.  
A weed of fields and gardens, general.
- \* **Amarantus Blitum** Linn. VAR. *oleracea*; B. P. ii. 871. *A. oleraceus*  
VAR. *alba* H. S. 316.  
v. *Sad<sub>1</sub> nati*.  
Cultivated generally.
- \* **Amarantus polygamus** Linn.; B. P. ii. 871. *A. polygonoides* H. S.  
315.  
v. *Chiru nati*.  
A weed of fields and gardens, general.
- \* **Amarantus tenuifolius** Willd.; H. S. 315; B. P. ii. 871.  
v. *Ghenti nati, jelchumli*.  
A weed of roadsides, waste places and fields, everywhere.

#### 459. *Pupalia* Juss.

- Pupalia atropurpurea*** Moq.; B. P. ii. 872. *Desmochæta atropurpurea*  
H. S. 319.  
v. *Duya kuya, kuya duya*.  
Recorded by Voigt from Serampore, a quite probable record, as  
the species is plentiful in districts to the west of our area.

#### 460. *Psilotrichum* Moq.

- \* ***Psilotrichum ferrugineum*** Moq.; H. S. 318; B. P. ii. 873.  
v. *Rakto sirinchi, lal sirinchi*.  
A weed of fields and wet places, mostly to the east of the Hughli.

#### 461. *Ærua* Forsk.

- \* ***Ærua lanata*** Juss.; H. S. 317; B. P. ii. 874.  
v. *Chaya*.  
Waste places and thickets, not uncommon.
- Ærua scandens*** Mart.; H. S. 317; B. P. ii. 874.  
v. *Nuriya*.  
Reported by Voigt from Serampore; the record is possible but  
needs confirmation; the species is common in districts to the west  
of our area.

#### 462. *Achyranthes* Linn.

- \* ***Achyranthes aspera*** Linn.; H. S. 318; B. P. ii. 875.  
v. *Apáng*.  
Waste places and roadsides, everywhere.



463. *Alternanthera* Forsk.

\* *Alternanthera sessilis* R. Br. ; H. S. 318 ; B. P. ii. 875.

v. *Chanchi*.

Waste places, roadsides and fields, everywhere.

464. *Gomphrena* Linn.

*Gomphrena globosa* Linn. ; H. S. 318 ; B. P. ii. 876.

v. *Gul makhmal*.

In gardens, and in waste places as an escape, general ; probably originally introduced from America.

## LXXXIV.—CHENOPODIACEÆ.

465. *Suaeda* Linn.

\* *Suaeda maritima* Dumort. ; B. P. ii. 878. *Salsola indica* H. S. 322.

Western Sundribuns.

466. *Chenopodium* Linn.

\* *Chenopodium album* Linn. H. S. 321 ; B. P. ii. 879. *C. laciniatum* H. S. 322.

v. *Chandan betu, betu shak*.

In gardens and also as a weed, everywhere.

*Chenopodium ambrosioides* Linn. ; H. S. 321 ; B. P. ii. 879.

In waste places, naturalised, general ; originally American.

467. *Beta* Linn.

*Beta vulgaris* Linn. ; H. S. 320 ; B. P. ii. 879. *B. bengalensis* H. S. 321.

v. *Palang shak*.

In native gardens, general ; native of Europe and temperate Asia.

468. *Spinacia* Linn.

*Spinacia oleracea* Linn. ; H. S. 320 ; B. P. ii. 880. *S. tetrandra* H. S. 320.

v. *Palang, pinis*.

In gardens, general ; native of Africa.

469. *Arthrocnemum* Moq.

\* *Arthrocnemum indicum* Moq. ; B. P. ii. 881. *Salicornia indica* H. S. 320.

v. *Fadu palang*.

Western Sundribuns.

470. *Salicornia* Linn.

- \* *Salicornia brachiata* Roxb.; H. S. 329; B. P. ii. 881.  
Western Sundribuns.

471. *Basella* Linn.

- \* *Basella rubra* Linn.; B. P. ii. 882. *B. alba* H. S. 322. *B. cordifolia*  
H. S. 322.  
v. *Poi, ban poi*.  
In gardens, cultivated; also in hedges and thickets, everywhere.

## LXXXV.—PHYTOLACCACEE.

472. *Rivna* Linn.

- Rivina humilis* Linn.; B. P. ii. 883. *R. lævis* H. S. 323.  
In village-shrubberies, naturalised, not uncommon; native of  
America.

## LXXXVI.—POLYGONACEE.

473. *Polygonum* Linn.

- \* *Polygonum plebejum* R. Br. VAR. *effusa*; B. P. ii. 886.  
In damp places, everywhere.  
VAR. \* *brevifolia*; B. P. ii. 886.  
In dry places, west of river Hughli.  
VAR. \* *elegans*; B. P. ii. 886. *P. herniarioides* H. S. 325.  
In dry uncultivated or waste places, everywhere.
- \* *Polygonum orientale* Linn.; H. S. 324; B. P. ii. 886.  
v. *Bara pani mirich*.  
In damp places, general.
- Polygonum tomentosum* Willd.; H. S. 324; B. P. ii. 886.  
Reported by Voigt from Serampore; not improbably, but the  
record needs confirmation.
- Polygonum lanigerum* R. Br.; H. S. 325. VAR. *effusa*; B. P. ii. 886.  
v. *Swet pani mirich*.  
Reported by Voigt from Serampore; quite possibly, but the record  
needs confirmation.
- \* *Polygonum glabrum* Willd.; H. S. 325; B. P. ii. 886.  
In ditches and swamps, general.
- Polygonum lapathifolium* Linn.; B. P. ii. 325. *P. nutans* H. S.  
324.  
Once collected by Kurz near Shibpur, probably, however, only  
as an escape from the Botanic garden where it occurs as a casual

immigrant. It is a common species in Eastern Bengal and Assam. *P. stagninum* is a species to be looked for in our areas as it is common both to the west and the north-east of our districts, though it has not been recorded by Voigt or by any subsequent collector.

- \* **Polygonum barbatum** Linn.; B. P. ii. 887, not of H. S. *P. rivulare* H. S. 325.  
v. *Bikh anjubas*.  
In damp places, general.
- \* **Polygonum serrulatum** Lagasc.; B. P. ii. 887. *P. flaccidum* H. S. 325.  
v. *Pani mirich*.  
In ditches and swampy places, general.
- \* **Polygonum Hydropiper** Linn.; B. P. ii. 887.  
v. *Pakurmal*.  
In ditches and beside ponds, not infrequent.
- \* **Polygonum flaccidum** Meisn.; B. P. ii. 887, not of H. S. *P. tenellum* H. S. 325.  
In swamps and ditches, occasional.

#### 474. **Rumex** Linn.

- \* **Rumex maritimus** Linn.; B. P. ii. 888. *R. Wallichianus* H. S. 326.  
v. *Ban palang*.  
In marshy spots, general.
- \* **Rumex dentatus** Linn.; B. P. ii. 889.  
In waste places, general.
- Rumex vesicarius** Linn.; H. S. 326; B. P. ii. 889.  
v. *Chuka palang*. Country Sorrel.  
In native gardens, occasionally; native of Africa.

#### 475. **Antigonon** Endl.

- Antigonon leptopus** Endl.; B. P. ii. 889.  
Sandwich Island creeper.  
In gardens, general; growing on trellises and fences.

### LXXXVII.—ARISTOLOCHIACEÆ.

#### 476. **Aristolochia** Linn.

- \* **Aristolochia indica** Linn.; H. S. 313; B. P. ii. 891.  
v. *Isharmal*.  
Hedges, roadsides and waste places, general.

## LXXXVIII.—PIPERACEÆ.

477. *Piper* Linn.

**Piper Chaba** Hunter ; H. S. 299 ; B. P. ii. 893.

v. *Choi*.

Cultivated generally ; native of Malaya.

**Piper Betle** Linn. ; H. S. 299 ; B. P. ii. 893.

v. *Pán, tambuli*. Betle-leaf.

Cultivated generally ; native of S. E. Asia.

\* **Piper longum** Linn. ; H. S. 299 ; B. P. ii. 893.

v. *Pipla, pipla-mal*. Long Pepper.

In hedges and thickets, general, but possibly not truly wild in our area ; native of India.

**Piper nigrum** Linn. ; H. S. 299 ; B. P. ii. 893.

v. *Gulmirich, kala mirich*. Black Pepper.

Cultivated generally.

478. *Peperomia* Ruiz & Pav.

**Peperomia pellucida** Kunth ; B. P. ii. 894.

Paths, roadsides, waste places, open glades, everywhere ; introduced since 1845 ; native of America. Now one of the most plentiful of our annual weeds.

## LXXXIX.—LAURINEÆ.

479. *Cinnamomum* Bl.

**Cinnamomum Tamala** Fr. Nees ; B. P. ii. 899. *C. albiflorum* H. S. 308.

v. *Tespat*.

Often planted in native gardens ; native of E. Himalaya and Indo-China.

**Cinnamomum Camphora** Fr. Nees ; B. P. ii. 899. *Camphora officinarum* H. S. 308.

v. *Kaphur*.

Occasionally planted in native gardens ; native of China.

480. *Litsæa* Lamk.

\* **Litsæa sebifera** Pers. ; B. P. ii. 902. *Tetranthera Roxburghii* VAR. *apetala* H. S. 309.

v. *Kukur chita*.

Thickets and village-shrubberies, everywhere.

VAR. \* *glabraria* Hook. f.; B. P. ii. 902. *Tetranthera laurifolia*  
H. S. 310.

Hedges, thickets and village-shrubberies; less common than the preceding and chiefly west of the river Hughli.

\* *Litsea polyantha* Juss.; B. P. ii. 903. *Tetranthera monopetala*  
H. S. 310.

v. *Bara kukur chita*.

Thickets and village-shrubberies, general.

\* *Litsea salicifolia* Hook. f. VAR. *laurifolia* Hook. f.; B. P. ii. 903.  
v. *Súm*.

Thickets, east of the river Hughli, occasional.

#### 481. *Cassytha* Linn.

*Cassytha filiformis* Linn.; H. S. 312; B. P. ii. 904.

v. *Akás-bél*.

Parasitic in hedges and thickets, general but not plentiful.

### XC.—LORANTHACEÆ.

#### 482. *Loranthus* Linn.

\* *Loranthus Scurrula* Linn. VAR. *bengalensis*; B. P. ii. 911.

v. *Manda*.

Parasitic on trees, general.

\* *Loranthus longiflorus* Desc.; H. S. 54; B. P. ii. 911.

v. *Bara manda*.

Parasitic on trees, everywhere.

\* *Loranthus globosus* Roxb.; H. S. 54; B. P. ii. 912.

v. *Chhota manda*.

Parasitic on trees, everywhere.

#### 483. *Viscum* Linn.

\* *Viscum monoleucum* Roxb.; B. P. ii. 912.

v. *Manda, banda*.

Parasitic on trees in the Western Sundribuns, less often near Calcutta.

### XCI.—EUPHORBIACEÆ.

#### 484. *Euphorbia* Linn.

*Euphorbia antiquorum* Linn.; H. S. 162; B. P. ii. 923.

v. *Bajvaran, tikata sij*.

In hedges generally; native of drier parts of India.

- Euphorbia nerifolia** Linn. ; B. P. ii. 923. *E. ligularia* H. S. 161.  
v. *Mansa sij*.  
In hedges occasionally ; native of drier parts of India.
- Euphorbia Nivulia** Ham. ; H. S. 162 ; B. P. ii. 923.  
v. *Sij*.  
Hedges and village-shrubberies everywhere ; native of drier parts of India.
- Euphorbia Tirucalli** Linn. ; H. S. 162 ; B. P. ii. 924.  
v. *Lanka sij*.  
Hedges generally ; native of Africa.
- Euphorbia pulcherrima** Willd ; B. P. ii. 924. *Poinsettia pulcherrima* H. S. 164.  
Gardens and lawns, general ; native of America.
- Euphorbia geniculata** Ortega ; B. P. ii. 924. *E. prunifolia* H. S. 163.  
In gardens occasionally, sometimes also self-sown on rubbish heaps and in waste places ; native of S. America.
- Euphorbia heterophylla** Linn. ; B. P. ii. 924.  
In gardens generally, also naturalized in waste places about Calcutta ; native of America.
- \* **Euphorbia dracunculoides** Lamk ; H. S. 164 ; B. P. ii. 924.  
v. *Jychi, chhagal puputi*.  
A field weed, west of the river Hughli only.
- Euphorbia graminea** Jacq. ; B. P. ii. 924.  
A weed of waste places about Calcutta ; recently introduced ; native of America.
- \* **Euphorbia hypericifolia** Linn. VAR. *indica* ; B. P. ii. 924. *E. uniflora* H. S. 163.  
Fields and waste places, general.  
VAR. *parviflora* ; B. P. ii. 924. *E. parviflora* H. S. 163.  
Fields and waste places, west of the Hughli.
- \* **Euphorbia pilulifera** Linn. ; B. P. ii. 925. *E. hirta* H. S. 163.  
v. *Bara kerui*.  
A weed of fields, gardens, waste places and roadsides, everywhere.
- \* **Euphorbia thymifolia** Linn. ; H. S. 163 ; B. P. ii. 925.  
v. *Swet kerui*.  
A weed of fields, gardens and paths, everywhere.

\* *Euphorbia microphylla* Heyne; B. P. ii. 925. *E. Chamæsyce* H. S. 163.

v. *Chhota kerui*.

A weed of waste places, west of the Hughli, rare.

485. *Pedilanthus* Neck.

*Pedilanthus tithymaloides* Poit.; H. S. 164; B. P. ii. 925.

v. *Belati sij*.

A hedge plant everywhere, sometimes also naturalized in village-shrubberies; native of America.

486. *Bischofia* Bl.

*Bischofia javanica* Bl.; B. P. ii. 926. *Stylodiscus trifoliatum* H. S. 160.

Planted in avenues and occasionally on roadsides; native of India, Indo-China and Malaya.

487. *Bridelia* Willd.

\* *Bridelia stipularis* Bl.; B. P. ii. 928. *B. scandens* H. S. 156.

v. *Harin hara*.

Village-shrubberies, also Western Sundribuns.

\* *Bridelia tomentosa* Bl.; B. P. ii. 928. *B. lanceæfolia* H. S. 156.

v. *Mindri, sirai*.

Village-shrubberies, occasional.

488. *Glochidion* Forst.

*Glochidion multiloculare* Voigt; H. S. 152; B. P. ii. 930. *Agyneia puber* H. S. 155.

Reported by Voigt from Serampore, a quite possible record, but one that needs confirmation; the shrub may be looked for in village-shrubberies; it is common in most other parts of Bengal.

489. *Flueggea* Willd.

\* *Flueggea microcarpa* Bl.; B. P. ii. 931. *F. retusa* H. S. 152. *F. virosa* H. S. 152.

Village-shrubberies, hedges, waysides and river banks, general.

490. *Agyneia* Vent.

\* *Agyneia bacciformis* A. Juss.; B. P. ii. 932. *Phyllanthus bacciformis* H. S. 154.

Damp fields in 24-Pergunnahs, south-east of Calcutta, also in the North-Western Sundribuns.

491. *Breynia* Forst.

- \* *Breynia rhamnoides* Muell.-Arg. ; B. P. ii. 933. *Phyllanthus reticulatus* H. S. 154.  
v. *Kali sitki, hamkatoguli*.  
Hedges and thickets, general.

492. *Phyllanthus* Linn.

- \* *Phyllanthus reticulatus* Poir. ; B. P. ii. 935. *P. multiflorus* H. S. 154.  
v. *Panjuli*.  
Hedges and thickets, everywhere.

*Phyllanthus Emblica* Linn. ; B. P. ii. 935. *Emblica officinalis* H. S. 153.  
v. *Amla*.

In gardens, occasionally ; native of drier parts of India.

*Phyllanthus maderaspatensis* Linn. ; H. S. 153 ; B. P. ii. 935.  
*P. obcordatus* H. S. 154.

Both the decumbent form (*P. maderaspatensis* proper) and the tall slender form (*P. obcordatus*) of this species are reported from Serampore by Voigt, but both records are somewhat unlikely and both need confirmation ; the species is common in the drier parts of India, but there are no specimens of any of its varieties from our area in the Calcutta herbarium.

\* *Phyllanthus urinaria* Linn. ; H. S. 154 ; B. P. ii. 935.  
v. *Hasar mani*.

In waste shady places, general.

\* *Phyllanthus simplex* Retz ; H. S. 153 ; B. P. ii. 936.  
A weed in cultivated ground, mostly west of the river Hughli.

\* *Phyllanthus Niruri* Linn. ; H. S. 154 ; B. P. ii. 936.  
v. *Bhui amla, sada hasar mani*.

A weed of cultivated ground, everywhere.

*Phyllanthus distichus* Muell.-Arg. ; B. P. ii. 936. *Cicca disticha* H. S. 153.

v. *Noari, nubari, loda, hariphul*.

In native gardens, general ; native place uncertain.

493. *Putranjiva* Wall.

*Putranjiva Roxburghii* Wall. ; H. S. 296 ; B. P. ii. 936.  
v. *Fia pata, putranjiva*.

In avenues and on roadsides, also often spontaneously in village-shrubberies ; native of India.



494. *Antidesma* Linn.

- \* *Antidesma Ghæsemhillia* Gærtn. ; B. P. ii. 938.

v. *Khudi jamb, tim tóa.*

In village-shrubberies, general.

- \* *Antidesma diandrum* Roth. ; B. P. ii. 938.

v. *Multa.*

In village-shrubberies, occasional.

495. *Jatropha* Linn.

*Jatropha multifida* Linn. ; H. S. 159 ; B. P. ii. 941.

In native and other gardens, and near temples and shrines, cultivated ; also occasionally self-sown in waste places ; native of America.

*Jatropha gossypifolia* Linn. ; B. P. ii. 941.

v. *Lal bherenda.*

Waste places, roadsides, village-shrubberies everywhere, never cultivated ; native of America. Though now one of the commonest and most striking of the shrubby weeds of our area, this species is not included in Voigt's list, published so recently as 1845.

*Jatropha Curcas* Linn. ; H. S. 158 ; B. P. ii. 941.

v. *Bagh bherenda.*

In native gardens and hedges everywhere, and sometimes sub-spontaneous in village-shrubberies.

496. *Aleurites* Forst.

*Aleurites moluccana* Willd. ; B. P. ii. 942. *A. triloba* H. S. 159.

v. *Akrot.*

Planted generally ; Voigt even records it from Serampore as wild, and it does sometimes occur sub-spontaneously, but it has no claim to be indigenous ; native of Papuasias.

497. *Croton* Linn.

- \* *Croton oblongifolius* Roxb. ; H. S. 156 ; B. P. ii. 943.

v. *Chucka, bara gachh.*

Village-shrubberies, everywhere.

- \* *Croton caudatus* Geisel. ; B. P. ii. 943. *C. drupaceus* H. S. 156.

v. *Nan bhantúr.*

Village-shrubberies and thickets on river banks, chiefly east of the river Hughli ; also in the North-Western Sundribuns.

- \* *Croton Tigilium* Linn. ; H. S. 156 ; B. P. ii. 943.

v. *Fayapala, jeypal.*

In hedges near villages everywhere, also often self-sown in village thickets; native of S. E. Asia.

**Croton sparsiflorus** Morong.

Abundant in waste places to the south of Calcutta, particularly about Diamond Harbour, a recently introduced weed; native of Paraguay.

498. **Codiaeum** Juss.

**Codiaeum variegatum** Bl.; B. P. ii. 944. *C. chrysosticta* H. S. 157.

In gardens everywhere: the "Croton" of English denizens; native of the Moluccas.

499. **Chrozophora** Neck.

\* **Chrozophora plicata** A. Juss.; H. S. 156; B. P. ii. 944.

v. *Khúdi okra*.

Waste ground and dry fields, everywhere.

500. **Gelonium** Roxb.

\* **Gelonium multiflorum** A. Juss.; B. P. ii. 945. *G. fasciculatum* H. S. 158.

v. *Ban naranga*.

In village-shrubberies, general.

Voigt also reports *G. lanceolatum*, a native of S. India and Ceylon, from Serampore, but if the species did exist there in 1845, it can only have been as a planted tree.

501. **Baliospermum** Bl.

\* **Baliospermum axillare** Bl.; B. P. ii. 946. *Croton polyandrum* H. S. 156.

v. *Dánti, hakun*.

Waste places and fields in Gogbat sub-division; also reported by Voigt from Serampore.

502. **Acalypha** Linn.

\* **Acalypha fallax** Muell.-Arg.; B. P. ii. 947.

Fields, gardens and waste places about Calcutta, very common.

\* **Acalypha indica** Linn.; H. S. 160; B. P. ii. 948.

v. *Makta juri, kokli*.

Fields, gardens and waste places, general.

**Acalypha ciliata** Forsk.; H. S. 159; B. P. ii. 948.

Reported by Voigt from Serampore, but the record needs confirmation; the species is found in Behar and westward to Arabia and Africa.

503. *Trewia* Linn.

\* *Trewia nudiflora* Linn.; H. S. 279; B. P. ii. 948.

v. *Pitáli*.

River banks, everywhere.

504. *Mallotus* Lour.

\* *Mallotus repandus* Muell. Arg.; B. P. ii. 949. *Rottlera laccifera*  
H. S. 157.

v. *Akús, nun bhantúr*.

Village-shrubberies and hedges, general.

*Mallotus philippinensis* Muell. Arg.; B. P. ii. 950. *Rottlera tinctoria* H. S. 157.

v. *Kamala*.

Sometimes planted about villages; native of the drier parts of India. Voigt records this as not having flowered in the Royal Botanic Garden between 1797, when it was first introduced, and 1814; and adds that at Serampore it had not flowered up to 1845. In some years at least it flowers freely, and occasionally self-sown young plants are to be met with in the Royal Botanic Garden.

505. *Ricinus* Linn.

*Ricinus communis* Linn.; H. S. 158; B. P. ii. 952.

v. *Bherenda*.

Cultivated everywhere in gardens and fields, and very common spontaneously in village shrubberies; native of Africa.

506. *Tragia* Linn.

\* *Tragia involucrata* Linn.; H. S. 160; B. P. ii. 952.

v. *Bichhati*.

Hedges, everywhere. Voigt also records the narrowly 3-partite leaved variety (VAR. *cannabina* = *T. cannabina* Linn.) from Serampore; this is a quite possible record, but it needs to be confirmed.

507. *Sapium* P. Br.

\* *Sapium indicum* Willd.; H. S. 161; B. P. ii. 954.

v. *Hurna batul*.

Western Sundribuns.

*Sapium sebiferum* Roxb.; B. P. ii. 954. *Stillingia sebifera* H. S. 161.

v. *Móm china*.

In village-shrubberies, general; native of China.

508. *Excoecaria* Linn.

\* *Excoecaria Agallocha* Linn.; H. S. 161; B. P. ii. 955.

v. *Géngwa, géo, ghéria.*

Western Sundribuns; salt lakes near Calcutta and banks of Hughli as far north as Uluberia.

## XCII.—URTICACEÆ.

509. *Trema* Lour.

\* *Trema orientalis* Bl.; B. P. ii. 960. *Sponia orientalis* H. S. 294.

v. *Filun, chikun.*

Village-shrubberies, hedges and waste places, everywhere.

510. *Cannabis* Linn.

*Cannabis sativa* Linn.; H. S. 282; B. P. ii. 960.

v. *Ganja.* The Hemp Plant.

A prohibited plant in our area, but occasionally occurring as a roadside weed; native of Siberia.

511. *Fleurya* Gaud.

\* *Fleurya interrupta* Gaud.; B. P. ii. 961. *Bœhmeria interrupta* H. S. 281.

v. *Lal bichchiti.*

Waste places and roadsides, general.

512. *Pilea* Lindl.

\* *Pilea microphylla* Liebn.; B. P. ii. 962.

Damp paths, old walls, rubbishy places; everywhere.

513. *Bœhmeria* Jacq.

*Bœhmeria nivea* Hook. & Arn.; B. P. ii. 964. *Urtica nivea* H. S. 280.

v. *Kankhúra.*

Occasionally cultivated, but not by natives, near Calcutta.

514. *Pouzolzia* Gaud.

\* *Pouzolzia indica* Gaud.; B. P. ii. 965.

Waste places, roadsides and fields, west of the river Hughli only, and always rare.

VAR. \* *alienata* Wedd.; B. P. ii. 965. *Urtica tuberosa* H. S. 280 (not *U. tuberosa* Roxb.).

v. *Chandar muli.*

Waste places, roadsides and fields, everywhere.

515. *Broussonetia* Vent.

*Broussonetia papyrifera* Vent. ; H. S. 284 ; B. P. ii. 967.

Occasionally planted and wherever this is the case readily springing up spontaneously : native of Eastern Asia.

516. *Morus* Linn.

*Morus indica* Linn. ; H. S. 283 ; B. P. ii. 968.

v. *Tút, tutri*.

Cultivated, but very rarely so in our area ; native of the Himalaya.

517. *Streblus* Lour.

\* *Streblus asper* Lour. ; B. P. ii. 969. *Trophis aspera* H. S. 291.

v. *Shiôra*.

Hedges and village-shrubberies, everywhere.

518. *Artocarpus* Forst.

*Artocarpus integrifolia* Linn. f. ; H. S. 289 ; B. P. ii. 971.

v. *Kathál*. The Jack Fruit.

Planted everywhere ; sometimes as if wild in village-shrubberies ; native of India.

*Artocarpus Lakoocha* Roxb. ; H. S. 290 ; B. P. ii. 971.

v. *Déphul, lakúch*.

In gardens, frequent ; occasionally as if wild in village-shrubberies ; native of India.

In one or two compounds within the city of Calcutta, but not elsewhere, examples of the Bread Fruit tree (*Artocarpus incisa*) are to be met with. Though it can be made to live in the vicinity of buildings in the town, it does not survive when planted in suburban gardens.

519. *Ficus* Linn.

*Ficus Benjamina* Linn. VAR. *comosa* Kurz ; B. P. ii. 979.

Planted in avenues ; native of S. E. Asia.

\* *Ficus bengalensis* Linn. ; B. P. ii. 979. *F. indica* H. S. 286.

v. *Bar, but*.

Planted, but also wild or at least self-sown on tombs and trees ; native of India.

\* *Ficus retusa* Linn. VAR. *nitida* King ; B. P. ii. 980. *F. Benjamina* H. S. 289.

v. *Fir, sir*.

In village-shrubberies and in Sundribuns forests.

- \* *Ficus religiosa* Linn. ; H. S. 287 ; B. P. ii. 980.  
v. *Asvattha*, *pipal*.  
In village-shrubberies and on old buildings, everywhere.
- \* *Ficus Rumphii* Bl. ; H. S. 287 ; B. P. ii. 980.  
v. *Gaiasvattha*.  
In village-shrubberies and on river banks ; also Sundribuns.
- \* *Ficus infectoria* Roxb. ; B. P. ii. 981. *F. venosa* H. S. 287.  
v. *Pakúr*.  
Village-shrubberies, general.
- \* *Ficus heterophylla* Linn. ; B. P. ii. 981. *F. rubescens* H. S. 285.  
v. *Gaori sheora*, *ghoti seora*.  
In damp places, occasional.  
VAR. \* *repens* King ; B. P. ii. 981. *F. repens* H. S. 285.  
v. *Bhui dumar*.  
Edges of ponds and ditches, general.
- \* *Ficus hispida* Linn. f. ; B. P. ii. 981. *F. oppositifolia* H. S. 288.  
v. *Dumar*, *kák dumar*.  
Hedges and thickets, everywhere.
- Ficus pumila* Linn. ; B. P. ii. 982.  
Grown generally on walls as a substitute for Ivy.
- \* *Ficus glomerata* Roxb. ; H. S. 288 ; B. P. ii. 983.  
v. *Jagya dumar*, *yajna dumar*.  
In village-shrubberies, occasional.

### XIII.—CASUARINEÆ

#### 520. *Casuarina* Forst.

*Casuarina equisetifolia* Forst. ; B. P. ii. 985. *C. muricata* H. S. 297.

v. *Belati jhau*.

Avenues and roadsides, but also very commonly self-sown ; native of sea coasts from Polynesia to Chittagong.

### XCIV.—CERATOPHYLLÆ

#### 521. *Ceratophyllum* Linn.

\* *Ceratophyllum demersum* Linn. ; B. P. ii. 990. *C. verticillatum*.  
H. S. 293.

v. *Fhangi*.

In ponds and ditches, everywhere.

## GYMNOSPERMEÆ.

## XCV.—CONIFERÆ.

522. *Thuya* Linn.

*Thuya orientalis* Linn.; H. S. 557; B. P. ii. 992.

In gardens and on lawns about Calcutta; native of China.

523. *Cupressus* Tournef.

*Cupressus sempervirens* Linn.; H. S. 558.

v. *Saras*.

In gardens, occasionally; native of the Orient.

## XCVI.—CYCADACEÆ.

524. *Cycas* Linn.

*Cycas revoluta* Thunb.; H. S. 555; B. P. ii. 993.

In gardens and on lawns about Calcutta; native of Japan.

## MONOCOTYLEDONES.

## XCVII.—HYDROCHARIDEÆ.

525. *Hydrilla* Rich.

\* *Hydrilla verticillata* Casp.; H. S. 617; B. P. ii. 995.

v. *Jhangi kurali*.

In ponds, everywhere.

526. *Lagarosiphon* Harv.

\* *Lagarosiphon Roxburghii* Benth.; B. P. ii. 995. *Vallisneria*

*alternifolia* H. S. 618.

v. *Rasna jhangi*.

In ponds, general.

527. *Vallisneria* Linn.

\* *Vallisneria spiralis* Linn.; H. S. 617; B. P. ii. 996.

v. *Syala*.

In ponds, everywhere.

528. *Blyxa* Thouars.

\* *Blyxa Roxburghii* Rich.; B. P. ii. 996. *B. octandra* H. S. 618.

v. *Pata syala*.

In ponds, general.

529. *Hydrocharis* Linn.

- \* *Hydrocharis cellulosa* Ham.; B. P. ii. 997.  
In ponds, north-east of Calcutta, rather rare.

530. *Ottelia* Pers.

- \* *Ottelia alismoides* Pers.; H. S. 618; B. P. ii. 997.  
v. *Parmi kalla*, *pani kalla*.  
In ponds, everywhere.

## XCVIII.—ORCHIDACEÆ.

531. *Dendrobium* Sw.

- \* *Dendrobium anceps* Sw.; B. P. ii. 1009. *Aporum anceps* H. S. 623.  
Western Sundribuns.
- \* *Dendrobium Pierardi* Roxb.; H. S. 623; B. P. ii. 1009.  
Western Sundribuns.

532. *Pachystoma* Lindl.

- \* *Pachystoma senile* Reichb. f.; B. P. ii. 1014. *Geodorum ramentaceum* H. S. 628.  
In grassy places, rare.

533. *Eulophia* R. Br.

- \* *Eulophia graminea* Lindl.; B. P. ii. 1016. *E. virens* H. S. 629  
(the Bengal plant).  
v. *Budbári*.  
In dry grassy places, west of the Hughli, rare.

534. *Geodorum* Jacks.

- \* *Geodorum dilatatum* R. Br.; H. S. 628; B. P. ii. 1017.  
In grassy glades, not uncommon.
- Geodorum purpureum* R. Br.; H. S. 628.  
Recorded by Voigt from Serampore, quite a possible record, but requires confirmation; native of India.

535. *Luisia* Gaud.

- \* *Luisia brachystachys* Bl.; B. P. ii. 1019. *Cymbidium triste* H. S. 627 partly.  
Western Sundribuns, common.



536. *Vanda* R. Br.

- \* *Vanda Roxburghii* R. Br.; H. S. 629; B. P. ii. 1021.  
v. *Nái, rasna, banda*.  
On trees, everywhere.

537. *Saccolabium* Bl.

- \* *Saccolabium papillosum* Lindl.; H. S. 630; B. P. ii. 1022.  
On trees, rare to north of the Sundribuns, not infrequent in Sundribun forests.

538. *Cleisostoma* Bl.

- Cleisostoma micranthum* K. & P.; B. P. ii. 1023. *Saccolabium micranthum* H. S. 630.  
Reported from Serampore by Voigt, a quite possible record, but it needs confirmation.

539. *Sarcanthus* Lindl.

- \* *Sarcanthus insectifer* Reichb. f.; B. P. ii. 1023.  
Western Sundribuns, on trees, very common.

540. *Didymoplexis* Griff.

- \* *Didymoplexis pallens* Griff.; B. P. ii. 1025.  
In shady thickets, general.

541. *Pogonia* Juss.

- \* *Pogonia plicata* Lindl.; H. S. 632; B. P. ii. 1026.  
In shady thickets, general.  
\* *Pogonia juliana* Wall.; H. S. 632; B. P. ii. 1026.  
In shady thickets, rare.  
\* *Pogonia carinata* Lindl.; H. S. 632; B. P. ii. 1026.  
In shady thickets, general.

542. *Zeuxine* Lindl.

- \* *Zeuxine sulcata* Lindl.; H. S. 633; B. P. ii. 1029.  
v. *Swet huli*.  
In grassy open spaces, general.

543. *Habenaria* Willd.

- \* *Habenaria digitata* Lindl.; B. P. ii. 1032.  
Grassy places, very rare.  
*Habenaria commelinifolia* Wall.; H. S. 632; B. P. ii. 1033.

Reported from Serampore by Voigt, the record needs confirmation.

\* *Habenaria marginata* Colebr. ; H. S. 632 ; B. P. ii. 1033.  
Grassy places, very rare.

\* *Habenaria viridiflora* R. Br. ; B. P. ii. 1033. *H. tenuis* H. S. 632.  
Grassy places, very rare.

### XCIX.—SCITAMINEÆ.

#### 544. *Globba* Linn.

*Globba sessiliflora* Sims.

In gardens, drops its bulbils freely and thereby readily comes up spontaneously in garden borders and in shady grassy places ; native of Burma.

#### 545. *Kaempferia* Linn.

*Kaempferia Galanga* Linn. ; H. S. 566 ; B. P. ii. 1038.  
v. *Chandu mûla, humula.*

In gardens, general : native of S. E. Asia.

*Kaempferia rotunda* Linn. ; H. S. 566 ; B. P. ii. 1038.  
v. *Bhui champa.*

In gardens, occasional ; native of S. E. Asia.

#### 546. *Hedychium* Koen.

*Hedychium coronarium* Koen. ; H. S. 568 ; B. P. ii. 1039.  
v. *Gorakh natha, dulala champa.*

In gardens and also sometimes in village-shrubberies, but though reported by Voigt from Serampore (as wild) is probably always an escape in our area ; native of S. E. Asia.

#### 547. *Curcuma* Linn.

\* *Curcuma aromatica* Salisb. ; H. S. 563 ; B. P. ii. 1042.  
v. *Fangli haldi, ban haldi.*

In village-shrubberies about Calcutta and elsewhere in our districts.

*Curcuma Zedoaria* Roscoe ; H. S. 564 ; B. P. ii. 1042.  
v. *Kachûra.*

Cultivated pretty generally.

*Curcuma cæsia* Roxb. ; H. S. 563 ; B. P. ii. 1042.  
v. *Kala haldi.*

Reported by Voigt from Serampore ; a possible record, since the species is common immediately to the west of our area, but one that needs confirmation.

\* *Curcuma ferruginea* Roxb. ; H. S. 563 ; B. P. ii. 1042.  
Village thickets near Shibpur.

\* *Curcuma rubescens* Roxb. ; H. S. 564 ; B. P. ii. 1042.  
Village-shrubberies, general.

*Curcuma longa* Linn. : H. S. 565 ; B. P. ii. 1042.  
v. *Haldi*.  
Cultivated generally.

*Curcuma Amada* Roxb. ; H. S. 564 ; B. P. ii. 1042.  
v. *Am ada*.  
Cultivated generally.

#### 548. *Zingiber* Adans.

*Zingiber Zerumbet* Sm. ; H. S. 562 ; B. P. ii. 1045.  
v. *Maha bar bach, nar kachúr*.

Cultivated and as if wild in village-shrubberies, native of S. E. Asia.

*Zingiber Casumunar* Roxb. ; H. S. 562 ; B. P. ii. 1045.  
v. *Ban-ada*.

Cultivated and as if wild in village-shrubberies and on abandoned sites in the Sundribuns ; native of India.

*Zingiber officinale* Roscoe ; H. S. 561 ; B. P. ii. 1045.  
v. *Adrak, ada*.

Cultivated sparingly ; native of S. E. Asia.

#### 549. *Costus* Linn.

\* *Costus speciosus* Sm. ; H. S. 572 ; B. P. ii. 1045.  
v. *Kust, keu*.

In village-shrubberies and shady waste places.

#### 550. *Alpinia* Linn.

*Alpinia Galanga* Sw. ; H. S. 570 ; B. P. ii. 1047.  
v. *Kulanjan*.

In gardens, occasionally.

\* *Alpinia Allughas* Roscoe ; H. S. 570 ; B. P. ii. 1047.  
v. *Taro, taruko*.

Muddy river banks, general.

#### 551. *Canna* Linn.

*Canna indica* Linn. ; H. S. 576. VAR. *orientalis* B. P. ii. 1047.  
v. *Sbha jaya, sarba jaya*.

In gardens everywhere, but also very general in waste places as an escape : native of Eastern Asia.

552. *Maranta* Linn.

*Maranta arundinacea* Linn. ; H. S. 575 ; B. P. ii. 1048.

v. *Tikhur*. Arrowroot.

Cultivated occasionally about Calcutta ; native of the West Indies.

The name *Tikhur* is applied to and was probably originally restricted to various species of *Curcuma*.

553. *Musa* Linn.

*Musa sapientum* Linn. ; B. P. ii. 1050. *M. paradisaica* H. S. 1050.

v. *Ram kela*, *kantali kela*, *kach kela*. Plantain.

Cultivated in numerous races, and also occurring in village-shrubberies as if wild ; native of India. The vernacular name for all the forms is *kela*. The *ram kela* is the form with numerous black seeds that is occasionally found about villages ; it does not, however, quite agree with the wild form of the species that occurs in the forests of Chota Nagpur and Chittagong, but is rather a form, feral by reversion, of the *kantali kela* or Cooking Plantain which is to be found in several races most of which may have been locally evolved. The numerous races, of *kach kela* or Dessert Plantain, on the other hand, would appear to be in no case of local origin, but to have been introduced from Southern India, Malaya, and possibly elsewhere.

C.—BROMELIACEÆ.

554. *Ananassa* Adans.

*Ananassa sativa* Linn. ; B. P. ii. 1052. *Ananas sativus* H. S. 614.

v. *Ananas*, from the American name. Pine apple.

Sparingly cultivated about Calcutta ; introduced to Asia from the West Indies.

CI.—HEMODOURACEÆ.

555. *Sansevieria* Thunb.

*Sansevieria Roxburghiana* Schult. f. ; H. S. 556 ; B. P. ii. 1054.

v. *Murva*, *murba*. Bowstring Hemp.

Cultivated and sometimes as if wild in village-shrubberies ; reported by Voigt from Serampore but certainly not wild in our area ; it is indeed doubtful whether the species is really indigenous in India

at all ; if so, it is the only species of the genus that seems to be so ; the other species are African.

**Sansevieria trifasciata** Hort. ; B. P. ii. 1054.

Cultivated, but also sometimes in village-shrubberies ; probably native of *West* Africa, but appears to have reached India from America where it is sometimes grown as *S. guineensis*, the West African Bowstring Hemp which is not naturalized and is hardly known even in cultivation, in India.

### CII.—IRIDEE.

556. **Cipura** Aubl.

**Cipura paludosa** Aubl. ; H. S. 601 ; B. P. ii. 1055.

Naturalized in thickets near Calcutta among grass ; native of America.

557. **Belamcanda** Adans.

**Belamcanda chinensis** Leman ; B. P. ii. 1056. *Pardanthus chinensis* H. S. 605.

v. *Dasbahu*, *dasbachandi*.

In gardens, everywhere ; native of China.

### CIII.—AMARYLLIDACEÆ.

558. **Agave** Linn.

**Agave VeraCruz** Mill. *A. cantula* B. P. ii. 1057.

v. *Kantala*, *bilati ananas*.

A hedge near villages ; native of America.

Other species of *Agave* are occasionally grown as hedges.

559. **Curculigo** Gært. n.

\* **Curculigo orchitoides** Gært. n. ; H. S. 580 ; B. P. ii. 1059.

v. *Tal muli*, *tal lura*.

Grassy places west of the river Hughli.

560. **Zephyranthes** Herb.

**Zephyranthes tubispatha** Herb. ; H. S. 582 ; B. P. ii. 1060.

In gardens, but also sometimes appearing spontaneously in grassy places ; native of Peru.

561. **Crinum** Linn.

\* **Crinum asiaticum** Linn. ; H. S. 588 ; B. P. ii. 1061.

v. *Bara kanur*.

Sundribuns, wild, plentiful ; often also in gardens in our area.

K

- \* *Crinum defixum* Ker; H. S. 590; B. P. ii, 1061.  
v. *Sukh darshan*.  
Banks of ponds and ditches, common.
- \* *Crinum pratense* Herb.; H. S. 580; B. P. ii, 1061.  
Wet places, rare.
- Crinum latifolium* Linn.; B. P. ii, 1061. *C. ornatum* VAR. *latifolium* H. S. 591.  
In gardens, generally; wild in Orissa.  
VAR. *zeylanica* B. P. ii, 1061. *C. ornatum* VAR. *zeylanicum* H. S. 591.  
In gardens; wild in Orissa.

## CIV.—DIOSCOREACEÆ

562. *Dioscorea* Linn.

- \* *Dioscorea pentaphylla* Linn.; H. S. 653; B. P. ii, 1066.  
v. *Kanta alu*.  
Hedges and thickets, general.
- \* *Dioscorea bulbifera* Linn.; B. P. ii, 1066. *D. crispata* H. S. 652.  
v. *Rat alu*.  
Hedges and thickets, general.
- Dioscorea fasciculata* Roxb.; H. S. 652; B. P. ii, 1066.  
v. *Susni alu*.  
Cultivated only.  
VAR. *spinosa* B. P. ii, 1066. *D. aculeata* H. S. 652.  
v. *Mou alu*.  
Thickets and village-shrubberies, general.
- \* *Dioscorea anguina* Roxb.; H. S. 652; B. P. ii, 1066.  
v. *Kukur alu*.  
Hedges and thickets, rare.
- \* *Dioscorea glabra* Roxb.; H. S. 653. *D. nummularia* B. P. ii, 1067.  
v. *Shora alu*.  
Hedges, thickets and village-shrubberies, general.
- Dioscorea alata* Linn.; H. S. 652; B. P. ii, 1067.  
v. *Khám, kham alu*.  
Generally cultivated.  
VAR. *globosa* B. P. ii, 1067. *D. globosa* H. S. 652.  
v. *Chupri alu*.  
Generally cultivated.

VAR. *rubella* B. P. ii. 1067. *D. rubella* H. S. 652.

v. *Guraniya alu*.

Generally cultivated.

VAR. *purpurea* B. P. ii. 1067. *D. purpurea* H. S. 652.

v. *Rakto guraniya alu, lal guraniya*.

Generally cultivated.

#### CV.—LILIACEÆ.

##### 563. *Asparagus* Linn.

\* *Asparagus racemosus* Willd. ; H. S. 674 ; B. P. ii. 1070.

v. *Sata muli*.

Hedges and thickets, occasional.

##### 564. *Smilax* Linn.

\* *Smilax prolifera* Roxb. ; H. S. 648 ; B. P. ii. 1071.

v. *Kumarika*.

Hedges and thickets, general.

*Smilax macrophylla* Roxb. ; B. P. ii. 1071. *S. ovalifolia* H. S. 648.

v. *Kumarika*.

Reported by Voigt from Serampore, a quite probable record but one that needs confirmation ; the species is common in West Bengal.

##### 565. *Gloriosa* Linn.

\* *Gloriosa superba* Linn. ; B. P. ii. 1073. *Methonica superba* H. S. 655.

v. *Ulat chandal*.

Hedges, generally.

##### 566. *Pollanthes* Linn.

*Pollanthes tuberosa* Linn. ; H. S. 656.

v. *Rajani gandha*. The Tuberose.

In native gardens, general ; native of S. America.

##### 567. *Allium* Linn.

*Allium ascalonicum* Linn. ; H. S. 668 ; B. P. ii. 1075.

v. *Gandhan*. The Shalot.

In gardens everywhere, cultivated ; native of the Orient.

*Allium Ceba* Linn. ; H. S. 668 ; B. P. ii. 1075.

v. *Piyaj*. The Onion.

Cultivated generally ; native of the Oriental and Mediterranean regions.

**Allium tuberosum** Roxb.; H. S. 669; B. P. ii. 1076.

v. *Ranga gandhina*. Indian Leek.

Recorded by Roxburgh as cultivated about Calcutta, but unknown to Voigt and not met with in our area as a crop by the writer: the species has, however, been raised from seeds received from Behar and the resulting plants compared and found to agree exactly with Roxburgh's drawing. It is just possible that it may be met with in gardens in the western part of Hughli district.

**Allium ampeloprasum** Linn.; H. S. 668; B. P. ii. 1076. *A. Porrum* H. S. 668.

v. *Paru, gandhina*. The Leek.

In gardens, generally; native of the Mediterranean and Oriental regions.

**Allium sativum** Linn.; H. S. 667; B. P. ii. 1076.

v. *Lasun, rashun*. Garlic.

Cultivated generally; native of the Mediterranean region.

#### 568. *Asphodelus* Linn.

\* ***Asphodelus tenuifolius*** Cav.; B. P. ii. 1076. *A. clavatus* H. S. 670.

In fields in the cold weather, but probably always a casual and introduced with seed sent from western provinces, where it is common.

#### 569. *Hemerocallis* Linn.

***Hemerocallis fulva*** Linn.; H. S. 670; B. P. ii. 1078.

v. *Gul nargis*.

In gardens, generally; native of China.

### CVI.—PONTEDERIACEÆ

#### 570. *Monochoria* Presl.

\* ***Monochoria hastifolia*** Presl; B. P. ii. 1079. *Pontederia hastata* H. S. 645.

v. *Nukha*.

In ditches and rice-fields, general.

***Monochoria vaginalis*** Presl; B. P. ii. 1079. *Pontederia vaginalis* H. S. 645.

v. *Nukha*.

Reported by Voigt from Serampore, and may quite possibly occur, because the species is plentiful in the Gangetic Plain to the north and also to the east of our districts; the record, however, needs confirmation.



VAR. \* *plantaginea* Solms-Lanbach; B. P. ii. 1079. *Pontederia plantaginea* H. S. 645.

v. *Nukha*.

Ditches, ponds and rice-fields, everywhere.

### CVII.—XYRIDEÆ.

#### 571. *Xyris*.

\* *Xyris pauciflora* Willd.; B. P. ii. 1080; *X. indica* H. S. 731, possibly.

v. *Dabi-duba*.

In wet places, about Serampore, Chandernagore and Jahanabad not seen from east of the Hughli in our area.

The species in our districts that alone is represented in the Calcutta Herbarium from our region is *X. pauciflora*. Voigt, however, gives *X. indica* as occurring at Serampore and notes *X. pauciflora* as a species that might be, but that up to 1845 had not yet been, introduced either to the Botanic Garden at Shibpur or to Dr. Carey's Garden at Serampore. From this it seems clear that only one species was present in our area in Voigt's time, and it is therefore possible that the specific names used by Voigt were misplaced. At the same time the occurrence of *X. indica* is not at all impossible since it occurs in Northern Bengal as well as in Orissa.

### CVIII.—COMMELINACEÆ.

#### 572. *Commelina* Linn.

\* *Commelina nudiflora* Linn.; B. P. ii. 1082. *C. cæspitosa* H. S. 677.

Goghat, western parts of Hughli district; also reported by Voigt from Serampore.

\* *Commelina salicifolia* Roxb.; H. S. 676; B. P. ii. 1082.

v. *Pani kanchira*.

Fields and damp waste places, general.

\* *Commelina Hasskarlii* Clarke; B. P. ii. 1082.

v. *Kanchira*.

Shady places, general.

\* *Commelina bengalensis* Linn.; H. S. 676; B. P. ii. 1082.

v. *Kanchira*.

Shady places, everywhere.

\* *Commelina attenuata* Koenig; B. P. ii. 1083.

Goghat, Western Hughli district.

- \* *Commelina obliqua* Ham.; B. P. ii. 1083. *C. communis* H. S. 677.  
v. *Futa kanchira*.  
Shady places, general.
- \* *Commelina appendiculata* Clarke; B. P. ii. 1083.  
Shady places, east of river Hughli, rare.
- \* *Commelina suffruticosa* Bl.; B. P. ii. 1083.  
Waste places, rare.

573. *Aneilema* R. Br.

- \* *Aneilema spiratum* R. Br.; B. P. ii. 1084. *A. nanum* H. S. 677.  
In fields and waste places, everywhere.
- \* *Aneilema nudiflorum* R. Br.; H. S. 677; B. P. ii. 1084.  
v. *Kanduli*.  
Waste places, general.
- \* *Aneilema vaginatum* R. Br.; H. S. 677; B. P. ii. 1084.  
Wet places, general.

574. *Tradescantia* Linn.

- Tradescantia discolor* L'Herit.; H. S. 678.  
In gardens and also as an escape.

575. *Cyanotis* Den.

- Cyanotis cristata* Schult. f.; H. S. 678; B. P. ii. 1085.  
Reported by Voigt from Serampore, the record requires verification. The species is common in Chota Nagpur.
- \* *Cyanotis axillaris* Rcem.; and Schult.; H. S. 678; B. P. ii. 1085.  
v. *Baghanula*.  
Fields and roadsides, general.

## CIX.—FLAGELLARIÆ.

576. *Flagellaria* Linn.

- \* *Flagellaria indica* Linn.; H. S. 681; B. P. ii. 1087.  
v. *Ban chanda*.  
Sundribuns, common; also reported by Voigt from Serampore, but probably not there truly wild.

## CX.—JUNCACEÆ

577. *Juncus* Linn.

- \* *Juncus prismatocarpus* R. Br.; B. P. ii. 1088.  
Gohat, Western Hughli district, in wet places.

## CXI.—PALMEÆ.

578. *Corypha* Linn.

*Corypha umbraculifera* Linn.; H. S. 640; B. P. ii. 1090 in part.

v. *Tali*.

In gardens and on lawns; introduced from Ceylon, doubtfully wild there and in Travancore.

*Corypha Talliera* Roxb.; H. S. 641. *C. umbraculifera* B. P. ii. 1090. in part.

v. *Tara*.

In gardens and on lawns; supposed to be wild in Bengal.

*Corypha elata* Roxb.; H. S. 641; B. P. ii. 1090.

v. *Bajur*.

In gardens and on lawns; supposed to be wild in Bengal.

579. *Borassus* Linn.

*Borassus flabellifer* Linn.; B. P. ii; 1092. *B. flabelliformis* H. S. 640.

v. *Tal gachh, tari*. The Palmyra tree.

In village-shrubberies, as if wild, everywhere; probably not, however, a native of India, certainly not indigenous in our area.

580. *Nipa* Wurmbr.

\* *Nipa fruticans* Wurmbr.; H. S. 684; B. P. ii. 1094.

v. *Golpatta, gabua, gulga*.

Sundribuns.

581. *Cocos* Linn.

*Cocos nucifera* Linn.; H. S. 643; B. P. ii. 1095.

v. *Narikel*.

Planted generally; native of Polynesian coasts.

582. *Phoenix* Linn.

*Phoenix sylvestris* Roxb.; H. S. 642; B. P. ii. 1096.

v. *Khajur*.

Planted generally, sometimes sub-spontaneous; native of the Punjab.

\* *Phoenix paludosa* Roxb.; H. S. 643; B. P. ii. 1096.

v. *Hital*.

Sundribuns.

583. *Areca* Linn.

*Areca Catechu* Linn.; H. S. 637; B. P. ii. 1097.

v. *Gua, supári*. Betel-nut Palm.

Cultivated generally; native of S. E. Asia.

584. *Calamus* Linn.

\* *Calamus viminalis* Willd. VAR. *fasciculata* B. P. ii. 1099. *C. fasciculatus* H. S. 639.

v. *Bara bet*.

Village-shrubberies, general.

\* *Calamus tenuis* Roxb.; H. S. 639; B. P. ii. 1099. *C. Rotang* H. S. 639, not of Linn.

v. *Sanchi bet*.

Sundribuns.

## CXII.—PANDANACEÆ.

585. *Pandanus* Linn. f.

*Pandanus foetidus* Roxb.; H. S. 683; B. P. ii. 1101.

v. *Keiya kanta, kotki kanta*.

In hedges, planted, generally; native of India.

\* *Pandanus fascicularis* Lamk.; B. P. ii. 1101. *P. odoratissimus* H. S. 682.

v. *Keiya, keori*.

Sundribuns, common; elsewhere planted.

## CXIII.—TYPHACEÆ.

586. *Typha* Linn.

\* *Typha elephantina* Roxb.; H. S. 693; B. P. ii. 1102.

v. *Hogla*.

Margins of ponds and streams, very rare.

\* *Typha angustata* Chamb. & Bory; B. P. ii. 1102. *T. angustifolia* H. S. 693.

v. *Ram hogla*.

Margins of ponds and streams, common.

## CXIV.—AROIDEÆ.

587. *Pistia* Linn.

\* *Pistia Stratiotes* Linn.; H. S. 684; B. P. ii. 1105.

v. *Takapana*.

In ponds, everywhere.

588. *Cryptocoryne* Fisch.

- \* *Cryptocoryne ciliata* Fisch. ; H. S. 685 ; B. P. ii. 1105.  
v. *Kerali*.  
In muddy creeks and ditches, general.
- \* *Cryptocoryne spiralis* Fisch. ; H. S. 685 ; B. P. ii. 1106.  
Edges of ponds, general.

589. *Typhonium* Schott.

- \* *Typhonium trilobatum* Schott ; B. P. ii. 1107. *T. orixense* H. S. 686.  
v. *Ghat kachu, ghekul*.  
In thickets among grass ; doubtfully native.
- \* *Typhonium Schottii* Prain. ; B. P. ii. 1108.  
In grassy glades, with the preceding of which it is possibly a variety.

*Typhonium inopinatum* Prain ; B. P. ii. 1108.

In garden ground and among grass in open glades, introduced but common ; native of Indo-China.

*Typhonium Roxburghii* Schott ; B. P. ii. 1108. *T. trilobatum* H. S. 686.

In grassy glades, introduced and very rare ; native of Malaya.

- \* *Typhonium cuspidatum* Bl. ; B. P. ii. 1108. *T. flagelliforme* H. S. 685. *Arum cuspidatum* H. S. 690.

In grassy glades, general.

Voigt also records, but doubtfully, as to the identification, *T. divaricatum* from Serampore. The record is not improbable but needs confirmation and the species intended may be one of the foregoing.

590. *Amorphophallus* Bl.

- \* *Amorphophallus campanulatus* Bl. ; H. S. 686 ; B. P. ii. 1109.  
v. *Ól*.  
Cultivated everywhere and also wild in all village thickets.
- \* *Amorphophallus bulbifer* Bl. ; B. P. ii. 1110. *Pythonium bulbiferus* H. S. 686.  
v. *Amla-bela*.  
In village-shrubberies, general.

591. *Plesmonium* Schott.

- \* *Plesmonium margaritifera* Schott ; B. P. ii. 1110. *Arum margaritifera* H. S. 690.  
Village shrubberies, general.

592. *Alocasia* Schott.

*Alocasia cucullata* Schott; B. P. ii. 1111. *Colocasia cucullata* H. S. 687.

v. *Bishman*.

Reported from Serampore by Voigt, but almost certainly only a cultivated plant in our area; native of Indo-China.

*Alocasia indica* Schott; B. P. ii. 1111. *Colocasia indica* H. S. 687.

v. *Mán kachu, mán giri*.

Cultivated about villages, everywhere; native of India.

*Alocasia macrorrhiza* Schott; B. P. ii. 1111. *Colocasia odora* H. S. 687.

Cultivated about villages, general; native of Indo-China.

\* *Alocasia fornicata* Schott; B. P. ii. 1111. *Colocasia fornicata* H. S. 687.

v. *Salo kachu*.

Village-shrubberies and thickets, general.

593. *Colocasia* Linn.

\* *Colocasia nymphaeifolia* Kunth; H. S. 687; B. P. ii. 1112.

v. *Sar kachu*.

Grassy glades and village shrubberies, general.

\* *Colocasia antiquorum* Schott; H. S. 686; B. P. ii. 1112.

v. *Kachu*.

Everywhere cultivated and also everywhere wild in grassy glades and village-shrubberies.

594. *Scindapsus* Schott.

\* *Scindapsus officinalis* Schott; H. S. 688; B. P. ii. 1114.

v. *Gaj pipal*.

Epiphytic in orchards and village-shrubberies; sometimes cultivated.

595. *Lasia* Lour.

\* *Lasia heterophylla* Schott; H. S. 689; B. P. ii. 1116. *L. Loureirii* H. S. 689.

v. *Kanta kachu, kanta mán*.

Swampy places, general.

## CXV.—LEMNACEÆ.

596. *Lemna* Linn.

\* *Lemna paucicostata* Hegelm.; B. P. ii. 1117.

In stagnant water, floating, general.

- \* *Lemna trisulca* Linn. ; B. P. ii. 1117. *L. cruciata* H. S. 692.  
In stagnant water, forming tangled masses below the surface, rare.
- \* *Lemna polyrhiza* Linn. ; B. P. ii. 1117. *L. orbiculata* H. S. 692.  
In stagnant water, floating ; everywhere.
- \* *Lemna oligorhiza* Kurz. ; B. P. ii. 1117.  
In stagnant water, floating ; rare.

597. *Wolffia* Hook.

- \* *Wolffia arrhiza* Wimm. ; B. P. ii. 1117. *Grantia globosa* H. S. 692.  
In stagnant water, floating, general.
- \* *Wolffia microscopica* Kurz ; B. P. ii. 1117. *Grantia microscopica* H. S. 692.  
In stagnant water, floating.

## CXVI.—ALISMACEÆ.

598. *Alisma* Linn.

- \* *Alisma reniforme* Don ; B. P. ii. 1119. *A. intermedium* H. S. 680.  
In pools and marshes, general.  
*A. intermedium* is doubtfully referred by Sir J. D. Hooker in the *Flora of British India* to *A. Plantago* ; the chief arguments against the suggestion are (1) that Griffith was very unlikely to have made any mistake as to the identity of *A. Plantago* ; and (2) that *A. Plantago* has not so far been met with in the Gangetic delta.
- \* *Alisma oligococcum* F. Muell. ; B. P. ii. 1119.  
In pools and marshes, very rare.

599. *Limnophyton* Miq.

- \* *Limnophyton obtusifolium* Miq., B. P. ii. 1119. *Sagittaria obtusifolia* H. S. 680.  
v. *Bara kat*.  
In pools and marshes, general.

600. *Sagittaria* Linn.

- \* *Sagittaria sagittifolia* Linn. ; H. S. 680 ; B. P. ii. 1120.  
v. *Muya-muya, chota kat*.  
Sides of ponds and ditches, general.
- \* *Sagittaria guayanensis* H. B. & K. ; B. P. ii. 1120. *S. cordifolia* H. S. 680.  
In pools and marshes, everywhere.

601. *Butomopsis* Kunth.

- \* *Butomopsis lanceolata* Kunth; B. P. ii. 1120. *Butomus lanceolatus* H. S. 679.

Wet places and rice-fields, west of river Hughli, rare.

## CXVII.—NAIADACEÆ.

602. *Aponogeton* Thunb.

- \* *Aponogeton monostachyum* Linn. f.; B. P. ii. 1122. *Spathium chinense* H. S. 694.

v. *Ghachu*.

In standing water, general.

- \* *Aponogeton echinatum* Roxb.; B. P. ii. 1122.

In standing water, west of river Hughli, rare.

- \* *Aponogeton crispum* Thunb.; B. P. ii. 1122. *Spathium undulatum* H. S. 694.

In standing water, general.

603. *Potamogeton* Linn.

- \* *Potamogeton indicus* Roxb.; H. S. 694; B. P. ii. 1123.

In ponds and ditches, everywhere.

- \* *Potamogeton crispus* Linn.; B. P. ii. 1123. *P. tuberosus* H. S. 694.

In ponds and ditches, everywhere.

- \* *Potamogeton pectinatus* Linn.; B. P. ii. 1123.

Salt-lakes near Calcutta.

604. *Ruppia* Linn.

- \* *Ruppia rostellata* Koch; B. P. ii. 1124.

Salt-lakes near Calcutta; Sundribuns.

605. *Najas* Linn.

- \* *Najas indica* Cham.; H. S. 694; B. P. ii. 1125.

In deep standing water, everywhere.

- Najas minor* All.; B. P. ii. 1125. *N. dichotoma* H. S. 694. *N. heteromorpha* H. S. 694.

In deep standing water, everywhere.

- \* *Najas foveolata* A. Br.; B. P. ii. 1125.

In deep standing water, general.

- \* *Najas graminea* Del.; B. P. ii. 1125. *N. seminuda* H. S. 694.

In deep standing water, everywhere.



Two other species, *Najas lacerata* Rendle and *Najas rigida* Griff. should be kept in view and looked for. The former is apparently plentiful in deep pools of standing water in the neighbouring district of Jessore. The latter was collected by Griffith at Serampore; it is a doubtful species, with fleshy rigid leaves, of which the original examples are not now to be found; if it be really a *Najas* it differs from all the known species in having alternate leaves.

### CXVIII.—ERIOCAULEÆ.

#### 606. Eriocaulon.

- \* *Eriocaulon Capillus-Naiadis* Hook. f.; B. P. ii. 1127. *E. setaceum*.  
H. S. 730 in part.  
Serampore, (*Griffith, Voigt*), in deep standing water.
- \* *Eriocaulon truncatum* Ham.; B. P. ii. 1127. *E. sexangulare* H. S. 730.  
Wet fields, west of the Hughli river.
- \* *Eriocaulon Sieboldianum* Sieb. & Zucc.; B. P. ii. 1127. *E. melaleucum* H. S. 731.  
Wet fields and marshy places, general.
- \* *Eriocaulon luzulifolium* Mart.; B. P. ii. 1127.  
Wet fields and marshy places, west of the Hughli river.
- \* *Eriocaulon quinqueangulare* Linn.; H. S. 730; B. P. ii. 1127.  
v. *Guri*.  
Wet fields and marshy places, everywhere.
- \* *Eriocaulon trilobum* Ham.; B. P. ii. 1127. *E. argenteum* H. S. 730.  
Wet fields and marshy places, west of the river Hughli.  
Voigt states (H. S. 731) that in addition to the five which he enumerates, seven other species were collected in the neighbourhood of Serampore by the native gardeners attached to the garden of which he had charge. The species of this genus therefore deserve to be carefully collected and examined. One of Voigt's seven doubtless was *E. luzulifolium*; what the others may have been it is impossible to conjecture.

### CXIX.—CYPERACEÆ.

#### 607. Scleria Berg.

- \* *Scleria biflora* Roxb.; B. P. ii. 1133. *S. tessellata* H. S. 728.  
Waste places, general.
- \* *Scleria lithosperma* Sw.; H. S. 728; B. P. ii. 1132.  
Waste places, west of the river Hughli.

608. *Kyllinga* Rottb.

- \* *Kyllinga monocephala* Rottb. ; H. S. 724 ; B. P. (*sphalmate* microcephala) ii. 1135.  
v. *Swet gothubi*.  
Waste places and fields, everywhere.
- \* *Kyllinga brevifolia* Rottb ; B. P. ii. 1135. *Cyperus dubius* H. S. 723 partly.  
Waste places, everywhere.
- \* *Kyllinga triceps* Rottb. ; H. S. 724 ; B. P. ii. 1135.  
Waste places, general.

609. *Pycereus* Beauv.

- \* *Pycereus sanguinolentus* Nees. ; B. P. ii. 1137. *Cyperus sanguinolentus* H. S. 721.  
Wet places, general.
- \* *Pycereus nitens* Nees ; B. P. ii. 1137. *Cyperus pulvinatus* H. S. 721.  
Wet places, everywhere.
- \* *Pycereus polystachyus* Beauv. ; B. P. ii. 1137.  
Wet places south of Calcutta ; Sundribuns.

610. *Juncellus* Clarke.

- \* *Juncellus inundatus* Clarke ; B. P. ii. 1138. *Cyperus inundatus* H. S. 721.  
v. *Pati*.  
Wet places chiefly east of river Hughli ; Sundribuns.
- \* *Juncellus pygmæus* Clarke ; B. P. ii. 1138. *Cyperus pygmæus* H. S. 721 partly.  
v. *Falmúti*.  
Damp places, everywhere.

611. *Cyperus* Linn.

- \* *Cyperus Cephalotes* Vahl ; B. P. ii. 1141. *Anosporum monocephalum* H. S. 725.  
v. *Gothubi, nirtroba*.  
Floating on tanks, rare in our area.
- \* *Cyperus cuspidatus* H. B. K. ; B. P. ii. 1141. *C. angustifolius* H. S. 722.  
In damp waste places, general.

**Cyperus castaneus** Willd. ; H. S. 722.

Reported by Voigt from Serampore ; this record needs confirmation and is not very probable ; the species is widespread in India, but is always rare and there are no specimens from Bengal in the Calcutta Herbarium. It is possible that the plant intended by Voigt is not true *C. castaneus* but the form of *C. cuspidatus* with chestnut-coloured fruits.

- \* **Cyperus flavidus** Retz ; B. P. ii. 1142.  
A weed of rice-fields, general.
- \* **Cyperus difformis** Linn. ; H. S. 723 ; B. P. ii. 1142.  
v. *Behua*.  
A weed of rice-fields, general.
- \* **Cyperus Haspan** Linn. ; B. P. ii. 1142.  
A weed of rice-fields in the western parts of the Hughli district.
- \* **Cyperus niveus** Retz ; H. S. 722 ; B. P. ii. 1142.  
A weed of fields, west of the Hughli river.
- \* **Cyperus compressus** Linn. ; H. S. 721 ; B. P. ii. 1143.  
v. *Chuncha*.  
A field weed, chiefly west of the river Hughli.
- \* **Cyperus aristatus** Rottb. ; H. S. 722 ; B. P. ii. 1143.  
A weed of fields and paths, general.
- \* **Cyperus Iria** Linn. ; H. S. 723 ; B. P. ii. 1143.  
v. *Bara chuncha*.  
A weed of rice-fields, general.
- \* **Cyperus pilosus** Vahl ; B. P. ii. 1143.  
A common weed.
- \* **Cyperus procerus** Rottb. ; B. P. ii. 1143.  
A sedge on banks of nals and rivers, general.
- \* **Cyperus distans** Linn. f. ; H. S. 723 ; B. P. ii. 1143.  
v. *Pani malanga*.  
A sedge on banks of ditches and rivers, chiefly east by the river Hughli.
- \* **Cyperus nutans** Vahl ; B. P. ii. 1144.  
A sedge of wet places, general.
- \* **Cyperus malaccen** Lamk ; B. P. ii. 1144. *Papyrus dehiscens* H. S. 724.  
v. *Chumati pati*.  
A tall sedge of river banks, everywhere.

- \* *Cyperus scariosus* R. Br.; B. P. ii. 1144. *C. pertenuis* H. S. 722.  
v. *Nagar motha*

A slender sedge of the Sundribuns, also reported by Voigt from Serampore.

- \* *Cyperus articulatus* Linn.; B. P. 1144. *C. articulatus* VAR. *niloticus* H. S. 722.

A sedge of river banks, general.

- \* *Cyperus tegetiformis* Roxb.; B. P. ii. 1144. *Papyrus tegetiformis* H. S. 724.

v. *Kuchkuchiya, gola methi, halaisa.*

A sedge of marshes and river banks, general. This species is sometimes termed *gola methi*, but that name is said by Voigt to be applicable only to the following.

- \* *Cyperus corymbosus* Rottb.; B. P. ii. 1144. *C. seminudus* H. S. 722.  
v. *Gola methi.*

A sedge of marshes and river banks, general.

- Cyperus tegetum* Roxb.; B. P. ii. 1144. *Papyrus Pangorei* H. S. 723.

v. *Madar ketai.*

Reported from Serampore by Voigt, but this record needs confirmation, the species is common both west and north of our area.

- \* *Cyperus rotundus* Linn.; B. P. ii. 1145. *C. hexastachyus* VAR. *communis* H. S. 722.

v. *Motha.*

A weed of fields and grassy places, everywhere.

- \* *Cyperus tuberosus* Rottb.; B. P. ii. 1145. *C. hexastachyus* VAR. *pendulus* H. S. 722.

A weed of fields and grassy places, general.

- \* *Cyperus radiatus* Vahl; B. P. ii. 1145. *C. verticillatus* H. S. 723.  
v. *Burethi.*

River banks and marshes, everywhere.

- \* *Cyperus exaltatus* Retz; H. S. 722; B. P. ii. 1145.

River banks and marshes, general.

- Cyperus digitatus* Roxb.; B. P. ii. 1145. *C. racemosus* H. S. 723.  
*C. venustus* H. S. 723.

Reported, in two states, from Serampore by Voigt, but the records require confirmation; the species is common in Eastern Bengal.

- Cyperus platyphyllus* R. & S. *C. Roxburghii* H. S. 723.

v. *Gol-melanga.*

Reported, with a vernacular name, from Serampore by Voigt, but the record is quite doubtful; the species is apparently confined to the Deccan and Ceylon.

#### 612. *Mariscus* Vahl.

- \* *Mariscus Drogeanus* Kunth; B. P. ii. 1146 *Cyperus dubius* H. S. 723 partly.  
About Calcutta (*Wallich*) and Serampore (*Voigt*), but very rare in our area, and not impossibly a casual.
- \* *Mariscus squarrosus* Clarke; B. P. ii. 1146.  
In wet places, general.
- \* *Mariscus panicens* Vahl; B. P. ii. 1147.  
In wet places, occasional.
- \* *Mariscus Sieberianus* Nees; B. P. ii. 1247. *M. cyperinus* H. S. 724<sup>a</sup>  
v. *Bara gothubi*.  
In wet places, everywhere.
- \* *Mariscus albescens* Gaud.; B. P. ii. 1147.  
v. *Halaiya*.  
Western Sundribuns, on muddy river banks.
- \* *Mariscus microcephalus* Presl; B. P. ii. 1147. *M. dilatatus* H. S. 724.  
In wet places, general.
- \* *Mariscus ferax* Clarke; B. P. ii. 1147.  
In wet places, east of Calcutta, rare.

#### 613. *Courtoisia* Nees.

- \* *Courtoisia cyperoides* Nees; H. S. 724; B. P. ii. 1147.  
Fields in Gohat, Western Hughli district.

#### 614. *Eleocharis* R. Br.

- \* *Eleocharis plantaginea* R. Br.; B. P. ii. 1148. *Limnochloa plantaginea* H. S. 727. *L. tumida* H. S. 727.  
v. *Chenchka*.  
In shallow ponds, general.
- \* *Eleocharis fistulosa* Schult.; B. P. ii. 1148. *Limnochloa acutangula* H. S. 728.  
In shallow ponds, general.
- \* *Eleocharis spiralis* R. Br.; B. P. ii. 1149.  
In standing water, Western Sundribuns.

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\* *Eleocharis capitata* R. Br.; B. P. ii. 1149. *Eleocharis capitatus* H. S. 727.

In shallow ponds, general.

\* *Eleocharis palustris* R. Br.; B. P. ii. 1149.

In shallow ponds, occasional.

**615. *Fimbristylis* Vahl.**

\* *Fimbristylis monostachya* Hassk.; B. P. ii. 1152. *Abildgaardia Rottbolliana* H. S. 725.

v. *Marmari*.

In damp ground, general.

\* *Fimbristylis acuminata* Vahl; B. P. ii. 1153.

In damp ground, occasional.

\* *Fimbristylis polytrichoides* Vahl; B. P. ii. 1153.

v. *Talnaru*.

Wet fields mostly south of Calcutta and in the Northern Sundribun clearings.

VAR.\* *halophila* Kurz; B. P. ii. 1153.

Wet open spaces in the Sundribuns, common.

\* *Fimbristylis schoenoides* Vahl; H. S. 725; B. P. ii. 1153.

v. *Kesari malanga*.

Wet places, general.

\* *Fimbristylis subbispicata* Nees & Meyer; B. P. ii. 1153.

Sundribun sea-face, in sand.

\* *Fimbristylis squarrosa* Vahl; B. P. ii. 1153.

In damp places, occasional.

\* *Fimbristylis dichotoma* Vahl; B. P. ii. 1153. *F. pallescens* H. S. 725.

In wet fields, everywhere.

\* *Fimbristylis diphylla* Vahl; B. P. ii. 1153. *F. Royeniana* H. S. 725.

v. *Bara nirbishi*.

In fields and waste places, everywhere.

\* *Fimbristylis aestivalis* Vahl; H. S. 725; B. P. ii. 1155.

In damp fields, everywhere.

\* *Fimbristylis ferruginea* Vahl; H. S. 725; B. P. ii. 1154.

In fields and waste places, everywhere.

\* *Fimbristylis argentea* Vahl; B. P. ii. 1154.

In fields, Goghat, Western Hughli district.

- \* *Fimbristylis tenera* Roem. & Schult. ; B. P. ii. 1154. *Trichelosty-  
lis tenella* H. S. 725.  
In damp places, general.
- \* *Fimbristylis globulosa* Kunth ; B. P. ii. 1154.  
In damp places, occasional.
- \* *Fimbristylis quinqueangularis* Kunth ; B. P. ii. 1154. *Trichelostylis  
quinqueangularis* H. S. 726.  
In wet fields, general.
- \* *Fimbristylis miliacea* Vahl ; B. P. ii. 1155. *Trichelostylis miliacea*  
H. S. 726. *T. tetragona* H. S. 726.  
v. *Bara javani*.  
In fields and waste places, everywhere.
- \* *Fimbristylis complanata* Link. ; B. P. ii. 1155. *Trichelostylis com-  
planata* H. S. 726.  
v. *Karatiya javani*.  
In damp places, everywhere.

#### 616. *Echinolytrum* Desv.

- \* *Echinolytrum dipsaceum* Desv. ; B. P. ii. 1155.  
In damp soil, general.

#### 617. *Bulbostylis* Kunth.

- \* *Bulbostylis barbata* Kunth. ; B. P. ii. 1156.  
In damp soil, general.

#### 618. *Lipocarpa* R. Br.

- \* *Lipocarpa argentea* R. Br. ; B. P. ii. 1157.  
In damp grassy places, occasional.

#### 619. *Fuirena* Rottb.

- \* *Fuirena glomerata* Lamk ; B. P. ii. 1158.  
v. *Band kola*.  
In grassy places, occasional.

#### 620. *Scirpus* Linn.

- \* *Scirpus Michelianus* Linn. ; B. P. ii. 1160. *Cyperus pygmaeus* H. S.  
721 partly.  
v. *Chhota gothubi*.  
In wet places, general.

In Voigt's *Hortus suburbanus* there is evidently a confusion under *Cyperus pygmæus* of this species and *Juncellus pygmæus*, while under *Cyperus dubius* which, by his citation as identical of the plants so named by Rottboell and Roxburgh respectively, includes *Kyllinga brevifolia* and *Mariscus Dregeanus* he gives, as the vernacular equivalent, the name usually associated with the present plant.

- \* *Scirpus squarrosus* Linn. ; B. P. ii. 1160. *Isolepis squarrosa* H. S. 726.  
v. *Guri, chancha marmari*.  
In wet places, general.
- \* *Scirpus grossus* Linn. f ; B. P. ii. 1160. *Hymenochaete grossa* H. S. 727.  
v. *Bara keshuria*.  
In wet places, west of the river Hughli.  
VAR.\* *Kysoor* Clarke ; B. P. ii. 1160. *Scirpus Kysoor* H. S. 727.  
v. *Késur*.  
In wet places, general.
- \* *Scirpus supinus* Linn. ; B. P. ii. 1160. *Isolepis supina* H. S. 726.  
In wet places, general.
- Scirpus Isolepis* Bœck. ; B. P. ii. 1160. *Isolepis setacea* H. S. 726, not of R. Br.  
Reported by Voigt from Serampore, the record is not improbable as the species has been collected in Lower Bengal by Griffith and is occasionally met with in Behar and Chota Nagpur.
- \* *Scirpus erectus* Poir. ; B. P. ii. 1160. *S. junciiformis* H. S. 727.  
In wet places, general.
- \* *Scirpus articulatus* Linn. ; B. P. ii. 1160. *Isolepis prolongata* H. S. 727. *I. articulata* H. S. 727. *I. incurvata* H. S. 727.  
v. *Pappati chickha*.  
In wet places, everywhere.
- \* *Scirpus mucronatus* Linn. ; B. P. ii. 1161.  
In wet places, general.
- \* *Scirpus maritimus* Linn. VAR. *affinis* Roth ; B. P. ii. 1161.  
Wet places, east of the river Hughli.
- \* *Scirpus triqueter* Linn. VAR. *segregata* Clarke ; B. P. ii. 1161.  
North-Western Sundribuns in swampy places.
- \* *Scirpus littoralis* Schrad. ; B. P. ii. 1161.  
Western Sundribuns.



## CXX.—GRAMINEÆ.

621. *Pennisetum* Pers.

*Pennisetum typhoideum* Rich.; B. P. ii. 1169. *Penicillaria spicata* H. S. 703.

v. *Bajra*.

Cultivated. The Kambu millet.

\* *Pennisetum setosum* Rich.; B. P. ii. 1169. *P. holcooides* H. S. 703.

v. *Shuti ghas*.

Collected at Serampore by Griffith, but not cited by Voigt as occurring there; possibly only a casual in our area as it has not been obtained again; it is common to the west of our districts.

*Pennisetum borbonicum* Kunth.; B. P. ii. 1169.

Collected about Serampore by Carey and about Shibpur by Kurz on the edges of fields, but probably an introduced grass only; native of Réunion.

622. *Setaria* Beauv.

*Setaria italica* Beauv.; B. P. ii. 1170. *Panicum italicum* H. S. 702. *P. macrochaetum* H. S. 702.

v. *Kangni, kangu*.

Cultivated. The Italian millet.

\* *Setaria glauca* Beauv.; B. P. ii. 1170. *Panicum helvolum* H. S. 702.

v. *Pingi natchi*.

In newly made pastures and dry fields, general.

\* *Setaria intermedia* R. & S.; B. P. ii. 1170.

v. *Dora-byara*.

In grassy glades, general, but never common.

\* *Setaria verticillata* Beauv.; B. P. ii. 1170. *Panicum verticillatum* H. S. 702. *P. tomentosum* H. S. 702.

v. *Dora-byara*.

In grassy glades, general.

This and the preceding species are apparently not distinguished from each other by the inhabitants of our area.

623. *Chamæraphis* R. Br.

\* *Chamæraphis spinescens* R. Br. VAR. *Brunoniana* Hook. f.; B. P. ii. 1171.

Floating on ponds, general.

- \* *Chamæraphis gracilis* Hook. f.; B. P. ii. 1171.  
Floating on ponds, 24-Pergunnahs, south-east of Calcutta.

624. *Isachne* R. Br.

- Isachne miliacea* Roth; B. P. ii. 1172. *Panicum patens* H. S. 700.

Reported from Serampore by Voigt but the record is doubtful; the grass occurs in North Bengal.

625. *Oplismenus* Beauv.

- \* *Oplismenus compositus* Beauv.; B. P. ii. 1173. *O. lanceolatus* H. S. 702.

Grassy glades, general.

- \* *Oplismenus Burmanni* Beauv.; H. S. 702; B. P. ii. 1173.

Grassy glades, general.

626. *Axonopus* Beauv.

- \* *Axonopus cimbicinus* Beauv.; B. P. ii. 1174. *Coridochloa cimbicina* H. S. 699.

Dry grassy places, in the western parts of the Hughli district.

627. *Panicum* Linn.

- \* *Panicum flavidum* Retz; H. S. 700; B. P. ii. 1176.

Waste places, roadsides, meadows, everywhere.

- \* *Panicum punctatum* Burm.; B. P. ii. 1177. *P. fluitans* H. S. 700.  
v. *Peti nar*.

Edges of ditches and wet places, everywhere.

- \* *Panicum Crus Galli* Linn.; B. P. ii. 1177. *P. Crus Corvi* H. S. 702.  
*P. hispidulum* H. S. 702.

v. *Bara shama*.

In waste damp places, occasional.

- VAR.\* *stagninum* Trin.; B. P. ii. 1177. *P. stagninum* H. S. 702.  
v. *Dal*.

In marshy places, general.

- VAR. *frumentaceum* Trin.; B. P. ii. 1177. *Oplismenus frumentaceus* H. S. 703.

v. *Damra shama*.

Cultivated.

- \* *Panicum colonum* Linn.; B. P. ii. 1177. *Oplismenus colonus* H. S. 703.

v. *Shama*.

In rich pasture land, general.

- \* **Panicum prostratum** Lamk; B. P. ii. 1177. *P. repens* H. S. 700.  
v. *Chhota jalganti*.

In cultivated land and gardens, general.

In the Flora of British India Roxburgh's *P. repens* is cited as equivalent to *P. villosum* and possibly Roxburgh included *P. villosum* and *P. prostratum* in one species. But that the *P. repens* which Roxburgh knew in the neighbourhood of Calcutta, which is also Voigt's *P. repens* and is the grass known locally as *chhota jalganti* is *P. prostratum*, and *P. prostratum* only, admits of no dispute.

- Panicum muticum** Forsk.; B. P. ii. 1177.  
v. *Nar dal*.

Sometimes cultivated as a fodder grass about Calcutta, but now quite general and well established in a wild state in ponds and ditches; native of Africa. Evidently introduced since 1845.

- \* **Panicum javanicum** Poir.; B. P. ii. 1177. *P. Helopus* H. S. 701.  
v. *Jalganti*.

Edges of cultivated fields, general.

- \* **Panicum setigerum** Retz.; H. S. 702; B. P. ii. 1178.  
v. *Bara jalganti*.

In glades and opener thickets and hedges, general.

- \* **Panicum distachyum** Linn.; B. P. ii. 1178.

Grassy glades and borders of cultivated ground, general.

- \* **Panicum Kurzii** Hook. f.; B. P. ii. 1178.  
Grassy glades, general.

- \* **Panicum Myurus** H. B. K.; B. P. ii. 1178. *P. serrulatum* H. S. 701.  
v. *Damsiria*.

In ponds and marshes, chiefly west of the Hughli.

- \* **Panicum interruptum** Willd; H. S. 700; B. P. ii. 1178.  
v. *Nardula*.

In ponds and marshes, chiefly south and east of Calcutta, but reported also from Serampore by Voigt.

- \* **Panicum myosuroides** R. Br.; B. P. ii. 1179. *P. curvatum* H. S. 700.

Margins of ponds and ditches, fairly general.

- \* **Panicum indicum** Linn.; B. P. ii, 1178.

In open grassy places, west of the river Hughli only.

- Panicum miliaecum** Linn.; H. S. 700; B. P. ii. 1179.  
v. *Cheena*.

Very sparingly cultivated in the Hughli district.

**Panicum miliare** Lamk.; H. S. 700; B. P. ii. 1179.

v. *Gendula*.

Very sparingly cultivated in the western parts of the Hughli district.

\* **Panicum psilopodium** Trim.; B. P. ii. 1179.

Open grassy places in the Goghat sub-division of the Hughli district.

\* **Panicum trypheron** Schult.; B. P. ii. 1179. *P. Roxburghii* H. S. 701.

v. *Jupi kanka*.

In dry fields, west of the river Hughli only.

\* **Panicum humile** Nees; B. P. ii. 1179.

v. *Jupi kanka*.

In dry fields, west of the river Hughli only. Appears not to be distinguished by the inhabitants from *P. trypheron*, of which it looks on casual observation much like a small form.

**Panicum maximum** Jacq.; B. P. ii. 1179. *P. jumentosum* H. S. 700. Guinea Grass. Cultivated occasionally about Calcutta.

\* **Panicum repens** Linn.; B. P. ii. 1179. *P. uliginosum* H. S. 700.

v. *Baranda*.

Borders of rice-fields, river banks and other wet places, everywhere.

\* **Panicum proliferum** Lamk.; B. P. ii. 1179. *P. paludosum* H. S. 700.

v. *Borati, kalas nar, dalakri ghas*.

Floating on ponds and ditches, everywhere.

**Panicum flavescens** Sw.; B. P. ii. 1180. *P. costatum* H. S. 701.

v. *Bans pati ghas*.

In open glades about Calcutta, very plentiful. Though now one of the commonest of grasses about Calcutta this species is not a native of India; it was originally introduced from Mauritius. The name given it by the inhabitants of our districts is that used elsewhere to indicate the allied but much larger species *P. plicatum*, which does not occur in our area.

\* **Panicum trigonum** Retz.; H. S. 700; B. P. ii. 1180.

About Serampore (*Voigt*) and also not uncommon about Shibpur. Though fairly frequent this grass is probably only an introduced one in our area for it has not been met with elsewhere in Bengal and has no vernacular name with us. It is common in the Deccan and occurs in Ceylon and Java.

628. *Digitaria* Lamk.

- \* *Digitaria sanguinalis* Scop. VAR. *ciliaris*; B. P. ii. 1181. *Panicum commutatum* H. S. 701.  
v. *Makar-juli*.  
In hedges and meadows, general.  
VAR.\* *extensa*; B. P. ii. 1181. *Panicum ægyptiacum* H. S. 701.  
*P. filiforme* H. S. 701.  
In hedges and meadows, general.  
VAR.\* *pruriens*; B. P. ii. 1181. *Panicum orthum* H. S. 701.  
In hedges and meadows, general.  
VAR.\* *debilis*; B. P. ii. 1181.  
Open grassy places, west of the river Hughli.  
VAR.\* *Rottleri* B. P. ii. 1181.  
Open grassy places, general.
- \* *Digitaria tenuiflora* Beauv.; B. P. ii. 1181. *Helopus longiflorus* H. S. 699. *H. filiculmis* H. S. 699.  
v. *Kanka-juriya*.  
In open grassy places, everywhere.
- \* *Digitaria puberula* Link. *D. Royleana* B. P. ii. 1182.  
In drier grassy places, general.
- \* *Digitaria pedicellaris* Prain; B. P. ii. 1182. *Urochloa panicoides* H. S. 701.  
v. *Chitri chiriya*.  
Dry fields, Goghat.

629. *Paspalum* Linn.

- \* *Paspalum serobiculatum* Linn.; B. P. ii. 1182. *P. stoloniferum* (n. 2) H. S. 699. *Helopus longifolius* H. S. 699.  
v. *Myna, kodu*.  
In damp places, everywhere.
- Paspalum conjugatum* Berg.; B. P. ii. 1182.  
In shady grassy places, general. Though now a common grass about Calcutta and Shibpur, this has all the appearance of being an introduced species: it was apparently unknown to Roxburgh and to Voigt: it probably came to India from tropical America.
- \* *Paspalum distichum* Linn.; B. P. ii. 1183.  
Sundribuns; banks of Hughli as far north as Calcutta.

630. *Eriochloa* H. B. K.

- \* *Eriochloa polystachya* H. B. K.; B. P. ii. 1183. *Helopus annulatus* H. S. 699.  
v. *Chiriya ghas*.  
In damp places, general.

**631. Oryza Linn.**

**Oryza sativa** Linn.; H. S. 711; B. P. ii. 1184.

v. *Dhan*. Rice.

Cultivated everywhere in several forms, some without awns, others with awns of varying length: native of various parts of India.

VAR. \* *fatua*; B. P. ii. 1184.

v. *Dhan*. Wild Rice.

Occasionally met with in the Sundribuns, but it is possible that the Sundribuns wild stock is only feral after escape and not truly wild. It is apparently always long-awned.

\* **Oryza coarctata** Roxb.; B. P. ii. 1184.

v. *Dhani, harakata*.

Western Sundribuns, common.

**632. Leersia Sw.**

\* **Leersia hexandra** Sw.; B. P. ii. 1185. *Hygrophiza ciliata* H. S. 710.

Floating on ponds and jhils, everywhere.

**633. Hygrophiza Nees.**

\* **Hygrophiza aristata** Nees; B. P. ii. 1185. *Potamocholea Retzii* H. S. 711.

v. *Jangli dal*.

Floating on ponds and jhils, general.

**634. Tragus Haller.**

\* **Tragus racemosus** Scop.; B. P. ii. 1186.

Goghat, Western Hughli, in dry fields.

**635. Perotis Ait.**

\* **Perotis latifolia** Ait.; H. S. 710; B. P. ii. 1186.

Dry fields, west of river Hughli, occasional.

**636. Zoysia Willd.**

\* **Zoysia pungens** Willd.; H. S. 709; B. P. ii. 1186.

Western Sundribuns, common, also reported by Voigt from Serampore. The latter record is not altogether impossible, but it is doubtful if the conditions in the neighbourhood favour the existence of the grass there now. It is particularly abundant in half-cultivated ground about Canning Town.

637. *Dimeria* R. Br.

*Dimeria ornithopoda* Trin.; B. P. ii. 1187. *Chrysopogon filiformis* H. S. 704. *Andropogon Roxburghianus* H. S. 707.

Fields near Calcutta (*Roxburgh*) and Serampore (*Voigt*); the records require confirmation; the species is common to the west of our area.

638. *Imperata* Cyrill.

\* *Imperata arundinacea* Cyrill.; B. P. ii. 1188. *I. cylindrica* H. S. 704.

v. *Ulu*.

Old stiff pasture land, everywhere.

639. *Saccharum* Linn.

\* *Saccharum spontaneum* Linn.; H. S. 705; B. P. ii. 1188. *S. semi-decumbens* H. S. 705. *S. canaliculatum* H. S. 705.

v. *Khasi, khuri, khakra*.

River banks, hedges, etc., general.

*Saccharum arundinaceum* Retz.; B. P. ii. 1189. *S. procerum* H. S. 705.

v. *Teng*.

Reported from Serampore by *Voigt*; the species is occasionally planted in our area but its record in a wild state needs confirmation; it is plentiful in North Bengal and East Bengal.

*Saccharum Sara* Roxb.; H. S. 705. *S. arundinaceum* VAR. *ciliaris* B. P. ii. 1189.

v. *Sara, Shâr*.

Occasionally cultivated in Hughli district, but not, I believe, wild in our area, though reported from Serampore by *Voigt*; it is common in the Upper Gangetic plain.

*Saccharum officinarum* Linn.; H. S. 705, B. P. ii. 1189. *S. sinense* H. S. 705.

v. *Akh, kushiar, gauna*. The pale forms are known as *Poori* and *kulloa*; the red as *kajuli*.

Cultivated generally; probably native of tropical Asia.

*Saccharum fuscum* Roxb.; H. S. 705; B. P. ii. 1189.

v. *Khuri, pati khuri*.

Reported from Serampore by *Voigt*; the record needs confirmation however: the species is common in Eastern Bengal.

*Voigt* gives the name *Kash* as limited to the erect rigid form of *S. spontaneum* and that of *khuri* to the semi-decumbent form of that species; he further indicates that the name for *S. fuscum* is *pati*

*khuri*. But apparently now-a-days the name *khasi* is applied to both the forms of *S. spontaneum*, and so far as I can ascertain the name *khuri*, without any qualifying epithet, is restricted to *S. fuscum*.

#### 640. *Pollinia* Trin.

\* *Pollinia argentea* Trin. ; B. P. ii. 1190. *Andropogon trispicatus* H. S. 707.

In new pasture land, occasional.

*Pollinia conjugata*. *Andropogon conjugatus* H. S. 707.

Serampore, according to Voigt.

This record is doubtful but deserves to be looked into. The grass in question, described by Roxburgh as *Andropogon conjugatus*, is stated by its author to be a native of Bengal, though no precise locality in Bengal is cited. He has left a coloured drawing of the species, but there is not now in Herb. Calcutta,—and the same is apparently true as regards Herb. Kew,—any specimen that agrees exactly with this figure which is clearly that of an species of *Pollinia*. Hackel suggests that the grass must be very closely allied to *P. fimbriata*, but it is clearly not that species as Hooker has shown, nor from the known distribution of *P. fimbriata* is it likely to be a form of it. There are examples of *P. articulata*, in Herb. Calcutta, that closely resemble in externals Roxburgh's figure of *Andropogon conjugatus*, but the awnless condition of the second glume of the sessile spikelets, as shown in Roxburgh's analysis, precludes the possibility of his species being referred to *P. articulata*, apart from the fact that *P. articulata*, though very common elsewhere in Bengal, does not seem to have ever been met with in our area. It is not impossible that *Andropogon conjugatus* may be a corresponding reduced state of *Pollinia argentea*, but so far no examples of that species, which was, moreover, well known to Roxburgh, have been communicated to Herb. Calcutta, bearing the necessary superficial resemblance to his drawing of *Andropogon conjugatus*.

#### 641. *Manisuris* Sw.

\* *Manisuris granularis* Linn. f. ; B. P. ii. 1191. *Peltophorus granularis* H. S. 709.

Rather rare in dry meadows west of the river Hughli; not recorded from our area by Voigt and perhaps only a casual with us.

#### 642. *Rottboëllia* Linn. f.

\* *Rottboëllia compressa* Linn. f. ; B. P. ii. 1192. *R. glabra* H. S. 709.

v. *Baksa*.



In pastures, general.

VAR. \* *fasciculata* Hack. *Hemarthria compressa* H. S. 708.

v. *Pani sharu*.

Edges of pools and ditches, general.

\* *Rottboëllia protensa* Hack. ; B. P. ii. 1192.

v. *Baksa*.

In pastures, general.

\* *Rottboëllia exaltata* Linn. f. ; H. S. 709 ; B. P. ii. 1192.

v. *Bara swati*.

Waste places and near pools, general.

#### 643. *Mnesithea* Kunth.

\* *Mnesithea laevis* Kunth ; B. P. ii. 1193. *Thyridostachyum perforatum* H. S. 708.

v. *Karki*.

Rich pastures, everywhere.

#### 644. *Apluda* Linn.

\* *Apluda varia* Hack. SUB.-SP. *mutica* Hack. ; B. P. ii. 1194. *A. geniculata* H. S. 708.

In hedges and on river banks, general.

SUB.-SP. \* *aristata* Hack. ; B. P. ii. 1194. *A. aristata* H. S. 708.

v. *Chun karki*.

In hedges and waste places, west of the river Hughli.

#### 645. *Ischæmum* Linn.

\* *Ischæmum aristatum* Linn. SUB.-SP. *imberbe* Hack. ; B. P. ii. 1196.

*I. aristatum* H. S. 708.

v. *Melencha*.

Waste places and hedges about Calcutta, general, but perhaps only introduced in our area.

\* *Ischæmum rugosum* Salisb. ; H. S. 703 ; B. P. ii. 1196.

v. *Moraro*.

Roadsides, waste places, hedges, everywhere.

*Ischæmum semisagittatum* Roxb. ; B. P. ii. 1196. *Spodiopogon semisagittatus* H. S. 706.

Near Calcutta (*Roxburgh*) and Serampore (*Voigt*); doubtless both records are correct but there are no specimens of the grass from our area in Herb. Calcutta. The species is widespread in the Deccan, but is probably only a casual in Lower Bengal.

**Ischæmum conjugatum** Roxb.; B. P. ii. 1196. *Spodiopogon conjugatus* H. S. 706.

Near Calcutta (*Roxburgh*) and Serampore (*Voigt*); again both records are doubtless correct but are worth while verifying as there is no Lower Bengal specimen in Herb. Calcutta. Like the preceding species this is a Deccan grass and is almost certainly only a casual in the Gangetic delta; in Ceylon whence it has also been recorded, Trimen thinks it is only naturalised.

\* **Ischæmum ciliare** Ret z; B. P. ii. 1196. *Spodiopogon geniculatus* H. S. 706.

Western Hughli district in dry waste places, rare.

#### 646. **Arthraxon** Beauv.

**Arthraxon microphyllus** Hochst.; B. P. ii. 1199.

Not uncommon in new pastures and in open grassy glades about Shibpur and Calcutta, but probably not indigenous in our area though plentiful in most parts of India, and possibly a recent introduction since it is not described by Roxburgh and is not recorded by Voigt.

#### 647. **Andropogon** Linn.

**Andropogon Schœnanthus** Linn.; B. P. ii. 1203. *A. Martini* H. S. 707.

v. *Agya ghas*, *Rusa ghas*.

Cultivated in native gardens; native of India.

**Andropogon nardus** Linn.; B. P. ii. 1203. *A. Schœnanthus* H. S. 706.

v. *Gandha bena*.

Cultivated in native gardens; native of India.

\* **Andropogon brevifolius** Sw.; B. P. ii. 1203.

Western Hughli district, rare.

\* **Andropogon pertusus** Willd.; H. S. 707; B. P. ii. 1204.

Western Hughli district, common.

\* **Andropogon intermedius** R. Br. VAR. **punctatus** Hook. f.; B. P. ii. 1204. *A. punctatus* H. S. 707.

v. *Gandha gurana*.

Banks of rivers and ponds, chiefly east of the river Hughli.

**Andropogon Sorghum** Brot.; B. P. ii. 1204. VAR. **vulgaris** Hack. *Sorghum vulgare* H. S. 704.

v. *Fuar*.

Cultivated; native of S. E. Asia,

VAR. *bicolor* Hack. *Sorghum bicolor* H. S. 704.

v. *Kala deodhan*.

Cultivated; native of India.

VAR. *Roxburghii* Hack. *Sorghum saccharatum* H. S. 704.

v. *Sada deodhan*.

Cultivated; native of India.

\* *Andropogon halepensis* Brot.; B. P. ii. 1204, *A. miliformis* H. S. 708.

v. *Kala mucha*.

Hedges, river banks and waste places, occasional; perhaps only a casual in our area.

\* *Andropogon squarrosus* Linn. f.; B. P. ii. 1204, *A. muricatus* H. S. 706.

v. *Bena, khas khas*.

In low moist ground, general; sometimes planted deliberately in our area, e.g. in cleanings in the North-Western Sundribuns.

\* *Andropogon aciculatus* Retz; B. P. ii. 1205. *Chrysopogon acicularis* H. S. 704.

v. *Chora kanta*.

In barren ground, everywhere.

*Andropogon contortus* Linn.; B. P. ii. 1205. *Heteropogon contortus* H. S. 706.

In newly laid down pastures about Calcutta, very rare. This species, though so common in most of the dry parts of India, is not recorded from our area by Voigt; the writer has only met with it on three or four occasions, always among the grasses that appear on plots of land that have been dug over and then left bare. It rarely persists for more than a couple of seasons and is undoubtedly only a casual in our area.

\* *Andropogon caricosus* Linn.; B. P. ii. 1205. *Lipeocercis serrata* H. S. 705. *Heteropogon tenellus* H. S. 706. *Andropogon binatus* H. S. 708.

v. *Detara, detta*.

In the drier parts of the Hughli district and also in sandy places in the North-Western Sundribuns about Canning Town, but always rare.

\* *Andropogon annulatus* Forsk.; B. P. ii. 1205.

*A. scandens* H. S. 707.

v. *Loari*.

In grassy glades and meadows, general but not common.  
 VAR. \* *Bladhii* Hook. f.; B. P. ii. 1206. *A. Bladhii* H. S. 707.  
 v. *Loari*.

In grassy glades and meadows, everywhere.

**648. Pseudanthistiria Hook. f.**

*Pseudanthistiria heteroclita* Hook. f.; B. P. ii. 1206. *Anthistiria heteroclita* H. S. 708.

Pastures about Calcutta, according to Roxburgh, also at Serampore, according to Voigt; the record is doubtless accurate, but it is worth confirming, because there are no examples of the grass from our area in Herb., Calcutta. The species is a native of the Concan and Canara and it is very probably only a casual in Lower Bengal.

**649. Anthistiria Linn.**

*Anthistiria ciliata* Linn. f.; B. P. ii. 1207. *A. scandens* H. S. 708.

Serampore, according to Voigt, quite possibly, but the record needs confirmation; the species is common immediately to the west of our area.

*Anthistiria gigantea* Cav. VAR. *arundinacea* Hack.; B. P. ii. 1207.  
*Andropogon arundinaceus* H. S. 706.

Serampore, according to Voigt; a record that needs confirmation; the species is common in North Bengal and in East Bengal, but if it formerly existed in our area it would now seem to have disappeared.

**650. Iseilema Hack.**

\* *Iseilema laxum* Hack.; B. P. ii. 1208.

Goghat, Western Hughli district in dry pastures.

**651. Zea Linn.**

*Zea Mays* Linn.; H. S. 709; B. P. ii. 1209.

v. *Makai*, *bhut*.

Cultivated; native of America.

**652. Polytoca R. Br.**

\* *Polytoca barbata* Stapf; B. P. ii. 1209. *Coix barbata* H. S. 710.

v. *Kanta gurgar*, *gurgar*.

Rice-fields and sides of ditches, general.

653. *Coix* Linn.

- \* *Coix Lachryma-Jobi* Linn.; B. P. ii. 1210. *Coix Lacrima* H. S. 709.

v. *Kanch gurgar, gurgar.*

Rice-fields and sides of ditches, general.

- Coix gigantea* Koenig; H. S. 710; B. P. ii. 1210.

v. *Dangagurgar.*

Reported from Serampore by Voigt; the record needs confirmation: the species is common in Chota Nagpur.

- \* *Coix aquatica* Roxb.; H. S. 710; B. P. ii. 1210.

v. *Jáb-gurgar.*

Floating in wet marshes and ponds, general.

654. *Aristida* Linn.

- \* *Aristida Adscensionis* Linn.; B. P. ii. 1211.

Goghat, in dry pastures.

655. *Polypogon* Desf.

- \* *Polypogon monspeliensis* H. S. 710; B. P. ii. 1212.

Goghat, sandy river beds; not recorded from our area previously.

656. *Sporobolus* R. Br.

- \* *Sporobolus diander* Beauv.; H. S. 711; B. P. ii. 1213.

v. *Bena joni.*

In moist pasture land, general.

- \* *Sporobolus tremulus* Kunth; B. P. ii. 1213. *S. tenacissimus* H.

S. 711.

v. *Pani durba.*

In moist pasture land, everywhere.

657. *Arundinella* Raddi.

- \* *Arundinella Wallichii* Nees; B. P. ii. 1216. *Oplismenus strictus* H. S. 703.

v. *Ganga bena.*

Goghat, Western Hughli district, in dry grassy places.

658. *Arundo* Linn.

- Arundo Donax* Linn.; B. P. ii. 1218. *Donax arundinaceus* VAR. *versicolor* H. S. 713. *Amphidonax bengalensis* H. S. 714. *A. bifaria* H. S. 714.

v. *Gaba nal, Unal.* Gardeners' garters.

M

In ditches in the vicinity of Calcutta chiefly.

The form of this grass with variagated leaves, rather a favourite plant in gardens about Calcutta, is an introduction from Europe and is a form of the European variety of this species. Voigt gives two Indian forms as occurring in our area; the first is the *Gabana* (*Arundo bengalensis*) which is the Bengal form of the European *Arundo Donax*; the second which Voigt terms *Unal* is the form of *Arundo Donax* characteristic of the Circar Mountains (Eastern Ghats), Roxburgh's *A. bifaria*. It is doubtful if the latter be really indigenous in our area. The difference between the two grasses is chiefly in habit, the inflorescence in *A. bengalensis* being more lax, in *A. bifaria* more compact; the distinction between the two is much like the distinction between the Teng (*Saccharum arundinaceum*) and the Shur (*Saccharum Sara*), but is less pronounced.

#### 659. *Phragmites* Trin.

- \* *Phragmites* Karka Trin.; B. P. ii. 1209. *Amphidonax* Karka H. S. 714.  
v. *Nal, durma*.  
Ditches and river banks, general.

#### 660. *Eragrostis* Beauv.

- \* *Eragrostis coarctata* Stapf; B. P. ii. 1221.  
Gohat, Western Hughli district, in poor dry soil.  
*Eragrostis aspera* Nees. *Poa paniculata* H. S. 716.  
Reported from Serampore by Voigt, but the record is most improbable, as the species is confined, so far as is known, to Southern and Western India. Probably some other species is intended but there is no clue as to which.
- \* *Eragrostis tenella* R. & S. VAR. *plumosa* Stapf; B. P. ii. 1221.  
*Poa plumosa* H. S. 715.  
Grassy places and roadsides everywhere.  
VAR. \* *viscosa* Stapf; B. P. ii. 1222. *Poa viscosa* H. S. 715.  
Dry grassy places, general.  
VAR. \* *breviculmis* Stapf; B. P. ii. 1222.  
Dry grassy places, occasional.
- Eragrostis interrupta* Beauv. VAR. *Koenigii* Stapf; B. P. ii. 1222.  
*Poa nutans* H. S. 715.  
In moist fields, everywhere.  
VAR. \* *diarrhena* Stapf; B. P. ii. 1222; *Poa diarrhena* H. S. 715.  
In moist fields, general.

- VAR. *tenuissima* Staef ; B. P. ii. 1222. *Poa tenella* H. S. 716.  
In pasture land, general.
- \* *Eragrostis amabilis* W. & A. ; B. P. ii. 1222. *Poa unioloides* H. S. 716.  
v. *Koni*.  
Dry grassy places, general.
- \* *Eragrostis gangetica* Steud. ; B. P. ii. 1222. *Poa gangetica* H. S. 716.  
River banks and moist pastures, general.
- \* *Eragrostis stenophylla* Hochst. ; B. P. ii. 1222. *Poa elegantula* H. S. 715.  
Moisture pastures, general.
- \* *Eragrostis major* Host ; B. P. ii. 1223. *Poa Roxburghiana* H. S. 716.  
Dry banks, old walls and waste ground ; west of the river Hughli.
- \* *Eragrostis minor* Host ; B. P. ii. 1223.  
Waste places, occasional.
- \* *Eragrostis tremula* Hochst. ; B. P. ii. 1223. *Poa multiflora* H. S. 716.  
Goghat, in Western Hughli district ; also at Sérampore according to Voigt.
- \* *Eragrostis pilosa* Beauv. ; B. P. ii. 1223. *Poa punctata* H. S. 716.  
v. *Tanajiniya*.  
In grassy places, chiefly west of the river Hughli.
- \* *Eragrostis cynosuroides* Beauv. ; B. P. ii. 1223. *Poa cynosuroides* H. S. 716.  
v. *Kusha*.  
In dry grassy places, general.

#### 661. *Myriostachya* Hook. f.

- \* *Myriostachya Wightiana* Hook. f. ; B. P. ii. 1224.  
v. *Nalai*.  
Western Sundribuns, on margins of creeks.

#### 662. *Diplachne* Beauv.

*Diplachne fusca* Beauv. ; B. P. ii. 1225.

In swampy fields to the south-east of Calcutta and in the cleanings of the North-Western Sundribuns, occasional ; almost certainly only a casual in our area, though a common grass in *usar* lands in the Upper Gangetic Plain.

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**663. Leptochloa Beauv.**

- \* *Leptochloa filiformis* R. & S.; B. P. ii. 1225. *Cynodon filiformis* H. S. 712.  
v. *Chhota pini nati*.  
Moist grassy places, general.
- \* *Leptochloa chinensis* Nees; B. P. ii. 1225. *Poa chinensis* H. S. 716.  
v. *Bara pini nati*.  
Moist grassy places, general.

**664. Microchloa R. Br.**

- \* *Microchloa setacea* R. Br.; H. S. 712; B. P. ii. 1226.  
Dry banks and old walls, rare.

**665. Cynodon Pers.**

- \* *Cynodon dactylon* Pers.; H. S. 712; B. P. ii. 1227.  
v. *Dúbh, Durba*.  
Roadsides and dry grass lands, general.

**666. Chloris Sw.**

- \* *Chloris virgata* Sw.; B. P. ii. 1228.  
Goghat, Western Hughli district, in dry grassy places.
- \* *Chloris barbata* Sw.; H. S. 711; B. P. ii. 1228.  
In waste grassy places, everywhere.

**667. Eleusine Gærtn.**

- \* *Eleusine indica* Gærtn.; H. S. 713; B. P. ii. 1229.  
v. *Mal ankura*.  
In fields and waste places, everywhere.
- Eleusine Coracana* Gærtn.; H. S. 712; B. P. ii. 1229.  
v. *Marua*.  
Cultivated; a native of India.
- \* *Eleusine ægyptiaca* Desf.; B. P. ii. 1230. *Dactyloctenium ægyptiacum* H. S. 712.  
v. *Makra, makar juli*.  
Waste places, roadsides, fields, everywhere.

**668. Triticum Linn.**

- Triticum vulgare* Linn.; H. S. 715; B. P. ii. 1231.  
v. *Gelum*. Wheat.  
Very occasionally sown in our area.



669. *Hordeum* Linn.

*Hordeum vulgare* Linn.; B. P. ii. 1231. *H. hexastichon* H. S. 714.  
v. *Fao, jab, javo*. Barley.  
Very occasionally sown in our area.

670. *Bambusa* Linn.

*Bambusa nana* Roxb.; H. S. 719; B. P. ii. 1232.  
v. *Chhota bans*.  
Cultivated as a hedge plant; native of China.

*Bambusa Tulda* Roxb.; B. P. ii. 1232. *Dendrocalamus Tulda* H.  
S. 718.  
v. *Tulda bans, matela bans, piah bans*.  
Cultivated; native of Eastern India.

*Bambusa Balcooa* Roxb.; B. P. ii. 1233. *Dendrocalamus Balcooa*  
H. S. 718.  
v. *Balku bans, dhuli bans, palu bans*.  
Cultivated; native of Eastern India.

*Bambusa vulgaris* Schrad.; B. P. ii. 1233. *Dendrocalamus Tulda*  
VAR.  $\gamma$ . H. S. 718.  
v. *Bashini bans*.  
Cultivated; native of Malaya.

*Bambusa arundinacea* Willd.; H. S. 719; B. P. ii. 1233. *B. spinosa*  
H. S. 719.  
v. *Bans, Behar bans*.  
Cultivated; native of the Circars and Orissa.

## CRYPTOGAMIA.

## PTERIDOPHYTA.

## CXXI.—POLYPODIACEÆ.

671. *Davallia* Sm.

*Davallia multiflora* Roxb.; B. P. ii. 1241. *D. parallela* H. S. 735  
Serampore, according to Voigt, but an improbable record; the  
species is to be found in Chota Nagpur but is not at all likely to  
occur in our area.

672. *Adiantum* Linn.

*Adiantum lunulatum* Burm.; H. S. 735; B. P. ii. 1243.  
v. *Kali jhamp, kali jhant*.  
Old walls, throughout our area, everywhere.

\* *Adiantum caudatum* Linn.; H. S. 735; B. P. ii. 1243.

On old walls about Calcutta, Chandernagore, Shibpur and elsewhere, rare.

This species is not cited by Voigt as occurring in our area and is recorded by Roxburgh as having been introduced to the Calcutta garden by H. T. Colebrooke. There is a manuscript note in Herb., Calcutta, by Kurz, to the effect that though it had been collected near Shibpur by Mr. John Scott, Kurz had never met with it himself. Besides Scott's Shibpur record, however, the writer is able to add one or two from Calcutta and one from Chandernagore. There is, however, little doubt that the species should be considered in our area only an introduced or at most a casual species.

#### 673. *Pteris* Linn.

\* *Pteris longifolia* Linn.; B. P. ii. 1245. *P. amplexans* H. S. 735.  
Waste places, general.

*Pteris cretica* Linn.; B. P. ii. 1245.

Cultivated and sometimes in abandoned gardens as if wild,

#### 674. *Ceratopteris* Brogn.

\* *Ceratopteris thalictroides* Brogn.; H. S. 736; B. P. ii. 1246.  
v. *Jangli jhao*.

In wet places and marshes, general.

#### 675. *Nephrodium* Rich.

\* *Nephrodium unitum* Sieb.; B. P. ii. 1252. *Aspidium unitum*  
H. S. 734.

v. *Panka krul*.

In swampy ground, general.

\* *Nephrodium aridum* Bak.; B. P. ii. 1253. *Polypodium semisagittatum* H. S. 734.

Western Sundribuns.

\* *Nephrodium molle* Desv.; B. P. ii. 1253.

Waste places, occasional.

#### 676. *Nephrolepis* Schott.

*Nephrolepis cordifolia* Presl.; B. P. ii. 1255. *Aspidium flagelliferum* H. S. 734.

Waste places, west of the river Hughli, occasional; possibly in our area only an escape.

**677. Polypodium Lina.**

- \* **Polypodium proliferum** Roxb. ; H. S. 734 ; B. P. ii. 1257.  
v. *Dapu*.  
Grassy moist places and sides of ditches, general.
- \* **Polypodium adnascens** Sw. ; B. P. ii. 1257. *P. pertusum* H. S. 734.  
On trees in the Western Sundribun forests.
- \* **Polypodium irioides** Lamk ; B. P. ii. 1258. *P. glabrum* H. S. 734.  
v. *Chittea bora*.  
On trees in village-shrubberies, general.
- \* **Polypodium quercifolium** Linn. ; H. S. 734 ; B. P. ii. 1258.  
v. *Gurúr*.  
On trees in village-shrubberies, general.

**678. Vittaria Sw.**

- \* **Vittaria elongata** Sw. ; B. P. ii. 1259. *Pteris angustifolia* H. S. 735.  
On trees in the Sundribuns.

**679. Drymoglossum Presl.**

**Drymoglossum piloselloides** Presl ; B. P. ii. 1259. *Notholaena piloselloides* H. S. 734.

Serampore, according to Voigt ; the record is not impossible as the species is not uncommon on trees in the forests of the *Eastern* Sundribuns. It has not, however, been collected in the Western Sundribuns nor, since Voigt's day, has it been recorded from elsewhere in our area.

**680. Hemionitis Linn.**

- \* **Hemionitis arifolia** Bedd. ; B. P. ii. 1259. *H. cordifolia* H. S. 734.  
v. *Chakuliya*.  
In shady groves, not uncommon.

**681. Acrostichum Linn.**

- \* **Acrostichum palustre** Bedd. ; B. P. ii. 1260. *Lomaria scandens* H. S. 735.  
North-Western Sundribuns, and marshy places south-east of Calcutta, climbing on trees.
- \* **Acrostichum aureum** Linn. ; B. P. ii. 1261. *A. emarginatum* H. S. 734.

In tidal marshes south-west of Calcutta and throughout the Western Sundribuns.

### CXXII.—SCHIZACEÆ.

#### 682. *Lygodium* Sw.

*Lygodium flexuosum* Sw.; H. S. 737; B. P. ii. 1262.

v. *Bhut-raj*.

Recorded from Serampore by Voigt; the record is quite probable as the species is common to the west of our area.

\* *Lygodium japonicum* Sw.; B. P. ii. 1262. *Ophioglossum filiforme* H. S. 737.

Hedges and thickets, general.

### CXXIII.—OPHIOGLOSSACEÆ.

#### 683. *Ophioglossum* Linn.

\* *Ophioglossum reticulatum* Linn.; H. S. 737; B. P. ii. 1264.

v. *Ektir*.

In grassy glades, general but never common.

#### 684. *Helminthostachys* Kaulf.

\* *Helminthostachys zeylanica* Hook.; B. P. ii. 1264. *H. laciniata* H. S. 737.

v. *Ekbir*.

In shady places, general.

### RHIZOCARPEÆ.

### CXXIV.—SALVINIACEÆ.

#### 685. *Salvinia* Schub.

\* *Salvinia cucullata* Roxb.; H. S. 740; B. P. ii. 1265.

v. *Indur kana pana*, *Indurni pana*.

Floating on ponds, general.

*S. natans* Hoffm. (*Ulki pana* or *Juga pana*) should also be looked for, though it has not yet been definitely recorded from our area.

#### 686. *Azolla* Lamk.

\* *Azolla pinnata* R. Br.; B. P. ii. 1266. *Salvinia imbricata* H. S. 740.

v. *Pana*.

Rice swamps and ponds, everywhere.

## CXXV.—MARSILEACEÆ.

687. *Marsilea* Linn.

- \* *Marsilea quadrifollata* Linn.; H. S. 739; B. P. ii. 1266.  
v. *Susni shak*.

Edges of ponds and ditches, everywhere.

- \* *Marsilea minuta* Linn.; B. P. ii. 1266.

Edges of ponds and ditches, general.

## CXXVI.—ISOËTACEÆ.

688. *Isoetes* Linn.

- \* *Isoetes coromandelliana* Linn. *I. capsularis* H. S. 738.

Serampore, *Griffith, Voigt*.

The specimens collected at Serampore by Griffith have been found by Mr. Baker to belong to *I. coromandelliana*.

## CXXVII.—LYCOPODIACEÆ.

689. *Lycopodium* Linn.

- \* *Lycopodium Phlegmaria* Linn.; H. S. 738; B. P. ii. 1269.  
v. *Sitahar*.

On trees in the Sundribuns, also reported by Voigt from Serampore, but the latter record requires confirmation.

## CXXVIII.—SELAGINELLACEÆ.

690. *Selaginella* Spring.

- \* *Selaginella proniflora* Bak.; B. P. ii. 1270. *Lycopodium imbricatum* H. S. 738.  
v. *Hatajhera*.

On damp paths, general.

*Selaginella tenera* Spring.

Cultivated and at times also sub-spontaneous in damp shady places near P. suburban gardens, about Chandernagore and Shibpur.

## BRYOPHYTA.

## CXXIX.—FISSIDENTACEÆ.

691. *Fissidens* Hedw.

- \* *Fissidens bengalensis* Hampe. *F. bryoides* H. S. 741.  
Heavy soil, general.

**CXXX.—CALYMPERACEÆ.****692. Calymperes Sw.****\* Calymperes tenerum C. Muell.**

On tree trunks, general.

**CXXXI.—POTTIACEÆ.****693. Barbula Hedw.****\* Barbula orientalis Willd. *B. indica* H. S. 741.**

On damp soil, general.

**\* Barbula gangetica C. Muell.**

On damp soil, occasional.

**694. Splachnobryum C. Muell.****\* Splachnobryum indicum C. Muell.**

On old walls, especially on the lime courses between the bricks, everywhere.

**CXXXII.—FUNARIACEÆ.****695. Physcomitrium Fuern.****\* Physcomitrium cyathocarpum Mitten.**

Damp soil, general.

**CXXXIII.—MARCHANTIACEÆ.****696. Cyathodium Kunze.****\* Cyathodium albonitens Schiffn.**

On damp soil in gardens, general.

**697. Athalamia Falc.****\* Athalamia pinguis Falc.**

On damp soil.

**ALGÆ.****CXXXIV.—ZYGNEFACEÆ.****698. Spirogyra Link.****\* Spirogyra elongata Kg.**

In rice-fields, general.

**\* Spirogyra nitida Lk.**

Howrah district.

- \* *Spirogyra Heeriana* Nagell,  
Calcutta.

## CXXXV.—MESOCARPACEÆ.

699. *Mougeotia* Wittr.

- \* *Mougeotia affinis* Kg.  
Matla, in brackish water.

## CXXXVI.—PROTOCOCCACEÆ.

700. *Stomatochytrium* Cunningh.

- \* *Stomatochytrium Limnanthemum* Cunningh.  
Endophytic in leaves of *Limnanthemum indicum*.

701. *Protococcus* Ag.

- \* *Protococcus cohærens* Kg.  
Damp walls.

## CXXXVII.—ULVACEÆ.

702. *Enteromorpha* Harv.

- \* *Enteromorpha intestinalis* Lk.  
Salt-lakes near Calcutta.

## CXXXVIII.—ULOTHRICACEÆ.

703. *Ulothrix* Kg.

- \* *Ulothrix pectinalis* Kg.  
Ponds and marshes, Howrah district.

704. *Conferva* Lagerb.

- \* *Conferva bombycina* Wille.  
River Hughli near Kidderpore; Botanic Garden, Shibpur, in ponds (VAR.  $\beta$ . *crassior* Mart).  
\* *Conferva antillarum* Kg.  
Salt-lakes, Calcutta.

## CXXXIX.—CHÆTOPHORACEÆ.

705. *Chætophora* Schrank.

- \* *Chætophora chlorotica* Kg.  
Salt-lakes, near Calcutta.

## CXL.—MYCOIDEACEÆ.

706. *Mycoidea* Cunningh.\* *Mycoidea parasitica* Cunningh.Parasitic on leaves of *Citrus*, *Michelia*, *Orchidaceæ*, etc.

## CXLI.—ÆDOGONIACEÆ.

707. *Ædogonium* Link.\* *Ædogonium scutatum* Kg.

Ponds, Howrah district.

## CXLII.—CLADOPHORACEÆ.

708. *Rhizoclonium* Kg.\* *Rhizoclonium antillarum* Kg.

Matla, in brackish water.

709. *Cladophora* Kg.\* *Cladophora bengalensis* Mart.

Barrackpore.

\* *Cladophora Rottleri* Kg.

Howrah.

\* *Cladophora simpliciuscula* Kg.

Kidderpore, on walls submerged at high tide.

## CXLIII.—CHARACEÆ.

710. *Nitella* Ag.\* *Nitella oligospira* A. Br.

Ponds, general.

\* *Nitella hyalina* Ag.

Ponds, everywhere.

\* *Nitella Roxburghii* A. Br.

Ponds, general.

711. *Chara* Linn.\* *Chara flaccida* A. Br.

Ponds, everywhere.

\* *Chara zeylanica* Willd.

Marshes at Matla.

\* *Chara foetida* A. Br.

Ponds, general.



- \* *Chara verticillata* Roxb.  
Ponds, general.

**CXLIV.—ENCÆLIACEÆ.**

**712. *Encœlium*, Kg.**

- \* *Encœlium vesicatum* Kg.  
Banks of canal near Salt-lakes, Calcutta.

**CXLV.—COMPSOPOGONACEÆ.**

**713. *Compsopogon* Montagne.**

- \* *Compsopogon Hookeri* Montagne.  
Canal banks near Calcutta salt-lakes ; marshes at Matla.

**CXLVI.—RHODOPHYLLIDACEÆ.**

**714. *Catanella* Grev.**

- \* *Catanella Opuntia* Grev.  
Salt-lakes near Calcutta ; banks of river Hughli.

**CXLVII.—DELESSERIACEÆ.**

**715. *Caloglossa* J Ag.**

- \* *Caloglossa Leprieurii* J. Ag.  
Salt-lakes near Calcutta ; Kidderpore on walls covered at high tide.

**716. *Delesseria* Lamouroux.**

- \* *Delesseria bengalensis* Martens (sub *Hypoglossum*).  
Matla, in tidal pools.

- \* *Delesseria pygmæa* Martens (sub *Hypoglossum*).  
Salt-lakes, Calcutta ; Baliaghat Canal.

**CXLVIII.—RHODOMELACEÆ.**

**717. *Polysiphonia* Grev.**

- \* *Polysiphonia rufo-lanosa* Harv.  
Submerged branches in river Hughli.
- \* *Polysiphonia angustissima* Kg.  
Salt-lakes, Calcutta.
- \* *Polysiphonia polychroma* Mart.  
Salt-lakes, Calcutta.

718. *Bostrychia Montagne.*

- \* *Bostrychia rivularis* Harv.  
Salt-lakes, near Calcutta.

CXLIX.—*CERAMIACEÆ.*719. *Hormoceras* Kg.

- \* *Hormoceras flaccidum* Ag.  
Salt-lakes, near Calcutta.

CL.—*CHROOCOCCACEÆ.*720. *Gloëocapsa* Kg.

- \* *Gloëocapsa Kurziana* Mart.  
Botanic Garden, Shibpur.
- \* *Gloëocapsa rupestris* Kg.  
On submerged branches, river Hughli.

721. *Microcystis* Kg.

- \* *Microcystis æruginosa* Kg.  
Tanks at Shibpur.

CLI.—*OSCILLATORIACEÆ.*722. *Oscillatoria* Vauch.

- \* *Oscillatoria amphibia* Ag.  
On masonry steps of ghats both below and above the water line.
- \* *Oscillatoria autliaria* Mart.  
Muddy river banks.
- \* *Oscillatoria Cortiana* Menengh.  
In tanks.
- \* *Oscillatoria Froelichii* Kg.  
Floating in ponds.
- \* *Oscillatoria Grateloupii* Bory.  
Wet rice-fields.
- \* *Oscillatoria interrupta* Mart.  
Mud of dried up ponds.
- \* *Oscillatoria Juliana* Menengh.  
Sealdah, in drains.

\* *Oscillatoria Kurziana* Mart.

Botanic Garden, Shibpur, in water in flowerpots.

\* *Oscillatoria limnosa* Ag.

In tanks.

\* *Oscillatoria tenerrima* Kg.

Salt-lakes, Calcutta.

\* *Oscillatoria tenuis* Lyngb.

In ponds.

\* *Oscillatoria versicolor* Mart.

Salt-lakes.

723. *Spirulina* Turp.\* *Spirulina oscillarioides* Turp.

Salt-lakes, Calcutta.

724. *Phormidium* Kg.\* *Phormidium oryzetorum* Mart.

Rice-fields; the commonest Alga in Lower Bengal.

\* *Phormidium Lyngbyaceum* Kg.

Salt-lakes, Calcutta.

725. *Lyngbya* C. A. Ag.\* *Lyngbya crispa* Kg.

Salt-lakes, Calcutta.

\* *Lyngbya circinnata* Kg.

Swamps and ponds, general.

\* *Lyngbya cinerascens* Kg.

Salt-lakes, Calcutta.

\* *Lyngbya solitaria* Kg.

Ponds, general.

726. *Leibleinia* Endl.\* *Leibleinia Juliana* Kg.

Salt-lakes, Calcutta.

727. *Hypheothrix* Kg.\* *Hypheothrix tenax* Mart.

Salt-lakes, Calcutta.

**728. Hydrocoleum Kg.**

- \* **Hydrocoleum Kurzii** Mart.  
Muddy banks of canals, also salt-lakes.
- \* **Hydrocoleum Lenormandi** Mart.  
Salt-lakes, Calcutta.

**729. Microcoleus Desmaz.**

- \* **Microcoleus salinus** (Kg.).  
Kidderpore near Calcutta.
- \* **Microcoleus Lyngbyei** Kg.  
Calcutta, salt-lakes.

**730. Leptothrix Kg.**

- \* **Leptothrix subtilissima** Kg.  
Damp walls, general.
- \* **Leptothrix mamillosa** Menengh.  
Salt-lakes, Calcutta.

**731. Dictyonema Ag.**

- \* **Dictyonema fuscescens** Mart.  
Stagnant pools, about Calcutta.

**CLII.—NOSTOCACEÆ.****732. Nostoc Vauch.**

- \* **Nostoc gregarium** Thuret.  
Submerged in ponds.

**733. Anabæna Bory.**

- \* **Anabæna mollis** Kg.  
Muddy edges of ponds, also in water.

**734. Cylindrospermum Kg.**

- \* **Cylindrospermum spirale** Kg.  
Floating in ponds.

**735. Hormosiphon Kg.**

- \* **Hormosiphon coriaceus** Kg.  
Banks of the river Hughli at Botanic Garden, Shibpur.

## CLIII.—SCYTONEMATACEÆ.

736. *Scytonema* J. A. Ag.

- \* *Scytonema ærugineo-cinereum* Kg.  
Walls about Calcutta, common.
- \* *Scytonema aureum* Meneng.  
Mud-banks of Hughli river.
- \* *Scytonema granulatum* Mart.  
Salt-lakes, Calcutta.
- \* *Scytonema palmarum* Mart.  
Within sheaths of palms, Botanic Garden.
- \* *Scytonema tomentosum* Kg.  
Botanic Garden, Shibpur.
- \* *Scytonema Veillardii* Mart.  
On walls, general.

## CLIV.—STIGONEMATACEÆ.

737. *Fischeria* Kg.

- \* *Fischeria tenuis* Mart.  
Damp walls with northern exposure.

## CLV.—RIVULARIACEÆ.

738. *Mastichonema* Schwabe.

- \* *Mastichonema granulatum* Mart.  
Stems of grasses in ponds and ditches.
- \* *Mastichonema cæspitosum* Kg.  
Stems of *Sesbania* in ponds and ditches.

739. *Rivularia* C. A. Ag.

- \* *Rivularia Lens* Meneng.  
In tanks, on *Vallisneria* leaves.

## CLVI.—BACILLARIACEÆ.

740. *Navicula* Bory.

- \* *Navicula velox* Kg.  
Matla in marshes.
- \* *Navicula cryptocephala* Kg.  
Botanic Garden, Calcutta.

741. *Nitzschia* Hassal.

- \* *Nitzschia dissipata* Grun.  
Matla, in marshes.

742. *Gloeotila* Kg.

- \* *Gloeotila concatenata* Kg.  
Tanks and pools about Shibpur.

## LICHENES.

743. *Pyrgidium* Nyl.

- \* *Pyrgidium bengalense* Nyl.  
Botanic Gardens, on an old *Ravenala madascariensis*, only once met with.

744. *Ramalina* Fries.

- \* *Ramalina angulosa* Laus.  
Botanic Garden, Shibpur.
- \* *Ramalina calicaris* Ach.  
On trees, general.

745. *Parmelia* Fries.

- \* *Parmelia perlata* Ach.  
Trees, general; especially on mangoes.

746. *Physcia* DC.

- \* *Physcia pieta* Sw.  
Trees, everywhere.

747. *Pyxine* Fries.

- \* *Pyxine Cocaes* Nyl.  
On trees, general, especially on palms.
- \* *Pyxine Meissneri* Tuck.  
On trees, general.

748. *Lecanora* Ach.

- \* *Lecanora aurantiaca* Lightf.  
General.
- \* *Lecanora Encephalarti* Nyl.  
Botanic Garden, Shibpur, on *Encephalartes* only.

- \* **Lecanora colubrina** Ach.  
Botanic Garden, Shibpur.
- \* **Lecanora subfusca** VAR. **distans** Ach.  
General.
- \* **Lecanora sarcopis** VAR. **subeffusa** Nyl.  
Botanic Garden, Shibpur.
- \* **Lecanora granifera** Ach.  
Botanic Garden, Shibpur.

#### 749. **Gyrostomum** Fries.

- \* **Gyrostomum scyphuliferum** Ach.  
Botanic Garden, Shibpur.

#### 750. **Lecidea** Fries.

- \* **Lecidea carneo-lutea** Turn.  
Botanic Garden, Shibpur.
- \* **Lecidea medialis** Tuck.  
Botanic Garden, Shibpur, on *Cycas Rumphii*.
- \* **Lecidea propinquella** Nyl.  
Botanic Garden, Shibpur.
- \* **Lecidea spadicea** Tuck.  
Botanic Garden, Shibpur.
- \* **Lecidea patellaroides** Nyl.  
Botanic Garden, Shibpur.
- \* **Lecidea triphragma** Nyl.  
General.
- \* **Lecidea premnea** VAR. **malargyra** Nyl.  
General.

#### 751. **Opegrapha** Humb.

- \* **Opegrapha Martii** Nyl.  
Botanic Garden, Shibpur.
- \* **Opegrapha varia** VAR. **pulicaris** Hoffm.  
Botanic Garden, Shibpur.
- \* **Opegrapha vulgata** Ach.  
General.
- \* **Opegrapha inæqualis** Fée.  
Botanic Garden, Shibpur.

752. *Platygrapha* Nyl.

- \* *Platygrapha pallidella* Nyl.  
General, especially on palm trees.
- \* *Platygrapha glaucomoides* Nyl.  
General, on trees.
- \* *Platygrapha stigmatica* Krempelh.  
Botanic Garden, Shibpur.

753. *Stigmatidium* Meyer.

- \* *Stigmatidium microcephalum* Nyl.  
Botanic Garden, Shibpur, on dicotyledonous trees.
- \* *Stigmatidium melastigma* Nyl.  
Botanic Garden, Shibpur.

754. *Arthronia* Eschw.

- \* *Arthronia cinnabarina* Nyl.  
On trees with coarse bare branches, general.
  - \* *Arthronia antillarum* Fée.  
On dicotyledonous trees, general.
  - \* *Arthronia impolitella* Nyl.  
Botanic Garden, Shibpur.
  - \* *Arthronia abnormis* Ach.  
On dicotyledonous trees, general.
  - \* *Arthronia circumalbicans* Nyl.  
On *Pandanus* stems, occasional.
- Arthronia astroidea* VAR. *Swartziana* Ach.  
Botanic Garden, Shibpur.

755. *Chiodecton* Ach.

- \* *Chiodecton heterotropum* Nyl.  
Botanic Garden, Shibpur.

756. *Graphis* Ach.

- \* *Graphis scripta* Ach.  
Frequent on bark of decayed *Pandanus*.  
Two varieties VAR. *pulverulenta* Nyl. and VAR. *subvirginea* Nyl  
occur along with the typical form.
- \* *Graphis obtecta* Nyl.  
General, on branches of various shrubs.



757. *Glyphis* Ach.

- \* *Glyphis cicatricosa* Ach.  
Botanic Garden, Shibpur.
- VAR. \* *favulosa* Ach.  
Botanic Garden, Shibpur.

758. *Verrucaria* Pers.

- \* *Verrucaria nitida* Schrad.  
Botanic Garden, Shibpur.
- \* *Verrucaria libricola* Fée.  
General, on trees, especially on *Bombax*.
- \* *Verrucaria tropica* Ach.  
On dicotyledonous trees, general.
- \* *Verrucaria diluta* Fée.  
Botanic Garden, Shibpur.
- \* *Verrucaria albo-atra* Krempelh.  
On dicotyledonous trees, general.
- \* *Verrucaria majuscula* Nyl.  
Botanic Garden, Shibpur.

759. *Thelopsis* Nyl.

- \* *Thelopsis inordinata* Nyl.  
Botanic Garden, Shibpur.

760. *Melanotheca* Nyl.

- \* *Melanotheca indica* Nyl.  
Botanic Garden, Shibpur, on *Pandanus*.

761. *Trypethelium* Ach.

- \* *Trypethelium Sprengelii* Ach.  
On dicotyledonous trees, general.
- \* *Trypethelium pallescens* Fée.  
Botanic Garden, Shibpur.
- \* *Trypethelium leucotrypum* Nyl.  
Botanic Garden, Shibpur.

762. *Lepraria* Ach.

- \* *Lepraria flava* Ach.  
On trees, general, especially on palms, such as *Areca*, *Arenga*, etc



SAPINDACEÆ NOVÆ INDICÆ ET MALAICÆ EX  
HERBARIO CALCUTTENSIS.

Auctore L. Radlkofer.

I.—ALLOPHYLUS L.

1. *A. serrulatus* Radlk.

*Schmidelia serrata* (non 'DC.') Wight Catal. autogr. (1833) p. 23 part., praesert. Nos. 374! 376!; Wight et Arn. Prodr. i (1834) p. 110 part.; Hook. f. et Thoms. Herb. Ind. Or. (circa 1850) part. ! (i.e., specimina e mont. Nilagir. et Kurg); Miq. in Hohenack. Pl. Ind. Or. (1851) No. 1066!; Cat. Kew. Herb. Wight (1869-1870) p. 7 No. 533!.

*Schmidelia Cobbe* (non 'DC.') Wight Ic. iii, (circa. 1846) t. 964 bis.

? *Cardiospermum Schmidelia* Dalz. & Gibs. Bomb. Fl. (1861) p. 34, excl. cit. 'Rheede Hort. Mal. v, t. 25' (ex descr.; perperam ab Hiern ad 'A. Cobbe f. villos.' cit. in Hook. Fl. Brit. Ind. i, p. 670).

*A. Cobbe* (non 'Bl.') Cooke Fl. Presid. Bomb. i, Part II (1902) p. 265, quoad syn. Dalz. & Gibs. antec. ?; Trimen Handbook Fl. Ceylon, i, (1903) p. 303, solummodo quoad cit. 'Wight Ic. t. 964 bis.'

Frutex?; rami teretes, juveniles petioli thyrsiq̄ue nunc sufferugineo-tomentelli, nunc subglabri, adultiores cortice fusco lenticelloso-punctato; folia 3-foliolata, mediocria, longe petiolata; foliola intermedia e rhombeo subobovata, basi subcuneata, lateralia ovalia vel subovata, basi obtusa inaequalia, omnia breviter acuminata, longiuscule petiolulata, mucronulato-serrulata, membranaceo-chartacea, nervis lateralibus approximatis oblique erectis rubentibus insignia, supra fuscescentia, subtus rubicunda, rarius virentia, opaca vel nitidula, praeter nervorum axillas barbatae glabra vel ad nervos pilis adpressis ± pubescentia, novella saepius pilis flavescentibus adpressis vestita,

glandulis crystallophoris ornata ; thyrsi simplices, interdum ad rha-  
cheos basin ramulo aucti, folia subaequantes vel quodammodo super-  
antes, sat pedunculati, sat densiflori ; flores mediocres, basi hispiduli,  
breviter pedicellati ; fructus cocci subglobosi, mediocres, glabrati.

Rami 3—5 mm. crassi. Folia petiolo 2—10 cm. longo adjecto 7—28 cm. longa ;  
foliola intermedia cum petiolo 0·5—2 cm. longo 5—18 cm. longa, 2·5—8 cm. lata,  
lateralia minora, petiolulis 2—5 mm. longis. Thyrsi 5—28 cm. longi, pedunculo  
1·5—6 cm. longo. Alabastra diametris 2 mm. Sepala basi pilis subsetaceis flavi-  
dulis adspersa ; petala spathulata, squama sordide villosa ; discus labriusculus ;  
stamina glabra ; germen parca setuloso-pilosum. Fructus cocci 6 mm. longi, 5  
mm. crassi.

In Indiae orientalis provincia Madras et? Bombay, praesertim in  
montibus Nilagiricis : *Wight* Hb. propr. Nos. 374! 376! ('Penins.  
Ind. or.', ca. 1832, fl. et fr. ; Hb. varia) ; *Hügel* No. 3400! ('Asia', ca.  
1835, fl. ; Hb. Vindob.) ; *Perottet* Nos. 160! 219! ('Nilgherries',  
1837-38, fl. ; Hb. Deless., Boiss., Vind.) ; *Wight* (quoad specim. in Ic.  
t. 964 bis ca. 1846 depict., c. indic. Malabar et Courtallum) ; *Wight*  
Hb., distrib. Kew. No. 533! ('Anamallay forests' m. Oct. 1851, fl., Hb.  
Vindob. ; 'Koathagerry' m. Aug. 1852, fl., Hb. Boiss. ; sine loci indic.  
exstat in Hb. Ber., Mon., Havn.) ; *Hook. f.* et *Thoms.* Hb. Ind. or. I  
( 'mont. Nilghiri et Kurg', fl. ; Hb. varia) ; *Mets* Pl. Ind. or. ed.  
Hohenacker a. 1851, n. 1066! ('in montibus Nilagiri', fl. ; Hb. varia) ;  
*Clarke* No. 10715 D! ('Conoor, Nilgherries' alt. 7000 ped., m. Mart.  
1873, fl. et fr.) ;— in prov. Bombay : *Dalsell?* ('Meera Hills near  
Penn', l. c.).

## 2. *A. subfalcatus* Radlk.

*Schmidelia glabra* (non Roxb.) Hook. f. et Thoms. Hb. Ind.  
or. (ca. 1850) e Khasia (nec alia specim.) ;—non 'Steud.',  
Cat. Kew. Hb. Griff. etc. (1865) p. 9 No. 979 ; non alior.

Frutex (?) ; rami teretes petiolique glabri, cortice albicante  
lenticelloso-punctato ; folia 3-foliolata, mediocria, longe petiolata,  
petiolis plerumque gracilibus ; foliola elongate lanceolata, plerumque  
in acumen longiusculum falcatum protracta, basi lateralialia valde  
inaequalia intermedia cuneata, omnia conspicue petiolulata, remote  
serrato-dentata, chartacea, nervis lateralibus remotiusculis oblique  
procurvis, venarum copia e nervo mediano (lateralibusque) emer-  
gentium insignia, subtus arcte reticulato-venosa, subfueca, subtus  
pallidiora, nitida, glabra ; thyrsi simplices, cincinnis infimis interdum

in ramulos breves patentēs evolutis, solitarii, interdum deflexi, petiolos superantes, rarissime folia ipsa subaequantes, minutim sordide puberuli, sat densiflori; flores mediocres vel majusculi, subglabri; fructus cocci clavato-ellipsoidei, majores, glabri.—Forsan *A. distachyos* forma tantum montana, monostachya.

Rami 3—4 mm. crassi. Folia petiolo 3—9 cm. longo adjecto 12—33 cm. longa; foliola intermedia cum petiolulo 0'3—1 cm. longo 9—24 cm. longa, 2'5—6 cm. lata, lateralia saepius vix minora. Thyrsi 5—15 cm. longi. Alabastra diametro 1'5—2'5 mm. Sepala glabriuscula; petala cuneata, squama sordide villosa; discus puberulus; stamina inferne pilosula; germen laxè pilosum. Fructus cocci 1 cm. longi, 0'5 cm. crassi.

In Assam, Khasia et Bengaliae parte orientali: *Simons*! (Assam; ex Herb. Calcutt. comm. c. Hb. Monac. et Hb. Rheno-Traj.); *G. Mann*! (Assam); *Kurs.* Nos. 11!, 17! (Assam, Khasia Hills, m. Apr. 1877, fruct.; ex Hb. Calcutt. comm. c. Hb. DC.); *Griffith*! (Khasia; Hb. Berol.); id.!, (a. 1843 comm. c. Hb. Zuccar.); id. No. 513! (Hb. van Heurck), *Hook. f.* et *Thoms.* Hb. Ind. or.!, (Mont. Khasia, alt. 3000—4000 ped., regio trop., m. Jul.—Aug. 1850, fl. et fr.; Hb. varia); *Native collectors*! (Khasia Hills, fl.; ex Hb. Calcutt. comm. c. Hb. Monac.); *Griffith* Hb., distrib. Kew. No: 979! ('East Bengal', fl.; Hb. varia); *Hook. f.* et *Thoms.* Hb. Ind. or. No. 505! (Chittagong, Sept. 1852, fruct.; Hb. Kew.); *Mokim*! (Chittagong, m. Nov. 1898, fl.; ex Hb. Calcutt. comm c. Hb. Monac.)

## II.—LEPISANTHES BI.

### 1. *L. assamica* Radlk.

Rami teretes, lenticelloso-verrucosi, pallidi, glabrati, innovationibus flavescenti-tomentosis; folia 4—6-juga, petiolo substriato; foliola subopposita, lanceolato-oblonga. sensim acuminata, petiolulis superne canaliculatis insidentia, subcoriacea, nervis lateralibus numerosis patulis, reti venarum subtus prominulo, livida, utrinque glabra, glandulis immersis rarioribus ornata; thyrsi axillares, fasciculati, dense cincinnigeri, cincinnis subsessilibus, petiolos aequantes, cano-tomentelli; alabastra subglobosa; flores sat magni, breviter pedicellati; sepala 5, exteriora tomentella, interiora sericea; petala 5, ate spathulata, extus infra medium dorsum villosa, intus squama biloba crista fimbriata instructa aucta; discus regularis, glaber; stamina 11—12, superne albido-villosa, in alabastro bis genuflexa, antherae glabrae vel connectivi lati dorso pilosello; germinis rudimentum triloculare, trisulcatum, villosum.

Frutex? ramis 1 cm. crassis. Folia petiolo ca. 5 cm. longo adjecto 25—31 cm. longa; foliola superiora (majora) 14—18 cm. longa, 3—4 cm. lata, inferiora 6—7 cm. longa, 2—2.5 cm. lata. Thyrsi 3—8 cm. longi; bractee bracteolaeque 2—3 mm. longae, subulatae, tomentellae. Pedicelli 2—3 mm. longi. Alabastra diametro 4—5 mm.

In Assam: *A. T. Gage* No. 185! ('South Lushai Hills, near Fort Lungleh,' alt. 3000—4000 ped., m. Apr. 1899, alab.; comm. ex Hb. Calcutt.)

(Affinis *L. angustifoliae* Bl., Sumatrae incolae.)

### 2. *L. Listeri* King Mss.

Frutex?; rami teretes, lenticellis oblongis bilabiatis instructi petiolique striati, hirtelli; folia 4-juga; foliola subopposita, obovato-oblonga, breviter acuminata, basi angustiore obtusa petioulis longiusculis incrassatis insidentia, membranacea, nervo mediano supra vix, subtus valde prominente, utrinque nervisque lateralibus subtus hirtellis, supra sublaevia, nitidula, subtus reticulato-venosa, opaca, glandulis immersis ornata, cellulis secretoriis instructa; thyrsi supra-axillares, (bini vel terni) fasciculati, laxe cincinnigeri, cincinnis subsessilibus; flores non visi nisi partes sub fructu pedicellato relictæ: sepala 5, sufferrugineo-tomentella; petala 5 (?), in unguem attenuata, extus sericeo-tomentella, squama—?; discus regularis, glaber; stamina e basi complanata filiformia, superne subvillosa; fructus breviter ellipsoideus, 3-ocularis, loculis compressis, extus adpresse sufferugineo-tomentosis, intus glabris, pericarpio carnosio cellulis saponinigeris instructo; semen ellipticum, hilo longo affixum, glabrum; embryo rectiusculus, cotyledonibus lateraliter juxtapositis, radícula basilari crassiuscula obtusa paullulum incurva.

Rami 1 cm. crassi. Folia petiolo 22 cm. longo adjecto ca. 70 cm. longa; foliola superiora (majora) cum petiulo 1—centimetrâli ca. 30 cm. longa, 14 cm. lata, inferiora 17 cm. longa, 6 cm. lata. Thyrsi 6—7 cm. longi, bractee bracteolaeque subulatae 2—3 mm. longae. Fructus (immaturus) 25 mm. longus, 18 mm. latus, pedicello 12 mm. longo basi articulo suffultus.

In Assam: *J. L. Lister*! (Duphla Hills, Dikrung valley, a. 1874; comm. ex Hb. Calcutt.)

(Affinis *L. Brownianae* Hiern.)

### 3. *L. granulata* Radlk.

Arbor?; rami teretes, cortice cano lenticelloso-punctato, juveniles thyrsisque dense sordide puberuli; folia 4-juga, petiolo leviter striato; foliola opposita, oblonga, superiora elongata, omnia utrinque subacuta,

conspicue petiolulata, membranaceo-chartacea, nervis lateralibus (utrinque 8—10) oblique procurvis, laxe reticulato-venosa, glabra, glandulis profunde immersis ornata; thyrsi dense cymulas paucifloras brevissime stipitatas gerentes; flores—?; discus (sub fructu relictus) semilunaris, glaber; fructus mediocris subglobosus, obscure 3-sulcatus, 3-locularis, extus sordide tomentellus, intus parce pilosus, siccus cellularum sclerenchymaticarum congregationibus crassioribus prominulis leviter granulatus, cellulis secretoriis nullis.

Rami ca. 8 mm. crassi. Folia petiolo 8 cm. longo adjecto ca. 40 cm. longa; foliola cum petiolulis ca. 8 mm longis 10—20 cm. longa, 3·5—5 cm. lata. Fructus diametro 1·8—2 cm.

In Burma superiore: *J. C. Praser*! (a. 1894; ex. Hb. Calcutt. comm. c. Hb. DC.).

(Affinis *L. Kunstleri* King.)

#### 4. *L. basicardia* Radlk.

Arbor?; rami petiolique sordide puberuli; folia ca. 6-juga, petiolo striato, rhachi supra profunde 2-sulcata; foliola subopposita, elongate oblonga, acuta vel subacuminata, basin versus angustata, basi ipsa oblique cordata, petiolulis brevissimis suffulta, chartacea, nervis lateralibus (utrinque ca. 15) obliquis ante marginem adscendentibus, utrinque reticulato-venosa, subtus ad nervos puberula, opaca, glandulis profunde immersis ornata, diachymate crystallis singulis crebris persito; paniculæ pauciramose, breviter pedunculatæ, dense cymulas paucifloras brevissime stipitatas gerentes, tomentellæ; alabastra subglobosa; flores mediocres, pedicellati; sepala puberula; petala 4, ex obovato unguiculata, intus squama singula deflexa obovato-cristata aucta, ungue villosa; discus semilunaris, margine puberulus, supra glabriusculus; stamina 8, filamentis villosis; fructus—(non visus).

Rami ca. 1 cm. crassi. Folia petiolo ca. 15 cm longo adjecto ca. 60 cm. longa; foliola 20—25 cm. longa, 5 cm. lata. Paniculæ ca. 12 cm. longæ. Alabastra diametro 2—2·5 mm.; pedicelli 2—3 mm. longi.

In Burma superiore: *Shaik Mokim*! ('Kachin Hills,' a. 1897, fl.; ex Hb. Calcutt. comm. c. Hb. DC.).

(Affinis *L. Burmanicæ* Kurz.)

#### 5. *L. Lamponga* Radlk.

Arbor mediocris, glabra; folia petiolata, 4—5 ?-juga; foliola maxima, subopposita, superiora ex obovato cuneata intermedia late

oblonga, infima obovata, breviter acuminata vel infima obtusa, chartacea, nervis lateralibus ante marginem evanescentibus, utrinque glabra, supra læviuscula livescentia, subtus laxè reticulatovenosa pallide subfusca, glandulis sat immersis utrinque ornata, cellulis secretoriis per diachyma sparsis instructa, epidermide paginæ inferioris sparsim (in cellulis minoribus sæpius geminatis) crystallo-  
rum concreciones gerente; thyrsi cincinnigeri albide puberuli (fragmentum tantum visum); alabastra subglobosa; flores mediocres, sat pedicellati; sepala dense tomento brevi sordide albido induta; petala 4 (alabastrum tantum visa), extus inferne sericea, intus squama deflexa brevi cristata subtus villosa vel subglabra (petalorum lateralium obliqua) aucta; discus semilunaris, glaber, nec nisi margine inter petalorum insertiones sericeus; stamina 8, lanosa, antheræ subglabræ; germinis rudimentum 3-gonum, dense hirsuto-tomentosum. fructus (t. Forbes) pallide viridis, tomentosus.

Arbor 30-pedalis. Folia, ut videtur, ultra 1 m. longa; foliola superiora (majora) cum petiolulis 1.5 cm. longis crassis glabris rubescentibus 4.5 cm. longa, 1.5 cm. lata. Alabastra diametro 4 mm.; pedicelli 4 mm. longi.

In Sumatra, prov. Lampong: *H. O. Forbes* No. 1708! (Penangcengan in silva magna, m. Sept. 1880, flor.; comm. ex Hb. Calcutt.; Hb. Berol.).

(Affinis *L. andamanicæ* King.)

### III.—OTOPHORA Bl.

#### 1. *O. resecta* Radlk.

Arbor parva; rami teretes, subtiliter striati, glabri; folia (mutilatum tantum visum) 10-juga, rachi tereti superne a lateribus compressiuscula striata glabra; foliola subsessilia, subopposita, refracta, linearia, sensim acuminata, basi inæqualiter subacuta, i.e. intus oblique truncata, quasi resecta extus sensim arcuato-angustata, petiolulis brevissimis tumidis, membranaceo-chartacea, nervis lateralibus subtilibus remotiusculis e basi patula procurvis utrinque prominulis, reticulato-venosa, nitidula, glabra, supra livescentia, subtus pallide subfusca, epidermidis paginæ inferioris cellulis hic illic singulis vel binis vicinis pachydermicis subreticulato-punctatis, utrinque glandulis profunde immersis ornata, infima (stipuliformia) mediocria, suborbicularia, sessilia; panicula elongata, glabra, ramis thyrsoides patentibus vel refractis cincinnos sessiles gerentibus, rachi subangulosa; alabastra subglobosa, pedicellata; flores rubri; sepala 5(-4), ovata, glabra; petala 5(-4), elliptica, vix unguiculata, sepalis multo



minora, margine ciliolata, extus basi pilosula, intus squama minima emarginata pilosula aucta; stamina 8, filamenta villosa, antheræ glabræ; germinis rudimentum 2-merum, glabrum.

Rami ca. 1 em. crassi. Folium (mutilatum) 75 cm. longum; foliola 20—22 cm. longa, ca. 3 cm. lata. Panicula ca. 35 cm. longa, ramis thyrsoidis 2—14 cm. longis. Pedicelli 5—6 mm. longi, basi articulati. Alabastra diametro ca. 3 mm.

In insula malaccensi Pulm Penang: *Ridley* No. 6948! (Penara Bukit, m. Dec. 1895, flor.; Hb. Calcutt.).

(Affinis *O. sessili* King, distincta foliis linearibus.)

#### IV.—EUPHORIA Commers. ed. Juss.

##### 1. *E. echinulata* Radlk.

Arbor?; rami teretes, juveniles ut et petioli inflorescentiæque pilis fasciculato-stellatis pulverulento-puberuli, denique glabrati, cortice subfusco; folia 2—3-juga; foliola subopposita, lanceolata, acuta vel in acumen longiusculum protracta, basi interdum subcuneata, breviter petiolulata, integerrima, subcoriacea, nervo medio supra prominulo, nervis lateralibus approximatis oblique procurvis subtus prominentibus, subtiliter clathrato-venosa, supra glabra nitidula, subtus ad nervos pilis laxè adpersa papillosa glaucescenti-opaca; paniculæ terminales, ramis thyrsoidis cymulas subsessiles gerentibus; flores —(non suppetebant); fructus cocci processibus brevibus conicis echinulati, glabrati.

Rami 3 mm. crassi. Folia petiolo 5—6 cm. longo adjecto 15—20 cm. longa; foliola cum petiolulis 3—5 mm. longis 8—15 cm. longa, 2.5—4 cm. lata. Fructus cocci diametro 2.5 cm.

In peninsula malaica: *Scortechini* No. 4! (Perak; ex Hb. Calcutt. comm. c. Hb. Monac.).

(Affinis *E. Longana* Lam., distincta fructu echinulato.)

##### 2. *E. setosa* Radlk.

Arbor; rami teretes, ut et inflorescentiæ petioli subtusque foliola in nervis præter pubem stellatam setis crebris sat longis obsiti; folia 4-juga; foliola subopposita vel alterna, oblongo-lanceolata, breviter acuminata, basi obtusa, breviter petiolulata, integerrima, chartaceo-coriacea, nervo medio supra impresso, nervis lateralibus approximatis patulis ante marginem adscendentibus, clathrato-venosa, supra glabra nitidula, subtus præter nervos glabriuscula glaucescenti-opaca; paniculæ terminales, ramis elongatis subsimplicibus laxè cymulas sessiles gerentibus; flores brevissime pedicellati; calycis

segmenta obtusa, extus pilis fasciculato-stellatis tomentella, intus pilis simplicibus puberula; petala anguste spathulata, acuta, calyce sesquilinguora, intus strigoso-villosa; discus pilis fasciculatis latioribus obtusiusculis obsitus; stamina laxe pilosa; germen pilis subsimplicibus obtusis hirsutum; fructus—(non suppetebat).

Arbor 40—60 pedes alta. Rami ca. 6 mm. crassi. Folia petiolo 4—6 cm. longo adjecto 18—24 cm. longa; foliola cum petiolulis 2—4 mm. longis 5—10 cm. longa, 2.5—4 cm. lata. Paniculæ ad 30 cm. longæ, ramis 12 cm. et ultra longis.

In peninsula malaica: *King's collector* No. 7677! (Perak, alt. 500-2000 ped., m. Maj. 1885, fl.; ex Hb. Calcutt. comm. c. Hb. Monac.).

(Affinis *E. malaiensi* Radlk., distincta ramis petiolis etc. setis crebris obsitis.)

## V.—XEROSPERMUM Bl.

### 1. *X. cylindrocarpum* Radlk.

Arbor?; rami, thyrsi petiolique pulverulento-puberuli; folia 2-juga; foliola ex oblongo lanceolata, in acumen acutum protracta, petiolulata, chartacea, utrinque arcte reticulata, cellulis secretoriis destituta, pilis obverse clavelliformibus utrinque ornata; thyrsi racemiformes, solitarii vel fasciculati; flores (e partibus sub fructu relictis) 4-sepali; fructus cocci elongati, subcylindrici, mediocres, sat acute tuberculati, tuberculis a lateribus compressis, pericarpio cotyledonibusque (seminis submaturi) cellulis secretoriis destitutis.

Rami subfusci, thyrsgeri 2—3 mm. crassi. Folia petiolo 2—4 cm. longo adjecto usque 24 cm. longa; foliola cum petiolulis 3—4 mm. longis 10—18 cm. longa, 3.5—6 cm. lata. Thyrsi 2—8 cm. longi. Fructus cocci 2.5 cm. longi, 1.2 cm. crassi. Semen acutum, 1.5 cm. longum.

In Sumatra: *H. O. Forbes* No. 2715! (a. 1880; Hb. Ber.). (Inter sp. affines insigne fructus forma.)

### 2. *X. brachyphyllum* Radlk.

Arbor; rami juniores pulverulento-puberuli, mox glabrati; folia 2-juga; foliola minora, ovata, breviter acuminata, basi in petiolulos contracta, subcoriacea, nervis lateralibus (utrinque 8) approximatis patule procurvis, utrinque arcte reticulata, cellulis secretoriis destituta, pilis obverse clavelliformibus præsertim subtus ornata; thyrsi perbreves, racemiformes; flores (e partibus sub fructu relictis) 4-sepali; fructus cocci e breviter ellipsoideo subglobosj, minores,

humillime tuberculati, tuberculis subpyramidatis quasi in areolas expansis, pericarpio cotyledonibusque cellulis secretoriis destitutis.

Rami subfusci, thyrsgigeri 2—3 mm. crassi. Folia petiolo ca. 2.5 cm. longo adjecto ca. 12 cm. longa; foliola cum petiolulis 3—4 mm. longis 8—10 cm. longa, 3.5—4 cm. lata. Thyrsi 1—2 cm. longi. Fructus cocci 2 cm. longi, 1.6 cm. crassi. Semen ellipsoideum, obtusum. Embryonis cotyledones minutissime albo-maculatæ.

In Javæ prov. Bantam: *H. O. Forbes* No. 452! (m. Dec 1879 fruct.; ex Hb. Calcutt. comm. c. Hb. DC.).

(Inter sp. affines insigne foliolis breviter ovatis.)

### 3. *X. intermedium* Radlk.

*X. spec.* Cat. Kew. Hb. Griff., Helfer etc. (1865) p 9, Nos. 1005!, 1006! (Hb. Helfer).—

*X. Noronhianum* (non Bl.) Hiern in Hook. Fl. Brit. Ind. i, (1875) p. 686, quoad locum Tenasserim (i. e. Hb. Helfer Nos. 1005, 1006); ? Kurz Pegu Report (1875) Append. A, p. 39 No 292, Append. B, p. 40; Kurz in Journ. As. Soc. Bengal xlv, 2, (1875) p. 186 ('Helfer 1006'); Kurz Forest Fl. Brit. Burma, i, (1877) p. 295; ? Ridley Fl. East Coast Malay Penins. in Transact. Linn. Soc., 2. ser., iii (1893) p. 289, quoad 'formam typicam', vulgo 'Rambutan Pachat'.—

*X. muricatum* (non Radlk.) King Materials etc. (1896) p. 431 432, solummodo quoad syn. '*X. Noronh.* Kurz Forest Fl. Br. Burma, i, 295'.—Vulgo? 'Rambutan Pachat', cf. supra sub Ridley, quod nomen '*Ramboutan patjat*' scriptum) in Herb. Florent. a Kehding adjectum invenitur specimini manco verisimiliter huc recensendo et *X. unijugo* Radlk. (nec non *Nephelio chryseo* Bl., coll. Goodenough No. 1897 e Malacca, in Hb. Calcutt.).

Arbor magna (Curtis in scheda); rami glabri; folia 2—1-juga, raro 3-juga; foliola nunc late elliptica, nunc oblongo-lanceolata vel inferiora basi subovata, ± acuminata, petiolulata, subcoriacea, utrinque arcte reticulata, subopaca, cellulis secretoriis rarioribus instructa, pilis obverse clavelliformibus ornata; thyrsi racemiformes, sæpe fasciculati, minutim puberuli; flores perbreviter pedicellati, 4-sepali; fructus juvenilis cocci ellipsoidei, nunc obtuse (Helfer 1005), nunc acutiuscule (Curtis 3436) tuberculati, pericarpio cellulis secretoriis destituto (cotyledones non suppetebant).

Rami cortice fusco, thyrsgigeri 2—4 mm. crassi. Folia petiolo 2—5 cm. longo adjecto 20—40 cm. longa; foliola cum petiolulis 3—10 mm. longis 12—30 cm. longa, 3—9 cm. lata. Thyrsi 2—12 cm. longi, cincinnos sessiles basi remotiusculos

apice confertos gerentes, bracteis bracteolisque minutis, vix 1 mm. longis, detoidis, præsertim margine puberalis; pedicelli, ut alabastra globosa, 1 mm. vix superantes. Sepala orbicularia, sparsim puberula, ciliata. Petala sepala paulo superantia, spathulata, extus puberula, intus et margine dense rufescenti-villosa. Stamina germen subæquantia, pilosula. Germen obcordatum, adpresse setuloso-pilosulum.

In Burma et in peninsula malaica: *Helper*, Distrib. Kew. Nos. 1005! 1006! (Tenasserim; flor. et in ramulis ad No. 1005 adjectis fr. juv.; Hb. var.); *Kehding*! (Peninsula malaica, ad Klang; Hb. Florent.); ? *Ridley* (cf. lit.; 'Tahan woods'); *Curtis* No. 3436! (Penins. malaica Dindings Lamut, m. Jul. 1900, fruct. juv.; Hb. Calcutt.).

(A *X. muricato* Radlk. distinctum foliis cellulis secretoriis instructis.)

#### 4. *X. echinulatum* Radlk.

*X. muricatum* (non Radlk.) King Materials etc. (1896) p. 432, solummodo quoad specimina Perakensia 'King's collector' No. 8637!, 'Scortechini No. 2104!'

Arbor sat alta, ramis expansis; rami juniores, thyrsi petiolique pulverulento-puberuli; folia 1-juga; foliola elliptico-lanceolata, breviter acuminata, basi acuta, petiolulata, coriacea, utrinque reticulata, supra nitentia, cellulis secretoriis instructa, pilis obverse clavelliformibus utrinque ornata; thyrsi racemiformes, breves; flores sessiles, 4-sepali; fructus cocci (breviter) ellipsoidei, minores, acutissime tuberculati, (sicci) pungentes, pericarpio cellulis secretoriis instructo, non vero cotyledonibus.

Arbor 30—70 pedes alta. Rami cortice nigro-fusco, thyrsigeri 3 mm. crassi. Folia petiolo 1.5—3.5 cm. longo adjecto 12—18 cm. longa; foliola cum petiolulis 5—8 mm. longis 10—15 cm. longa, 4—5.5 cm. lata. Thyrsi 1—3 cm. longi. Sepala (alabastra) glabra, margine ciliolata. Petala utrinque dense sufferrugineo-villosa. Stamina villosa. Germinis rudimentum pubescens. Fructus pedicellis incrassatis 2 mm. longis et crassis insidentes abortu monococci, coccis (siccis) 2 cm. longis, 1.4 cm. crassis. Semen ellipsoideum, 1.5 cm. longum. Embryo curvatus, cotyledonibus minutim albo-maculatis, inferiore basi transversim replicata.

In peninsula malaica prope Perak: *King's collector* No. 8637! (alt. 500—800 ped., m. Mart. 1886, fruct.; Hb. DC.); *Scortechini* No. 2104! (alabastra; Hb. DC.).

(Inter sp. affines insigne fructus sicci tuberculis acutissimis pungentibus.)

**5. X. unijugum** Radlk.—Vulgo ‘Ramboutan-patjat’ t. Kehding in Hb. Florent. (cf. X. intermedium.)

Arbor pulchra, magna, glabra; folia 1-juga; foliola ex elliptico vel oblongo lanceolata, acuta vel acuminata, margine subundulata, basi in petiolulos attenuata, coriacea, reticulata vel supra sublævigata, nitida, cellulis secretoriis, ut et pericarpium et cotyledones, instructa, glaberrima; thyrsi paniculiformes, fasciculati, rhachi ramisque angulosis sulcatis glabris; flores conspicue pedicellati, 5-sepali; fructus cocci breviter ellipsoidei, mediocres, acute tuberculati.

Arbor 60—80 ped. alta. Rami fuscî, glabri, thyrsgeri 2—3 mm. crassi. Folia petiolo 1-2 cm. longo adjecto 10—16 cm. longa; foliola cum petiolulis ca. 5 mm. longis 9—14 cm. longa, 3.5—5.5 cm. lata. Thyrsi 3—12 cm. longi; pedicelli 3 mm. longi, ad medium articulati, flores delapsi inde ramulos scopuliformes relinquentes. Sepala glabra. Petala (5) spatulata, extus et præsertim intus dense villosa. Stamina præter apicem villosa; antheræ subrotundæ, glabræ. Germinis rudimentum villosum. Fructus cocci (submaturi) 2 cm. longi, 1.3 cm. crassi; cotyledones albido-maculati, cellulis secretoriis crebris.

In Indiæ orientalis peninsula malaica: *Kehding*! (in silvis ad Klang, m. Febr. 1879, fruct. ‘edules’; Hb. Florent.).—Huc quoque recensendum, ut videtur: *King’s collector* No. 7267! (Perak, alt. 100 ped. m. Febr. 1885, flor. ‘albi;’ sub alio genere alius tribus comm. c. Hb. DC., in King Mater. præterit.).

(Sp. Sectionis II, inter affines insignis foliis pericarpio et cotyledonibus cellulis secretoriis instructis.)

**VI. NEPHELIUM L.**

**1. N. pallens** Radlk.

*N. mutabile* var.? *pallens* Hiern in Hook. Fl. Brit. Ind. i, (1875) p. 687, quoad coll. Maingay! (No. 454 part. i. e. Hb. n. 1527 fide Hb. Kew.).

*N. chryseum*? (non Bl.) Radlk. in Sap. Holl.-Ind. (1877-78) solummodo quoad p. 75 (226), coll. Maingay.—Vulgo ‘Rambutan Bukit’ fid. Holmberg in scheda.

Arbor sat alta; rami teretes, striati, glabri, fuscescentes; folia 2—3-juga; foliola oblonga, superiora utrinque subacuta, breviter petiolulata, subcoriacea, nervis utrinque 7—9 oblique adscendentibus subtus prominulis, laxius subtiliter reticulato-venosa, interdum trans-euntia in clathrato-venosa, glabra, flavescenti-viridia, supra nitida, subtus pallida, opaca, cellulis secretoriis numerosis instructa, epidermide non mucigera; paniculæ axillares vel terminales, foliis breviores,

laxe pulverulento-puberulæ; flores apetalī, sat pedicellatī; discus lobatus, subglaber vel puberulus; fructus cocci muricati, processibus mediocribus (siccis) rigidis.

Arbor 50—60-pedalis. Folia petiolo 4—6 cm. longo adjecto 15—25 cm. longa foliola cum petiolulis 3 mm. longis 8—12 cm. longa, 3—4 cm. lata. Paniculæ 9—16 cm. longæ. Calyx 5-fidus, puberulus. Staminal exserta, basi villosiuscula Gerinen 2—3-coccurum, verruculosum, ferrugineo-pubescentis; stylus breviter 2—3-cruris. Fructus processus ca. 8 mm. longi.

In Malacca: *Maingay* Nos. 454! part. (i. e. Herb. No. 1527, m. Jan. 1865-66, flor.), 449! part. (i. e. Hb. No. 1629, fruct.); *King's collector* No. 5505! ('Larut Perak, open jungle, hilly locality', alt. 500—800 ped., m. Febr. 1884, fl. ♂; ex. Hb. Calc. comm. c. Hb. Monac.), No. 5534! (ibidem, fl. ♀; ead. Herb.); *Holmberg* No. 749! (Penang, Sungei Udang, m. Apr. 1891, fl. ♀; Hb. Calcutt.).

(*Nephelio chryseo* Bl. potius quam *N. mutabili* Bl. affine, distinctum disco subglabro, foliolis flavescenti-viridibus subtus pallidis.)

## 2. *N. tuberculatum* Radlk.

Arbor alta, ramis patentibus; rami juveniles e triangulari subteretes vel compressi, sulcati, ut et paniculæ petiolique sordide puberuli, innovationibus subsusco-tomentosis; folia 2—3-juga; foliola alterna vel subopposita, oblonga subacuta, basi obtusa, chartacea, nervis utrinque 14—18 oblique patulis subtus acute prominentibus, subclathrato-venosa et laxè reticulata, supra glabra, ex olivaceo fusciscentia, vix nitidula, subtus ad nervos pilis teneris patulis decoloribus adpersa, ceterum glabrata, glaucescenti-opaca, cellulis secretoriis instructa, epidermide non mucigera; paniculæ ad apices ramorum axillares, foliis breviores, rhachi ramisque angulosis dense glomeruligeris; flores apetalī, sat pedicellatī, nutantes; discus subcupularis, ± in glandulas fissus, hirsutus; fructus (semimaturi) cocci elongate ellipsoidei (subcylindrici), tuberculati, tuberculis breviter pyramidalibus obtusis subcontiguīs glabris; seminis micropyle apicalis.

Arbor 60—80 pedes alta, trunco diametro 2—3 pedum. Rami paniculigeri 5—8 mm. crassi. Folia petiolo 3—8 cm. longo adjecto 18—40 cm. longa; foliola cum petiolulis 5 mm. longis 2 mm. latis 12—20 cm. longa, 4—8 cm. lata Paniculæ ca. 15 cm. longæ. Calyx cupularis, 5-fidus, lobis obtusis, extus laxius, margine et intus dense canescenti-pubescentis, 2 mm. altus, pedicello æquilongò suffultus. Stamina filiformia, ultra medium villosiuscula; antheræ oblongæ, glabriusculæ; germinis rudimentum (floris ♂) tomentosum. Fructus cocci (t. collectore) maximi 2.5—5 cm. longi, diametro 1.5—2 cm., læte virides, pruinosi (sicci semimaturi nigricantes), tuberculis 3 mm. altis, pericarpio substantia fusca tannino affini aqua agitata spumamefficiente fæto.

In peninsula malaica ad Perak: *Scortechini* No. 1767! (m. Febr. 1885, flor. ♂; ex Hb. Calcutt. comm. c. Hb. Monac.); *King's collector* No. 7903! (m. Jul. 1885, fruct. semimat.; ex eodem Herb. comm.).

(Affine *Nephele juglandifolia* Bl., distinctum foliolis non adeo elongatis, disco hirsuto ± in glandulas fisso.)

### 3. *N. subfalcatum* Radlk.

Arbor larga, glabra; rami teretes; folia 1—3-juga; foliola lanceolata, præsertim superiora subfalcata, in acumen obtusum angustata, basi subacuta et præsertim superiora inæquilatera. latere interiore latiore, gracilius petiolulata, subcoriacea, nervis lateralibus subtilibus vix prominulis, oblique reticulato-venosa, subfusca, supra nitida, subtus opaca et maculis lævibus notata, cellulis secretoriis nullis, epidermide mucigera; paniculæ axillares et terminales, breves, pauciramosæ pulverulento-puberulæ; flores, ut ex partibus sub fructu immaturo relictis patet, petaligeri; discus hirtellus vel glabratus; fructus immaturi cocci globosi, dense muricati, processibus sat longis compressis striatis procurve hamatis glabris nitidis.

Rami paniculigeri 2—3 mm. crassi. Folia petiolo 3—4 cm. longo adjecto 5—18 cm. longa; foliola cum petiolulis 8 mm. longis 8—11 cm. longa, 2—3 cm. lata. Paniculæ 5—12 cm. longæ.

In Sumatra: *Forbes* No. 3092! ('River Rawas', alt. 1500 ped. a. 1881; Hb. Berol., Monac.).

(Affine *Nephele laurino* Bl., distinctum foliolis subfalcatibus et fructus processibus longioribus.)

### 4. *N. dasyneurum* Radlk.

Arbor?; rami teretiusculi, striati thyrisque dense ferrugineo-tomentosi; folia 4—6-juga, rhachi petioloque fulvo-velutinis; foliola subopposita, oblongo-lanceolata, cuspidata, basi inæqualiter acutata, latere interiore brevior, sat petiolulata, tenuius chartacea, nervis lateralibus numerosis oblique adscendentibus subtus prominentibus nervoque mediano præsertim foliorum juniorum fulvo-velutinis, clathrato-venosa et tenuissime reticulata, supra præter nervum medianum puberulum glabra nitida subfusca, subtus inter nervos pilis adpressis adpersa, venarum reti papilloso incluso glaucescenti opaca, cellulis secretoriis nullis, epidermide non mucigera; thyrsi axillares, breves, ad apices ramorum dense conferti, ± ramosi, densiflori; flores petaligeri; discus crenatus, glaber; fructus—(non suppetebat).

Rami thyrsgigeri 5 mm. crassi. Folia petiolo ca. 8 mm. longo adjecto ca. 30 cm. longa; foliola cum petiolulis ca. 6 mm. longis 8—12 cm. longa, 2.5—3.2 cm. lata. Thyrsi 5—8 cm. longi. Flores breviter pedicellati. Calyx 5-fidus, extus ferrugineo-, intus canescenti-tomentosus. Petala anguste spathulata, brevia, præter apicem villosa. Stamina 8, præter apicem pilosula; antheræ breves, puberulæ. Germinis (in fl. ♂) rudimentum dense ferrugineo-tomentosum.

In Sumatra: *Forbes* No. 2842! (a. 1880; Hb. Berol.).

(Affine *Nephelio cuspidato* Bl., distinctum nervis foliolorum lateralibus oblique adscendentibus, nec patentibus, iisque subtus fulvo-velutinis.)

**5. *N. obliquinerve* Radlk.**—Vulgo 'Rambutan hutan' t. Goodenough sub No. 1304; 'Sunggol lotong' t. eod. sub No. 1782.

Arbor; rami subteretes, sulcati, ut et thyrsi petioli et foliorum rhaches subhirsute ferrugineo-tomentosi; folia 4—6-juga; foliola alterna vel opposita, elongate oblonga, brevius longiusve acuminata, basi subacuta, crassiuscule petiolulata, chartacea, nervis lateralibus sat numerosis oblique adscendentibus nervoque mediano subtus prominentibus, clathrato-venosa et tenuiter reticulata, supra præter nervum medianum puberulum glabra nitida fuscescentia, subtus præsertim ad nervos puberula, venarum reti papilloso incluso glaucescenti-opaca, cellulis secretoriis crebris instructa, epidermide non mucigera; thyrsi axillares, elongati, basi ramo uno alterove instructi; flores—(non suppetebant); fructus cocci breviter ellipsoidei, dense muricati, processibus sat longis tenuibus striatis apice procurvis glabris.

Rami thyrsgigeri 6 mm. crassi. Folia petiolo 10 cm. longo adjecto ca. 40 cm. longa; foliola cum petiolulis basi incrassatis ca. 6 mm. longis 10—18 cm. longa, 3.5—5 cm. lata. Thyrsi 10—15 cm. longi. Fructus cocci 2.5 cm. longi, 1.8 cm. lati, processibus ca. 8 mm. longis.

In Malacca: *Goodenough* No. 1304! (ad Kesang m. Jul. 1893, fruct.), 1782! (ibid., m. Mart. 1894, infloresc. floribus denud.; ex Hb. Calcutt. miss.). Huc quoque, ni memoria me fallit, recensend. videtur *Maingay* No. 450! part., i.e. Hb. No. 1628 A, m. Mart. 1867, fruct. juven. petalorum reliquias exhibent., Hb. Kew.

(Affine *Nephelio dasyneuro* Radlk., a quo inter alia differt foliolis cellulis secretoriis instructis.)

## VII.—GUIOA Cav.

### 1. *G. microphylla* Radlk.

Rami teretes, apice petiolique hirsuti; folia abrupte pinnata; foliola



ca. 14, parva, subopposita vel præsertim superiora alterna, lanceolata, inferiora falcata, superiora leviter sigmoideo-curvata, sensim acuminata, basi in petiolulum brevem attenuata, integerrima vel apicem versus levissime denticulata, subcoriacea, præter nervum medianum supra hirtellum subtus pilis setaceis adpersum glabra, utrinque lævia, impunctata, attamen cellulis secretoriis parvis instructa, subtus obscure 1—2-foveolata; rhachis foliorum nuda; inflorescentia axillaris brevis (thyrsus eramosus), subhirsuta; sepala late imbricata, exteriora ovata, interiora suborbicularia; discus annularis, æqualis, glaber; stamina infra medium villosa; germen ad angulos pilis setaceis laxè adpersum.

Rami foliigeri 3 mm. crassi. Folia petiolo 2 cm. longo adjecto 10—14 cm. longa, 8 cm. lata; foliola ca. 4 cm. longa, 12 mm. lata, sicca nigro-fusca, margine subrevoluta, nervis lateralibus patulis ante marginem arcuato-anastomosantibus. Inflorescentia 4 cm. longa; cincinni breviter stipitati; pedicelli 2 mm. longi, basi articulati.

In Peninsula malaica: *C. Curtis* No. 1346! (Perak, 'Hermitage Hill', alt. 2000 ped., m. Dec. 1887, fl.; Hb. Calcutt.).

(Affinis *Guiœ venustæ* Radlk. in Borneo indigenæ, a qua inter alia differt rhachi foliorum nuda, nec alato-marginata.)



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*New species or varieties are in bold type.*

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## A REVISION OF THE INDO-MALAYAN SPECIES OF CEDRELA.

—◆—  
*By*

*C. DE CANDOLLE.*

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### INTRODUCTION.

The genus *Cedrela* was first founded by Linnæus on *Cedrela odorata*, a West-Indian species in which the receptacle of the flower is very much elongated and which has seeds winged at their lower end only. An Indian and a Javanese species having a much shorter receptacle and seeds winged at both ends were afterwards added to the genus by Roxburgh and Blume. Then A. de Jussieu and Royle again added to it two Asiatic species having also a relatively short receptacle but the seeds of which have afterwards been found to be winged only at their upper end. Later on Roemer<sup>1</sup> detached all the species with a short receptacle from the *Cedrelas* and formed with them his genus *Toona*. The subsequent writers, however, continued to include them in genus *Cedrela*, an arrangement which I adopted in my monograph of the *Meliaceæ*, published in 1878. On the contrary, Harms<sup>2</sup> has recently reverted to Roemer's classification.

Such was the state of things when I undertook the present revision with the help of the materials of the Calcutta herbarium which had been put at my disposal for that work. It was of course impossible for me to carry it out without examining anew the characters distinguishing the West-Indian and American from the Indian species, since on my opinion of the importance of these characters depended the generic name to be adopted for the latter. Thus I was led to extend my revision to the whole genus, and I must say that this study has confirmed me in the idea that there is such a close affinity between the species of the two groups, that it is quite natural to keep them together in the same

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<sup>1</sup> *Synopses monographiæ*, fasc. 1, p. 131.

<sup>2</sup> Engler und Prantl. *die natürlichen Pflanzenfamilien*, iii, iv, p. 267.

genus. In that respect the striking elongation of their floral receptacle particularly deserves to fix the attention. It constitutes a thick column along which the petals are attached by means of a prominent ridge. It has been variously called by the authors: a disk, a stipes, a gynandrophore, a gynophore,—but none of these terms is really appropriate to it. In the first place that elongated receptacle is not homologous with the organs habitually designated as disks, for they are of appendicular nature, and, secondly, the fact of its being concrescent with the petals excludes the other denominations just mentioned. So a new term was to be found for it, and I, long ago, adopted that of *column*, suggested to me by the expression "*Receptaculum columnare*" formerly applied by Patrick Brown<sup>1</sup> to that special structure characterizing the flowers of all *Cedrelas*. It is true that the column is much shorter in the Asiatic and Malayan species than in the others. But such a vague character as the relative length of an organ cannot, in my opinion, be looked upon as having the value of a generic character.

Now there is in the structure of the column itself a detail to which sufficient attention has not been paid yet. It consists in a curious concrescence of the top of that organ with the base of the carpels; the consequence of that concrescence being that the cells of the ovary get prolonged inside the column, so far down as to a little below the insertion of the stamens; this character has first been noticed by Harms<sup>2</sup> in *Toonas*, and I have since ascertained that it exists in all *Cedrelas* without an exception. In other words, it can be said that in all of them *the ovary is partially inferous*. That being so, it now seems more natural to compare the length of the column to that of the cells than with that of the visible part of the ovary, and I shall do so henceforth in my descriptions.

It is to be remarked that in almost all the species the ovules are all inserted in the upper part of the cells, that is to say, outside the column. In only three of them, of which one is American (*C. bogotensis*) and the others Indian (*C. Toona* var. *Pealii*; *C. Mannii*), did I find that the lowest ovules are inserted in the inferous portion of the ovary. But in these species, as in all the others, that portion remains rudimentary during the evolution of the fruit, the capsule being entirely formed by the magnified free portion of the ovary. On the other hand the prolongation of the cells into the column, although so very slightly marked and apparently useless, gains a systematic importance from the fact of its being a character common to *all* the species.

<sup>1</sup> History of Jamaica, p. 158.

<sup>2</sup> l. c., p. 269.

As above stated, the present revision is principally based on a study of the specimens preserved in the Calcutta herbarium. But although I have thus had at my command the best materials at present available, it has unfortunately not been possible for me to settle, as fully as I hoped to be able to do, many points concerning the Indian Cedrelas. There are, for instance, in that rich collection several specimens which I should certainly have considered as specifically distinct from *C. Toona*, were it not that there are also various forms intermediate between them and the latter species. Moreover, some of these specimens are incomplete and they seldom correspond to the same phases of vegetation. All this has greatly puzzled me for a long time, and I finally adopted the plan of adding to the type of *C. Toona* a rather lengthy series of varieties, instead of creating new species which would unavoidably have been founded on insufficient characters. Among the few new species described in this paper *Cedrela Hainessii* deserves a special mention on account of the presence of staminodes in its flowers. It is greatly to be desired that fruiting specimens of that species should be obtained, for it would be interesting to know if its seeds are winged at their upper end only as it is the case in *C. sinensis* and in *C. serrata*, the only other two Cedrelas the flowers of which are also provided with staminodes.

*Key to the Indo-Malayan species.*

**A. Flower containing 5 staminodes besides the 5 stamens.**

*I. Column and ovary glabrous, calyx cupulate.*

† *Leaflets of the adult tree entire or very sparingly denticulate at the edge—*

Adult leaflets glabrous on both surfaces . . . . . 1. *sinensis* A. Juss.

†† *Leaflets of the adult tree serrate at the edge—*

Adult leaflets glabrous on both surfaces.

Anthers cordate at the base . . . . . 2. *serrata* Royle.

Adult leaflets shortly hairy underneath.

Anthers sagittate at the base *serrata* var. *puberula*  
C. DC.

*II. Column and ovary hirsute, calyx dialy-  
sepalous—*

Adult leaflets glabrous on both sur-  
faces, entire at the edge . . . . . 3

*Hainessii* C. DC.

**B. Flower containing no staminodes—**

(Leaflets entire at the edge in all the species except in No. 4 var. *v* and in No. 9.)

*a. Calyx dialysepalous, column hirsute.*

*Adult leaflets quite glabrous on both surfaces or pubescent only on the nerves—*

Pedicels and calyx puberulous or glabrous . . . . . 4. *Toona* Roxb. and vars.

Pedicels and calyx densely hirtelous . . . . . 5. *microcarpa* C. DC.

*Adult leaflets pubescent on both surfaces and more densely so underneath—*

Base of leaflets tapering on both sides 6. *Kingii* C. DC.

*b. Calyx cupulate, dentate.**1°.* *Column and ovary hirsute—*

Leaflets moderately petiolulate, ovate-lanceolate, the base tapering below, rounded above . . . . . 7. *febrifuga* Bl. and vars.

Leaflets very shortly petiolulate, oblong; the base rounded on both sides . . . . . 8. *Mannii* C. DC.

*2°.* *Column and ovary glabrous—*

Leaflets subremotely serrulate at the edge, the base tapering on both sides . . . . . 9. *longifolia* Wall.

**1. *C. sinensis* A. Fuss.; *Mém. Mel.*, 142.**

Leaflets 5-6 on each side, opposite or alternate, petiolulate, ovate-oblong, acutely acuminate, entire or remotely serrulate at the edge, the base tapering below, rounded and longer above, both surfaces glabrous; rhachis puberulous; panicles as long or longer than the leaves, pendulous, densely puberulous; flowers shortly pedicellate; calyx cupulate, sinuate-crenate when adult, glabrous outside, appressedly puberulous inside, ciliolate at the edge; petals ovate-oblong, rounded at the base, obtuse at the top, glabrous; filaments glabrous; anthers shorter than the filaments, elliptic, cordate at the base, connective apiculate;

*N.B.—C. multijuga* Kurz For. Fl. = *Dracontomelum multijugum* Radlk. in litt.



staminodes 5, filamentose; column and ovary glabrous; seeds with a wing at the upper end only.—Decaisn. in *Compte-rend.* 83, p. 266; C. DC. in *Mon. Phan.* 1, p. 743.—*Toona sinensis* Roem. Syn., fasc. 1, p. 138; Harms in *Engl. Pr. Pflanzenf.*, iii, iv, p. 269.

A tree, wood reddish, branchlets glabrous, dark-reddish with pale lenticels when dry. Leaves impari-pinnate in seedlings, afterwards pari-pinnate, up to 50 cm. long. Leaflets firm, smelling of garlic when crushed, up to 13.5 cm. long, 3.5 cm. wide, upper and lower ones gradually smaller, those at the base oval; secondary nerves subspreading substraight, about 18 on each side. Petiolules 7-10 mm. long. Rhachis terete. Petiole terete, 7 cm. long. Lower branches of the panicle up to 20 cm. long, alternate, upper ones opposite. Pedicels up to 7.5 mm. long. Calyx membranous, 1 mm. long. Petals 4-5 mm. long, 2-2.25 mm. wide. Filaments 2-2.5 mm. long. Anthers 7.5—1.25 mm. long. Column shorter than the cells of the ovary. Ovary 5-celled or sometimes 4-celled, cells 8-ovulate. Panicle when fruiting black-reddish with pale lenticels. Capsule about 2 cm. long, 8 mm. wide, black-reddish with minute pale lenticels. Seeds about 12 mm. long, wing 10 mm. long, 5 mm. wide.

China, near Peking (*Dinkarville*, h. Juss.; *Bunge*, h. Cand.; *David*, h. Berol.; *Skatschkoff*, h. Calcutt., Petrop., Berol., Boiss.; *Bretschneider*, h. Berol.); Cima del Tui-Kio-fan in Chen-Si septentrionali (*G. Giraldi* n. 4351, *ibid.*); central China, prov. Szech'uan, Wanch'uan (*v. Rothorn* n. 910, *ibid.*); Japonia, (*Osumi*, h. Boiss.).

Prov. Yunnan, Szemao, alt. 4,000 ft. (*A. Henry* n. 12807, h. Calcutt., h. Kew).

**b. Hupehana**, n. var.; calyx inside more hirsute, petals oblong, only 1.5 mm. wide.

Prov. Hupeh (*A. Henry* n. 3657, h. Calcutt.).

**c. Schensiana**, n. var.; leaflets pubescent on both surfaces, the hairs longer and more dense on the nerves underneath; ripe panicle puberulous.

Schensi septr. dalla falda alla metà del Toe-pei-san (*G. Giraldi* n. 4352, h. Berol.).

**2. C. serrata** Royle; *Ill.*, p. 144, tab. 25.

Adult leaves glabrous; leaflets 11-14-jugate, opposite, petiolulate, oblong-elliptic or oblong-lanceolate, acutely and rather long acuminate, serrate at the edge; the base tapering on both sides, longer and wider above; panicle longer than the leaves, long branched, ultimate branches hirtellous; flowers pedicellate; calyx cupulate, dentate, glabrous outside, appressedly puberulous inside, the lobes rounded, obtuse or subacute

quite at the top, ciliolate at the edges; petals elliptic-oblong, truncate at the base, obtuse at the top, glabrous; filaments glabrous, anthers shorter than filaments, oblong, emarginate at the base, the connective apiculate; staminodes 5, filamentose; column and ovary glabrous; seed with a wing at the upper end only.—Brandis For. Fl., p. 73; Ind. Tr., p. 145; C. DC. Monog. Phan. 1, p. 742; Koord. et Val. Bijdr. 3, p. 205; Gamble Man. Ind. Timb., p. 160. *C. serrulata* Miq. Flor. Ind. Bat., supp., pp. 198 et 508; Ann. Mus. Bot. iv, p. 64; C. DC. l. c. p. 746. *C. Toona* Hiern Fl. Brit. Ind. 1, p. 568, in p.—*Toona serrata* Roem. Syn., fasc. 1, p. 139.

A tall tree, bark dark-grey (Gamble l. c.), branchlets glabrous, dark-reddish when dry, with few and pale lenticels or elenticellate. Leaves impari-or-abruptly-pinnate, up to 50 cm. long. Leaflets membranous, intensely dark-green (Koord. et Val. l. c.), about 13 cm. long and 4 cm. wide; secondary nerves subspreading, straight, about 25 on each side. Petiolules 5 mm. long. Rhachis terete. Petiole terete, 9 cm. long. Panicle up to 1.25 m. (Koord l. c.) long, the lower branches up to 16 cm. long, close from the base, remotely ramulose. Pedicels glabrous up to 1 mm. long. Calyx 1 mm. long. Petals 5.5-5 mm. long, 1.5-2 mm. wide. Stamens occasionally 6 (Brandis l. c.), filaments 2 mm., anthers 1.25 mm. long. Column shorter than the cells of the ovary. Ovary 5-celled, cells 8-ovulate. Capsule obovate-fusiform, about 2.5 cm. long, glabrous, smooth, nigrescent when dry, with few pale lenticels. Seeds about 16 mm. long.

“The great clusters of flowers appear in May and June, and the seed ripens in August, has on the Sutlej the smell of the pencil-cedar when fresh cut, at times said to have a strong fetid smell. The wood is lighter-coloured and more open in the grain than that of the *Toona*, but much like it in appearance. The hoops of sieves are made of it, it is also used for bridges. Shoots and leaves are lopped for cattle-fodder.” (Brandis l. c.)

India (*Royle*, h. Petrop.); North-West India (h. *Royle*, in h. Calcutt.); valleys of the Himālaya, extending to the Indus, and ascending to 8,000 ft., in moist, shady places (*Brandis* l. c.); Simla, Gowai, alt. 5,500 ft., Annandale, alt. 7,000 ft. (*J. S. Gamble* n. 569, 25535, h. Calcutt.); prope Mussourie N. W. Himalaya (*G. King*, *ibid.*); Sao Valley, alt. 5,000 ft. (*Lace* n. 961, 1707, *ibid.*); Tamsa, Chakrata, alt. 7,000 ft., flowering in June (*Gamble* n. 27070, *ibid.*); Almorah (*G. King*, *ibid.*); Kumaon, Baramula pass (*R. Strachey* et *J. E. Winterbottom*, *ibid.*); prope Chergaon in Kunawar (*Brandis* l. c., p. 573); Manipoor, Jaccoma, alt. 4-6,000 ft., fructifying in May (*G. Watt* n.

7243, h. Calcutt.); upper Burma, on the hill east of Maymyo, January fruiting (*f. C. Praser*, *ibid.*); Hort. Bogor. culta (n. 384, h. Berol. ex h. Lugd. bat.); Java, Gedé, alt. 520 ft. (*H. O. Forbes*, h. Calcutt., Berol.); Sumatra, Lobualang (*Teysm.*, h. Calcutt. ex h. Lugd. bat., *H. O. Forbes* n. 1209, h. Berol.); Hort. Bogor, e Sumatra (*Hochr.* Pl. Bogor-exsicc. n. 158, *a* and *b*).

***β. puberula* n. var.**

Leaflets puberulous underneath, mainly on the nerves; petiolules and rhachis puberulous; panicles puberulous when young, afterwards nearly glabrous even on the ultimate branchlets; lobes of the calyx subacute or acute; anthers about as long as the filaments, oblong, sagittate at the base, the connective hardly apiculate.

Petals 5 mm. long, 2 mm. wide. Filaments 1.5 mm., anthers 2 mm. long. Ovary 5-celled or sometimes 4-celled, cells 6-ovulate.

N. W. Himalaya, Sains-Givi (*D. Brandis* n. 875, h. Cand.); Ganges Valley below Dangulla, 7-8,000 ft. (*f. F. Duthie* n. 1102, h. Boiss.).

**3. *C. Hainessii* n. sp.**

Leaflets 11-jugate, opposite or subopposite, petiolulate, lanceolate, somewhat long and acutely acuminate, entire at the edge; the base acute and of same length on both sides, a little wider above; both surfaces puberulous principally along the central nerve when young, afterwards glabrous; petiolules and rhachis puberulous when young, afterwards glabrous; panicles shorter than the leaves, puberulous, pedunculate, loosely pyramidically branched; branchlets loosely floriferous; flowers pedicellate, pedicels glabrous; sepals rounded, puberulous outside, ciliolate at the edge, petals oblong-elliptic, obtuse at both ends; filaments glabrous; anthers shorter than the filaments, oblong-elliptic, cordate at the base, the connective shortly apiculate; column and ovary hirsute; style glabrous.

Branchlets sparingly hirtellous, reddish when young, elenticellate. Leaves about 50 cm. long. Leaflets up to about 10 cm. long and 3 cm. wide, the point 1.5 cm. long; secondary nerves spreading-subascendent, thin, about 15 on each side. Petiolules nearly 7 mm. long. Rhachis terete. Petiole terete, 11.5 cm. long. Panicle branched from nearly 3 cm. above its base; the lower branches about 14 cm. long. Pedicels 1 mm. and sepals about 1.25 mm. long. Petals 4-4.5 mm. long, 2.5 mm. wide. Filaments 1.25 mm., anthers .75 mm. long. Staminodes 5, filamentose. Ovary 5-celled, cells 6-ovulate.

Singbhum (*Haines* n. 189, 357, h. Calcutt.).

4. *C. Toona* Roxb. ex Rottl. et Willd. in Ges. Naturf. Fr. Neue Schr., iv, p. 198.

Leaflets 6-12-jugate, opposite or subopposite or even sometimes alternate, somewhat long-petiolulate, lanceolate or ovate-or-oblong-lanceolate, acutely acuminate, entire at the edge; the base a little longer above, tapering on both sides or subrounded above; upper surface glabrous, the lower pilose in the axils of the secondary nerves only; petiolules, rhachis and petiole glabrous; panicle about as long as the leaves, shortly pedunculate or nearly epedunculate, somewhat loosely and moderately long branched, puberulous; flowers shortly pedicellate, pedicels puberulous; sepals rounded-ovate, subacute at the top, puberulous outside, ciliate at the edge; petals ovate-oblong or oblong, obtuse at the base, subacute at the top, glabrous on both surfaces, ciliate at the edge; filaments glabrous; anthers shorter than the filaments, oblong, cordate at the base, the connective apiculate; column and ovary densely hirsute, style glabrous; capsule elliptic-oblong, elenticellate, seeds winged at both ends.—Roxb. Pl. Cor. iii, p. 34, tab. 238, Fl. Ind. 1, p. 635; Wight et Arn., p. 124; Wight Ic., tab. 161; Bedd. Fl. Sylv., tab. 10; A. Juss. Mém. Mel., p. 103?; Hiern. Fl. Brit. Ind. 1, p. 568 in p.; Brandis For. Fl., p. 72, Ill. tab. 14, Ind. Tr., p. 145; Kurz For. Fl. 1, p. 228; C. DC. Mon. Phan. 1, p. 745 (syn. A. Juss. et Forst. excluded); Grah. Cat., p. 246; Dalz. et Gibs., p. 38; Talb. Trees of Bomb., p. 43 (f. Cooke l. c.); Cooke Fl. Pres. Bomb. ii, p. 217; Gamble Man., p. 157.—*Toona ciliata* Roem. Syn., fasc. i, p. 139; Harms in Engl. Prantl. Pflanzf. iii, iv, p. 270. *C. hexandra* Wall.—*Surenus Toona* O. Ktz. Rev. i, p. iii.

A deciduous or nearly evergreen (Brandis l. c.) tree, 60-70 ped. high; bark thin, dark grey (Brandis l. c.). Branchlets puberulous when young, then glabrous, reddish when dry, sparingly lenticellose. Leaves up to 38 cm. long. Leaflets 11-12 cm. long, 3.5-4 cm. wide; secondary nerves thin, spreading-ascendent, about 18 on each side. Petiolules 8-12 mm. long. Rhachis terete. Petiole terete, 6 cm. long. Lower branches of the panicle up to 12 cm. long. Pedicels 1 mm., sepals about .8 mm. long. Petals 3.5-4.5 mm. long, 2-2.5 mm. wide. Filaments 1.5 mm., anthers .75 mm. long. Staminodes 0. Column shorter than the cells of the ovary. Ovary 5-celled, cells 8-10-ovulate. Capsule about 2 cm. long, blackish when dry. Seeds 15 mm. long, both wings oblong-ovate obtuse or subacute at the top, the upper one a little shorter than the other.

North-Western Himalaya (Royle, h. Calcutt.); Chamba to Raleh (J. H. Lace n. 1410, h. Calcutt.); East India (R. Wight, h. Berl.);

Belaspoor (*Stoliczka*, h. Calcutt.). Simla, alt. 3,000 ft. (*J. S. Gamble* n. 568, *ibid.*); Nepaul (*Wall.* n. 1272, h. Deless; 1272E, 1272-1, h. Calcutt.); East Himalaya (*Griffith* n. 1030-1, h. Calcutt., h. Monac., h. Holm.); Summit Paras nath (h. Calcutt.); Sikkim (*G. King*, *ibid.*); Khasia, alt. 2-3,000 ft. (*Hook. f.*, *Thoms.*, *ibid.*, h. Cand.); outer Khasia hills below Chirung (h. Calcutt.); Sylhet (*C. B. Clarke* n. 7172, *ibid.*); Prov. Bombay (*O. Hoffmann*, h. Berl., with capsules only 2 cm. long.); hort. bot. Calcutt. (*Kurz*, *ibid.*); Ganja Mahal (*D. Prain*, *ibid.*); Rajpore (*S. Kurz*, *ibid.*); Ghát (*J. S. Gamble*, *ibid.*); Nilgiris, Carnon. alt. 3,000 ft.; Assam, Goalpara (*C. B. Clarke* n. 43149 B., *ibid.*, n. 43149A, h. Berol., Cand., Boiss.); Assam (*Jenkins*, h. Calcutt.); Jeypore (*D. Prain*, *ibid.*); Dukkinishur (*Clarke* n. 34531, h. Boiss.); Chittagong, a tree 90-100 ft. high (*Dr. King's collect.*, *ibid.*; *J. S. Gamble*, *ibid.*); Tenasserim circle (*ibid.*). Java (*Horsefield*, *ibid.*).

Largely cultivated in India, cultivated also in Mauritius (Bojer, h. Cand.). The following varieties are to be distinguished from the type.

#### A.—Branchlets and adult leaves as in the type.

(a) Column and ovary hirsute.

1. *Filaments glabrous.*

$\beta$ . *nepalensis* n. var.

Sepals a little longer than in the type; petals up to 5 mm. long and up to 3 mm. wide; capsule smaller than in the type, about 1.5 cm. long.—*C. hexandra* Wall. in Roxb. Fl. ed. Car., p. 225.

Nepaul, 1821 and 1823 (*Wall.* n. 1272, h. Deless., spec. florif. et spec. fructif.; 1272, A. h. Mus. Par.).

$\gamma$ . *pulistila* n. var.

Leaflets obliquely oblong-elliptic, acutely acuminate, the base tapering and of same length on both sides; panicle shorter than the leaves, subglabrous, somewhat densely branched from near the base; sepals glabrous, ciliate at the edge; style sparingly hirsute nearly up to the top.

Shevaroi hills (*Perrottet* n. 239, 240 (or 89?), h. Calcutt.).

$\delta$ . *latifolia* *Miq. in Hohen. Exsicc.*, n. 1539.

Leaflets ovate, up to 6 cm. wide, acutely acuminate, rounded towards the base on both sides, or subattenuate at the base below, extreme base acute and of same length on both sides; petals up to 5.5 mm. long, and to 2.5 mm. wide; filaments up to 2.5 mm., anthers up to 1.5 mm. long.—*C. Toona* C. DC. Mon. Phan. l. c.

Mount Nilagiri, prope Melur, incolis Kilichin-Mara (*Hohen* n. 1539, h. Cand., and the leaf only in h. Berol.); Nilghary hill (*T. Kist. Naidoo*, h. Calcutt.); Bangalore (ibid.); East India (*Wight* n. 422, ibid.); Nilgiris, Coonoor, alt. 9,000 ft. (*J. S. Gamble* n. 16241, with lowest leaflet obtusely dentate, ibid.).

2. *Filaments pilose.*

ε. *yunnanensis* n. var.

Leaflets opposite or alternate, up to 10 cm. long and to 4 cm. wide, the lower ones ovate, acutely acuminate and nearly equally rounded on both sides at the base; the others ovate-lanceolate, the base of same length on both sides, tapering or rounded below, rounded and wider above; petiolules up to 11 mm. long; petals 5 mm. long, 3 mm. wide.

Yunnan, Szemao Mounts (*Aug. Henry* n. 13001, h. Calcutt; Berl.).

ζ. *pilistaminea* n. var.

Leaflets as in the type; capsule smaller, 2 cm. long, 9 mm. wide, black when dry, with minute lenticels.—*C. febrifuga*, forma timorensis et forma ternatensis Miq. Ann. Mus. 4, p. 63.

Flowering specimens: Salsette, Bombay (*Law*, h. Dalzell in h. Calcutt.); Himalaya (h. Calcutt.); Dehra Dún (*B. Birbal*, ibid.); Kumaon (*G. King*, ibid.); Bilghy, Soonda (ibid.); Dinajpoor (ibid.); Jessore (*C. B. Clarke* n. 8369, ibid.); Shevaroi hills (*Perrottet* n. 113, 238, ibid.); Khasia, Cachar (*Mann*, ibid.); Chittagong (*King*, ibid.); Manipur and lower hills, alt. 2-4,000 ft. (*G. Watt*, ibid.); Pegu, Toukgeghat (*Kurz* n. 1384, h. Calcutt.); Penang, Government hill (*C. Curtis*, h. Calcutt.); Java, Preanger (*Warburg* n. 3166, h. Berl.); Java (h. *Holm.*, h. Calcutt.).

Flowering and fruiting specimens. Ind. Bor. occ. (*Hook. & Thom.*, h. Berl.). Timor (*Spanoghe*, h. Calcutt. ex h. Lugd. Bat.); Ternate (*Teysman*, h. Calcutt.).

η. *deccana* n. var.

Leaflets as in the type, only longer acuminate, sepals rounded, glabrous, ciliate at the edge; petals obtuse at the top, 5 mm. long, 3.5 mm. wide, subcoriaceous when dry; Deccan (*T. Cooke* n. 179, h. Calcutt.).

θ. *cuspidata* n. var.

Leaflets opposite or alternate, up to 14 cm. long, and to 4 cm. wide, subfalcate-lanceolate, long and acutely acuminate; the base tapering on both sides, longer and wider above; panicle nearly as long as the leaves, sparingly hirtellous, pyramidically branched; sepals

rounded-ovate, acute at the top; petals oblong-elliptic, acute at the top; capsule oblong-obovate, about 3.5 cm. long, sparingly lenticellate; upper wing of the seed shorter than the lower.

Upper Burma, Myitkyina (*Shaik Mokim* n. 29, h. Calcutt., h. Cand., floriferous specimens); India? (*Ritchie* n. 1660, h. Boiss, fructiferous specimen).

ι. *Stracheyi* n. var.

Leaflets oblong-lanceolate, acutely acuminate, the base tapering and of same length on both sides, 16 cm. long, 5 cm. wide; panicle minutely puberulous; sepals rounded, puberulous outside, ciliate at the edge; petals ovate-oblong, obtuse at the top, very sparingly pilose on both surfaces.

Kumaon in Sarja valley, alt. 3,500 ft. (*R. Strachey*, *J. E. Winterbottom*, n. 1, h. Calcutt., specimen with only one leaf and a branch of the panicle).

κ. *pillipetala* n. var.

Leaflets up to 10 cm. long and 38 mm. wide, ovate-oblong, acutely acuminate, the base tapering below, rounded above, nearly of same length on both sides; panicle puberulous, dark reddish with pale lenticels when dry; sepals rounded, sparingly puberulous outside, ciliate at the edge; petals subovate-oblong, subacute at the top, pilose on the inner surface; style hirsute.

Nilghiris (*B. Schmid*, h. Calcutt. ex h. Kew.); Salsette, Bombay (*N. Dalzell*, h. Calcutt.).

(b) Column hirsute, ovary glabrous.

1. *Filaments glabrous.*

λ. *Gamblei* n. var.

Leaflets up to 9.5 cm. long and to 3.5 cm. wide, lanceolate, acutely acuminate, the base tapering on both sides, longer above, petiolules about 8 mm. long on the upper side; panicle shorter than the leaves, branched from the base, racemose above, puberulous; sepals rounded glabrous, ciliate at the edge; petals obovate-oblong; filaments glabrous; ovary and style glabrous.

North-West Prov., Dharmigadh, Jaunsar district, alt. 4,000 ft., flowering in May (*J. S. Gamble*, h. Calcutt.).

2. *Filaments pilose.*

μ. *Talbotii* n. var.

Leaflets 4-jugate, up to 12 cm. long, up to 5 cm. wide, subobliquely oblong-ovate, long-acuminate, the point subulate; the base attenuate below, rounded, wider and a little longer above; panicle as long as the leaves, loosely branched, glabrous; petals oblong, obtuse at both ends, 4.5 mm. long, 2 mm. wide; the connective sometimes long acuminate, ovary hirsute at the base only.

Northern Canara (*Talbot*. n. 325, h. Calcutt.).

v. *australis* n. var.

Leaflets up to 12.5 cm. long and up to 5 cm. wide, subobliquely oblong-ovate, acutely acuminate, the base tapering below, rounded and a little longer above; panicle as long as the leaves, loosely and shortly branched, glabrous; sepals rounded, glabrous, ciliate at the edge; petals elliptic, obtuse at both ends; filaments pilose; ovary and style glabrous; capsule obovate-oblong, fuscous when dry; nearly elenticellate; seed as in the type.—*C. Australis* F. Muell. *Fragm.* 1, p. 4; *C. DC. Mon. Phan.* 1, p. 743, tab. ix, fig. 5 (with filaments erroneously glabrous). *C. Toona* Benth. *Fl. Austr.* 1, p. 387. Red Cedar of the colonists.

Littoral forests of eastern Australia (*F. Muell.* l. c.); Moreton Bay; Mackenzie's station (*Benth.* l. c.); Rockingham Bay (*Dallachy*, h. Calcutt.); Ipswich in Queensland (*Bedel*, *ibid.*); Brisbane (*Warburg* n. 19213, h. Berl.); Patterson river (*R. Brown*, *ibid.*); Hunter's river (*Cunningham*, h. Deless.).

ξ. *parviflora* Benth, l. c.

Leaflets up to 6 cm. long and to 28 mm. wide, ovate-lanceolate, acutely acuminate; the base tapering on both sides, longer and wider above; panicle about as long as the leaves, shortly pedunculate, loosely and shortly branched, nearly glabrous except on the ultimate branchlets; sepals ovate, acute at the top, glabrous, ciliate at the edge; petals oblong-elliptic, obtuse at both ends; filaments pilose.

New South Wales, Vicary (*Maitland*, h. Calcutt.); Hastings river (h. Berl.); Hunter's river (*Cunningham*, h. Deless.).

**B.—Branchlets as well as the petioles rhachis and petiolules of the adult leaves pubescent. Column and ovary as in the type.**

1. *Filaments glabrous.*

o. *pubinervis* n. var.

Leaflets alternate, 5 (or more?) on each side; up to 15.5 cm. long, and nearly to 6 cm. wide; oblong-ovate, acutely acuminate; the base



nearly of same length on both sides, tapering below, rounded above, both surfaces puberulous on the nerves; petals ovate-elliptic, obtuse at the top, about 4 mm. long, 2 mm. wide.

Himalaya (h. Calcutt.).

2. *Filaments pilose.*

π. *puberula* n. var.

Leaflets alternate or opposite, 5-10 on each side, 12-14 cm. long, 4.5-5 cm. wide, ovate-lanceolate acutely acuminate; the base tapering below, subtapering or rounded above; petiolules about 15 mm. long, petals oblong-elliptic, rounded at the top, 4.5 mm. long, 2.5 mm. wide; filaments sparingly pilose.

Kachin hills (*E. Pottinger, Shaik Mokim*; h. Calcutt., h. Monac.).

ρ. *Henryi* n. var.

Leaflets 12 cm. long, 4.5 cm. wide; upper surface puberulous on the central nerve, the lower as in the type; the base tapering on both sides, wider and a little longer above; petiolules 12 mm. long; flowering panicle much shorter than the leaves, loosely branched nearly from the base; petals elliptic, rounded at both ends, 4.5 mm. long, 2.5 mm. wide; filaments sparingly pilose. A tree 20 feet high.

China, prov. Yunnan, Szemao Mounts, alt. 5,000 ft.

(*A. Henry* n. 11963, h. Calcutt.)

σ. *pubescens* *Franch. Pl. Delav.*, p. 126;

Leaflets pubescent on both surfaces when young, afterwards glabrous except in the axils of the secondary nerves, about 9 cm. long, up to 3 cm. wide, oblong-lanceolate, acutely acuminate, the base tapering and of the same length on both sides; petiolules up to 9 mm. long; petals subovate-oblong, subacute at the top, 4.5 mm. long, 1.5 mm. wide; filaments sparingly pilose; style hirsute. A tree 20 ft. high.

China, Prov. Yunnan, Szemao Mounts. in the forest, alt. 5,000 ft. (*A. Henry* n. 11963A, h. Calcutt., h. Berol.); forests Tapintze (*Delavey*, h. Berol., h. Mus. Par.).

τ. *sublaxiflora* n. var.

Leaflets opposite or alternate, up to 13 cm. long and to 3.5 cm. wide, oblong-lanceolate, acutely acuminate, the base tapering and of same length on both sides; upper surface puberulous on the main nerve, under surface as in the type; petiolules about 8 mm. long; rather densely

pubescent as well as the rhachis, the petiole and the branchlets; petals oblong, subacute at the top, 5 mm. long, 2 mm. wide; filaments sparingly pilose.

China, Prov. Yunnan, alt. 4,600 ft. (*A. Henry* n. 9486A, h. Calcutt., h. Berol.).

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**C.—Flower unknown, seed as in the type.**

*v. Listerii* n. var.

Branchlets and leaves as in the type, except that the lowest leaflets are remotely and acutely dentate at the edge; capsule only 2 cm. long.

Kasalong (*f. L. Lister*, h. Calcutt.).

---

**D.—Flower and fruit unknown.**

*φ. Warburgii* n. var.?

Leaflets opposite, petiolulate, up to 18 cm. long and to 7 cm. wide, oblong-elliptic, linear-acuminate at the top; the base tapering below, subrounded above; nerves hirtellous on both sides; as well as the petiolules and rhachis.—Vern. name '*Suren.*'

Java, Preanger, Tjilakei bei Pengalengan, alt. 1,300 m. (*Warburg* n. 3167, 3168, h. Berol.).

**5. C. microcarpa** C. DC. *Mon. Phan.*, I, p. 745.

Leaves glabrous; leaflets 9-jugate, opposite, petiolulate, more or less obliquely oblong-ovate, acutely acuminate, entire at the edge, the base tapering below, rounded wider and a little longer above; panicle a little shorter than the leaves, pedunculate, shortly branched, elongated, hirtellous; flowers pedicellate, pedicels densely hirtellous; sepals rounded, densely hirtellous outside, ciliate at the edge; petals oblong-obovate, subacute at the base, rounded and somewhat cucullate at the top, glabrous, ciliate at the edge; filaments densely pilose; anthers shorter than the filaments, oblong, cordate at the base, the connective apiculate; column and ovary densely hirsute, style glabrous; capsule elenticellate; seeds winged at both ends.—Gamble *Man. of Ind. Timb.*, p. 159. *C. Toona* *β. grandiflora* C. DC. l. c. *Toona microcarpa* Harms in *Engl. Pr. Pflanzf.* iii, p. 270.

A large evergreen tree (Gamble l. c.), branchlets puberulous and brown when young, later on dark-rubescens and glabrous. Leaves abruptly pinnate, up to 50 cm. long. Leaflets firm when dry, up to

12 cm. long, 4.5-5 cm. wide; the secondary nerves spreadingly-ascendent, subarcuate, about 12 on each side. Petiolules nearly 5 mm. long. Rhachis terete. Petiole 15 cm. long, terete. Peduncle of the panicle 4.5 cm. long; the lower branches of the panicle about 5 cm. long. Pedicels 1.5 mm., sepals 1 mm. long. Petals 6 mm. long, 3 mm. wide. Filaments 3 mm., anthers 1.75 mm. long. Staminodes 0. Column shorter than the cells of the ovary. Ovary 5-celled. Capsule elliptic, 2 cm. long, blackish when dry, the valves thin. Nepal (*Wall.* n. 9041, h. Calcutt.); Sikkim, alt. 4,000-5,000 ped. (*Hook.*, *Thoms.*, h. Cand., florif. specim. and ripe fruits, h. Calcutt., h. Monac., h. Berol., florif. specim. and unripe fruits, h. Monac., fruit only); W. Burma, vern. 'yetana' (*f. B. Dickinson*, h. Calcutt.); Australia where most likely not spontaneous (h. Deless.).

***β. grandifoliola* n. var.**

Leaflets alternate or opposite, 7-8 on each side, up to 18 cm. long and to 7 cm. wide, oblong-ovate, acutely and rather long acuminate; the base as in the type; panicle loosely branched, puberulous; sepals rounded, nearly glabrous on both surfaces, ciliate at the edge; petals oblong obtuse at the top, 5 mm. long, 2.5 mm. wide, sparingly puberulous at the base; filaments pilose, 2.5 mm. long; anthers 1 mm. long, the connective not apiculate; column and ovary as in the type; lower part of the style hirsute; fruit unknown.

Punkabari, Sikkim (h. Calcutt.).

**6. *C. Kingii* n. sp.**

Leaflets 4-6-jugate, opposite or subalternate, somewhat long petiolulate, ovate-lanceolate, acutely acuminate, entire and ciliate at the edge, the base tapering on both sides, wider and a little longer above, upper surface hirtellous above on the nerves, under surface densely hirsute; petiolules rhachis and petiole densely hirsute; panicle about as long as the leaves, branched from near the base, velvety-hirtellous; flowers somewhat long pedicellate, pedicels hirtellous; sepals rotundate-ovate, subacute at the top, hirsute outside and ciliate at the edge; petals oblong-obovate or obovate, obtuse at the base, rounded at the top, glabrous on both surfaces, ciliate at the edge; filaments sparingly pilose, anthers shorter than the filaments, elliptic, cordate at the base, the connective apiculate; column and ovary hirsute; style glabrous.

Branchlets hirsute, fulvescent when dry. Leaves abruptly pinnate, about 30 cm. long. Leaflets brown when dry, about 10.5 cm. long, 3.5

cm. wide, secondary nerves spreading-subascendent, straight, about 14 on each side. Petiolules 7 mm. long. Rhachis terete. Petiole terete, 5.5 cm. long. Lower branches of the panicle up to 18 cm. long. Pedicels 1.5 mm., sepals .75 mm. long. Petals 4.5 mm. long, 2 mm. wide. Filaments 1.5 mm., anthers .75 mm. long. Staminodes 0. Column shorter than the cells of the ovary. Ovary 5-celled, cells 6-ovulate; unripe seeds winged at both ends.

Sikkim Himalaya (*G. King*, h. Calcutt., flowering specimen); Lahore distr., only one leaf 62 cm. long, less hairy, from a young tree having a greenish grey and very smooth bark (*J. S. Gamble* n. 23384, h. Calcutt.).

***β. birmanica.***

Leaflets 5-9-jugate, oblong-lanceolate, up to 11 cm. long and up to 4 cm. wide; petiolules up to 12 mm. long; flower unknown; capsule oblong-obovate, rather slender, black when dry, with minute and paler lenticels, 2 cm. long, the valves only 5 mm. wide; seed winged at both ends, upper wing shorter and obtuse, the lower acute.—*C. Toona* Kurz; For. Fl., p. 228, p. p. '*Thit Kador*' of the Burmese. (Kurz Sp. quoted below.)

Upper Burma, Kachin hills (*Shaik Mokim*, h. Calcutt.); Pegu (*Kurz*, h. Calcutt.).

**7. *C. febrifuga* Bl. Bijdr., i, p. 180.**

Leaflets 6-12-jugate, opposite or subopposite, petiolulate, ovate-oblong, subobliquely acutely and rather long acuminate, entire at the edge; the base tapering below, rounded or subrounded and a little longer above; upper surface minutely puberulous on the main nerve only, lower surface sparingly pilose in the axils of the secondary nerves only; petiolules and rhachis minutely puberulous; panicles as long as the leaves, pyramidically branched, densely puberulous; flowers pedicellate, pedicels puberulous; calyx cupulate, bluntly 5-dentate, rather densely puberulous outside, nearly glabrous inside, ciliate at the edge; petals oblong-ovate, subattenuate-obtuse at both ends, hirsute on both surfaces, especially near the middle, ciliate at the edge; filaments pilose; anthers shorter than the filaments, elliptic, the connective obtuse or very shortly apiculate; column and ovary densely hirsute; style glabrous; capsule obovate-fusiform, lenticellate; seed equally or nearly equally winged at both ends.—*Surenus* Rumph. Amb. iii, tab. 39; *S. febrifuga* O. Ktz. Rev. i, p. 111 *Swietenia Surenii*

Bl. Cat. Hort. Buit. (f. Roemer). *Toona febrifuga* Roem. Syn. i, p. 139; Pierre Fl. For. 23; *Cedrela febrifuga*, A. Juss. Mem. Mel., p. 103; Don. Gen. Syst. i, p. 687; Forsten Diss., p. 16 cum icone; Hassk. Cat. Hort. Bogor, p. 129; Miq. Ann. Mus. Bot. 4, p. 63; C. DC. Mon. Phan. i, p. 744; King Mat. Mal. 7, p. 577; Koord et Val. Bijdr. 3, p. 202. *C. Toona* Miq. Fl. Ind. Bat. i, pars 2, p. 548, p. p.; Hiern Fl. Brit. Ind. i, p. 569, p. p.; non *C. Toona* C. DC. l. c. p. 745; *C. Teysmanni* Hassk. Hort. Bogor. i, p. 135; *C. odorata* Blanco. Flor. Phil., ed. I, p. 184.

A tree up to 180 ft. high; branchlets densely pubescent when young, afterwards glabrous, dark-reddish with pale lenticels when dry. Leaves abruptly pinnate, 30-50 cm. long. Leaflets 11.5-20 cm. long, 4.5-7.5 cm. wide; secondary nerves spreading-subascending, arcuate, about 12-15 on each side. Petiolules about 6 mm. long. Rhachis subterete. Petiole terete, up to 10.5 cm. long. Lower branches of the panicle 25-30 cm. long; branchlets floriferous nearly from the base. Pedicels about 1 mm. long. Calyx 1 mm. long, the lobes rounded. Petals about 4 mm. long, 1.5 mm. wide. Filaments 1.5 mm., anthers 1 mm. long. Staminodes 0. Column shorter than the cells of the ovary. Ovary 5-celled, cells 6-ovulate. Capsule 25-30 mm., seeds 18-22 mm. long.

Perak, dense jungle, alt. 400-600 ft. (*King's collector* n. 10403, h. Calcutt., h. Berl.); Penang (*Curtis* n. 826 fide. King l. c.).

Java (h. Cand., Petrop., Holm. ex h. Lugd. bat.; *Junghuhn* n. 50, h. Calcutt.; *Koord et Val.* n. 4825  $\beta$ , 4835  $\beta$ , 14575  $\beta$ , h. Calcutt., n. 4835, h. Cand.); Banjoevangie (*Teysm.*, h. Calcutt.).

Philippines, Polo Mindoro (*D. Merrill* n. 2372, h. Berl.)?; Luzon (*G. P. Mann* n. 73, h. Berol.)?

$\beta$ . *glabrior* C. DC. l. c.

Leaflets quite glabrous except underneath in the axils of the secondary nerves; the base acute or subacute on both sides, a little longer above; petals less pubescent than in the type or even glabrous, the connective shortly apiculate.

Java (*Zollinger* n. 946, h. Cand., h. Berol. not n. 9467 as in C. DC. Mon. Phan.).

$\gamma$ . *inodora* n. var.

Leaflets quite glabrous except underneath in the axils of the secondary nerves; petiolules and rhachis glabrous; flowers unknown; wood whitish, inodorous.—*C. inodora* Hassk. Hort. Bogor., p. 131; Hochr. Pl. Bogor-exsic. n. 157, Hort. Bogor. e Sumatra? (Hochr. l. c.).

$\delta$ . *assamensis* n. var.

Leaflets up to 13 cm. long and to 4.5 cm. wide, ovate-lanceolate, rather long and acutely acuminate; the base subacute on both sides, a little longer above; secondary nerves subspreading substraight; petals 5 mm. long, 2.5 mm. wide, oblong-elliptic, obtuse at both ends, minutely puberulous on both surfaces; capsule obovate-fusiform, reddish when dry, up to 4 cm. long; seed winged at both ends, upper wing shorter than the lower. Vernacular name "*Fata Poma*."

Branchlets glabrous, pale reddish when dry, with a few pale brown lenticels.

Sibsagor (*G. E. Peal*, h. Calcutt.).

ε. *Pealii* n. var.

Leaflets up to 10.5 cm. long and to 5 cm. wide; ovate, subacutely acuminate, the base tapering below, rounded and a little longer above; secondary nerves spreading, subarcuate; calyx glabrous, rugulose outside; petals oblong-elliptic, obtuse at both ends, glabrous outside, sparingly pilose inside; lower ovules inserted within the column. Fruit unknown. Vernacular name "*Fata Poma*."

Branchlets glabrous, pale reddish when dry, elenticellate.

Sibsagor (*G. E. Peal* n. 275, h. Calcutt.).

ζ. *Cochinchinensis*

Leaflets and petals as in the preceding; upper wing of the seed a little shorter than the lower. *Toona febrifuga*, var. *cochinchinensis* Pierre l. c., tab. 388A.

Cochinchina, prov. Bian Hoa (Pierre, h. Cand.).

η. *verrucosa* n. var.

Leaves glabrous; rhachis and petiole together with the branchlets of the panicle and the capsules covered with verrucose lenticels; upper wing of the seed rather shorter than the lower.

Bhutan-Himalaya (h. Calcutt.); Sikkim, alt. 5,000-6,000 ft. (*S. A. Gammie*, h. Calcutt., h. Cand.); Darjeeling, alt. 5,000 ft. (*J. S. Gamble* n. 9618, h. Calcutt.); upper Burma, Kachin hills, alt. 5,500 ft., Sima road (*Shaik Mokim*, h. Calcutt., h. Cand.).

Sumatra forest on Mount Kaba, alt. 3,500 ft. (*H. O. Forbes*, h. Calcutt.; n. 2881, h. Berl.).

8. *C. Mannii* n. sp.

Leaflets 6-7-jugate, opposite or subopposite, very shortly petiolulate, oblong or the lower ones ovate-oblong, somewhat obtusely acuminate, the edges entire, the base subequally rounded on both sides, the upper surface minutely puberulous on the main nerve only, the under surface quite glabrous; rhachis and petiole minutely puberulous;

panicles minutely puberulous; flowers pedicellate; pedicels puberulous; calyx bluntly 5-dentate, puberulous outside, ciliate at the edges; petals oblong, obtuse at both ends, glabrous, ciliate at the edges, filaments densely pilose; anthers much shorter than the filaments, elliptic, cordate at the base, the connective blunt; column and ovary hirsute; the ovules partly inside the column; style glabrous.

Leaves more than 33 cm. long. Leaflets up to 11 cm. long and to 42 mm. wide; secondary nerves spreading, nearly straight, about 20 on each side. Petiolules 2 mm. long. Rhachis and petiole terete. Lower branches of the panicle up to 20 cm. long. Pedicels 1.5 mm. long. Calyx 1 mm. long, the teeth rounded. Petals 5 mm. long, 2 mm. wide. Filaments 2 mm., anthers .75 mm. long. Staminodes 0. Column shorter than the cells of the ovary. Ovary 3-celled, lower ovules within the column.

Khasia (*G. Mann.*, h. Cand.).

9. *C. longifolia* Wall. Cat. n. 1273.

Leaflets 11-12-jugate, opposite, subsessile or the lower ones very shortly petiolulate, oblong-lanceolate, long and acutely acuminate, subremotely serrulate, the base tapering on both sides equal or unequal in the lower leaflets, upper surface glabrous, under surface sparingly pilose in the axils of the secondary nerves only; panicles densely pubescent; flowers shortly pedicellate, pedicels puberulous; calyx cupulate, subacutely 5-dentate, glabrous outside, appressedly puberulous inside, ciliate at the edge; petals elliptic-oblong, obtuse at both ends, glabrous outside, with a few hairs at the base inside, not ciliate at the edges; filaments glabrous; anthers shorter than the filaments, oblong, cordate at the base, the connective subapiculate; column and ovary glabrous.—*C. Toona* Wall. Cat. p. p.; DC. Prodr. 1, p. 624; A. Juss. Mém. Mel., p. 103. *C. glabra* C. DC. Mon. Phan. 1, p. 742.—*Toona longifolia* Roem. Syn., fasc. i, p. 140. *T. glabra* Harms in Engl. Pr. Pflanzf. iii, 4, p. 269.

A tree; branchlets glabrous, dark-reddish when dry, with few pale lenticels. Leaves abruptly pinnate, up to 70 cm. long. Leaflets about 12.5 cm. long, 3.5 cm. wide, denticles obtuse or subobtuse; secondary nerves subspreading, nearly straight, about 14 on each side. Petiolules up to 2 mm. long. Rhachis subterete, petiole terete 7 cm. long, both puberulous when young, afterwards nearly quite glabrous. Pedicels .75 mm. long. Calyx nearly 1.5 mm. long. Petals 5 mm. long, 2 mm. wide. Filaments 2.5 mm., anthers 1.5 mm. long. Staminodes 0. Column shorter than the cells of the ovary. Ovary 5-celled, the cells

6-8- ovulate. Capsule about 2.5 cm. long, blackish elenticellate. Seed unknown.

· *Napalia* (*Wall.* 1821; sine n., h. DC.); *Ava?* (*Wall.* n. 1273, h. DC. Mon. Phan., h. Calcutt. sub *C. longifolia*).

β. *kumaona* n. var.

Leaflets loosely pilose underneath on the nerves; panicles subglabrous; lobes of the calyx rounded, obtuse or subacute at the top; the connective obtuse or subobtuse, seeds winged at the upper end only, 15 mm. long, wing oblong, obtuse. A tall tree.

Kumaon, upper Tola, alt. 6,400 ft. (*R. Strachey* et *J. E. Winterbottom*, h. Calcutt.); Hazara (*Stewart*, h. Calcutt.).



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*New species or varieties are in bold type.*

[ **Synonyms and vernacular names in italics.** ]

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