THE VEGETABLE PRODUCTS OF CEYLON.

(A Guide to their Identification and Economic Uses.)

BY

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FOREWORD.

THE publication of this book is associated with circumstances that are as sad as those which attended the issue of the last volume of Dr. Trimen's monumental work, "The Flora of Ceylon."

Trimen was an indefatigable worker, whose researches in the field of Tropical Botany were prosecuted with a vigour that sorely tried his health, already impaired by extensive and hard travelling in remote parts of the Colony; and before he had completed the gigantic task he set himself—which engaged him even when lying on a bed of sickness,—death overtook him.

In his "Introduction" to the first volume, Trimen wrote "Much remains to be done by others, and indeed it is only by the co-operation of many observers that anything like completeness can be attained. I hope that the result of this publication may be to stimulate such observation and enquiry by those who have the opportunity to make them." This hope has certainly been fulfilled in the case of Mr. Frederick Lewis.

In spite of an enfeebled frame, the result of tireless work, which gave him no opportunity of recruiting his health. Mr. Lewis kept himself busy almost up to his last hours.

Trimen's Flora had to be brought to a finality by a contemporary; and it has been my privilege to assist in the preparation of Mr. Lewis' book for publication.

A part of this work appeared serially in the columns of the Sunday issue of the *Ceylon Observer*, whose proprietors wisely decided to bring it out in its entirety in book form, for the benefit of students of Ceylon Botany, and others interested in the Vegetable Products of the East.

In this utilitarian age, a work of this description is of particular value, as a compendium of information based, to a large extent, on first-hand observation.

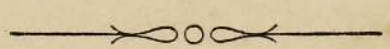
Mr. Lewis' study of plant life in Ceylon extended over half a century, during which time he was more or less continuously on the move, as a pioneer planter who opened land in different districts, as Assistant Conservator of Forests who had to traverse the Island's jungles, and as a Land Settlement Officer who was almost incessantly on tour.

Constant travel afforded him ample means of studying our local flora, which he did not miss; and he was able not only to

identify nearly every plant he came across, but also to acquaint himself with its vernacular name, medicinal properties and economic uses.

It has been a pleasure to me to help, in however small a measure, in perpetuating the work of a man of astounding industry and encyclopædic knowledge, who spent the best part of his life in unselfish devotion to the welfare of this Colony.

C. DRIEBERG.



INTRODUCTION.

THIS work is intended to supply the non-technical reader with a concise description of our useful Trees and Plants. It does not pretend to deal with *all* our plants, nor does it profess to go beyond the grasses.

An attempt is made to give the reader a short description of each of those plants that come into economic use, and in language free, as far as possible, from terms with which the average reader is unacquainted.

Considerable attention is paid to the description of the leaf, often more so than to the flower, as it is the general experience of plant collectors in Ceylon, that flowers and fruits are not always available, when the specimen comes to hand. Leaves are, on the other hand, always accessible, and if a minute description of these is closely followed, it will be generally found that an identification of the species can pretty nearly be arrived at. It is not contended that flowers should be disregarded, as they are, for purposes of identification, the last word: but where they cannot be got, especially fresh, a leaf description is of the greatest assistance.

I have strictly followed the classification adopted in *Trimen's*, "*Flora of Ceylon*," and in all cases a reference will be found, after the name of the plant, to the volume and page of this invaluable standard work on our Flora—a work that has also been quoted by me in the text freely and unreservedly; and I desire to take this opportunity, not only of acknowledging my obligation, but of advising all Students of Botany in Ceylon to consult it.

Where I have had notes of the material described, and where I have identified the material so collected, I have followed my own line of description; but where I have had the least reason to consider my own observations inadequate, I have relied on the work under reference. My obligation to other writers is also very great, and though for considerations of space I do not single out each authority for special thanks, the subjoined list of writers and works consulted will, I trust, indicate the great assistance I have derived from them. Lastly, I wish to make a special acknowledgment to two gentlemen—Mr. A. F. Broun and Mr. T. Petch—the former for having inspired me by his own profound and unselfish knowledge of Botany, to make a close study of this fascinating subject;

and the latter, for his kindness in identifying species that I often, inconsiderately, submitted to him for that purpose.

It is perhaps desirable to afford the reader a rough sketch of our Flora, as a whole, before the individuals themselves are examined, or if the expression may be used, take a bird's-eye view of the vegetation of this Island.

It must strike the observer as very noticeable, in the course of a Railway journey, say from Colombo to Badulla, that there are remarkable transitions in the vegetation. These transitions, in a great measure, correspond with altitudinal variation; but that is not the only factor in the case. If a rainfall chart of the Island be consulted, the variation in rainfall will be found even more remarkable than the altitudinal fluctuation. Thus, we will find that in a line drawn, say from Bentota in the West to the mouth of the Verugal River in the East, we pass through remarkable extremes of rainfall; for we shall start with about 110 inches of rainfall, and steadily increase till nearly 300 inches are reached, after which we shall find a sudden drop to below 90 inches, followed by a short abrupt rise, and then come upon a region where 55 to 60 inches a year is what is to be expected; and this diminished fall is confined, or practically confined, to one monsoon.

We therefore find that we may divide our Island into Zones, and these can be classed as:—

(i.) Dry Zone.
(ii.) Wet Zone.
(iii.) Intermediate Zone.
(iv.) Montane Zone.

The *Dry Zone* may be conveniently divided into two subdivisions, (*a*) Dry, and (*b*) Arid, the former having a rainfall above 35 inches and below 80, and the latter below 35 inches.

These Zones are however very much affected by two other conditions that react to an enormous extent upon our plant distribution, viz., cultivated areas, and patina lands.

Ceylon being an agricultural country, and one that is purely tropical, it is inevitable that the action of man must have played an enormous part in changing the face of the land. The casual observer will hardly realise how great this influence has been, not only in altering the face of the land, but in breaking up the normal development of vegetable life as it proceeds in a state of nature. It is indeed difficult to picture what the vegetation of Ceylon would be like, had no human beings set foot upon its shores.

As it is, we have a combination of plants, some of which have their natural affinities to adjoining countries, growing

side by side with purely introduced units. We have introductions that have become completely naturalised, and we have species that are endemic, and typical of this Island alone.

The process of felling and clearing of forest land for agricultural purposes has inevitably broken the natural contiguity of large areas that once were covered by forests in a state of nature; and this process has, in addition to its disruptive action, brought about conditions of change directly affecting the soil. Indeed, it might be said, that except in those places where natural inaccessibility or climatic unsuitability have preserved an unbroken isolation, there is but little left in Ceylon of what once *must* have been its primeval forest. We have therefore to deal with a vegetation that has survived not only the struggle normal to its existence, but with conditions brought about by mankind alone. It is the more remarkable that our forests have continued to "preserve their dignity," and that we have so extensive a list of species as we still possess.

Exclusive of Vascular Crytogams, and obvious modern introductions, the total Flora, as enumerated by Dr. Willis, is thus represented:—

149 Orders of plants,
1028 Genera, and
2808 Species—Varieties are omitted.

Of the 2808 species, 807 are endemic, that is to say, peculiar to Ceylon. Of the non-endemic species, we have a large proportion that are common both to India as well as this Island, and very many that occur in Malaya, and still further east; while our affinities also extend westward, leaving the impression that they are not dependent on botanical grounds alone, but that once a vast continent existed which extended from the Malayan countries to Africa, absorbing this Island, and making it but an isolated group of hills rising from a plain of exceeding immensity.

It is perhaps out of place to speculate here on this problem, which belongs more to the Geologist than the Naturalist; but the evidence is still with us that Ceylon was not in geological times what we find it to be at present. And this fact is clearly indicated by the circumstance that many of our plant-forms are so closely related to the plant-forms of lands now separated by the ocean.

Taking the Island as we find it at present notwithstanding the artificial, as well as natural disruptive forces that have been in continuous and strenuous action, we still find that the various zones enumerated above have distinctly typical plants and trees.

We have also examples that are typical of a Western aspect, as distinct from the Eastern; as, for example, in that magnificent family the *Dipterocarpaceae*, though it is significant that they are probably more Malayan in character than Indian. It may also be remarked as anomalous, that one typical Eastern Ceylonese *Dipterocarp* should nowhere occur in the West of this Island, as is the case with *Vatica obscura*, while a whole genera—*Doona*—belonging to this great family, is confined to Ceylon alone, and to the West exclusively, except in the isolated Moneragala range, where it occurs on the Eastern and Western aspects of those hills.

As regards the distribution of our endemics, they, in common, with non-endemics are numerically more abundant at low levels than at high; but this condition of affairs is due to a combination of influences that leads to an over-crowding of species, and possibly to a consequent development of survivors, in the struggle for existence, that have evolved changed forms of their own. In consideration of the restricted nature of this work, I have abstained from detailing the particulars that would illustrate a theory as to plant distribution in Ceylon, as such, even though speculative, is more a matter for the Botanist pure and simple, than for the ordinary reader who is desirous of information respecting the uses and purposes of particular Flora, and for whose use this work has been specially designed. But it will be quite clear to the student, as already indicated, that our various Zones have their own characteristic forms, and this fact might be illustrated by the following examples.

Dry-Zone Types.—Among the larger trees the more typical are *Chloroxylon Swietenia* or Satinwood; *Gleniea zeylanica*, the "Kuma" of the Tamils; *Mimusops hexandra* or "Palu"; and *Hemicyclia sepiaria*, or "Wira."

Of smaller dry-zone plants, we may regard as typical, *Zizyphus Œnoplia*, and *Z. rugosa* or "Hin" and "Maha-eraminiya" respectively; *Scutia indica*, the "Tuvadai" of the Tamils; *Acacia tomentosa* or "Jungle Nail"; *Carissa spinarum* or "Hin-Karamba"; *Calotropis gigantea* or "Wara"; and *Pedaliun Murex* or "Anai-nerinchi."

When the dry-zone is more restricted to what might more appropriately be called the *Arid-zone*, the typical trees are *Salvadora persica* or "Uvay" of the Tamil; *Tamarix gallica; Crataeva Roxburghii*, or "Lunu-warana" and *Spinifex squarrosus*, so common on the coast at Arippu.

Wet-zone Types.—These are very much more numerous, and embrace nearly all our non-aquatic orders. It is therefore

difficult to select one as more typical than another among so many competitors, but the following twenty-five may be taken as the best examples. viz.—

Wormia triquetra—"Diyapara."
Calophyllum bracteatum—"Walu-Kina"
Dipterocarpus zeylanicus—"Hora."
Elaeocarpus serratus—"Weralu."
Pometia eximia—"Na-imbul."
Campnosperma zeylanicum—"Aridda"
Humboldtia lurifolia—"Gal-Karanda"
Eugenia sylvestris—"Alu-bo."
Barringtonia racemosa—"Diya-Midella."
Sonneratia acida—"Kirilla."
Mastixia var b. Thwaitesii—"Diyataliya."
Hedyotis fruticosa—"Weraniya."
Maesa idica—"Matabimbiya."
Bassia neriifolia—"Gan-mi."
Palaquium petiolare—"Towenna."
Diospyros Gardneri—"Kadumbiriya."
D. Thwaitesii— do
D. insignis—"Porowa-mara."
Symplocos coronata—"Ugudu-hal."
Myristica Horsfieldia—"Ruk."
Machilus macrantha—"Ullu."
Aporosa latifolia—"Pepaliya."
Agrostistachys Hookeri—"Maha beru."
Caryota urens—"Kitul."
Loxococcus rupicola "Dotalu."

I purposely omit small plants, to prevent needlessly extending an already long list.

The Intermediate Zone may be described as being intermediate in the matter of rainfall, and to some extent, in the matter of altitude. It more or less generally follows the base of our main ranges of hills where the latter depart from the flat plains of the Low-country. Yet this definition is not completely correct, as an intimate examination of the country will show that it does not completely embrace *all* such instances. But as we cannot adopt mathematical accuracy, we are forced to employ general terms; therefore it is desirable to accept the term "Intermediate" as applying both to rainfall and altitude, the former being from 70 to 80 inches. The typical plants of this zone are:—

Berrya Ammonilla—"Halmilla"
Melia dubia—"Lunumidella"
Filicium decipiens—"Pehimbiya"
Albizzia stipulata—"Mara"

Artocarpus nobilis—"Del"
Pterospermum suberifolium—"Welang"
Coscinium fenestratum—"Weniwel" } Creepers
Uncaria dasyoneura— }

This list is purposely made as brief as possible for considerations of space.

The Montane Zone may be considered as applying to altitudes *above* 4,000 feet, but it must not be overlooked that a very important factor is wind, and that in many parts of our hill country the wind-action is very apparent, and produces a stunted vegetation, so that the size of the trees enumerated below is not to be regarded as a factor.

The following may be taken as typical:—

Michelia nilagirica—"Wal Sapu"
Bocagea coriacea "Keku"
Garcinia echinocarpa—"Madol"
Calophyllum Walkeri—"Kina"
Gordonia zeylanica—"Mihiria"
Doona Gardneri—"Red Doon"
Engenia subavenis—"Dambu"
Rhodomyrtus tomentosa—"Hill Guava"
Kendrickia Walkeri—a superb creeping plant
Leucocodon reticulatum.
Anaphalis cinnamomea
Rhododendron arboreum—"Rhododendron"
Solanum giganteum
Strobilanthes Walkeri and *vestitus*—"Nellu."
Actinodaphne speciosa—"Elephant's ears"
Litsea ovalifolia
Agrostistachys indica—"Beru."
Girardinia heterophylla—"Hill Nettle"
Dendrobium heterocarpum—"Primrose Orchid"
Loxococcus rupicola—"Dotalu."

Another important factor in our Plant Geography is the Patina. The Patina lands of Ceylon extend to about 1,000,000 acres, mostly in the hill country; and in the lower altitudes they are represented by Park lands, or Talawas.

The origin of the Patina is a difficult matter to determine, and this is no place for a disquisition on that complex problem; but it is sufficient to say that not only are there vast extents of *contiguous* Patina lands (as in Uva), but there are many instances of comparatively small isolated patches of this class of land at some of our highest altitudes, where they are surrounded by forest.

For the most part these Patina lands are covered with grass, and grass of inferior quality, much mixed with *Cyperaceous* forms.

Small patches, or "Islands" of well-wooded forest occur in these otherwise grass-covered lands, and from careful observations that I have made in the Horton Plains, I am of opinion that the forest growth suddenly stops at the Patina edge, and does not encroach upon it.

Why this abrupt demarcation between the Forest area and the Patina? I am unable to say; but the fact remains. If on the other hand, the soil of the Patina is broken up and much disturbed, a Forest growth begins to form; so that these large, open, barren spaces also possess a Flora of their own, which acts as a break in the continuity of the ordinary vegetation, and thus plays an important part in the struggle for existence among the neighbouring forest plants.

The effect of constant burning is not only disastrous to plant life, but it is equally destructive to the soil, and till some effective means can be found of stopping these senseless Patina fires, no attempt at covering these lands with useful trees will be successful.

The "Patina Oak"—*Careya arborea*,—is the best example of a Patina *tree* at mid elevation, where it is replaced at high altitudes by the *Rhododendron*.

The *Talawa* lands of the Low-country mostly belong to those localities where the rainfall is low. Here, a characteristic plant is "Gammalu"—*Pterocarpus marsupium*,—and often *Butea frondosa* occurs; while "Aralu" or the common "Myrobalan" (*Terminalia chebula*) is typical, especially in Uva and the country east of Balangoda.

In many parts of the dry Country, as for example around Maha Oya in the Eastern Province, there is a class of land that is neither strictly Patina, nor Park Land. This is generally covered with the pestiferous "Illuk grass' (*Inperata arundinacea*). Lands so covered are difficult of cultivation, and left to themselves do not reproduce natural forest growth; while the danger of fire, in this sturdy grass, adds another serious menace to the forester, who desires to utilise the soil, that otherwise appears to be promising. It will be seen therefore, from this very brief sketch, that not only is our Flora widely affected by rainfall and altitude, but there are other forces at work to still further complicate the problem of plant distribution in the country. The richest centres for purely scientific study will be found *in the most inaccessible places*, and possibly a complete exploration of those areas will add a fresh volume to our knowledge of Ceylon Plants.

N.B.—The reference after each botanical name is to Trimen's "Ceylon Flora," *e.g.* (1. p 10) signifies, Part (or volume) 1, page 10.

The numbers against the orders are those used by Trimen in his Flora.

II. DILLENIACEAE

This order contains both erect, as well as creeping plants and small shrubs. A very marked characteristic of the order is that the lateral veins of the leaves terminate on the margin of the leaf with a more or less distinct point. It is represented in Ceylon by the following Genera:—(1) *Delima*, (2) *Tetracera*, (3) *Acrotrema*, (4) *Schumacheria*, (5) *Wormia*, and (6) *Dillenia*, comprising (exclusive of varieties) 15 species, of which 12 (mostly *Acrotremas*) are endemic.

No. 1. **SCHVMACHERIA CASTANEAEFOLIA** I p. 10.

Kekiri-wara, S.

An erect shrub, 18 to 20 feet high. Leaves about 7—8 inches long, oval, sometimes markedly acute, glabrous (smooth) above. Veining prominent. Flowers many, close, about ¾ inch, yellow, in panicles, 2 bracts at base. Sepals and petals, 5. Stamens in 2—3 rows, numerous. Sepals and bracts finely hairy.

Wood white, or pale creamy, soft, with distinct pores, light.

Wood used in Sabaragamuwa for fence sticks, or in roofing for temporary sheds. It is usually straight and easily cut. Quickly decaying.

This plant is *endemic*, and is common in the wet zone up to 1,500 feet altitude, in the western half of Ceylon. In the Kukulu Korale, in Sabaragamuwa, it is very abundant, and almost gregarious in certain localities.

A Second Species—S. ALNIFOLIA (I. p. 10)—with smaller and more rotund leaves occurs in higher wet zone forests at about 3,000 to 4,500 ft. altitude, but is distinct from last by its smaller and darker leaf. It is not used for timber.

No. 2. **WORMIA TRIQUETRA** I. p. 11.

Diyapara, S.

A tree, with moderately thick bark, of greyish colour in very old ones. Branches and twigs, smooth, leaf-scarred. Leaves rather variable in size, usually much larger in young than in

old. Leaves broadly oval, 6—10 inches in young, and 4—6 inches in old examples. Strongly lateral-veined, stiff, glabrous. Leaf stalk (*petiole*) long, and carries on its upper surface, enclosed within a casing formed by the folding of the stipule, the succeeding leaf in its "bud" stage. This characteristic makes an easy identification of the plant.

Flowers rather large, about 2—2½ in. diam.; conspicuous, white, with light yellow stamens, placed on small leaf-opposed racemes.

Wood soft; easily split, about 44 lbs. per cubic foot, very handsome if cut in slabs oblique with the axis, when the "silver grain" becomes very distinct.

Carefully seasoned wood, treated in this way and french polished, makes very handsome panels, resembling the finest grained oak, but owing to its liability to split, special attention to seasoning must be observed. The wood is not suited to carving.

This plant is the only representative of its genus and is endemic. It is found in all parts of the wet zone up to 5,000 feet altitude, especially in damp soils, or marshy ground.

Gamble states that the nut gives an oil, but I am unable to find a confirmation of this.

No. 3. **DILLENIA INDICA** I. p. 12.

Hondapara, Wampara, S.

A tree, usually short-stemmed, with close compact crown. Bark rather thick, pale reddish with a tendency to flake off. Leaves closely arranged, large 10—12 inches long, rather narrowly oblong, finely acute, with very marked lateral parallel veins, that terminate in short points on the margin of the blade. Upper surface of the leaf glabrous; finely pubescent (downy) on underside of leaf-nerves. Leaf stalk stout, about 2 inches, deeply channelled.

Flowers large, often 6 inches in diameter; white, with yellow stamens. Sepals stout, persistent, finally closing and forming a large globular fruit of 5—6 in. diameter.

The wood is dull red, faintly speckled with two classes of medullary rays—broad and fine. Pores numerous. Moderately hard, suitable for window frames, but rarely procurable in long pieces. Weight 45 lbs.

Occurs near water from sea level to 2,000 feet, but appears to have been an introduction, as it is not known to be a forest species.

The fruit is used, when reduced to a pulp, as a hair wash, and is somewhat soapy. Cooked, and allowed to form a jelly, it is not a bad substitute for a *blanc-mange*.

No. 4. **D. RETUSA** I. p. 13.

Godapara, S.

A small tree. Bark grey-brown, often mottled, rather strong. Leaves 6—10 in. long; oblong, tapering to base, stiff, glabrous on both surfaces, dull dark-green above; markedly lateral nerved. Petiole about 1 in., channelled. Flowers about 3 in. diameter, on rather long pubescent terminal or sub-terminal stalks. White, with purple or pink stamens.

The fruits resemble the last, only very much smaller, being about 1½ in. diameter, of a dull orange colour. The actual fruit which is enclosed by the outer fleshy thickened sepals, is hardly an inch in diameter, containing many smooth seeds.

Wood reddish-brown, moderately close-grained, with evenly distributed pores. Weight 45—48 lbs. per cubic foot.

Moderately durable, provided it does not come in direct contact with moisture, and is therefore best suited for rafters and reepers. Much care is required in seasoning. If sawn while the wood is "green," it is liable to split and warp.

Fairly common up to 1,500 feet in the western parts of the Island, less so in the dry districts, or in places much exposed to high winds. It is endemic. In many parts of the low country it is used for making live fences, for which is suitable.

The bark is used in native medicine to induce the formation of pus in boils.

III. MAGNOLIACEAE

This order is represented in Ceylon by two genera, (1) *Michelia* and (2) *Kadsura;* the former being trees, and the latter a climbing shrub. Our three species are none of them endemic.

No. 5. **MICHELIA NILAGIRICA** I. p. 14.

Walsapu, S.

A large forest tree, irregularly branched, with wide dense crown. Bark thick, greyish or ashen, often coated with moss. Leaves about 3 or 3½ inch long, tapering to both ends, lanceolate, or narrowly ovate, with hard margins. Upper surface

smooth, bright green, glaucous (waxy); or finely pubescent below, almost silky in immature leaves. Stipules conspicuous, very silky, covering young buds, but early-falling.

Flowers about 2 inch diameter, terminal, of a beautiful canary or sulphur yellow colour; very sweet-scented.

Fruits, in an irregular spike of follicles opening into two valves, seeds on the outer side thick, bright red. Inner side thin, black, and faintly grooved.

Wood hard, of a pale greenish brown colour, becoming paler with seasoning, when it is not unlike satinwood—a circumstance that has led to up-country carpenters calling it "Wal-buruta." Grain, fine, close. Weight about 40 lbs. per cubic foot. With careful seasoning, this is a most excellent and durable timber; handsome, and capable of taking a very fine surface. Suitable for doors and windows, or for panels. When fresh, the wood has a disagreeable greenish tinge, but this is lost by seasoning.

A mountain species, rarely found much below 4,000 feet. Horton Plain forests appear to be rich in this fine tree.

No. 6. **MICHELIA CHAMPACA** I. p. 15.

Sapu or *Hapu*, .*S. The Champak, E.*

A large erect tree. Bark pale, almost greyish, thick, rather smooth; *bitter.* Leaves large, 8—10 inches, narrowly oval, tapering to a fine apex; waved, glossy above, enclosed when young in softly hairy stipules. Flowers large, 2—3 in. diameter; very fragrant; rich sulphur yellow. Sepals and petals 15—20.

Fruits very ornamental, and not unlike masses of coral, when the carpels first open.

Timber, light straw yellow; light, about 40 lbs. per cubic foot. Sap-wood pale. Annular rings distinct, pores small. From well matured trees, the wood is very durable, and excellent for indoor building timber. Polishes to a fine degree, but is unsuitable for *direct* sun or rain action, Tennant states, that the wood is used for carving figures of Buddha.

This handsome plant is an introduction, and as it is sacred to Vishnu, was probably brought to this country in connexion with temples and places of worship. It grows freely up to about 4,000 feet altitude, and is moderately plentiful in long-established Kandyan villages. Its timber has frequently been mistaken for that of *Cananga odorata*, by the unsuspecting, owing to similarity in colour and weight, in addition to the name—"Wana-Sapu," but a careful comparison of the two will show the great superiority of *M Champaca* in all respects.

The leaf-juice is alleged to be of use as a vermifuge, while the bark of the root, infused, is according to Nadkarni, (*"Indian Plants and Drugs"*) an emmenagogue. The bitter and aromatic nature of the bark renders it a medicinal plant in India, though apparently it is not highly esteemed in Ceylon, except the flowers which are frequently used in temples owing to their yellow colour and delightful fragrance.

IV. ANONACEAE.

This large order is well represented in Ceylon. It has 13 Genera, viz.: (1) *Uvaria*, (2) *Cyathocalyx*, (3) *Artabotrys*, (4) *Unona*, (5) *Polyalthia*, (6) *Anaxagorea*, (7) *Xylopia*, (8) *Goniothalamus*, (9) *Mitrephora*, (10) *Bocagea*, (11) *Miliusa*, (12) *Orophea*, and (13) *Alphonsea;* and of these, 18 species are endemic.

No. 7. **CYATHOCALYX ZEYLANICUS** I. p. 20.

Ipetta, S. Kekala, Ipetta, S.

A tall slender, erect tree, with rather crowded horizontal or drooping branches, that form a small crown. Bark smooth, rather thin, variable, between brownish and pale grey. Leaves large, 7—8 inches (sometimes larger) oblong, or oblong lanceolate, acuminate (pointed) at apex, tapering at base, smooth, paler below than above. Flowers green, or greenish yellow, with dark red stigma; large, 5 in. diameter; terminal or axillary, usually solitary on short peduncle (stalk). Calyx conspicuously cup-shaped, with few minute teeth. Fruits, large, egg-shaped, rather waxy surface, green.

Wood pale creamy white, or faintly yellowish; about 32 lbs. per cubic foot; soft, quickly decomposing.

Sticks of this wood, polished and lacquered, supplied the material for Kandyan Chiefs' staffs.

The timber has been made use of for tea boxes, but is unsuitable.

On the other hand, it is suitable for cigar boxes, or small cases, such as butterfly cases, &c.

The flowers are eaten in parts of Sabaragamuwa, as an addition to the betel leaf.

Common in our wet forests up to 1,000 ft. altitude, in the western side of Ceylon. Plentiful in the lower positions of the Peak wilderness and Singha Raja forests.

No. 8. **POLYALTHEA LONGIFOLIA** I. p. 24.

Sometimes, but wrongly, called *Ipetta*, *S.* *Maraillupai*, *T.*

A tall erect tree, with tapering crown. Bark thick, pitted, dull brownish. Branches slender. Leaves 8—10 inches long, oblong, very finely tapering to apex, rounded at base, thin, gland-dotted. Petiole, short. Flowers in clustering umbels (a rayed mass) in the leaf axils, and sometimes on old wood, Pedicles (stalk supporting a fl.) about 1 inch, faintly hairy. Flowers about 1 inch in diameter, pale yellow, or greenish. Fruits on stalks, oval, smooth, purple when ripe.

Wood pale, nearly white, about 38 lbs. per cubic foot. Pores minute, sometimes sub-divided. Medullary rays distinct.

The timber is used for scaffolding, and such temporary purposes, but is not durable.

Common in the dry country near rivers. Very large examples occur in the banks of the Mahaweli-ganga in its lower reaches.

A handsome and ornamental tree, and as such is planted "throughout Bengal and S. India" (Gamble). Suitable as a shade tree for streets, in dry country towns of low altitude.

No. 9. **XYLOPIA PARVIFOLIA** I. p. 28.

Netawu, *Atuketiya*, *S.*

A tall slim tree with small thin crown of slender branches. Bark, pale, rather smooth. Twigs terminating in fine silky shoots. Leaves about 5 in., broadly ovate, tapering suddenly to apex, acute at base; with short petiole. Flowers sweet scented, yellow, or yellowish, on very short stalk, sometimes as many as three together, axillary. Sepals pointed at base, pubescent. Fruits ovoid, shortly stalked, radiating.

Wood pale, soft, uneven. Suitable for scaffolding, and mine props owing to its straightness, but the timber is not durable. Weight probably about 35 lbs. per cubic foot.

This is an endemic species, and fairly common in the wet forests of the south and west of Ceylon, up to 1,000 feet altitude.

The root bark, combined with other ingredients, is used in native medicine for ulcers.

At one time this wood was employed in the manufacture of tea boxes, for which it is unsuitable, as it splits freely.

No. 10. **X. CHAMPIONII** I. p. 28.

Dat-Ketiya, S.

Rather like the last in general appearance. Bark, red-brown. Leaves, 2—4 inches; narrowly oval, or lanceolate, acuminate at apex, tapering at base; smooth above, faintly pubescent below, with short (¼-in.) petioles, and silky buds. Flowers solitary, strongly scented; yellow, stained within at base with purplish red. Fruits, about 2 inches, slightly corrugated.

Wood, much like last, and equally suitable. Sometimes used for rafters in temporary structures; not durable. Pale white, easily stained. Splinters freely.

An endemic plant, fairly common in the wet forests of the Adam's Peak range, and in the Pasdum Korale. Often becomes a large tree.

No. 11. **MITREPHORA HEYNEANA** I. p. 32.

A small erect tree, with slender stem, and short branches. Bark rather dark; smooth, thin. Leaves about 4 inches, narrowly oval or lanceolate, or ovate, tapering, rounded at base, with short petiole and pubescent buds. Leaves rather stiff, finely prominently veined below.

Flowers sweet-scented; very orchid-like; yellow, with inner parts blotched with red spots. Sepals very small, pubescent. Fruits oval, hairy, closely attached to main stalk in a cluster.

Wood pale, moderately hard, but never of large size. Suitable for rafters.

A dry-country plant, chiefly confined to the lower foot hills. Nowhere common and little known to the people.

No. 12. **BOCAGEA CORIACEA** I. p. 34.

Keku, S.

A moderately large dark-foliaged tree. Bark dark, not unlike ebony; thin, tough. Leaves 3—4 inches, ovate, smooth and shining above, rounded at base, more or less acute, attached by very short stout petiole that extends into the prominent (below) midrib. Minor reticulation distinct.

Flowers small, greenish within, purplish outside or claret-coloured; in small clusters, or solitary. Stamens 9, in 3 rows. Fruits nearly spherical, smooth. Flowers often appear on old wood.

Wood, pale, yellowish, or bone-white; smooth, light, but never very large. Suitable for rafters for temporary buildings, owing to its being very uniform in size. Not durable.

An endemic species, and found in fair abundance at high altitudes on our Western hill slopes. Abundant at 5,000 feet round the Peak.

IX. CAPPARIDAE.

A moderately large order, of generally dry-country plants, in Ceylon. The order embraces the following genera:—(1) *Cleome*, (2) *Gynandropsis*, (3) *Maerua*, (4) *Crataeva*, (5) *Cadaba*, and (6) *Capparis*, mostly small plants, or shrubs.

No. 13. **CRATAEVA ROXBURGHII** I. p. 59.

Lunu-warana, S. Navala, Navilankai, T.

A small deciduous tree. Bark greyish, or greenish grey, rather thick, wrinkled. Branches irregular, leaf-scarred. Leaves 3-foliolate, about 3—4 inches, oval or ovate, tapering at base, rather thin; glabrous, on short stalks attached to long petiole (4 ins.)

Flowers showery, large, in lax clusters, appearing after leaves have been shed. Creamy yellow, or greenish.

Fruits large, 2 ins., ovoid, and placed at the end of a thickened gynophore (stalk of the female reproductive organ), hard, speckled with white spots. Seeds many, enclosed in a close pulp.

Wood, pale yellowish white, moderately hard, springy, becomes pale brown with age. Medullary rays distinctly wavy. Pores surrounded with a pale ring. Weight about 36 lbs. per cubic foot.

The timber is not used in Ceylon, though used in India for sandals, and in turnery.

Probably an introduced plant. Common near gardens in the dry districts, never found in forest. Medicinal.

XI. BIXACEAE.

The order in Ceylon is represented by (1) *Scolopia*, (2) *Erythrospermum*, (3) *Flacourtia*, (4) *Aberia*, (5) *Trichadenia*, and (6) *Hydnocarpus*. Seven species are endemic, which includes one monotypic genus—*Trichadenia*. The order is mostly distributed over the low-country.

No. 14. **SCOLOPIA GAERTNERI** I. p. 71.

Katu-Kurundu, S.

A moderate sized tree, with pale grey thin hard bark, stem slender, often when young heavily armed with powerful branched spines that occur as solitary and axillary in the young branches. Leaves from 1 to 3 inches, ovate, or oval, or oblong-ovate, slightly bluntly serrate on the margins, rounded or cordate at base, acute, shortly stalked. Flowers white, small, in short racemes. Anthers opening by slits. Fruit a bright scarlet ovoid berry, about ½ an inch in diameter.

Wood dull red, close, hard, heavy, probably about 60 lbs. per cubic foot. Suitable for posts, wall plates, and rafters. Used for arms to outriggers. Rarely a large-sized timber.

Found in dry and wet forests but chiefly in quartz-soils, extending to about 2,000 feet, after which it becomes scarce.

No. 15. **FLACOURTIA RAMONTCHI** I. p. 73.

Uguressa, S. Katukali, T.

A deciduous tree of moderate size. Bark greyish brown or pale. Stem sometimes armed with stout branched spines. Twigs spinous at ends. Leaves about 3 inches or less; broadly ovate, acute at base, also at apex, or obtuse. Smooth above, pubescent leaf-nerves below. Margins faintly rounded-serrate. Petiole stout, short, smooth or pubescent. Flowers yellowish, small, unisexual, dioecious (male and female on distinct plants) in short racemes. The sepals in the male flowers are reflexed. Fruit a berry, about half inch in diameter, of a deep blackish purple colour, edible but not particularly nice.

Wood, dull red, very close, hard, with fine pores, arranged in close radial lines. Medullary rays indistinct, wavy. Weight 50 lbs. (Brandis, quoted by Gamble). Liable to split.

Distinctly a rare plant, distributed sparcely in the dry country up to 1,500 feet. Owing to its scarcity it is not much used, but is said to be a durable timber suitable for posts.

The fruits are said to be cooling. They make an agreeable tart fruit.

No. 16. **TRICHADENIA ZEYLANCIA** I. p. 75.

Tolol, Titta-eta, S.

A large tree with thick dull-brown bark. Branches usually contorted, young twigs scar-mottled. Leaves, variable in size, from 4 to 13 inches, ovate or oblong, rounded at base, suddenly

tapering (especially in male trees) to an acuminate apex. Margins in males sinuate (wavy) or distantly serrate (more so in female trees), smooth above, strongly tomentose on veins below. Petiole long, 1—2½ ins., rather slender. Lateral veins, opposite. Intermediate veining wide and conspicuous in female plants, less so in males. Flowers pale yellow, in solitary erect panicles; stouter in females (which are often in small groups) springing from *below* the leaf-stalk. Stigmas in males, 5, curved. Pistil in female, hairy, stout. Fruit, a berry, 1½ ins. diameter, one or three seeded. Wood, pale dull white, very soft, quickly decomposing. It has been used for tea boxes, owing to its lightness, but is quite unsuitable.

An endemic species. Found occasionally in the wet forests in the south and west of Ceylon, and sometimes in the Kegalla district. Medicinal.

Note.—The young leaves often attain a considerable size, and assume a palmate form, quite unlike the normal leaf.

An oil extracted from the seeds is said to be useful in diseases of the skin.

No. 17. **HYDNOCARPUS VENENATA** I. p. 75.

Makulu, S.

A large water-loving tree, with pale greyish-white smooth bark, and finely pubescent young shoots. Stem much grooved. Leaves alternate, 5—6 inches, lanceolate, or broadly lanceolate, tapering to a narrow apex, gradually tapering at base, dark green above, pubescent on veining below. Petiole, about ½ in. Midrib and oblique lateral veins prominent below. Margins slightly serrate. Stipules small, caducous. Flowers in the male tree, small, dingy, in short-stalked axillary panicles. Female flowers usually solitary, axillary, densely pubescent. Ovary a rich golden brown, finely hairy, almost bearded. Stigmas flat, conspicuously cleft; green. Fruit, a berry, about 1 in. in diameter, covered with a velvety surface of a dark rusty brown colour. Poisonous.

Wood, old ivory colour; rather hard, but not in favour for construction work. An endemic. Common in both wet and dry zone, extending to 2,000 feet altitude. Medicinal.

The fruits are eaten by fish, crabs, and crayfish, the effect in the first of these is poisonous. Instances of fish poisoning in man have been associated with the fruits of this tree.

An oil obtained from the seed is said to be effective in leprosy. Chaulmugra oil, used in leprosy, is obtained from an allied plant, *Taraktogenus Kurzii.*

The beautiful "Kinihiriya," or "Elaimbul" of the Sinhalese (*Colchospermum Gossypium*), doubtless an ancient introduction into Ceylon, is valued for its large golden-yellow flowers.

This tree is to be found associated with some of our oldest Temples, *e.g.*, Mul-Kirigalla in the Southern Province; the flowers being suitable for offerings at shrines. It is a deciduous plant, with thick, furrowed bark. Leaves palmately 5-lobed, about 6 inches in diameter.

The wood is very light, soft, and of a pale grey colour. Pores large, sub-divided, Medullary rays conspicuous. Weight 17 lbs. (*Gamble.*) Affords a colourless gum.

Widely distributed in India.

According to Gamble, it is called "Tanaku," and "Kongillam" by the Tamils.

As an ornamental plant, it deserve more considerable than it receives.

XIII. POLYGALACEAE.

A small order in Ceylon, represented by 3 genera: (1) *Polygala*, (2) *Salomonia*, and (3) *Zanthophyllum*, affording no large trees. One only has a claim to be classed as a timber tree, and is made use of.

No. 18. XANTHOPHYLLUM FLAVESCENS I. p. 84.

Palala, Kele-gas (in W.P.) S.

A small tree, or more often, a slender bush, with pale thin ashen bark. Leaves alternate, variable in length, 3—7 ins., oblong-ovate, or narrowly oblong, tapering to an acuminate apex, narrowed at base, entire, glossy above, paler below, with rather distinct prominent reticulation. Petiole about 1 inch, slender.

Flowers bean-like in general appearance, in short axillary racemes, that form a panicle at the end of the branch. Pinkish white. Fruit round, about ¾ in. in diameter, pale green, more or less waxy-coated (glaucous.)

Wood, pale yellowish white, light, moderately stiff. Useful for "warrachies" for walls, and roofs, or for temporary fencing.

Common in chena lands in the wet country in the west of Ceylon, often found abandoned in lands overgrown with bamboo ("Bata").

XIX. GUTTIFERAE

This is a very important order of plants in Ceylon, as it consists mostly of trees, many of which afford valuable timber, in addition to medicinal purposes. The order is represented by (1) *Garcinia*, (2) *Calophyllum*, (3) *Kayea*, and (4) *Mesua*, covering 19 species.

No. 19. GARCINIA CAMBOGIA I. p. 95.

Goraka, S. Korraka-pulli, T.

A tree, with slender erect stem, and narrow crown of drooping branches. Bark, dark brown, or blackish, sometimes mottled with gray, rather thick; quite smooth in young shoots.

Leaves opposite, 3—5 inches, lanceolate, or narrowly oval, acute at apex, or acuminate, tapering at base, smooth petiole, stout, about ½ inch. Midrib conspicuous, lat. veins very distinct, oblique. Flowers male and female; males in simple umbels of 3 and 4 in leaf axils. Females solitary, or up to 3, from axils of terminal leaves. Stamens forming a ring round the ovary. Stigma rayed. In the males the sepals are thick, 4; Petals much longer than sepals. Fruit not unlike a deeply grooved orange, varying in colour from rose-pink to deep dull red. At first, before ripening, these are green, the groves are variable in number and depth.

The timber is pale ashy, hard, shining. Pores small, radially packed. Medullary rays, fine annular rings, not very distinct.

Weight about 50 lbs. The wood in used for posts, but apparently is not a favourite in house building, owing to its early decomposition. In very old trees the heart-wood is distinctly hard and durable.

Fairly common in the wet forests of the west of Ceylon up to 2,000 feet altitude, but rarely abundant.

A transparent yellowish resin is found in the bark.

The fruits afford a popular acid, and are used to make a pickling brine for preserving fish. (MacMillan.)

No. 20. G. MORELLA I. p. 96.

Gokatu, Kana-goraka, S.

A small erect tree, with conical crown.

Bark brown, smooth. Young twigs compressed, quadrangular. Leaves opposite, about 3—5 ins. long; oval or narrowly oval, much tapered to base, nearly acute at apex; glossy

above, paler below, entire. Petiole short, about ¼ in., rather stout. Midrib direct. Lateral veins indistinct, oblique. Flowers greenish. Male and female distinct. Males 2 or 3, shortly stalked. Female solitary. In the males the staminal filaments congregate into a column, opening out at the ends. In the females the stamens (?) surround the ovary.

Fruits small and *not* grooved, round, about 1 inch or less in diameter. This is a marked distinction by which this species may be known from the last.

Wood yellowish; hard with distinct medullary rays. Pores, large. Weight 56 lbs. Not in much favour as a timber, but is suitable for temporary work.

Moderately common up to 2,000 feet in the wet forests in the south and west of Ceylon, and occurs again in Uva, where it is rather plentiful.

This tree yields gamboge which is almost identical with the Siamese product. From time to time attention has been drawn to the possibility of a trade in this product, but owing to its comparative scarcity, and the small quantity procurable per tree, it is unlikely to attract commercial attention.

Medicinal. 10450

The gum-resin in combination with other medicines is regarded as an anthelmentic.

No. 21. **G. ECHINOCARPA** I. p. 96.

Madol, S.

A medium-large tree, with stout stem, producing several aerial roots near the base—a distinct characteristic of the species. Bark, rather thick, moderately smooth, dull brown, often mottled where trees are exposed.

Trees, generally gregarious in habit. An endemic species.

Leaves opposite, rather variable, 3—6 inches, broadly oval, tapering at base, generally rounded at apex, entire, thick. Petiole stout, hard, about ½ inch. Midrib direct, distinct, with close numerous parallel lateral veins. Flowers, males in clusters. Female solitary, usually terminal and on short stalk. The fruits are characteristic, in that they are covered with sharp prickly tubercles. They measure about 2 inches, and contain 1—3 reddish brown, ovoid, *oily* seeds.

Wood pale brown or reddish, easily split, about 50 lbs. per cubic foot. Is used for shingles, but is not very durable.

A widely distributed hill-country tree, from 2,000 feet upwards. Very abundant in the "Knuckles" country, "Madol-kellie" being called after it. I have not found it in the lower

parts of Uva at levels corresponding to localities in Sabaragamuwa where it is plentiful. Apparently it thrives in high rainfall districts.

The oil obtained from the seed is used by the poorer classes for lighting, and at one time was procurable as Madoltel. It has been superseded by Kerosine.

No. 22. **G. TERPNOPHYLLA** I. p. 97.

Kokatiya, S.

A moderately tall handsome tree, with drooping branches. Bark pale, greyish or yellowish-grey, rather thin, smooth, affording a turgid, yellowish-green resin, in small quantity.

Leaves very variable in size and shape, opposite, about 3 to 8 inches long, oval, or narrowly oval, or lanceolate, much tapered at base, abruptly, or gradually acute at apex, or acuminate. Stiff, dark above, much paler below, entire. Petiole thick, short, ½ inch or less. Midrib distinct, prominent. Lat. veins parallel.

An intramarginal vein runs between the arching ends of the lateral veins, and the leaf margin is conspicuous.

When very young, the leaves are tinged with pink. Flowers scented, pale yellow; in axillary clusters.

Male flowers have 4 sepals and 4 petals, the latter much longer than the former. Stamens, in spreading bundles. Female flowers larger than males. Stigma irregularly lobed. Fruits about 1 inch, ovoid, smooth, pointed.

Wood. The outer sap-wood very pale-yellowish, or greyish white, soft. Heart-wood yellowish brown, becoming a rich mahogany brown with age; smooth, close-grained, and intensely hard. With water-seasoning, the wood is much improved in general, but owing to its extreme hardness it is not a favourite with sawyers. Very durable, and suitable for beams, posts, or any work involving compression-resisting timber. Weight 78 lbs.

This endemic tree is irregularly distributed in Ceylon. It is chiefly confined to the wet forests from 1,000 to 4,000 feet altitude, but is nowhere very abundant. It is occasionally subgregarious.

It is unfortunate that this splendid wood is not more common in Ceylon, as the timber is one of the most durable, and suitable for handles for small tools, as well as for building purposes.

No. 23. **G. SPICATA** I. p. 98.

Gonapana, Ela-gokatu, S. Kokotti, T.

A smallish tree, with wide horizontal branches. Bark pale brown, smooth, rather thick. Young shoots more or less angled, compressed. Leaves opposite, round, or broadly ovate, obtuse, thick, hard; about 3—5 inches. Petiole stout, thick, hard, about ½ inch. Midrib broad. Lat. veins inconspicuous, numerous.

Male flowers in short racemes, crowded, in axils of fallen leaves. Sepals 5, very small. Petals much longer. Stamens forming bundles. Female flowers with 5 trifid bundles of stamens. Fruit smooth, pointed, ovoid, green, about 1½ inches in diameter. Seeds brown, marked with distinct veins. The fruit-pulp produces a yellow pigment.

Wood according to Trimen is yellowish, close-grained, heavy. Apparently not much used, but quite suitable for wattle-and-daub buildings.

Abundant in the dry country. I have found it plentiful in the Eastern Province up to 1,800 feet; also in parts of Uva.

Belonging to this genus are the well-known mangosteen (*G. Mangostana*) and the Cochin Goraka (*G. Xanthochymus*), the former of which may justly claim to be the most delicious fruit in the East. They are both introductions to Ceylon; the mangosteen being Malayan, and the Cochin goraka being Indian and Burmese.

The date of the introduction of the Mangosteen is given by Trimen in his *Hortus Zeylanicus* as "about 1800," and Percival in his "Account of Ceylon" published in 1803 speaks of it as "one of the rarest in Ceylon, being only found in one or two gardens belonging to Dutch gentlemen." From this it may be assumed that it was brought here by the Dutch. Since then, it has been grown in many parts of our wet zone, even up to an altitude of close on 4,000 ft., and is cultivated entirely for the sake of its delightful fruit. The rind of the fruit contains tannin.

The Cochin Goraka, easily recognised by its long strap-shaped leaves that often measure as much as 15 inches by 3 inches, appears to have been brought here in the early part of the XIXth century. It affords an acid, and rather refreshing fruit, of no great popularity. It is to be found in some of the very old gardens about Colombo and Galle, but nowhere plentiful.

No. 24. **CALOPHYLLUM SPECTABILE** I. p. 99.

Domba-Kina, S.

A large tree with widespread horizontal branches. Bark thick, yellowish, or greyish-yellow, rather smooth. Leaves opposite, large 5-10 in. lanceolate-oblong, finely tapered at base, nearly acute; entire, with curved margins. Petiole thick, stout, slightly pubescent when young; smooth in old leaf; about ¾ inch. Midrib clear, direct, with very fine close parallel veins. Flowers small under ½ in. in diameter, white—*Petals absent*— In erect axillary panicles. Fruits smooth; nearly round with a distinct point at the apex. Fruit-stalk, ½ inch. slender.

Wood, "38 to 39 lbs." per c. foot (Gamble), light red, more or less marked by waves of shades alternating with paler colouring. Pores distinct, rather large. Medullary rays fine, distinct. Lines of soft tissue distinct, in broken concentric circles. The timber is admirable for door frames, and when polished makes very handsome panels. Durable, easily worked. Handsome ceiling boards can be made from this timber.

Not very common. Occurs in the Pasdun Korale, the valley of the Gin Ganga and parts of the Kukulu Korale in the Sabaragamuwa Province.

A thick resinous gum exudes from the bark when freshly cut, not unlike Canada Balsam, but is difficult to spread.

No. 25. **C. BURMANNI** I. p. 99.

Gurukina, Hinkina, S. Chirupunnai, T.

A small tree, or bush-like tree with many stiff branches, and quadrangular twigs (sides compressed). Bark rather variable. In dry districts, thick and deeply furrowed; much less so, and of a dull saffron tinge, in wet districts. Ends of twigs coated with dull, rusty tomentum. Leaves opposite 2 to 2½ inches long, broadly ovate, tapering at base; entire, stiff, smooth, with numerous fine, close, lateral veins, that are about equally distinct above and below. Petiole stout, thick. Leaf-buds small. Flowers about ½ inch in diameter, white, arranged in spreading, stalked panicles. Axillary. Petals absent, sepals 4, of which the inner are the longer. Fruits bright orange-coloured, small, smooth, and carrying persistent style.

Wood, generally small, well-suited for axe handles, or for small cabinet-work. It is used for cart poles owing to its lightness, and elasticity. In colouring and marking, not unlike the last species. Weight 60 lbs.

It occurs both in the wet and dry districts, up to about 1,000 feet altitude. The dry-zone plant is much more of a tree

than that found in the Western Province. The seeds yield a turgid, resinous yellowish-green oil, that is said to be a specific for itch.

No. 26. **C. PULCHERRIMUM** I. p. 100.

Kina, S.

A small tree, with bright, yellow, smooth bark, of no great size. Twigs compressed; buds pubescent. Leaves, small; 1½ or 2½ inches long, lanceolate, with clear minute parallel lateral, veins. Leaf-stalk (Petiole) short ¼ inch stiff. Flowers, white; in axillary stalked clusters. Flower-stalks, very slender. Petals, absent. Sepals as in No. 25.

Wood. I have not seen the timber of this species in use. It is probably suitable for buildings, such as flooring boards.

This is one of the rare Kinas, and according to Trimen, appears to be confined to the Hewissa locality.

No. 27. **C. INOPHYLLUM** I. p. 100.

Domba, Tel-domba, S. Punnai, Dombakottai, T.

A moderately large tree, its size being very much according to situation, as it grows to a fairly tall tree in sheltered gardens. Ornamental.

Bark greyish, with distinct lenticellate prominences, variable in thickness. Leaves large, 6-8 inches; oblong, rounded at apex, stiff, smooth, dark, glossy-green above, paler below; entire, opposite.

Petiole about ½ inch, stout, slightly wrinkled. Midrib, very prominent below, pronounced above. Lat. veins numerous; fine hair-like, parallel.

Flowers scented; white, or faint rose-pink.

Petals 4, spreading; sepals 4, concave; inner two longer.

Stamens numerous, in bundles. Style twisted.

Infloresence from axils of leaves at the end of the branch, and shorter than the leaf.

Fruits rather large; spherical, over 1 inch in diameter.

Wood handsomely marked in wavy bands of reddish brown colour, alternating with paler colouring. Weight 45 lbs.; fairly tough, elastic, durable. Much used for cart-poles.

Pores in groups, small. Medullary rays, fine, indistinct, broken by rings of soft tissue.

A fairly common tree, especially near the sea, and occurs on both sides of the Island.

Our plants never attain the same size of trunk or height as do the Malayan examples, which are said to grow to 80 or 100 feet, with a diameter of 10. It is a prolific seeder, and might be used as a shade plant on Irrigation Channels.

Affords the "Punnai nuts" of commerce that at one time were a considerable item in our exports.

The seeds afford a greenish oil used externally for skin diseases and internally as a purgative.

No. 28. **C. TOMENTOSUM** I. p. 101.

Kina, S. Kine, T.

A very large tree, with erect trunk. Bark, tinged with red-brown; rough, thick; thin on twigs. Twigs and young wood compressed ("quadrangular") densely coated with rhubarb-like scurf and hair, especially in the conspicuous leaf-buds.

Leaves opposite, oblong-lanceolate or lanceolate, rich green, much paler when freshly open, often pinkish for a few days. Entire, undulating, stiff, smooth on both sides. Petiole ½ inch, stout, densely coated with fine rusty hair. Midrib prominent below. Lat. veins fine; parallel, distinct below. Flowers white; about 1 inch in diameter, in short slender axillary panicles, or racemes. Fruits spherical, about 1 in. in diameter.

Wood, 36 to 38 lbs. per cubic foot, very handsomely marked with wavy bands of Cedar-red shades alternating with light red. Tough, durable, and easily worked. Structure of wood very closely like that of *C. Inophyllum.*

A well distributed tree above 2,000 feet. I have found it in Meda and Kadawata Korales of the Sabaragamuwa Province in fair abundance, and again towards Rangalla. It is a very useful wood for building purposes, and capable of much improvement by polishing and varnishing.

Its seeds are of medicinal value.

No. 29. **C. BRACTEATUM** I. p. 102.

Walu-Kina, S.

A beautiful and graceful tree, with drooping branches, somewhat like a willow. Stems slender, rarely attaining a large girth. Bark smooth; broken by conspicuous lenticels; pale nearly greyish. Young twigs tomentose at ends, and on leaf-buds. Leaves of two classes (dimorphic), the larger or

regular leaf, measuring about 5 to 7 inches in length, and the secondary, or smaller, being at intervals in clusters of 2 to 4, over-lapping. These are about 2 inches long. The ordinary leaf is narrowly lanceolate-oblong, pointed or acuminate at apex, tapering at base; opposite, entire, smooth; petiole ½ inch or less, slender. Lateral-veins fine, hair-like, inconspicuous above. When young, the newly opened leaves are a delicate creamy-white, or even silvery, making the plant exceedingly graceful in appearance.

Flowers white, or very faintly rose-tinged; small, about $\frac{7}{16}$th of an inch diameter. Inflorescence in short axillary racemes (rather hidden by leaves), peduncles faintly pubescent, with a distinct pubescent bract.

Fruit, ovoid pointed, about ¾ inch long.

Wood light, 32 pounds per cubic foot, even-grained, reddish-brown, in wavy streaks, easily worked, suitable for indoor ornamental work. Takes a fine polish, suitable for cabinet-work.

Endemic, chiefly confined to the wet districts, and often found near streams. Plentiful in the Pasdun, Kuruwiti, Nawadun and Kukul Korales, in the Galle District, the Morawak Korale.

Probably owing to its slender stem, it is not a favourite with sawyers, but it might be exploited for the manufacture of ornamental boxes, microscope cases, mathematical instrument-boxes and the like.

Highly suitable as an ornamental waterside tree.

No. 30. **C. THWAITESII** I. p. 102.

Kina, S.

A much-branched tree, of moderate size. Stem erect, rather slender. Twigs quadrangular. Leaves opposite, 1½ to 3 in. long, round or orbicular, rounded or cordate at base, obtuse; thick, harsh and stiff. Petiole very stout; short; midrib broad, and conspicuous. Lateral-veins parallel, thick, prominent above, entire. Margins rigid.

Flowers yellowish; large, about one inch across; in axillary racemes, longer than the leaf. Petals 4. Fruit, spherical, or nearly so, about ¾ inch.

I have no knowledge of the timber. I have found this endemic Kina in the wettest parts of the Ratnapura District, in Gilimale, at an altitude over 2,000 feet. Trimen records it from Ambegamuwa. It appears to be uncommon.

No. 31. **C. TRAPEZIFOLIUM** I. p. 103. (?)

Kina, S.

I am personally unacquainted with this endemic species, but Trimen records it from Madulkellie, Rangalla and Hunasgiria, as "a large or small tree, twigs quadrangular, glabrous. Leaves small, $1\frac{1}{2}$—$2\frac{1}{2}$ in., ovate-oval, or slightly rhomboid."

"Flowers large, nearly 1 inch, in few-flowered axillary racemes, longer than the leaves."

It is said to be "a good all-round useful wood."

No. 32. **C. CUNEIFOLIUM** I. p. 103.

Kina, S.

A small erect tree branching with contorted crowded branches. Bark dull pale orange, fissured vertically, about $\frac{3}{4}$ in. thick. Branchlets cylindrical, twigs compressed, green at ends, glabrous. Leaves, opposite, rather crowded, small, $1\frac{3}{4}$ by $\frac{5}{8}$ in., narrowly ovate, shortly blunt acuminate at apex, entire, stiff, dead-green above, rather glossy. Petiole short, $\frac{3}{16}$ in. dilated at base. Midrib pronounced below, conspicuous above.

Lat-veins numerous, oblique, inconspicuous. Leaf buds rusty pubescent. Flowers white, about $\frac{3}{4}$ in. in diameter in erect axillary racemes, about as long as the leaf. Fruits rotund-ovate, $\frac{5}{8}$ in. diameter, marked with a conspicuous apical cleft.

Wood pale in colour; pores rather large, irregularly scattered, fimbriated. Rays indistinct, close. Annular rings distinct, close.

This species is apparently uncommon generally, but is locally abundant. I have obtained it at Madugoda only in the Central Province.

No. 33 **C. CORDATO-OBLONGUM** I. p. 103.

"A very large tree" according to Trimen, and only found in the Hiniduma Forest. Endemic.

I am quite unacquainted with it.

No. 34. **C. WALKERI** I. p. 104.

Kina, S.

A large tree with an umbrella-like crown. Stem erect, stout, not very long, with thick, rough, reddish-brown bark, often densely mossy.

Leaves opposite; small, 1 to 2 inches long, crowded; round or ovate, obtuse at apex, rounded at base, or cuniate, entire; stiff, smooth. Petiole rigid, short brittle when dry. Lat.-veins inconspicuous, parallel; midrib, stout. Flowers in terminal panicles, exceeding the leaves, about 1 in. across; pale, soft pink, and sweet-scented. The flowers are not annual, but appear at about 3 years' interval.

Wood, light red-brown, in wavy lines, handsome. Weight about 46 lbs. per cubic foot. A very useful building timber for beams, rafters, posts, or door frames and with careful treatment suitable for ornamental panels, dadoes, &c. Durable.

A common tree at high altitudes, Nuwara Eliya, Horton Plain and Totapolla Forests, Knuckles and Upper Maskeliya. Peculiar to Ceylon.

"Kina Cottage" is called after this tree, which is perhaps one of the most familiar around Nuwara Eliya.

Note.—I am inclined to believe that at least three more species will be found in Ceylon, belonging to this genus.

Thus, at Degalhella, near Siyambala-Anduwa, not far from the boundary of the E. Province, I found an extraordinarily beautiful *Calophyllum* with remarkably thick bark, small leaves, and minute fruits, the wood of which was completely "marbled" in pinkish-red, and paler waves of graining.

Near "Westminster Abbey" I found a second species, with long strap-like leaves and short petioles. The tree of this species is slender, smooth-barked, and tall.

A third species is to be found in the very wet forests to the south-east of Adam's Peak. In this species the leaves taper acutely to base and apex, and the whole plant is slender and whippy.

The seeds in all the species yield a thick greenish oil of medical reputation, especially *C. Inophyllum*, the oil of which is known as Domba Tel.

No. 35. **KAYEA STYLOSA** I. p. 104.

Suwanda, S.

A graceful water-loving tree of considerable size. Leaves small, opposite, 2 to 3 inches long, lanceolate or ovate-lanceolate, rounded at base, tapering to acute apex, which is frequently split at the tip like a pen-nib; stiff, glabrous, entire. Petiole short, about ⅓ of an inch. Lat.-veins connected with fine net-like reticulation that is distinct below. Flowers small; deliciously scented; white, bisexual; in axillary racemes. Sepals

persistent. Petals, strongly concave, considerably longer than sepals. Flower buds red. Fruit, surrounded and enclosed by sepals, tipped with the style.

Wood reddish, rather hard, finely grained. Pores abundant, small. Rays indistinct, fine, crossed by rings of soft tissue. Weight 56 lbs. (*Gamble.*)

This scarce plant is confined to swampy low-lands. I have found it at Honakka in the Pasdun Korale, but am unacquainted with it as a building timber. It is endemic.

No. 36. **MESUA FERREA** I. p. 105.

Ironwood, E. Na, S. Nanga or Naka, T.

One of our most beautiful trees, and frequently found as a sacred plant round temples and shrines. A moderately tall erect tree, with a distinctly pyramidal crown. Bark variable in colour according to rainfall, those in the dry parts of the Island having a paler colour than in the very wet zone. Leaves, 3 to 4 inches long; spreading, oblong-lanceolate, finely tapering to long acuminate apex; acute at base. Deep, or dull-green above; entire, coated beneath with a fine greyish waxy powder, hiding the inconspicuous lateral veining. Petioles short, about ¼ in. Flowers solitary, axillary, large, often 4 inches across, acacia-scented; white, with orange anthers and canary-yellow filaments. Sepals 4, in two rows. Petals large, broad, beautifully "crisped and undulated." Stamens much shorter than petals. Fruits enclosed by the hard sepal-lobes; squat, compressed, and pointed. Seeds large brown, oily.

Wood, hard, durable, heavy, 77 lbs. per cubic foot. Dark beef-red, sometimes tinged with a purplish blush. Pores in sparse groups, small, often resinous. Rays very minute, numerous. Annular rings very indistinct, light coloured.

One of Ceylon's best timbers, suitable for beams, joists, trusses, bridge planks or sleepers, but unless carefully seasoned, it is very liable to split. With water-seasoning this objection disappears, and improves the wood considerably. Used as shingles, and coated with tar it makes a very fine lasting roof, but is distinctly heavy, requiring stout rafters for its support.

This beautiful, ornamental tree, was probably introduced at a very early date in our history, in association with Temples, both Hindu and Buddhistic, from which it has probably escaped naturally, and seeds possibly have been carried by man, owing to their having oil in their composition. Thus its

distribution is very wide, up to about 4,000 feet. I have found it growing apparently wild in the forests of the North, and again in abundance in the Vedda country south of Siyambala-Anduwa, at Hibitalanagalla, in the Panama Pattu; at Galagama, Muttettugama, and West Haputale; in the Atakalan, Kuruwita, and Nawadun Korales in the Ratnapura District; in the valley of the Walawey ganga from the base of Detanagalla to Waleboda; in many parts of the Kandy and Kegalla Districts; and occasionally in the North-Western Province.

No. 37. **M. THWAITESSII** I. p. 106.

Diya-na, S.

A river-side or stream-loving tree; rather small stemmed, and rarely exceeding 20 feet. Bark smooth; twigs and young parts distinctly glabrous. Leaves very large, 8 to 14 inches long; linear or oblong-linear, rounded, at base, shortly acuminate; entire, glaucous below. Petiole, about ½ inch, midrib strong, prominent. Lat.-veins inconspicuous.

Flowers as in *M. ferrea*, but very much larger, white, solitary, or 2 or 3 in leaf axils. Fruits, as in the last.

Wood very inferior to last, and small in size, but fairly durable. Useful for posts.

Fairly plentiful by rivers and streams in the wet-zone up to 1,500 feet. Occurs in the Pasdun Korale, Labugama, Kitulgalla, Udugama, Gilimale, Eratne, Bambarabotowa, Ambegamuwa.

The species is endemic.

XX.—TERNSTROEMIACEAE.

This is a small order in Ceylon represented by four genera, viz.: 1, *Ternstroemia*; 2, *Adinandra*; 3, *Eurya*; and 4, *Gordonia*. Of these only a few are of value as timber trees, *Eurya* is represented by shrubs, one of which locally called "Wild Tea" is widely distributed in our moist districts, and at one time attracted attention as a tea plant, as the leaves, treated in the same way as the commercial product, actually produced a liquor like exceedingly strong tea. This particular plant is known to the Sinhalese as *Neyadasse*, or in parts of Sabaragamuwa, *Dannaw*. It is useless as a timber. Commercial Tea is *Camellia Thea*.

No. 38. **TERNSTROEMIA JAPONICA** I. p. 107.

Ratatiya, S.

A small tree, with irregular branching. Bark soft, rather thick, brownish or mottled. Leaves dense small, 2 to 3 ins. lanceolate or narrowly oval, tapering at base, slightly acuminate, entire, thick, petiole very short, thick, dull claret-colour, or red, staining the lower half of the midrib, veining inconspicuous. Flowers yellow, about ½ an inch in diam., solitary, generally in the axil of fallen leaves, on rather long nodding stalk (preduncle). The calyx is supported by 2 bracteoles. Sepals and petals 5, stamens many and free. The seed when split longitudinally, has a striking resemblance to the human ear. Wood fairly hard, durable, of a dark brown colour tinged with pink. Suitable for rafters, reepers and roof construction generally. Sometimes used for shingles, but as such is not a satisfactory wood, as it does not stand direct sun and rain.

Not uncommon in the hill country from about 4,000 feet upwards, and frequently confused by sawyers with "Mihiriya," which see.

No. 39. **ADINANDRA LASIOPETALA.** I. p. 108.

Ratu-mihiriya, S.

A fairly tall slender tree but rarely attaining a large size. Bark, dull brown, often mottled with grey. Young parts, such as shoots, pale and finely hairy; leaves rather large, crowded; about 3 to 4 inches (larger in young plants), oblong, or oblong-lanceolate, tapered at base, strongly recurved margins, glossy above, finely pubescent below. Petiole very short, stout, more or less tinged with dull red.

Flowers axillary; solitary, white, about 1 inch in diam. on thick recurved pubescent stalk, 5 sepals, half as long as petals; Petals 5, silky-hairy. Stamens 18; Bracts (immediately under the flower) 2, of triangular outline.

Wood, deep red-brown, or raw beef colour, rather heavy, fairly durable, suitable for roof construction, but liable to split. Tarred, or "treated," makes excellent weather boarding.

An endemic hill-country species; plentiful in upper Bogawantalawa, and the Horton Plains country; and in Upper Dimbula.

No. 40. **GORDONIA ZEYLANICA** I. p. 110.

Mihiriya, S.

A fairly big tree with small crown, and irregular branching. Bark rather thick, dull red when cut. "Young shoots, silky, pubescent." Leaves rather crowded; large, 3 to 5 inches long, by ¾—1 inch wide, oval or ovate-lanceolate, acute (sometimes rounded) at base, acute at apex; entire, with more or less recurved margins (according to exposure), smooth veins, concealed. Petiole stout about ¼ in. Flowers large, often 3 inches in diam., white solitary, axillary, on stalk about ⅓ of an inch.

Sepals persistent, stiff, much shorter than petals and surrounding the later-formed, capsular, woody, fruit.

Wood red; fairly hard, very liable to crack, but suitable for flooring, or ceiling boards.

A hill species and peculiar to Ceylon. It occurs both in the Nuwara Eliya and Rangalla Forests, but becomes rare below 4,000 feet.

A second species (*G. speciosa*) described by Trimen (p. 112, vol. I.) as very rare, and growing gregariously above Ramboda, can be distinguished from the last by its very large crimson flowers, that measure up to 4 inches in diameter. I have found it in Maskeliya, and Bogawantalawa, where the names "Mihiriya" and "Ratatiya" are given by local carpenters.

It is used for the same purposes as No. 40.

XXI.—DIPTEROCARPACEAE.

From the timber point of view, perhaps the most valuable order of trees we have in Ceylon.

Our knowledge of the order, notwithstanding its utilitarian value, is by no means complete, and much difficulty arises in finding clearly defined differences between members of the same genus. Many of them do not flower yearly, and as most of them are lofty, it is difficult to procure perfect material for the study of the flower development. The order is for the present divided into 10 genera, viz.: 1. *Dipterocarpus*, 2. *Shorea*, 3. *Doona*, 4. *Hopea*, 5. *Sunaptea*, 6. *Vatica*, 7. *Balanocarpus*, 8. *Vateria*, 9. *Stemonoporus*, 10. *Monoporandra*.

These cover no less than 48 species, of which only one is *not* indigenous to Ceylon. They are all resinous, though this characteristic is more pronounced in point of volume of resin

in some species, than in others. The distribution of the resin ducts, in this order, has been the subject of a special study and a treatise by the late Sir D. Brandis; but this particular subject has not been exhaustively worked out in Ceylon. A fresh classification of the order is desirable, especially in the interests of identification from the leaf alone, and it is hoped that, from this standpoint only, our local students of Botany will study the family in order to construct a complete key to this large order. In the present work I have rigidly followed Dr. Trimen's classification, though I must regretfully add that I do not find it a ready means of identification in all cases. I have been the means of discovering two new species belonging to this large order, but I am convinced that a more detailed study will show that fresh species will be added to our already large stock.

Identification from native names alone will be found very misleading, as frequently examples, structurally wider apart, are called by the same name, thus "Yakahalu" may apply to three *Doonas* and two *Shoreas*, while these names again have local variations.

I am unable to give a full description in all cases of wood structure, as my efforts in this direction have been much distracted by confusion over identity of individual species.

It is, therefore, the more desirable that a complete study of this order should be seriously taken in hand, and thoroughly worked out.

No. 41 **DIPTEROCARPUS HISPIDUS** I. p. 114.

Bu-hora, S.

An immense tree, with straight cylindrical stem, and rather close crown. Young plants densely shaggy with clusters and tufts of long pale-brown hair; this characteristic prevailing especially in freshly formed branch ends, or in shoots. Bark thick, pale grey, rather smooth, exfoliating sporadically on the stem. Resinous. Leaves deciduous, alternate, very large (especially in young trees) 7 to 14 inches, by 4 to 8 wide; ovate, or broadly ovate-oblong, cordate, or sub-cordate at base, rounded at apex, suddenly acuminate; entire, rather sinuate; margins more or less hairy, stellate hairy above when young, becoming smooth with maturity. Petiole large, about 2 inches, swelled at base of leaf, coarsely shaggy hairy; resinous. Midrib very prominent below, less so above, densely stellate hairy.

Lat.-veins parallel, about 18 pairs, sub-opposite, rather oblique, prominent, hairy below, depressed above, suddenly

arching within margin. Stipules very large, tinged with rose-pink, coated with masses of fulvous stellate hair, strongly nerved.

Flowers about 2 inches across, pinkish, in racemes. Calyx 5 lobed, stellate pubescent. Petals, hairy outside. Fruits with two large 3-nerved, strongly veined, curved, inwardly convexed wings. Fruit-calyx without ribs.

Wood, pale reddish-brown; about 46 lbs. per cubic foot; much impregnated with resin. Pores large; Rays not very distinct. The durability of this wood depends very much on its seasoning. Freshly cut, and exposed to the sun, the resin oozes out freely on the heated side, thus forming spaces in the cellular tissue, and consequent brittleness.

Suitable for plumbago casks, boat building, loft floors, but not for work involving sun-exposure continuously.

The heart-wood in very old trees is inferior, and often hollow.

This endemic tree is not very common generally, but is locally abundant, and gregarious. It occurs in the Pasdun Korale, Kukulu Korale, parts of the Atakalan Korale, Gilimale, Eratna, Udugama and the valley of the Gin-ganga beyond Deniyaya, extending into the Sinha Raja Forest.

No. 42. **D. ZEYLANICUS.** I. p. 114, Pl. X.

Hora, S.

A very lofty cylindrical-stemmed tree; often over 70 feet to the first branch. Bark thick; pale ashen; smooth, exfoliating in patches; Resinous. Branchlets leaf-scarred. Leaves deciduous, alternate, variable in size, 5 to 11 inches, smaller in old wood; ovate, or broadly elliptical, rounded at base, abruptly shortly acuminate at apex, entire, faintly crenate-serrate; glabrous. Petiole about 2½ in.; thickened at base of blade and enlarged at foot, sparsely stellate-hairy, often hairless. Lat.-veins, 14—22 pairs; parallel, straight, suddenly arching within margin, and indistinctly uniting. Nerves parallel; usually at right angles with lat.-veins, slightly prominent above, fine below. Stipules, large on shoots, smaller in branch ends, densely coated with stiff fulvous hair, early falling, and leaving scars.

Flowers about 1½ inch, purplish pink, edged with yellow, arranged in hanging double racemes. Flower-stalk about ½ inch, "stellate-pubescent." Petals "recurved at end," 5; stamens crowned with a conspicuously clawed (*apiculus*) terminal anther. Fruit-tube, with 5 prominent ridges, and

two large wings, often 7 inches in length. The "wings" are curved, nerved, and prominently veined; often tinged with dull pinkish brown. These fruits are by this wing arrangement adapted to flight over quite a considerable distance, and may be found deposited 50 and 60 feet distant from the root of the tree.

The wood is about 52 lbs. per cubic foot in weight, down to 45 lbs. (Gamble); pale brownish-red, fading with maturity. The wood is full of wood-oil making it difficult to season. Pores rather large; rays, fine, distinct. The "Hora" tree is a great favourite with sawyers in consequence of its perfectly straight and cylindrical stem. Its durability depends very much upon the seasoning of the wood, and its direct exposure to the weather. I have seen Hora beams that have lasted for 40 years while they were in a uniform shade and temperature.

The wood can be easily bent with heat, hence its popularity in boat building and cask making.

This plant is widely distributed in the lower mountain country up to about 2,000 feet, especially on the western side of the Island. In the eastern half it will be found extending from Lunugala towards Bibile, and again near Moneragalla, after which it disappears. It is plentiful in the Matara District in the South, and through many of the forests of the Western, North-Western and Sabaragamuwa Provinces. Its popularity has done much towards its extermination in parts of Ceylon, but planters might do well to grow this valuable timber as a roadside, and stream-side tree, in Districts below 2,000 feet, as it grows easily and requires very little attention.

No. 43. **D. SCABRIDUS** I. p. 115.

Hora, S.

A large tall erect tree, very much resembling the last. Leaves about 6 to 8 inches long; oblong, or oblong-lanceolate, rather acute at base, and "shortly acuminate." Petiole rather short, about 1 inch, densely hairy, swelled at base of blade. Lat.-veins parallel, about 18 pairs, hairy below.

Fruits, much shorter in the "wing" than the last, but the ribs on the fruit-tube are much developed, and appear to form "wings."

I have only met with this species once, at Ambegoda in the Pasdun Korale, when it was in fruit. The wood is pale and rather soft, but I am unacquainted with its uses, or the flowers which appear not to have been seen.

Trimen's locality is "Near Ratnapura."

No. 44. **D. GLANDULOSUS** I. p. 115.

Dorana, S.

A large erect tree, with pale cylindrical stem. Crown rather spreading. Bark, thick, smooth; resinous. Young shoots, or plants, hairy. Leaves from 2½—5 inches long, oblong, or oblong-oval, rounded at base and apex, with short abrupt points; entire, smooth above, minutely glandular below. Petiole about 1 inch; swelled at base of blade, stellate hairy. Midrib distinct; hairy above; lat.-veins "11—13," parallel. strong. Stipules 1½ inches long, conspicuously hairy in tufts. Flowers about 1½ inch diameter; yellowish, tinged with pink; sparce, in axillary racemes on stellate-hairy stalks. Calyx, with 5 blunt wing-liked ridges. Petals, stellate-pubescent on outer surface. Wings of fruits rather narrow, and shorter than in Hora.

Wood, pale reddish; said to quickly rot, but is used for temporary planking and wood sheeting. Weight, about 45 lbs. per cubic foot.

Locally gregarious. Occurs in many parts of the Sabaragamuwa Province, below 2,000 feet altitude, but nowhere very common. It is in much demand for its wood-oil which is used in parts of the Sabaragamuwa Province in conjunction with the latex of *Willughbeia zeylanica* (*Kiriwel*) for the destruction of "Fly" in paddy fields.

No. 45. **D. INSIGNIS** I. p. 116.

I am unacquainted with this "rare" tree, and I quote from Trimen, who describes it as "a large tree, twigs woolly-pubescent. Leaves 3½—5 in. oval, rounded, or acute at base, shortly and bluntly acuminate; entire, glabrous above, hairy on veins beneath; Lat.-veins 10—12, Petiole ¾ inch, pubescent. Flowers 2½ inches in diam., sessile, distant, on short drooping axillary spikes, purplish yellow. Fruit wings 5, not undulated, ¼ inch wide."

The recorded localities are "Near Ratnapura, Hewissa, Pasdun Korale."

No. 46. **SHOREA OBLONGIFOLIA** I. p. 116.

Yakahalu, S.

A very large tree with domed crown. Bark thick, dull red-brown, rough, flaking off in irregular scales. Branchlets pale, spotted with narrow lenticels; young parts finely pubescent. Leaves alternate, large, about 8 inches by 3¾; oblong, cordate

or sub-cordate at base, rounded and suddenly shortly acuminate at apex, entire, completely glabrous, dark shining green above, brighter below. Petiole about 1 inch, strong, wrinkled, curving below base of leaf, and dilated at that point. Midrib direct, prominent below, depressed above. Lat.-veins 10 or 12 pairs, nearly opposite, stiff, at first straight, suddenly arching within margin, but *not* uniting with next pair. Nerves parallel, rather distant. Stipules, scale-like, dotted with stellate scales, often waxy. Flowers small, yellowish, with pinkish base, stalk-less (*sessile*) attached to branches of rather long flaccid terminal or sub-terminal panicles. Sepals 5, "densely pubescent," petiole short, with recurved margin, very softly silky, stamens 60, "with (conspicuous) three terminal bristles." Fruit with 5 wings, 3 of which are long and 2 short and narrow. Nut about $\frac{3}{4}$ inch; sharp pointed pubescent.

Wood, variable in colour; the sap-wood being much paler than the heart-wood which is brownish, crossed with amber coloured irregular shades. Weight about 60 lbs. per cubic foot. Very suitable for beams, rafters, joists and flooring boards, but difficult to season, owing to the presence of wood-oil.

A fairly common tree in many parts of the Western and Sabaragamuwa Provinces, below 2,000 feet altitude, and to be looked for in rocky land, and on low ridges. It grows gregariously, but not to any very large extent, where it occurs.

The Sinhalese name for this species applies to so many of the same genus, and to "Doonas," that it affords no means of identification, but it may be noted that a section of the dilated portion of the petiole will generally show a semi-circle of seven to nine half-moon shaped bundles, each with a resin duct.

No. 47. **S. LISSOPHYLLA** I. p. 117.

Yakahalu, Dumala, Malmora, S.

A moderate sized tree; erect with cylindrical stem. Bark brown; splashed with grey; $\frac{1}{2}$ inch thick, exfoliating irregularly. Branches short, irregular, sub-dividing into many twiggy leaf-scarred branchlets. Very young twigs sparcely dotted with scurfy granules. Leaves alternate, variable in size, about 5 x $3\frac{1}{2}$ inches (often larger), broadly ovate, cordate at base, obtusely rounded at apex, and suddenly bluntly acuminate; entire; margins generally recurved, completely glabrous, dark glossy-green above, dead green below. Petiole $\frac{5}{8}$ to $\frac{3}{4}$ inch. Midrib, prominent below depressed above. Lat.-veins 7 pairs; almost opposite, prominent below, strong, broadly arched, scarcely uniting. Nerves parallel; inconspicuous. Stipules small; crisply pubescent. (Note.—First pair of leaves after

germination are opposite, and conspicuously acuminate). Flowers on "very short stalks, nodding, arranged in short branches of lax elongated axillary panicles, shorter than leaves." Sepals 5, broad, pointed, pubescent; petals 5, pubescent outside; stamens 35, with curiously bearded anthers. Fruit with hardly any wings.

Wood, hard; close grained, rich brownish cream colour. Pores small, indistinct, in isolated clusters, fimbriated. Rays very distinct, thin. Resinous. The timber of the species is not well known, but appears to be well suited for flooring. It is of no great size, however.

Not a common tree. Found generally in low wet districts, and growing on shallow soil over-laying slab rock. I have found it in the Wallalawiti Korale, Pasdun Korale, Talpe Pattu, Udugama and at Karawita Kanda in the Ratnapura District. Recorded from Singha Raja.

No. 48. **S. STIPULARIS** I. p. 118.

Yakahalu, S.

A large erect tree, with dark bark, exfoliating in scales: resinous. Branches rather slender. Leaves alternate, 7 x 3½ inches, oblong-ovate, abruptly or slightly tapered at base, gradually tapering to slender acuminate apex (variable); entire; thin, glabrous, glossy green above. Petiole rather slender, ¾—1 inch, thickened at base of leaf, slightly wrinkled. Midrib, prominent below, depressed above; Lat.-veins, 10 pairs ("16—18," Trim.) rather oblique, slender, prominent below, distinct above, finely tapering and uniting within the leaf margin. Nerves, parallel; hidden. Stipules "very large," conspicuous; ⅝ x ⅜ inch, foliar; acute at apex, clasping.

Fruit with five wings of about 5 inches by ½ inch, rather finely net-veined. Nut ¾ in. diam., much pointed.

Timber apparently little known. I can find no reference to it as being used, except in mines.

Uncommon. Occurs in the Kukulu Korale in some abundance, but thereafter it is occasional, and nowhere plentiful. Affords a very fine clear resin.

No. 49. **DOONA ZEYLANICA** I. p. 119.

Dun, S. Koongili Maram, T.

A lofty tree with dense dome. Bark coarse, reddish brown. Twigs, dull brown, scarred, drooping. Leaves, variable, 2—3 inches long; lanceolate, tapering at base, attenuate

caudate, glabrous, entire. Petiole, slender, half inch, curved. Lat.-veins 10 or more, inconspicuous, pellucid. Base of leaf strongly recurved at its margin. Flowers, pale pinkish white, or rose colour, about half inch diam., arranged in terminal or axillary drooping panicles, often freely detached by gusts of wind. Sepals 5, of which the 3 outer are larger than the other two. Petals 5, silky without; oval or obtuse, united at base. Stamens 15, "Anther cells equal, connective prolonged into a short obtuse clavate or spathulate appendage" (Brandis.) Wings when very young rich crimson-lake, changing colour early, $1\frac{1}{4}$—$1\frac{1}{2}$ inches long, faintly 10-veined, obtuse, twisted. Nut pointed, concealed.

Wood, brownish straw coloured, hard, easily split, durable. Weight about 68 lbs. (wrongly quoted as 29 lbs. by Gamble). Pores large, frequently divided. Rays, fine, uniform, close. A very valuable timber for house building, joists, flooring-boards, and shingles. Heartwood, *soft*. Occurs gregariously in the hill country, and probably was once very plentiful. I have found it as low as 1,500 feet in the Meda Korale and up to 4,000 in the Rakwana hills.

This tree takes its Sinhalese name of "Dun" from the copious resin that it affords. This often forms in stiff masses on the lower side of the branches and can be easily collected. Treated with turpentine, the resin makes an excellent varnish.

No. 50 **DOONA AFFINIS** I. p. 120.

Yakahalu, S.

A very large tree, with contorted or irregular, stem. Leaves, "2—$2\frac{1}{2}$ ins. lanceolate, rounded at base, caudate acuminate, drooping. Lat.-veins numerous, inconspicuous, much arched. Midrib chanelled above." (Trimen,) I have not sufficient material for further description of this species, which I collected in 1892 in the Kukulu Korale.

It appears to be a moderately hard timber.

No. 51. **D. GARDNERI** I. p. 121.

Doon, local English name. *Yakahalu, Dun, S. Koongili, T.*

A very large tree, often attaining 15 feet in circumference. Bark, dark; rather thick, fairly smooth; resinous. Shoots and young parts smooth.

Leaves alternate, 3—4 inches, ovate, or ovate-oval, rounded at base, with the margin rolled inwards, entire, glabrous, rather glossy green above, generally much caterpillar-eaten.

Petiole thin, channelled, about ¾ inch long, dilated at base of blade. Midrib strong, prominent.

Lat.-Veins 12—15 ("13" *Trim*) fine. Nerves fine, inconspicuous. Flowers small; about ½ or ¾ inch in diam., soft pink; on drooping axillary or terminal panicles.

Sepals 5, smooth, enlarging into wings, about 1½ to 2 inches long. Petals 5, broad, concave, smooth within, and hairy without. Fruit-wings narrowly oblong, curved.

Wood, when freshly cut is pale rose-pink, quickly fading to pale straw-brown. Smooth, easily carved, and taking a handsome polish if very well seasoned. Structure much as in last, except the heartwood, which is spongy.

Very suitable for house building; durable; weight, 65—68 lbs. per cubic foot. Was employed for sleepers on the Haputale section of the Ceylon Government Railway, but as no antiseptives were used for its preservation, it did not compare favourably with imported woods.

Locally gregarious, occurring in the Central and Sabaragamuwa Provinces, at elevations of from 3 to 5,000 feet. I have met with it in some abundance on the confines of the Peak Forests towards Maskeliya, and in isolated places in Lower Bulatgama.

It should be cultivated in waste lands on estates at the altitude mentioned, as affording a very useful timber, and as a tree that self-sows itself freely after attaining a height of about 20 feet. It is a prolific fruiter.

No. 52. **D. NERVOSA** I. p. 121.

Beraliya Kotikan-beraliya, S.

A large tree, with thick, rough, exfoliating bark, Resinous. Young twig-ends smooth. Leaves alternate, about 3 to 5 inches long; lanceolate, rounded at base, tapering, acute or "tailed" at apex; entire; smooth, rather glossy-green above. Petiole short, ¼ or under ½ an inch. Midrib direct, prominent. Lat.-veins 10-12 curved, hair-like. Nerves, equally prominent on both sides.

"Flowers ⅝ inch; nodding, in few-flowered axillary panicles shorter than leaves." Flower-stalks thick. Sepals 5, smooth; Petals, finely silky outside. Fruit sepals forming wings about 1¼ inches long; curved, narrow. Nut, pointed, rather conspicuous.

Little is known of the timber of this species beyond that it comes within the sawyer's classification of "*Dun.*" It is

hard, close, and heavy; very much like other *Doonas* in colour, and structure.

I have found it at Weddagala in the Kukulu Korale, but the material I collected was insufficient for a more thorough description than the above, though in the main agreeing with Trimen.

Note.—Trimen refers to hop-galls found on this species. If that may bear on identification, I append the following description of the leaf of a *Doona* I collected at Nambapana that may be this species, or be referred to *D. ovalifolia*. Leaves alternate 2½-3½ inches long; ovate, or ovate-oblong, rounded at base; suddenly tapering to a markedly "tailed" apex; entire; smooth. Petiole about ⅓ of an inch, curved, rather grooved above, slender. Midrib direct, prominent on both sides. Lat.-veins about 7, sub-opposite, obtusely arched; fine. My figure shows a leaf that has formed a star-like mass from a hop-gall. This particular example was from trees of this species growing gregariously in ravines.

No. 53. **D. TRAPEZIFOLIA** I. p. 121.

Dun, Yakahalu, S. (locally) *Beraliya.*

An immense tree with large irregular boughs. Bark, dark; rather thick, rough. Resinous, yielding a pale resin. Leaves alternate, rather small, 2½ to 3 inches long; ovoid, or oblong-oval, rounded or tapered at base, suddenly "tailed" at apex; entire; smooth, rather stiff. Petiole, about ⅞ of an inch, slender, finely pubescent in young leaves.

Lat.-veins 18 to 20 pairs, fine or hair-like. Nerves rather prominent above, by which it may be distinguished.

Flowers said to appear at intervals of 7 years, not seen by me. Trimen records them as ½ inch in diam., with slender stalks, in short axillary panicles.

Fruit-wings up to 2 inches long, narrowly oblong.

Nut, about ½ an inch across, acute. Eaten roasted.

Fairly common in the wet districts, below 3,000 feet. I have found it in the "Peak forests," at Pelmadulla, and Kitulgala. Also Morawak Korale.

Wood, hard, about 60 lbs. per cubic foot, suitable for house-building, and makes excellent floor, but is shy of strong sun exposure. The sap-wood in this species is very poor, and should be excluded when the timber is used for buildings.

No. 54. **D. CONGESTIFLORA** I. p. 122, Pl. XI.

Thiniya, S. Koongili, T.

A tall erect rather slender tree. Bark brownish, thick, easily stripped, and often used for temporary wig-wams by sawyers. Branches spreading, forming a compact-dome. Twigs slender, dull brown, often exuding tears of fragrant white or straw-coloured resin. Very young parts pubescent, especially in seedlings.

Leaves alternate, plentiful, about 4½ in. by 1½, narrowly oblong, or ovate lanceolate, rounded at base, tapering and suddenly shortly acuminate; entire; completely glabrous, rather thin. Petiole ¼ to ½ inch, groved above. Midrib thin, depressed above, conspicuous below.

Lat.-veins about 14 or fewer, sub-opposite, thin; suddenly arching within margin, equally conspicuous on both sides. Nerves parallel, indistinct.

Flowers, pale soft rose-pink, about ½ inch in diam. on very short stalks, crowded in pubescent axillary and terminal panicles. *Petals "notched."* Fruit-wings narrowly oblong, about 2 inches, variable. Nut about ½ inch, shortly pointed, often glossy with dried resin. Wood light; 30 to 36 lbs. per cubic foot; soft reddish or pinkish brown in colour, becoming pale on drying. Soft, easily split or sawn, but quite useless as a building timber, though ideal for tea boxes. If very carefully seasoned, it makes a suitable wood for lining almirahs, drawers, and factory tables, but care must be taken to use wood-preservatives, as this is not a durable timber.

It occurs in gregarious patches in many of the wet Sabaragamuwa forests, at about 2,500 ft. altitude. It is highly resinous.

No. 55. **D. CORDIFOLIA** I. p. 122.

Beraliya, Yakahalu, S.

If the scanty materials I have collected may be referred to this species, it is a large tree with a somewhat uneven stem. Bark, dull brown, thick, scaling off in irregular flakes; rough. Branches few, short, often dividing into erect shoots. Branchlets and twigs, slender, smooth, leaf-scarred. Leaves, scanty; alternate; 5 to 7 inches by 3 to 5 inches, ovate, rounded or tapering to base, slightly or strongly cordate, finely tapering to a suddenly shortly "tailed" apex; entire; thin, glabrous rich dark green above, glossy below. Petiole, short; stout, curved, shortly channelled at base of blade, tinged with yellowish brown. Lat.-veins 10, opposite, or sub-opposite, oblique,

conspicuously forking into Y-shaped forks immediately within the margin. Nerves parallel, recrossed; distinct above. Midrib prominent. Flowers not seen; said to appear at long intervals.

A profusely resinous tree, occurring in the southern wet forests at about 1,000 ft. altitude.

I am doubtful if this tree is identical with a species locally called (Udugama country) *Pulun-yakahalu*, the timber of which is pale, and appears to be soft, though of large size, and probably very useful for packing-case material.

Trimen says the seeds are eaten after being roasted, but this affords no identification.

No. 56. **D. OVALIFOLIA** I. p. 123.

Pini-beraliya, Yakahalu, S.

A large tree, erect, rather heavily buttressed. **Bark,** thick, rough, brown, scaling. Young branchlets and shoots, smooth. Leaves alternate, variable, 2 to 4 inches long, but usually small. Oval or ovate, rounded at base, rather suddenly long-"tailed," entire, smooth, paler below than above. Petiole ½ inch, curved, grooved above, slender. Midrib rather slender. Lat.-veins, parallel, slender, 7 to 10 pair, distinct below. Nerves, fine. Flowers "on slender drooping stalks, in few-flowered axillary racemes or panicles, shorter than the leaves." (Trim).

Fruit-wing oval, about 1 inch long.

Wood, close grained and hard, but I am not acquainted with its qualities, as it appears to be little known.

I have met with this tree in the Raygam and Kukulu Korales, in isolated patches, but it is nowhere common. Mr. A. F. Broun, late Conservator of Forests, collected it near Labugama, and his examples are specially referred to by Trimen as having less caudate leaves than the type.

No. 57 **D. VENULOSA** I. p. 123.

I have condensed and followed Dr. E. J. Livera (*Annals R. B. G. Vol. ix., Part* 1, *p.* 92) in his excellent description. He says: "Tree large, young parts glabrous, and bark of twigs dark. Leaves 2½ to 3¼ inch, oval or ovate-oval, rounded at base, suddenly acuminate. Lat.-veins 6 to 8, the lower very oblique, ascending. Nerves very prominent above. Flowers white, ¾ inch in diam. with articulated stalks in terminal glabrous panicles. Sepals 5, outer 3 larger, distinctly veined, inner 2 smaller, broadly ovate. Petals 5, fleshy, pubescent,

stamens 5 with connective produced into a club-shaped process. Fruit wings, 3; obscurely veined.

Seemingly rare, and obtained from the South of the Island.

Its timber is apparently unknown, but the species should be looked for, as it is one of a genus specially rich in useful wood.

No. 58. **D. MACROPHYLLA** I. p. 124.

Honda-beraliya, Kana-beraliya, Maha-beraliya, S.

A tall erect tree, with low buttresses, and cylindrical stem. Bark hard, greyish brown, flaking off in irregular strips, or scales. Branches rather slender, dividing into zig-zagged twigs. Leaves rather few, alternate, large, 10-11 inches, of a rich Roman-purple colour, when very young, narrowly oblong, rounded at base, rather gradually tapering and then suddenly acuminate, stiff, entire completely glabrous, shining rich green above, paler below, margins slightly curved, cartilaginous. Petiole stout, about 1 inch, curved, faintly wrinkled. Midrib, much pronounced below, concealed above. Lat-veins 15-22, sub-opposite, broadly arched, curving alternately with margin, but not uniting with next above. Nerves many, parallel, indistinct. Stipules (?) bud-scale short, blunt, rounded.

Flowers, rather small, about $\frac{3}{4}$ inch, white, on stout short stalks in (?) axillary racemes, or panicles longer than leaf.

Fruit rather large, about $\frac{3}{4}$ inch, diam., with three broad, stout, curving wings. Inner two short and obscure.

Wood hard, even, and close grained; durable. Brownish with lighter shades in the intermediate graining.

Very resinous, drops of resin forming on bruised leaf-stalks, twigs, and fruits.

Not much used as a timber but suitable for rafters, and wall-plates.

Occurs in many parts of Sabaragamuwa in the wet forests of the Kukulu and Atakalan Korales at about 1,500 feet altitude and lower. I have found it in the Udugama Forests and in parts of the Matara district, but though partially gregarious it is nowhere abundant.

Its fruits are eaten.

Mr. Broun heard it called. "Napat Beraliya" in the Southern Province, probably in mistake for "Sunaptea," which has been pointed out to me by this same name.

Note.—A more complete and comprehensive study of "Doona" is required before much can be said regarding the

timber of each individual member of this important endemic genus.

No. 59. **HOPEA DISCOLOR** I. p. 125.

Dun, Malmora, Iree-durulla, Durulla, S.

A tall erect slender tree, with cylindrical stem. Bark, brown, thick, distinctly furrowed longitudinally, in long straight grooves. Ends of branches and young parts scurfy. Leaves alternate, rather small 2—3 inches long, narrowly ovate or ovate-lanceolate, rounded to narrow base, tapering to an acute slightly blunt apex; entire; smooth above, conspicuously rufous scurfy below, giving the leaves a rusty appearance when viewed from under the tree. Petiole short, about $\frac{1}{4}$ of an inch long, scrufy. Lat.-veins few, alternate, rather wide apart, prominent below, rather depressed above. Flowers, small; about $\frac{1}{2}$ inch, pinkish-yellow, beautifully fragrant; in spreading, short axillary and terminal racemes. Stalks very short. Sepals 5, much shorter than petals. Petals 5, narrow, externally hairy. Stamens 15, produced beyond the anthers into a fine hair-like process. Ovary hairy. Fruit with two wings nearly as long as the leaf, conspicuously veined. Lesser wings very short. Nut pointed.

Wood pale, soft, quickly decaying, unsuitable for building work, but useful for light packages. This tree grows gregariously in patches, but is not plentiful. It occurs in many parts of the Sabaragamuwa Province, especially in Gilimali, Bambarabotowe, Panilla, and in the watershed of the Ginganga. It affords resin in small quantities, of a clear white or glassy color.

It can be readily distinguished by its grooved bark, and rusty leaves.

No. 60. **H. JUCUNDA** I. p. 125.

Beraliya, Rat-beraliya, S.

Usually a moderate-sized erect tree, with cylindrical stem, short and irregular branches. Bark, brown, thin, smooth. Branchlets and twigs, dull purplish brown, covered with very short, erect, rigid hair. Leaves alternate, rather small, $2\frac{1}{2}$ by $1\frac{1}{8}$ inch, ovate, rounded at base, tapering and suddenly ending in a "tailed" apex; entire, smooth, shining, dull green above. Petiole half inch, slender, pale, smooth. Midrib, prominent below, depressed above. Lat.-veins 4, opposite, or sub-opposite, with a distinct gland in the axil with the midrib; oblique, curved with a wide arch within margin. Nerves parallel, horizontal, minute, inconspicuous.

Flowers small, white, short stalked, on slender drooping branched panicles, usually axillary. Fruits with 2 narrow, ribbed wings.

Wood, hard; close grained, pale; usually small, and therefore not popular as a building material.

Not very common, and usually found by streams in the wet forests of the Southern and Sabaragamuwa Provinces.

No. 61. **H. JUCUNDA,** *Var.* **MODESTA** I. p. 125.

Pini-beraliya, Pini-Baru, S.

A repetition of the above only with very much smaller leaves—about 2 inches long, or less, and rarely more than a short bush with horizontal branches. The leaf-axil glands are concealed, and slightly hairy. Found gregariously growing in isolated patches in the wet forests of the Pasdun Korale, Kukulu Korale, and Singha Raja. It has a tough timber, but never of any appreciable size. Very useful for warrachies. Resinous.

No. 62. **H. CORDIFOLIA** I. p. 126.

Mendora, Yakahalu, S. Uva Mendora.

A moderately large tree, rarely over 20 feet high. Bark, dark dull brown thick, deeply furrowed in old trees, purplish brown in young. Branches few, irregular, drooping, terminating in paler foliage at the ends. Leaves alternate, very variable in size and outline from 5 to 7 inches by $2\frac{3}{4}$ to $3\frac{1}{4}$ inches wide, ovate-oblong, or ovate, strongly cordate at base gradually tapering to a more or less bluntly-acuminate apex; entire, glabrous, thick, dark, glossy-green above, dead green below. Petiole $\frac{3}{4}$ inch, curved, rather thick, finely pubescent when young, becoming harsh with maturity. Midrib rather indirect, prominent above and below. Lat.-veins 5 to 7, alternate, oblique, curving broadly within margin and rarely uniting. Nerves distant, netted, obscure. Flowers small, $\frac{3}{4}$ inch in diam., creamy white, in solitary or clustering 5—6 branched axillary panicles; nodding, on short quickly-disarticulating stalks. Calyx 5, of which two become very much enlarged into fruit wings of about 3 inches in length. These wings are oblong, of spathulate outline, and distinctly ribbed longitudinally. Petals 5, with twisted tips, pubescent outside. Stamens 15 with short filaments, constricted between the anther cells and terminating in a long, (or sub-equal) hair-like appendix. Style as long as filament plus appendix.

A rare water-loving tree, of which little or nothing of its wood qualities appears to be known. Wood, pale yellowish, or yellowish brown, hard, close-grained, and capable of taking a high polish. Weight 76 lbs. (from a sample lately in my possession.)

I have only met with this tree in the valley of the Wallawey ganga from Uggalkaltota downwards. Also along the banks of the Kirinda river, where Broun and myself found its fruit. Later, in 1900, I obtained and figured fresh fruits collected at Uggalkaltota, and in April, 1912, I obtained the flowers for the first time, from the same spot where Broun and I first collected fruits in 1891. A full description of this plant by Dr. E. J. Livera appears in the Annals of the R.B.G. Vol. IX,. p. 92, Plate XI A 1-4.

No. 63. **SUNAPTEA SCABRIUSCULA** I. p. 126, Plate XII.

Na-mendora, Napat-beraliya, S.

A moderately large tree with even cylindrical stem. Bark rather thick, brown, furrowed. Branchlets and shoots softly woolly. Leaves, 4 to 5 inches (young leaves larger), lanceolate or oblong-lanceolate, obtuse at base, tapering to shortly or abruptly acuminate apex. Entire, glabrous above, ovate below with fine white stellate pubescence. Petiole about $\frac{3}{4}$ inch, thick; Midrib prominent below, stellate. Lat.-veins many, in double series, the first oblique and arching within the margin and touching the second. Second series, within the first, but falling short of it. Both series parallel and oblique. Nerves prominent, netted.

Flowers (not seen by me) "rather large, nearly sessile, in small axillary and terminal tomentose spicate panicles shorter than leaves" (*Trimen*) Bracts large. Sepals and petals 5, stamens 15, with large oblong anthers and appendix blade-like. Fruit sepals large, two longer than rest, winged.

Wood, pale yellowish; hard, heavy; suitable for buildings, beams, &c., durable.

This tree appears to be confined to Pasdun Korale and Udugama forests, up to the lower hills in the Morowak Korale, but nowhere abundant. I have not found it in Sabaragamuwa, but its existence there is probable. I am informed that it was at one time used for bridge planks by the P.W.D. owing to its extreme durability. There is some confusion over the name, as I was first assured by villagers that "*Mendora*" was the accepted name, and that *Na mendora* and *Napat beraliya* were only local terms.

No. 64. **VATICA ROXBURGHIANA** I. p. 128.

Mendora, S.

A slender medium-sized tree. Bark pale gray, smooth. Young parts or shoots very finely pubescent.

Leaves alternate, very variable in size, from 6 to 10 inches; oblong, or oblong-oval, broadly rounded at base, tapering at apex or obtuse; smooth above and shining, dull below, often tinged with rose pink in seedlings.

Petiole 1 to 1½ inch, swelled at base of blade. Midrib stout; lat.-veins about 12, prominent below. Flowers about 1 inch across, white, with very short tomentose stalks, in "erect axillary panicles, shorter than leaves." Sepals and Petals 5, but latter much longer than former, and finely tomentose. Stamens 15; Anthers with a *small* appendix. Fruits spherical about 1½ inches diam., marked with 3 distinct grooves, and swelled sepals at base, pubescent.

Wood, dull brownish, hard, smooth, about 50 to 60 lbs. per cubic foot. Very suitable for piles as it stands immersion in fresh water.

Occurs in the west of Ceylon, generally near rivers, and in "Waturana" lands. The farthest south that I have obtained it has been the Bentota river.

It yields an abundant resin, nearly transparent, of a yellowish colour, very suitable for varnish.

This species occurs in Travancore, as well as Ceylon.

No. 65. **V. AFFINIS** I. p. 128.

Hal-mendora, S.

Trimen describes this as a large tree with young parts glabrous. Leaves, 4-6 inches, ovate-lanceolate, rounded at base, tapering to sub-acute apex, glabrous; Petiole about 1 inch thickened above. Lat.-veins 5-6, oblique, very prominent below. Nerves small, reticulate (netted), prominent below. Flowers on short stalks on upright axillary and terminal panicles, shorter than leaves. Fruit small, less than ½ inch, ovoid, densely pubescent, surrounded at base by enlarged sepals which are broadly ovate, acute, thick, concave, glabrous, spreading.

Apparently very much like the last as regards wood, but heavier, and darker. I am not acquainted with it. It is an endemic species found in the Pasdun Korale and Hinidum Pattu.

Brandis says that the anthers in this species are ovate-oblong, cells nearly equal, appendage thick, short, style cylindrical, thickened at apex.

The name "*Hal-medora*" is I find applied to *Stemonoporus Wightii* and should not be confused with the present species.

No. 66. **V. OBSCURA** I. p. 129, Plate XIII.

Tumpalai, T. Dummala, (Vedda.)

A tall slender tree. Bark pale, hard, smooth. Twigs and young parts, finely pubescent. Leaves, alternate, about 6½ by 1½ inches; lanceolate, rounded at base, gradually tapering to acute apex; entire; glabrous, rather stiff. Petiole, about ½ inch, curved, thickened at base of blade, faintly channelled above, greenish. Midrib, prominent below, greenish yellow, in contrast to the dark green of the leaf-blades.

Lat.-veins 12 to 15, sub-opposite, abruptly arching below margin. Nerves indistinct, reticulate. Leaf-bud (? stipule) minute, conical, suddenly acute. Flowers, about ¾ inch in diam., white, or tinged with pink, on jointed stem in many-flowered, axillary, tomentose, short panicles. Sepals 5, short, stiff. Petals 5, much longer than sepals. Stamens in two series, with filament shorter than anthers, the latter shortly apiculate. Fruits, 1 inch, ovoid, chocolate brown, sparsely hairy, with curved persistent sepals at base.

Wood brown; hard, close grained, durable, suitable for buildings, beams, or sleepers. Heavy. Injured trees however are liable to attack by a big borer that works upwards, and establishes large galleries immediately under the bark.

The gummy resin of this tree, appears both on the stem and branches, especially when there have been injuries.

According to the village people, the bark can be used to arrest fermentation in toddy.

Occurs in gregarious masses in the Eastern Province, especially by non-perennial streams.

Abundant. It will be observed that this remarkable tree is practically the only *Dipterocarp* belonging to the eastern side of Ceylon, the order as already shown, being all but entirely represented in the West. Common at Tumpalancholai (which takes its name from this plant) and as far south as the Karandi Oya, and probably extending into lower Uva. Recorded from the North-Western Province.

No. 67. **BALANOCARPUS ZEYLANICUS** I. p. 130.

A small erect tree, with cylindrical stem: much branched. Bark, smooth, rather thin, pale brown, flaking. Young twigs, faintly spotted with minute beads of resin.

Leaves alternate, about 4 by 2 inches; ovate, cordate or rounded at base, arching to and terminating in a more or less attenuated apex; entire; stiff, glabrous, glossy. Petiole short ½ inch, curved, pubescent. Midrib, prominent below, rather stout. Lat.-Veins 4-6, sub-opposite or alternate, much arched, but not directly uniting; occasionally with glands in axils. Nerves parallel, roughly at right angles to midrib, distinct below.

Flowers very small, spreading thin long axillary 1 to 3 clustered pubescent racemes, that alternately fork. Sepals, and Petals, 5. Stamens 15, with filaments dilated at base; in two rows. "Connective prolonged into a curved pointed arrow, equal in length to anther" (*Livera*). Fruits small, ½ inch pointed, seated on oval hard, minute, persistent, sepals.

Wood—to judge from living examples—hard, close-grained, and tough, suitable for posts, as the tree attains no large size. Resin, pale, copious.

I only know this endemic plant from the summit of Doluwa Kanda, near Hiripitiya, where I found it growing gregariously, but I could get no local name for it. It appeared to be wild. I suspect it to be an introduction.

No. 68. **VATERIA ACUMINATA** I. p. 131.

Hal, S.

A tall stately endemic tree, with compact crown. Bark grayish, or ashen, about ½ inch thick. Branchlets and twigs covered with dense masses of brown stellate hair; leaf-scarred. Leaves, alternate, large, about 10 inches long, often much more in young plants, oblong or lanceolate-oblong, rounded or nearly cordate at base, or extended; tapering, or abruptly rounded at apex, often shortly acuminate: entire; stellate-hairy on midrib and venation below. Petiole large, stout, 1½ inch, swelled at base of leaf, hairy. Midrib, strong, very prominent below, concealed above. Lat.-veins 20, sub-opposite, parallel, stiff, depressed above, suddenly arching within margin. Nerves strong, distinct above.—(?) Stipules large, crowded, often like resinous scales. Flowers 1 inch, creamy white; scented; on stout stalks in large ascending panicles, produced from near the end of the branch. Inflorescence hairy, with reddish hair. Sepals 5, attached at base. Petals 5, free; Bracts, large,

deciduous, stiff. Stamens 50; Anthers narrow, but without appendix. Fruit very large, irregularly ovoid, with large convolutions; about 6 inches long, rough, spongy.

Wood, pale, yellowish-gray, straight-grained, light; about 40 lbs. cubic foot: moderately hard. Pores small, in groups. Rays distinct, broad, rather wide. The wood of this tree at one time was in very great demand for tea-boxes, for which purpose it is most suitable, but it is too porus and soft for building work.

In many parts of Sabaragamuwa, the bark is largely used by jaggery-makers for arresting the fermentation of Kitul "toddy," and owing to this, and the tea-box industry, the "Hal" tree is now becoming scarce. It occurs in the wet parts of the Western, Southern, Central and Sabaragamuwa Provinces, up to 2,000 feet, and is also occasionally planted. It is easily grown and is very ornamental, and fairly quick growing.

It produces a beautiful pale, clear, yellowish resin, known as *Hal-dummala*, suitable for fine varnishes. The fruit, made into "*Hal-pittu*," is eaten.

STEMONOPORUS.

Note on the Genus. To save repetition it may simplify matters if a short description of this large genus is given, as a preliminary to the details following each of the species hereafter described. The Genus, in Ceylon, is represented by 15 species, all of which are endemic, but not all of value, as timber trees. They consist of *S. Wightii, S. Gardneri, S. acuminatus, S. lanceolatus, S. affnis, S. rigidus, S. canaliculatus, S. petiolaris, S. oblongifolius, S. reticulatus, S. nitidus, S. nervosus, S. Moonii, S. revolutus, and S. Lewisianus.*

Flowers pedicellate, pedicels (stalks) often bracteolate, solitary, or in few-flowered axillary clusters, or racemes. Sepals 5, slightly intricate. Petals 5, usually larger than sepals. Stamens 15; ten external, and five inner. Anthers oblong; outer longer than inner, opening at the apex; more or less hairy with very short (or absent) appendix. Fruit generally spherical, with attached, reflexed, persistent sepals.

No. 69. **STEMONOPORUS WIGHTII** I. p. 132.

Hal-mendora, S.

A large tree 30 to 40 ft.; straight, erect. Bark $\frac{1}{3}$ of an inch, thick, pale ashen, or brownish-ashen, smooth with few transverse wrinkles at distant intervals. Branchlets slender. Twigs, grayish-green, mottled with small waxy-scurfy prominent lenticels. Leaves, alternate, large, 5 to 10 and even 17

inches long, ovate-oblong, rounded at base, rounded and suddenly terminating in a narrowly acute "tailed" apex; entire; completely glabrous. Petiole long, 2 to 5 inches; stout, faintly striate (grooved), swollen at base of leaf blade. Midrib direct, very prominent below, nearly concealed above. Lat.-veins, 22 to 25, opposite, or sub-opp., straight, suddenly curving immediately within the margin and uniting with next. Nerves large, parallel, with intermediate minute reticulation; faintly, distinct above. Stipulus claw-like, resinous.

Flowers about ¾ inch in diam., pale yellowish white; nodding; in axillary racemes at ends of branches—fruits solitary, under one inch, spherical, rough with reflexed persistent sepals.

Wood pale, little known to carpenters, said to be durable. Probably suitable for flooring planks.

Occurs at about 1,000 feet in our wet forests in the Sabaragamuwa Province.

No. 70. **S. GARDNERI** I. p. 133.

Mendora, S.

A moderately large tree, with erect stem. Bark pale, or ashen, often moss-covered. Branches short, ending in thick leaf-scarred twigs. Leaves alternate, rather large, 4½ by 3 inches; oblong-ovate, rounded or cordate at base, suddenly shortly acuminate; entire; margins faintly thickened, and often recurved. Petiole under 1 inch, upturned, swelled at base of leaf, strong. Midrib strong, prominent below, slightly raised above. Lat.-veins 10-12, stout, prominent below, distinct above, much arched within margin. Nerves conspicuous, parallel; entire vein-system prominent below. Flowers about ¾ inch in diam., pale yellow; few, in stiff short axillary panicles. Nodding.

I have not seen the timber in use.

A rare species, apparently found below Badulla.

No. 71 **S. ACUMINATUS** I. p. 133.

Mendora, S.

A moderately large tree. Bark pale, smooth, thin. Branches ending in many leaf-scarred twigs.

Leaves alternate, rather crowded, about 4½ by 1¼ inches, narrowly oblong or lanceolate-oblong, rounded, or obtuse at base, tapering to suddenly acuminate apex, often "tailed";

entire; margins slightly curved; glabrous. Petiole slender, about 1¼ inch, thickened at base.

This is not a plentiful tree. It occurs in wet forests, generally close to streams, up to about 1,500 ft. I have obtained it at Nambapana, Labugama, Morowak Korale and Singha Raja. Also in the valley of the Kaluganga above Ratnapura.

No. 72 **S. LANCEOLATUS** I. p. 134.

A small, slender tree. Leaves, 5-7½ inches long by 1¾-2½ inches wide, lanceolate, acute, or rounded at base, gradually tapering to a long acuminate apex; entire; glabrous. Petiole about 1 inch, swelled at base of blade. Lat.-veins 9-12 sub-opposite, curving, and finely arched below margin, distinct below. Nerves rather distant; parallel, square with midrib. Flowers about ¾ inch, yellowish, solitary, or in 2's. Timber little known. Apparently confined to country near Ratnapura.

No. 73. **S. AFFINIS** I. p. 134, Plate XV.

A small erect tree with rather dark bark; often much coated with lichens. Branches short, irregular, smooth at ends. Leaves variable according to locality, 3 to 9 inches long, ovate-oblong, or ovate-lanceolate, rounded at base, tapering, or suddenly tapering to acuminate apex; entire; somewhat swelled between lat.-veins, glabrous. Petiole about 1 inch, thick, swelled at base of leaf. Lat.-veins variable in number, usually 9, sub-opposite, arching within margin, but not uniting. Nerves, parallel, distinct above, rather wide apart. Flowers ¾ inch diam., creamy or yellowish white, solitary or in 2-5; axillary. Fruit large, 1 to 1½ inch, globular, brownish, grooved, and on opening disclose rich pink cotyledons before expanding. Wood pale brown, rather hard, but of no great size. Suitable for line-rafters. Fairly abundant on the south and west of Meriacotta Peak, and upper Bambarabotuwa. Also in the Knuckles country, and upper Atakalan Korale or Rakwana hills.—A distinctly hill species.

No. 74. **S. RIGIDUS** I. p. 134.

"A large tree" (*Trimen*) Leaves clustering at ends of branches, about three inches long, oblong, tapering to and rounded at base, emarginate at apex; entire; glabrous above, roughly hairy beneath. Petiole, about ½ inch. Lat-veins 8 to 12, oblique, very prominent below, arched within margin, not

uniting. Flowers about ¾ inch. Yellow; in small 2-3 axillary clusters, on very short stalks.

Wood. I have no particulars, but probably useful for posts, as the whole genus has serviceable timber.

Apparently uncommon. Recorded from Ambegamuwa.

No. 75. **S. CANALICULATUS** I. p. 135.

A medium sized tree, with irregular branches. Twigs and shoots slender; pale leaf-scarred. Leaves alternate or sub-opposite, variable in size, about 5 by 2½ in.; ovate-oblong, tapering at base, suddenly tapering to a "tailed" apex; entire glabrous above, hairy on venation below, rather swollen between lat.-veins.

Petiole about 1 inch, swollen at leaf base. Midrib depressed above; prominent below. Lat.-veins 10, direct, oblique, arching within margin, uniting so as to appear like a continuous intramarginal vein. Nerves strong; parallel; prominent below.

Flowers axillary, solitary, on very short pubescent stalk; yellowish. Fruit about 1 inch diam., globular, rough. I am unacquainted with the timber.

Occurs in the valley of the Ginganga, and parts of the Pasdun Korale, but is not plentiful.

No. 76. **S. PETIOLARIS** I. p. 135.

A tree about 20 feet high, erect, with rather slender cylindrical stem. Twigs thick, often exuding drops of clear white resin. Bark pale, rather smooth. Young branch-ends roughly pubescent. Leaves large, 9 by 2½ inches, narrowly oblong, acute or rounded at base, more or less suddenly terminating in a strongly short-tailed apex; entire; glabrous above, faintly hairy on larger nerves below. Petiole long 2¼—2½ inches; slender, slightly swollen at base of blade. Midrib partially raised above, prominent below. Lat.-veins, sub-opposite, or alternate about 12 pair, very pronounced, oblique curving below margin but hardly uniting. Nerves rather distinct, strong, especially in the axils of the lat.-veins. Flowers about ¾ inch, in short axillary clusters on short stalks; yellow. Sometimes solitary.

Wood: This timber seems to be unknown to carpenters, but appears to be hard, and close-grained, I have met with it on the Gongalla range, where it occurs sub-gregariously, and attains a considerable size. Also recorded from Kitulgala. I found some ovoid fruits in a decomposed state that I take to

belong to this species. These were rather thick; brownish, and woody.

No. 77. **S. OBLONGIFOLIUS** I. p. 135.

I have not seen this rare tree, I quote, therefore, from Trimen, who describes it as large with densely puberulous young parts. Leaves 2½—6 inches long, oval or oblong-oval, obtuse or acute at base, usually very obtuse, or rounded at apex, glabrous. Petiole ½ inch, channelled. Lat.-veins 7 to 9 distant, prominent on both surfaces. Flowers over ½ inch, on pubescent stalks, 3 to 5, closely placed in very short axillary racemes at ends of branches. Fruit over ½ inch, nearly globular, rough, 3 grooved.

Recorded as "very rare," from Ambegamuwa, at about 4,000 ft. altitude.

No. 78. **S. RETICULATUS** I. p. 136.

Again I quote from Trimen, as I have doubts if the example I found once in the upper Rakwana hills is identical with this "very rare" tree. Trimen says, it is moderate sized, young parts puberulous. Leaves 2½—4½ inches, ovate, or oblong-ovate, rounded at base, more or less acuminate, glabrous, thick, very rigid. Petioles 1 to 2 inches, thickened at (leaf-base) end. Lat.-veins about 9, faintly prominent on both surfaces. Nerves reticulate, prominent beneath. Flowers 1 inch, pale yellow, on short stalk, 3 to 5 in. short axillary racemes. Fruit 1¼ inch, pointed, globular-ovoid, 3-grooved, rough.

Recorded from Nillowe, Hiniduma Pattu, in Galle District. Appears to be unknown to carpenters.

No. 79. **S. NITIDUS** I. p. 136.

(*Locally*) *Mendora, S.*

A small tree with slender stem and thin branches. Bark pale, or grey. Ends of twigs, smooth.

Leaves, about 3 by 1½ inches, narrowly oval, or lanceolate, tapering at base, slightly rounded, tapering to a tailed apex; entire; rather glossy dark green above; thin. Petiole short, about ½ inch, slender, swollen at leaf-base. Lat.-veins 6, fine, inconspicuous, much curved. Flowers, yellowish; small, about ½ inch diam., solitary, axillary, on thick short stalks.

Fruits nearly round, seated on persistent sepals, nearly as long as the fruit.

Wood.—I am not aware if it is used, but appears to be close-grained, hard, and suitable for rafters. Bark resinous, with pale white resin.

I have met with this plant sparingly in Gillimali, Eratna, Borangamuwa, and near Eknelligoda, in the Ratnapura District. Recorded from Pasdun korale in Kalutara District.

No. 80. **S. (?) MOONII** I. p. 137.

This can be hardly included as a timber tree, as I have only found it as a small slender-stemmed plant, growing in "Waturana" land at Honakka, in the valley of the Maguru-ganga, in the Pasdun Korale. It is unlike any others of this genus, the leaves being crowded at the end of the main shoot, broom-like, and having large stipules. I regret that I did not take copious notes of this curiosity.

Trimen says the leaves are 6-9 inches long, erect, and tapering at both ends.

No. 81. **S. REVOLUTUS** V. p. 384.

A small erect tree, with few short irregular branches. Bark, mottled brown and grey, rather thick.

Leaves 2—5 inches by 1 or 1½ with strongly revolute margins, dark green above, oblong, rounded at base, emarginate at end; entire; smooth and glossy above; glandular. Petiole about ½ inch, strong. Midrib inconspicuous above, pale. Lat.-veins 8 or 10, fine, much arched. Nerves, finely reticulate. Flowers ½ inch, nearly white, in short axillary cymes. Fruits small, about ⅓ inch diam. ovoid, pointed, dark cream colour when fresh, rather rough, seated on stiff persistent sepals.

This plant was discovered by me on the confines of the Wallankanda Forest Reserves, on the Kukulu Korale side of a steep ridge of hills overlooking Depedene Estate. It is apparently unknown to the Sinhalese. It grows gregariously, and appears to confine itself to steep rocky ground. It is highly resinous.

Timber tough, rather heavy.

No. 82. **S. LEWISIANUS** V. p. 383

Vatica (*Retinodendron*) *Lewisiana* (*Livera*).

Annals 3. B. G., Vol. IX, part I. p. 97, Plate XI, CI—4. A very large tall erect tree, with cylindrical stem. Bark

thick, pale brown, or greyish brown. Twigs copious, grayish at ends, studded with stellate hair. Leaves alternate, clustering at ends of twigs, 2½ by 1½ inches; ovate, rounded at base, more or less suddenly tapering to blunt shortly-acuminate apex; entire; smooth, dark green above, densely stellate hairy below obscuring the venation and giving the entire under-surface a stone-grey colour. Petiole ⅞ inch, swelled at leaf-base, furrowed. Midrib stout, concealed above. Lat.-veins close, numerous, inconspicuous above, uniting in narrow loops. Flowers small, 1/3 inch, white, with conspicuous yellow anthers; on short stalks, in slender axillary panicles, Calyx 5, united at base, Sepals, densely stellate pubescent outside, lanceolate. Petals 5, strongly nerved, with faintly hairy margins. Stamens conspicuous, 15, in an outer and inner series with appendix longer than the filament below the anther cell. Style much produced above ring of stamens; leaving fruits small, spherical, densely covered with reddish tomentum and seated within reflexed persistent sepals.

Wood very hard, pale greyish-white, close-grained, smooth, with occasional lacunae filled with bright red-brown resin. Weight 70 lbs per cubic ft.

This wood was first made use of as bridge staging to support the large bow-spring girders of the Kurugangmodera bridge. After the timber had served that purpose, it was sawn up for wall-plates and rafters for buildings connected with the District Judge's house in Ratnapura, where several years later, I found them to be still in good condition.

I discovered the plant in 1893 growing on the summit of Hunuwalkanda near Pelmadulla, some of the trees being 12 feet in girth at the base. Later, I rediscovered the same species at Eratna-kanda, on a similarly restricted cap of a rocky mountain, but though I made several efforts later to find it in the neighbourhood, I failed to discover fresh specimens. Where it occurs, it is gregarious. The fruits I found to be infested with small grubs, that appeared to have entered from the side, by boring a minute hole.

The native name given to me for this magnificent tree was *Mendora*, but it appeared to be unknown as a timber-tree till I first made use of it in the manner described above.

It may be looked for in the wet forests of Gilimali, and Bambarabotowa, and probably in the Peak Wilderness, beyond Hin-pidurutalagalla.

MONOPORANDA.

Note on the genus. The two members which constitute this small genus strongly resemble *Stemonoporus*, except that

the minor leaf-nerves are not conspicuous; the Ovary is 2-celled, and the filaments of the 5 stamens are extremely short. Anthers pubescent "with large terminal pores." Both our forms under this genus are endemic.

No. 83. **MONOPORANDRA CORDIFOLIA** I. p. 157.

A small tree. Bark smooth. "Leaves 2½—4 inches ovate, or oval-ovate, rounded at base, suddenly candate-acuminate." Entire. Petiole, slender, about 1 inch. Lat.-veins 6-7 pair, prominent below, conspicuous, Flowers yellow, small, in many-stalked axillary panicles, shorter than leaves. Fruit globular, pointed, ½ inch diam.

I have not seen the timber of this species. Occurs in the wet forests of Ambegamuwa, where according to Trimen, it extends to 3,000 feet altitude.

No. 84. **M. ELEGANS** I. p. 138.

A small tree with glabrous young parts. Leaves, 2½—3 inches, lanceolate, minutely tapering to tailed apex. *Margins of base revolute.* Lat.-veins 10 or more, indistinct. Petiole short, ¼ inch. Flowers in groups of 1-4, in small axillary racemes. *Sepals conspicuously acute.* Fruit 1/3 inch. A very rare species, recorded from the foot of Adam's Peak, at 2,000 ft. altitude. I have no notes of its uses.

XXII. MALVACEAE.

This very large and important order is composed of 12 genera in Ceylon, mostly shrubs and herbs, of which one *Julostylis*, is a monotypic endemic. The genera consists of 1, *Sida;* 2, *Abutilon;* 3, *Wissadula;* 4, *Urena;* 5, *Pavonia;* 6, *Julostylis;* 7, *Dicellostyles;* 8, *Hibiscus;* 9, *Thespesia;* 10, *Bombax;* 11, *Eriodendron, and* 12, *Cullenia.*

Excepting the abovenamed monotypic-endemic, Ceylon has only one other indigenous plant belonging to his order, viz. *Dicellostyles axillaris*, so that though the order represents no less than 36 distinct species, only 2 are confined to the Island. In their local distribution, the plants of this order are mostly confined to the low-country; the chief exception being *Cullenia.* They occur in abundance in waste places, and follow chena clearings, and secondary growth. Our largest form is *Bombax*, individual examples often attaining a height of 50 feet, with a girth of 12.

No. 85. **SIDA CORDIFOLIA** I. p. 143.

Wal-bevila, Sulu bu-bevila, Hin-anoda, S. Chevakanpudu, Mayir-manikkam, T.

A many-branched erect shrub with silky branchlets and shoots. Leaves variable in size, from 1 to 2 inches, ovate, strongly cordate at base, obtuse at apex, velvety on both surfaces. Margins dentate, or dentate-serrate. Petiole about 1 inch, or less; covered with spreading hair. Flowers small, yellow, solitary. Calyx densely hairy, 5-lobed. Petals 5, attaching to the tube of the staminal column. Carpels 10.

The root-bark is employed in Sinhalese medicine, having cooling, astringent, and tonic action. The leaves being mucilaginous, are regarded as demulcent. According to Dr. G. Gunawardana, this plant, taken together with other medicinal elements, is of value in Fever, Bilious fever, Nervous disorders, and Hæmorrhage. Dr. Nadkarni states that a decoction of the root of *S. cordifolia*, with ginger, is given in intermittent fever. It is probable that, in native medicine, not only is this particular plant used, but others of the same genus are included, especially in demulcent preparations.

It is a common plant in the low dry country, usually found in open or waste places.

No. 86. **WISSADULA ZEYLANICA** I. p. 146.

Kiri-kaju, Thun-mul, S.

A slender-branched semi-shrubby plant, of about 3 feet in height. Stems and branches dotted with stellate hair. Leaves rather distant, about 3 inches to 3½ inches long, triangular, cordate at base, much tapered to acute apex, much covered below with pale or brownish stellate hair. Smooth above. Entire. Petiole about 1 inch, woolly.

Flowers solitary about ⅛ of an inch diam., pale yellow, in slender erect, terminal panicles. *Seeds pubescent.*

A most excellent fibre, but apparently very little known, and worthy of consideration. Common.

No. 87. **URENA LOBATA** I. p. 147.

Epala, Patta-epala, S.

A wide-branching herb, rarely exceeding 4 feet, with shoots and branches coated with spreading stellate hairs.

Leaves about 2—2½ inches long, round in outline, but divided into 5 shallow *lobes*. Margins indifferently serrate, densely stellate on both surfaces, but paler below.

Petiole variable, 1—2 inches, or less; strongly hairy. Stipules narrowly oblong. Flowers solitary, about $1\frac{1}{4}$ inches diam., pink, with darker centre. Sepals 5, united in tube. Petals 5, attached to staminal column. Anthers "nearly sessile." bracteoles 5, attached to calyx. Flowers-stalk very short, stout, very hairy. Fruits, coated on the back with spines, terminating in hooks, by which they will attach themselves to clothing.

Affords an excellent fibre of remarkable strength and flexibility. It is easily stripped from the stem, and after a short immersion in water, can be cleaned and spun into exceedingly strong twine, or pack thread.

A common way-side weed, but more plentiful in the wet districts than in the dry.

No. 88. **U. SINUATA** I. p. 148.

Hin-Epala, Epala, S.

Much resembling the last, except that the leaves are more deeply cleft into 5 lobes with re-lobed divisions. Flowers clear bright pink, with darker centre. Fruits as in the last, but with longer spines, and troublesome when they get attached to clothing. Affords an excelent fibre. This species and the last, deserve more attention than they receive as a fibre material, for not only is the fibre easily worked, but with a little cultivation, longer staples could be secured.

Exceedingly common in dampish waste ground, up to about 3,000 feet altitude.

No. 89. **HIBISCUS ABELMOSCHUS** I. p. 156.

Kapu-Kinnissa, S. Kattuk-Kasturi, T. The Musk Mallow, E.

Attains a height of about 10 feet, stems coated with crisp hair. Leaves palmate, usually 5-lobed, dentate or crenate on the margins; strongly hairy on both surfaces. Petiole long, longer than leaves, hairy. Stipules small. Flowers solitary, about 4 inches diam., bright yellow with rich purple centre. Stalk dilated at base of flower, curved; Bracts 8, much shorter than calyx.

Capsule large, 3 inches, ovoid, pointed, crisply-hairy. Seeds strongly scented with musk. Not very common, and probably at one time cultivated, as it is in India, for its fibre. Occurs up to about 2,000 feet.

The seeds (which are kidney-shaped) are aromatic, tonic, and carminative, and are used in Indian medicine for nervous troubles and hysteria, and also used as an inhalation, for dryness of the throat.

No. 90. **H. ESCULENTUS** I. p. 156.

Bandakka, S. Vandakkai, T. Ladies' fingers, E.

An introduced plant, belonging to Tropical Africa, but grown here as one of our most popular vegetables, and cultivated entirely for its fruits, which are known as "Ladies' fingers." The whole plant abounds in mucilage, of which the active ingredients are *pectin* and starch.

Medicinally it is demulcent, and diuretic. Externally, the leaves are efficient as an emollient poultice. According to Nadkarni, it is used in chronic dysentery, "the bland mucilage being often most beneficial," but I find no reference to it in Dr. Gunawardana's work, which is the more surprising as it is so highly spoken of by Indian writers.

The fibre of the Bandakka has long been known as a strong and efficient cordage, capable of many purposes in weaving, but apparently has aroused no serious commercial consideration.

No. 91. **H. TILIACEUS** I. p. 157.

Beli-patta, S.

A much branched shrubby tree, with pale bark and pubescent shoots. Leaves rather large, from 2 to 4 inches in diam., nearly round in outline, cordate at base, shortly and abruptly acuminate, smooth above, nearly white below, finely silky-pubescent. Petiole, about 2 inches or less, finely pubescent. Veining below, pubescent. Stipules conspicuous, large, about ½ inch, ovate. Flowers large, 3 inches diam., pale sulphur-yellow, with crimson centre. Capsule 10-celled, about ½ inch, acute at apex; more or less enclosed by the calyx. Hairy.

Wood pale purplish; light, about 35 lbs. per cubic foot. Pores small, entire or sub-divided, very numerous. Rays rather wide, fine, inconspicuous.

Owing to the smallness of the tree, the wood is little used, but is suitable for plugs and bungs.

Affords an excellent string-fibre for rough work. Common round our coasts, especially fringing rivers and backwaters, where it grows gregariously in both zones. Not plentiful above 1,000 ft. altitude. Common to the tropical world.

H. rosa-sinensis—the "Shoe-flower"—of which there are many garden varieties, chiefly differing in the shade of color of flower. Perhaps the oldest form of shoe-flower, is the blood-red flowered species. The first to turn his attention to cultivating and improving this handsome genus in Ceylon, was

Mr. T. C. Huxley of Peradeniya Estate, who in the course of a few years succeeded in permanently establishing most of our handsomest varieties.

H. Sabdariffa—the Rozelle—is another early introduction into Ceylon, and is known as having a powerful and pliable fibre. After the flowers open and fall away, the sepals remain in an enlarged form, surrounding the capsule. This affords the delicate-flavoured "Rozelle jelly." The fruits are antiscorbutic. The plant is known to the Sinhalese, as "*Rata-bilincha*," and "*Pulincha keri*" by the Tamils.

No. 92. **THESPESIA POPULNEA** I. p. 158.

Suriya, S. Puvarachu, Kavarachu, T. The Tulip Tree, E.

A short stemmed rugged tree; rarely erect. Bark varying from grey to brown, and smooth or fissured, according to age and local conditions.

Leaves rather irregularly crowded at ends of shoots or twigs, 3-5½ in. long, by 3½-4½ wide; deltoid-ovate, cordate at base, tapering in a curve to finely acute apex; entire, slightly undulate, glabrous on both sides, shallowly pitted above, sparcely dotted with disc-like scales below. These stellate, or disc-like scales, occur on the stipules, petioles, flower-stalks, calyx, and exposed portions of the unexpanded corolla.

Petiole shorter than leaf; slender. Flowers solitary, axillary, sub-terminal, large 2—3½ inches in diam., rich pure yellow, tinged at base with a shading of dark pink. Petals strongly nerved, with beautifully crisped, round edges, giving the whole the appearance of "crinkled paper." Calyx cup-shaped, with 5 minute teeth. Seeds woolly.

Wood, pale chocolate-brown, grained with fine semi-continuous hair-like lines, which upon microscopic examination reveal them to be narrow vessels filled with resinous wax, yellow in its early stages, but becoming brown, and bituminous with maturity. Hard, fairly durable, capable of taking a high polish. Pores, regular, (open in young wood) round, fimbriated. Rays, fine, close, distinct. Annular rings, most indistinct. Weight about 50 lbs. per cubic foot. Wood used in making spokes of wheels in carriage building. Excellent for gun-stocks.

An introduced plant, and frequently planted for hedges, and as an ornamental tree.

Chiefly found near the coast, and has become "wild" in the dry districts.

No. 93. **BOMBAX MALABARICUM** I. p. 160.

Imbul or *Katu-imbul*, *S. Kadu-parutti*, or *Illavu*, *T.*
The Silk Cotton Tree, *E.*

A large, erect, deciduous tree, much buttressed at base. Bark pale, at first set with prickles mounted on large conical bases that in time fall away, after which the surface of the bark becomes moderately smooth. Young parts quite glabrous.

Leaves digitate, large, crowding. Leaflets lanceolate, or ovate-lanceolate, acute, 4—9 inches long, (central always largest) entire, on short stalks; Petiole longer than leaflets. Flowers appear before the leaf, large, 3 in. diam. coarse, scarlet, or blood-red. Calyx silky tomentose inside, leathery. Petals 5, stellate on both sides. Stamens in a bundle of about 60 filaments, that are united at base, closely enclosing the ovary. Style longer than stamens; stigma, 5. Fruit capsular, with harsh leathery valves, filled within with silky hair of pale white colour. The seeds are about ⅓ inch, "closely packed in cotton." Wood very light, about 24 lbs. per cubic foot, pale white in color, or faintly creamy; very perishable; no heartwood. Pores large, sparce; often divided. Rays fine distinct. Annular rings, absent. At one time the wood of this cotton tree was in great demand for tea boxes, but owing to its proneness to borers (*Xyleborus fornicatus* and *X. compactus*) it soon fell into evil repute.

It is however suitable for very temporary purposes, such as floats for outriggers, as it improves by water-seasoning.

This plant is widely disturbed in Ceylon, and often planted. It occurs in its largest form round our foot-hills. It is frequently met with in the Uva patana lands, but becomes scarce at 3,000 feet altitude.

It is used in Sinhalese medicine in various forms, as it is said to cure diarrhœa, dysentery and hæmorrhagia. The bark leaves, gum and flowers, are of officinal value. The gum, mixed with sugar, is used in diarrhœa. The bark, and powdered leaves, admixed with other vegetable compounds, are used in urinary disorders. In India, the gum, rolled into roundish dull-brown tears, are sold as Mocharas, and are employed as an astringent.

The root, called in bazaars *Musla*, is alleged to be tonic. MacMillan says "the fleshy calyces are much relished as a curry vegetable by the Burmese."

No. 94. **ERIODENDRON ANFRACTUOSUM** I p. 161.

Imbul, Pulun-Imbul, S. Panchchi, T. Kapok, (Malay.)
Silk Cotton Tree, E.

An introduced plant in Ceylon. A tall erect tree, with branches in 3—s, jutting out horizontally—a conspicuous and ready characteristic. Leaves alternate, on long petioles, terminating in 7 leaflets, of which the central is the longest. The leaflets are entire, narrowly ovate-oblong, tapering to base, much attenuated to acute apex, faintly glaucous below. Flowers rather large, about 2 inches diam., pale creamy-white, slightly scented, in clusters of 2 or more, appearing with the young leaves at the ends of branches. The fruit, or capsule, is ovoid, about 4 inches long; blunt-pointed, hard or leathery, opening from the base, containing masses of white silk-like hair, that detaches, itself, leaving the covering envelope bare. Seeds nearly globular, black, completely embedded in the hairy mass.

Timber white; worthless, weighing about 30 lbs. per cubic ft., very soft.

This plant is very common in gardens throughout the low-country. It is nowhere truly wild. It is often grown as a fence plant, and as it is easily raised from cuttings its propagation is simple. It, however, does not thrive much above 2,000 feet, and appears at its best in the intermediate zone. The value of its cotton has of late years become more appreciated than in early days, when it was only made use of, to a limited extent, for stuffing pillows. The Great War produced new uses for this important plant, which unfortunately is still not systematically cultivated, or to the extent that it should be. The seeds afford an excellent food for cattle. The gum, exuded by the plant on being wounded, is astringent, and a bland demulcent fluid is obtained from bruised young branches.

No. 95. **CULLENIA EXCELSA** I. p. 162.

Katu-boda, S. Mullu-plaka, T. Wild Durian, E.

A large, handsome, erect forest tree. Bark pale brown, or grayish; smooth, rather thick.

Branches rather verticillate in arrangement ending in smooth surfaces. Leaves, alternate 7 inches by 3, ovate-oblong, or broadly lanceolate, rounded at base, rather abruptly acuminate, entire, dark green above, beautifully studded over the whole under surface with masses of golden-brown scrufy, stellate hair, giving the underside of the leaf a rich chestnut-cream colour. Petiole 1 inch, thickened at base of blade, scurfy. Midrib prominent below, depressed above, rich golden chestnut

in colour. Lat.-veins about 12 pairs, irregular, arching much below margin. Stipules (?) absent, or very minute. Flowers in clusters "from bosses on old wood," about 1 inch diam., pale reddish or rusty-brown, enclosed within a hard woolly calyx. Petals absent. Stamens many, uniting into a longish tube below. Fruit large, 4—6 inches, highly spinous, dividing into thick valves. Seeds large, two in each cell, nearly covered by a white semi-fleshy coat or aril; hard, bright brown. The fruits are eaten by monkeys, notwithstanding their spinous coat.

Wood pale yellowish brown, about 32 to 38 lbs. per cubic foot, very easily split into wedges and pegs, and useful for small packing materials and cases, such as cigar boxes, and possibly pencils, and penholders.

A fairly common tree in the wet and intermediate zones, in the west of the Island, from 2,000 to 4,500 feet altitude. It is locally abundant, but not gregarious, and occurs in South India.

The famous "Durian," or Civet-cat fruit (*Durio zibethinus*) is closely allied to the foregoing. It is a Malayan form, and has been successfully grown in Ceylon, examples of 100 feet in height being met with in the Peradeniya Gardens. It is also found in gardens near Ratnapura, but its restricted general cultivation is possibly due to the excessively offensive odour of the ripe fruit, (the rhapsodical praises of Dr. Wallace notwithstanding) which distinctly affects its popularity as a table fruit.

Another remarkable tree of this order is *Adansonia digitata*, the Baobab, which attains to a great girth. It is found in Mannar and Delft.

XXIII. STERCULIACEAE.

This important order is represented in Ceylon by the following genera:—1. *Sterculia;* 2. *Heritiera;* 3. *Helicteres;* 4. *Pterospermum;* 5. *Pentapetes;* 6. *Melochia;* and 7. *Waltheria.* Though as many as 12 species occur here, only one is endemic, viz., *Sterculia Thwaitesii.* This last is recorded by Trimen as having been found at Haragama in 1853, but appears to be identical with examples found by the writer on the banks of the Wallaway River in the South. For our purposes the first four genera alone deserve consideration, as the remainder afford no plants of special utility, and are therefore excluded.

Of the introduced *Sterculiaceae*, the most familiar is the Cocoa—*Theobroma Cacao*—which according to Trimen (*Hortus Zeylanicus*) was introduced about 1819. Mr. J. W. Bennett in

his work "Ceylon and its Capabilities," published in 1843, refers to this plant and says he had in his garden trees of Cocoa that were "planted by the late Jacobus Burnand, who introduced valuable exotics from the Malay peninsula." Burnand arrived in Ceylon in 1778, and died in 1816, so if Bennett is correct, Trimen's date is too late. At first Cocoa appears only to have been a curiosity, and not seriously regarded as a commercial product. I possess a letter dated 8th July, 1904, from the late Mr. J. K. Ingleton in which he says: "Cacao was introduced into Ceylon (Dumbara) by the late Mr. R. B. Tytler of Pallekelly, about 1850, or a little later may be, but it was not extended beyond a small patch at Pallekelly for many years afterwards. It was extended after the coffee leaf disease set in badly, and the first shipments were made about 1880 or a little later, and it fetched over 120 shillings per cwt. in London."

At first, the cultivation of Cocoa was not readily taken up, for the area in 1877 to 1878 was only about 500 acres, but in 1883 the area under this product was about 10,000 acres. In the year 1886—7 the export of this product reached 16,638 cwts., rising to a maximum of 81,122 cwts. in 1909, and in 1921 falling to 62,244 cwts. (*Turner*). With the success of this product in Ceylon, many varieties came to be imported here, thus we have "*Forastero*," "*Criollo*," "*Calabacillo*," and many others, including the non-commercial curiosity *Theobroma angustifolia* or Monkey Cacao which was introduced at Peradeniya in 1895 (*Macmillan*).

It is of interest to observe that the first public notification of this now familiar article of food in England was in the "Public Advertiser" of the 16th June, 1657, which stated that "In Bishopgate Street, in Queen's Head Abbey, at a Frenchman's House, is an excellent West India drink, called chocolate, to be sold, where you may have it ready at any time, and also unmade, at reasonable rates." So much for the nativity of great industries!

A second, but inconspicuous product belonging to this family, and closely allied to the genus Sterculia, is *Cola accuminata*, or the Cola-nut. This is a native of Western Tropical Africa, and was introduced here in 1879, and is to some extent cultivated in the Matale District as a minor product. In West Africa, the seeds of this nut are used to "satisfy the cravings of hunger, and to enable those using them to endure prolonged labour without fatigue." In Ceylon it used as an ingredient in a mineral water, under the title of "Kola," or "Kola-champagne," but Cola has not yet become an industry of importance.

No. 96. **STERCULIA FOETIDA** I. p. 164.

Telambu, S. Kadu-tenga, T.

A tall, erect, partially deciduous tree of considerable size. Bark rather thick, pale, grey, smooth, flaking in scales. Twigs much leaf-scarred. Leaves in close clusters at ends of branches, digitate, the leaflets radiating from the end of a long (12—18 inches) smooth cylindrical petiole. Leaflets about 10 inches by 2½, very narrowly lanceolate ovate, tapering at base, finely tapered to acute apex, glabrous, tinged with pink when young. Leaflet-stalk very short. Midrib direct, prominent below, slightly raised above. Lat.-veins numerous; opposite or sub-opposite, fine, pale, conspicuous below, arching in oblique loops within margin. Nerves fine, rather distant, inconspicuous. Midrib and upper end of petiole softly hairy for about two inches on the under-side. Stipules, early-falling. Flowers about 1½ inch diam., dull orange, with very oppressive smell. Calyx 5; Petals absent. Male flowers with staminal column about ½ inch long, curved; anthers up to 20. Female flowers with a gynophore, and "abortive anthers." Inflorescence in panicles about 6 inches long, growing immediately under new leaves. Fruits very large, in follicles of 5, pendulous, woody, "ovoid-pyriform," bluntly pointed, nearly scarlet, very conspicuous. Seeds large, about 1 inch, black with a small yellow aril at base, otherwise smooth. Heart-wood pale brown, tinged with salmon-pink, streaked with darker brown. Annular rings prominent, about 5 to the inch. Pores large, often double, unequally scattered between rays. Rays distinct, wavy, pale. Weight about 36 lbs. per cubic ft. When quite dry the wood fades in colour to a pale greenish white. Not durable, but is often used for boat-building in the Eastern Province. Suitable for packing cases. The seeds are eaten roasted.

Widely distributed in the low-country of Ceylon up to 1,200 ft. altitude, but more abundant in the dry zone. Occurs in the tropical belt from Northern Australia to East Africa.

Nadkarni (*Indian Plants*, p. 376) says that the seeds, if swallowed, produce nausea and vertigo, and that by boiling, an oil is extracted. The bark and leaves are aperient.

No. 97. **S. URENS** I. p. 164.

Kavali, T. Dadiya, (Vedda name.)

A large deciduous tree. Bark smooth, white or grey exfoliating in thin flakes. Leaves crowding at branch-ends, large, 8-12 inches, shallowly 5-lobed, cordate, lobes entire, caudate acuminate, very softly velvety below, faintly pubescent above.

Petiole about 6-10 inches. Flowers crowded in pyramidal panicles, densely covered with viscous tomentose stellate hair, about ½ inch in diam. greenish with purple centre." Calyx pubescent. Staminal-column in male flowers short; bisexual flowers few, mixed with males. Fruit 4-5 radiating follicles, ovoid, red when ripe, densely pubescent and armed with "stiff red stinging bristles;" wood very soft, reddish brown with lighter-coloured sap wood, offensive in smell. Pores large, often divided and filled with gum. Rays broad, undulating. Weight 42 lbs. per cubic foot. Used for guitars and toys. (*Gamble.*)

A rather rare tree in Ceylon, and probably introduced from India as a medicinal plant, as the gum affords an excellent application for cuts and wounds. The gum known as "Gum Kuteera," once exported to England as a substitute for Tragacanth is the product of this species. My specimens were collected in the Panama Pattu, Eastern Province. Also recorded from Uma-Oya and Haragama.

No. 98. **S. GUTTATA** I. p. 165.

Kavali, Tondi, T.

A moderately large tree with vertically furrowed bark, and pubescent young parts. Leaves *simple*, rather crowded at ends, 5-10 inches, rounded or slightly cordate at base, ovate, tapering, or shortly acuminate at apex, glabrous above, underside stellate-hairy on lat.-veins, and nerves. Petiole 2-3 inches stellate-scurfy. Lat.-veins about 7-8 (first pair, basal) opposite, or sub-opposite, oblique, not uniting, prominent below. Nerves nearly parallel, conspicuous on underside, fine. Flowers small, about ⅜ in. in diam., white spotted with pink. Staminal-column in male flowers rather long. Calyx segments spreading, 5, thick, purple inside, rusty, tomentose outside. Anthers 10-12. Follicles about 3 inches, torpedo-shaped, bright red, velvety. Seeds large, black. The wood does not appear to be used, but the bark affords a very useful cordage. The seeds are eaten.

A rare tree occasionally found in the Ratnapura District. Common in South India.

No. 99. **S. BALANGHAS** I. p. 165.

Nava, S.

A small tree with erect cylindrical stem and many small branches. Bark about ⅓ of an inch, pale creamy brown, smooth; leaf-scarred in young wood.

Leaves simple, irregularly placed, rather crowded at ends of branches, about 7 inches by 3, ovate-oblong, rounded at base and apex, often suddenly shortly acuminate, glabrous, rather thin; entire. Petiole 1 inch, swelled at both ends, stiff, distantly stellate-hairy. Midrib direct, pale, pronounced below, distinct above. Lat.-veins about 10 broadly arched, obscurely uniting, fine, scantily stellate-hairy below. Nerves distant, with sparse masses of stellate hair.

Leaf-buds (? stipules) claw-like, closely stellate-hairy. Flowers small, under ½ inch diam., greenish "with crimson hairs;" scented, in drooping panicles of about 5 inches in length. Panicles and flowers-stalks, stellate-hairy, calyx-segments united at tips, deeply cut, hairy within. Anthers 15. Follicles about 5, spreading, on very short stalks, very bright flaming orange scarlet when ripe, making the fruits at once distinctive.

The material of the follicles (pericarp) is leathery, quite smooth within, and on opening disclose large ovoid, polished-black seeds with a yellowish base. This tree appears to be a cultivated species, as nowhere have I found it a forest plant. It occurs plentifully in the low-country, in the South and West of the Island, often in gardens as a fence plant, and sometimes as an ornamental tree, its brilliant fruits being very attractive. In recent years, with the advent of the "Kalutara Hat," much attention has been given to this plant for the sake of its beautiful lace-like inner bark, which is found to afford a most excellent material for this new industry. Owing to the popularity of this head gear, the demand for "*Nava bark*" is likely to exceed the natural supply, and though the plant is capable of reproducing its bark, it is unlikely to be able to meet an increasing market. As its cultivation in gardens indicates the ease with which the plant can be grown, it is very desirable in the interests of the cottage industry just referred to, that further planting up of garden lands, and owitas, should be steadily advanced.

The wood is not made use of.

No. 100. **S. COLORATA** I. p. 166.

Malaiparutti, T. Kenawila, Vedda.

A moderately large, erect, deciduous tree, with often fluted stem. Bark nearly white, papery, smooth. Leaves crowding at branch ends, 5 or 3-lobed, shallowly or deeply cleft into triangular lobes, each ending in a more or less acuminate apex. Base of leaf deeply cordate. Sparsely stellate, having petiole about 12 inches (longer than leaf is broad), rather slender. Lat.-veins rather slender, obliquely arching and uniting. Nerves

rather distant, fine. Stipules pubescent. Flowers polygamous, about ¾ inch diam., scarlet-orange. Panicles many, erect, varying in colour from coral red to greyish, densely stellate. Calyx pubescent with stellate hair within. Follicles few, about 3 inches membraneous, veined, narrowly oval, pinkish green, carrying on the margin two seeds in each follicle. Wood pale ashen, very soft with broad distinct rays and large pores. Weight 24 lbs. per cubic ft. (*Gamble*) suitable for light package-boxes. Affords a fine inner fibrous bark.

Occurs in the very dry country, in rocky land about Nilgala, Dambulla and in the North-Western Province. It is common in India and Burma.

No. 101. **S. THWAITESII** I. p. 166.

Gal-nawa, S.

A tall erect tree with irregular crown. Bark pale grey, smooth, longitudinally fissured, rather thick. Ends of twigs and shoots smooth, pale green.

Leaves crowding at ends of branches, about 6 inches by 2½, oblong, rounded or obtuse at base or faintly cordate, rounded or tapering to broad, blunt, acuminate apex, entire, faintly sinuate; glabrous above, slightly pustular below, stiff. Petiole long, 2—2½ ins., dilated at both ends, sparcely scurfy, wrinkled. Midrib strongly prominent below, tinged with yellow, slightly raised above. Lat.-veins, about 6 (first pair basal) opposite, obliquely arched and uniting with lateral nerves, pale, thin. Nerves closely reticulate, fine, pellucid, inconspicuous. Leaf buds enclosed in an acutely conical rufous-red cap. Immature leaves pinkish. Wood (from a branch) pale, nearly white. Rays distinct, broad; pores, rather large, open, distinct. Apparently very light, but unknown as to uses.

I have not seen the flowers, which Trimen describes as small, ½ inch on short, rufous, pubescent, racemose panicles from below the new leaves; pale green. Follicles about 3 inches, thick, hardy, woody, of a dull red-brown colour, Seeds large.

I only know of this rare plant as occuring on the banks of the Wallawey Ganga for about 12 miles from its mouth, and I have also obtained it at Kurunegala, Trimen's locality is Haragama, and he records it as very rare.

No. 102. **HERITIERA LITTORALIS** I. p. 167.

Etuna, Ho-mediriya (local in Kalutara District). S. Chomuntiri, T.

A rather large water-loving tree with irregular stem, often short and much-branched. Bark dull brown, much furrowed

with longitudinal lines. Young parts coated with peltate scales. Leaves large, 6—8 inches long by 2—3 wide, entire, oblong or elliptic-oblong, rounded at base, or slightly cordate, curving to a more or less pointed apex; glabrous above, covered below with fine silvery peltate scales. Petiole about one inch slightly swelled at base of blade. Midrib very prominent below; scaled. Lat.-veins about 10, often unequal, sub-opposite, curved, ending in broken reticulation, more pronounced below than above. Stipules small.

Flowers very small, under $\frac{1}{4}$ inch diam., pale greenish pink. Panicles axillary, shorter than leaves. Calyx 4—5; Petals absent; stamens forming a small central column; Anthers minute, 5. Fruit carpels about 3 inches, hard, woody, remarkably like a miniature boat with distinct keel and with a raised fold on the upper surface, which acts as a sail.

Wood very hard. Heartwood dull red, tough, close-grained, durable, but liable to attacks from minute borers. Pores small, oval, often sub-divided. Rays broad, wavy, with many white fine transverse lines. Sapwood pale straw, or white soft.

Weight 75 lbs. per cubic foot when quite dry. Suitable for beams, posts, and heavy work generally, but care should be taken to use strong preservatives, owing to its liability to borer attacks. Much used in Calcutta for boat building.

Occurs round our sea coast and up tidal rivers, but never away from water. Found in many parts of the tropical world.

I can find no explanation for the local name—"*Ho mediria*" —that is applied in the Kalutara District to this species, as it in no way resembles any Ebenacious plant to which this name would refer.

No. 103. **HELICTERES ISORA** I. p. 168.

Liniya, S. Vallampuri, T. Indian Screw Tree, E.

A shrub or bush. Bark pale, twigs coated with stellate hair. Leaves about three inches, or more, rounded or oblique at base, suddenly acuminate or serrate at apex, with a more or less lobed appearance; sparcely hairy and rather rough. Petiole about $\frac{1}{3}$ inch, stellate. Stipules bristle-like, about as long as petiole. Lat.-veins prominent below, stellate-hairy. Flowers $1\frac{1}{2}$ inches, dull crimson, becoming lead colour when faded; in axillary clusters on short stellate stalks. Calyx tubular, 5-fid. Petals 5, clawed. Stamens 10 adhering to (adnate) the gynophore. Fruits consisting of 5 narrow follicles, twisted spirally into a screw-like mass, scrufy-stellate.

A very strong fibre is obtained from the inner bark.

A common low-country plant, often occurs in abandoned chena lands in the intermediate and dry zones.

Owing to the curious form of the fruit, it is supposed to be a remedy against colic or *twisting* of the bowels! The seeds, powdered and mixed with castor oil, forms an application in ottorrhœa, ulcers in the ear, &c. (*Nadkarni*).

No. 104. **PTEROSPERMUM SUBERIFOLIUM** I. p. 169.
Welang, Welanga, S. Vinanku, T.

A most variable plant both as to its general appearance and in the form of its leaves: In the dry zone it appears as a slender tree, erect, with thin cylindrical shoots. In the hill country, at about 2,000 feet, it is a small tree, or only a bush. The bark is dull, dark brown, longitudinally fissured. Young parts are finely tomentose, sometimes woolly. Leaves exceedingly variable, especially in young plants, no two being alike. Generally about 4 in. long, pointed, or rounded, or obtuse at apex, with varying margins; dull, dark green above, creamy white below with close fine tomentose coat. Petiole about quarter of an inch, but this too is variable; tomentose. Stipules early falling, small.

Flowers about 1 inch diam., yellowish, delightfully scented, solitary on a pointed stiff highly tomentose stalk; Sepals 5, nearly united at base; Petals 5, Stamens 20, of which 5 are much larger than the others, and barren. Both petals and stamens are united (connate) at base. A line of hair occurs in the inner side of the reflexed sepals.

Fruits 5-valved, woody, about 2 inches long, tapering to apex, tomentose. Seeds numerous, more or less winged.

Wood pale reddish or cedar-brown in colour, rather light, about 36 lbs. per cubic foot, moderately hard. Pores few, slightly oval, often divided. Rays, close.

Very suitable for packing-case material, or linings, ceilings, and the like. Much employed by Veddas for arrows, and for "fire devils." As the shoots of this plant are straight, cylindrical and easily smoothed, they are in favour for arrows, while longer poles of the same material are used by Veddas for removing honey combs.

Dr. R. L. Spittel informs me that the Veddas call this wood "Ee," but I fancy that this is probably a contraction of "Iya" an arrow in Sinhalese, as "*Aude*" is the usual Vedda word for the short arrow.

The remarkable variation in the size of the tree and its leaves, singles this plant out for speculation as to variation,

and as such deserves comparison with members of the *Urticaceae*.

It is plentiful in the dry zone, where it attains its largest size. Also in Southern India and Burma.

XXIV.—TILIACEAE

This important order of plants is represented in Ceylon by six genera, viz.: 1, *Pityranthe;* 2, *Berrya;* 3, *Grewia;* 4, *Triumfetta;* 5, *Corchorus;* and 6, *Elæocarpus*, nearly all of which belong to the low-country.

No. 105. **PITYRANTHE VERRUCOSA** I. p. 172.

Dikwenna, S. Vippanai, T.

A small tree with rather spreading open crown. Bark, thin, ashen, smooth, studded with small lenticels. Twigs, greyish, rough at ends. Leaves alternate, about 5 inches by 3 or larger, broadly ovate-oblong, rounded or sub-cordate at base, or abruptly rounded, obtuse at apex; margins unevenly crenate; stiff; dark-green above or slightly mottled, ashen below. Upper surface with masses of stellate hair on veins and nerves; under surface rough, densely stellate-hairy. Petiole about 1 inch, stiff, swelled at base of leaf, scurfy, midrib prominent below. Lat-.veins about 8 pairs, conspicuous. Nerves distinct, rather pellucid. Flowers small, pale pinkish-white, in erect many branched terminal and axillary panicles. Flower-stalks very short, rough. Calyx 5-lobed, petals 5, distinct; stamens 20, distinct, 5 reduced to barren staminodes. Fruits, capsular, top-shaped, with 5 prominent ridges; straw-coloured, densely covered with crisp stellate masses showing a rough exterior. Seeds 4, usually mature ones, solitary, globular, black with a few pale scales.

Wood pale yellowish white when freshly cut, very tough and dense, and used for cart axles. Unfortunately this very hard wood rarely attains a large size, or it would be a most important timber.

Common in the Eastern dry country, where it is locally gregarious. I have found it in abundance in the Trincomalee District, near and around Polonnaruwa, and a few examples in lower Uva. The genus is monotypic and endemic.

Note.—In the Trincomalee District, where this curious plant is more abundant than elsewhere, it is used for axles for cart wheels owing to its extraordinary toughness.

No. 106. **BERRYA AMMONILLA** I. p. 173.

Halmilla, S. Chavandalai, T. Trincomalee-wood of Commerce.

A tall, erect, slender-stemmed tree, with small dense crown. Bark pale ashen, smooth, easily stripped when young. Leaves variable in size, and according to age of plant, about 5 to 8 inches long, ovate, cordate at base, rounded or acute at apex; entire; glabrous, rather undulate. Petioles long, about 2 in. Midrib prominent below. Lat.-veins radiating 5—7. Stipules ½ inch, narrow. Flowers about ¾ inch in diam., white. Calyx 3 or 5-lobed. Petals 5, oblong, reflexed. Stamens numerous. Fruit a capsule, 3 valved with 2 conspicuous thin wings of about 1 inch in length. Seeds "covered with long yellow hair."

Wood pale yellowish, marked transversely with very fine parallel hair-like lines. Weight, about 56 to 60 lbs. per cubic foot, tough and durable. Pores, oval, small "enclosed in white patches which are united by narrow undulating bands of soft tissue." (*Gamble*) Rays distinct, many, uniform.

The timber was at one time largely exported to India, and there used for gun-carriages. It is a valuable wood for oil casks, as it is both flexible and tough.

It occurs in our dry forests, spreading inland to the base of the hills. Often found semi-cultivated in garden, especially in parts of Sabaragamuwa and Matale. Its further cultivation is very desirable owing to the great value of its timber.

Occurs in Malabar, Burma, the Adamans and Philippines.

Its value as a timber in ship-building was appreciated by the Dutch who made considerable use of it. As far back as the beginning of the last century, the export duty on *Halmilla* was 6 fanams per cubic foot, as it was considerably imported by other countries for casks and barrels. (A fanam=6 cents Ceylon.)

No. 107. **GREWIA TILIÆFOLIA** I. p. 175.

Daminiya, S. Chadachchi, T.

A moderate sized tree, with rather spreading crown. Bark pale, rather thick, fibrous, flaking in small flakes. Often with many erect cylindrical shoots.

Leaves alternate, overlapping, variable in size 3—7 inches by 2 to 5 inches, unequally lobed, ovate-orbicular, rounded, or oblique at base, coarsely rounded at apex, serrate or crenate-serrate on the margin, glabrous or very sparcely

hairy. Stipules large, leafy, rounded or acute at apex. faintly hairy on margin, with pellucid venation. Petiole about 1 inch, thickened at base, stiff, sparcely hairy. Veins 3 to 5, the first or basal pair outwardly re-veined, prominent below. Nerves rather distant, distinct, parallel, few-haired on larger nerves. Midrib depressed above. Young parts and immature leaves stained with dull fleshy pink. Flowers small, pale soft yellow, on slender stalks, in stalked, umbellate clusters of 3, several together. Sepals 5, narrow, oblong, "stellate tomentose outside." Petals shorter than sepals. Stamens many, crowded on a raised limb, distinct. Fruit, 4-lobed, fleshy outside, and containing hard or bony stones.

Heart-wood, rather limited, brown, close, tough, hard. Sap-wood very pale and soft. Pores many, rays clear, distinct. Annular rings, clear. Weight about 40 lbs. per cubic foot. Unfortunately this tree attains no great size, or its touch elastic wood would be more used. In India, the timber is used for oars and shafts.

The inner bark affords an excellent rough cordage. Elephants are very fond of the young branches and leaves.

Widely distributed in the low-country below 1,500 feet, but not in the arid zone. Also in South India, Burma and East Tropical Africa.

No. 108. **G. POLYGAMA** I. p. 177.

Boradaminiya, S. Thavattai, T.

A moderate sized tree, with erect stem, rather deeply buttressed. Bark, pale or brownish; smooth. Branchlets many, slender, straight; pubescent at ends. Leaves regular in opposite rows ("distichous") about $3\frac{1}{2}$ inches by $1\frac{1}{4}$ or less; narrowly ovate or oblong-lanceolate, unequally lobed, tapering to a fine acuminate apex. Serrate. Young leaves minutely stellate-hairy above, becoming nearly glabrous with maturity. Under-parts stellate-hairy on veins and nerves. Petiole short, $\frac{1}{4}$ inch, stellate-hairy. Midrib prominent below, slightly raised above. Two strong basal veins extended for $\frac{2}{3}$ of the leaf blade, giving out on the outer margin about 10 curved secondary nerves. Remaining lateral-veins about 3. Stipules large about $\frac{1}{2}$ or $\frac{3}{4}$ inch, narrow, acute, finely stellate-hairy. Young foliage tinged with rose pink.

Flowers small, about $\frac{1}{2}$ inch diam., pale. Polygamous. "Pedunculate umbels 1—4 together from axil"; Fruits nearly round, hairy, with 4 stony seeds.

I have no record of the wood structure, or its use, but Trimen says it (heart-wood) is heavy, rather hard. Smooth, even-grained, pale brown.

Common in the dry country, especially about Anuradhapura and eastwards; also in the sub-Himalayan tract, Burma to North Australia.

Of this genus there are in Ceylon eight more species, mostly shrubs that are not of sufficient importance to be described, but it may be noted that as all are fibrous, and possibly attention will be drawn to them as affording "string material."

No. 109. **CORCHORUS CAPSULARIS** I. p. 181.

Jute.

An erect slender annual, with cylindrical stem usually glabrous. Leaves 3 to 5 inches, narrowly ovate-lanceolate, tapering to acute apex, rounded at base with two distinct prolongations of the serration into tail-like appendages, the rest of the margin being strongly serrate; glabrous. Petiole rather short, slender. Veins 3-5, at base, distinct. Midrib slender. Stipules narrow, "filiform", about ½ inch. Flowers small, about, or less than, ½ inch diam., yellow, in clusters of 2 or 3. Fruit, an almost globular but flat-topped capsule of ½ inch diam., ridged and rough, valves 5 "without transverse partitions." Seeds smooth, brown, "wedge-shaped."

This is one of the two species that affords the well-known jute of commerce, so familiar as a bag material, and in tea factories for "withering tats." Its occurrence according to Thwaites (*Enumeratio* p. 31) is "very common," though Trimen says he has not met with it.

I have found it—or at any rate a plant that I am unable to distinguish from it—in damp places, such as the beds of shallow tanks in the dry country, both in the North, East, and South of the Island. The following characters help to distinguish the two forms of jute:—

C. capsularis.	*C. olitorius.*
Leaf.—Narrowly ovate-lanceolate.	Ovate lanceolate
Capsule.—Sub-globose, *without* transverse partitions inside.	*With* transverse partitions.
Seeds.—Smooth, brown.	Wrinkled, black,

Our members of this genus are none of them peculiar to the Island, their distribution being practically the tropical belt of the old world.

The genus is represented here by 6 species.

No. 110. **ELÆOCARPUS SERRATUS** I. p. 184, Pl. XX.

Veralu, S. Ceylon Olive, E.

A moderate sized tree, with rather broad or irregular crown. Branchlets crowding, leaf-scarred. Bark, grey or greyish brown, rather smooth.

Leaves crowding, about 2-4 inches by 1 to 1½, oval, tapering at base, often slightly bladed on petiole, acute, or ovate-acute at apex, distantly crenate on margins; glabrous, dark green above, pale below, becoming dull orange before falling. Petiole, ½ inch, rather stout, tinged with yellow. Midrib, strong, conspicuous below, distinct above. Lat.-veins rather variable in number, about 5, sub-opposite or alternate, looping within margin and uniting with next vein above it, more prominent below than above, and glandular in the axils between the veins and the midrib. Nerves rather wide apart, distinct below. Flowers numerous, small about ½ inch diam., white, of an offensive sickly odour. Inflorescense in axillary racemes, the flowers hanging, and alternately arranged. Sepals 5, distinct. Petals 5, much split up at ends into slender narrow thread-like lobes. Stamens many (25 or more), with valve of anthers terminating in a brush of 5 or 6 hairs. Anthers much longer than filaments. Style and ovary hairy. Fruit a drupe, ovoid, smooth, about 1 or 1½ inches long, with fleshy pulp of a sub-acid flavour (when ripe,—very astringent when unripe,), over-laying a hard nodule-covered bony seed of oval outline. Wood soft, pale yellowish, not durable, and little used. Suitable for linings, small packing boxes, and "backings."

A common tree in the damp forests in the west and centre of the island up to 2,500 feet, especially in the intermediate zone. Also in India, Malaya and Java.

The fruit of this species has been used as a cure for tapeworm. The late Dr. Murray informed me that he submitted samples of the fruit to Professor Spencer Cobbold for examination, in connexion with other remedies for "Taenia," and that it had been proved to be of value, but it has not become an established remedy.

No. 111. **E. AMOENUS** I. p. 185.

Titta-Veralu, S.

A small tree with unevenly cylindrical stem. Branches wide-spreading, ending in finely soft surface. Bark, dull ashen, furrowed with irregular longitudinal fissures. Leaves crowded at ends of twigs, $3\frac{1}{2}$ by $1\frac{3}{4}$ inch, ovate, tapering at base and apex, the latter often blunt; glabrous; coarsely or unevenly crenate. Petiole, $\frac{2}{3}$ inch, tinged with dull pink. Midrib stout, prominent below, raised above. Lat.-veins about 5, arched, with a conspicuous gland in each vein-axil. Nerves, distant. Leaf-bud (? stipule) conical, softly hairy. Flowers small, hanging from spreading axillary racemes, white with reddish sepals. Petals 5, gashed with fine divisions. Stamens numerous, 18—30; with filaments about as long as the anthers, which last have no hairs as in No. 110. Fruit ovate-spherical, tinged with dull pink, smooth, about 1 inch in diam. Stone, brain-like, with 3 distinct grooves, hard, bony, covered with bitter fleshy pulp.

Wood, pale, rather light, soft, not durable. Suitable for same purposes as last. The hard stones are used for necklaces, which are extremely handsome.

Fairly common in the damp forests over 2,000 feet up to 5,000, and extending to the higher hills of the Pasdun Korale. Also South India.

No. 112. **E. SUBVILLOSUS** I. p. 186.

Gal-Veralu, S.

A moderate sized tree with rather slender erect stem. Bark dull brown, smooth. Young parts softly tomentose. Leaves large, 5 inches, oval, rounded at base and apex, sometimes shortly acuminate; glabrous above, pubescent beneath and on margins. Serrate, but not deeply notched on margin. Petiole long, about $1\frac{1}{2}$ inches, tomentose. Midrib prominent below, pubescent. Lat.-veins prominent, curved within margin. Nerves rather distant. Flowers about 1 inch diam., on "short thick tomentose stalks in long racemes, from axils of fallen leaves." Sepals 5, tomentose; Petals much longer than sepals and gashed into narrow filaments. Stamens 15—20, finely pubescent. Anthers without "beard." Fruits large, about 1 to $1\frac{1}{2}$ inch in diam., globular, densely tomentous with rusty hair. Stone much noduled, slightly pointed, 3-grooved.

Wood light, pale yellowish white, soft, and only suitable for temporary purposes.

Occurs mostly in the western part of Ceylon, in the wet forests up to 3,000 feet, but nowhere very abundant. Its fruits appear to be eaten by monkeys and squirrels, the latter hoarding them in hollow trees.

Of this genus we have four endemic species, viz.: "*E. obovatus*," "*montanus*," "*zeylanicus*," "*glandulifera*," but they are not of economic value.

XXV. LINACEAE.

This order is only represented by three genera in Ceylon and seven species, of which one (*Linum mysorense*), though not peculiar to the Island, occurs as a hill species on some of our patanas. Three are endemic. The common Flax, or Linseed (*Linum usitatissimum*) though extensively grown in Bengal, does not occur here.

No. 113. **ERYTHROXYLON MONOGYNUM** I. p. 190.

Devadaram, Chemmanatti, T.

A small tree with many twiggy branches. Bark brown, rough, thick. Leaves small, about 2 inches, oval, obvate broad at apex, tapering at base, smooth, glossy above, pale below. Petiole very short. Midrib thin, prominent below. Veins much netted and finely nerved. Stipules *persistent*, flowers very small, about quarter inch diam., pale greenish white, on thin stalks in small axillary clusters of one to four. Sepals 5, much shorter than petals. Petals 5, styles heterostylic, united half way up. Stamens 10. Fruit a small scarlet drupe pointed, somewhat 3-angled, smooth, with persistent remains at base of flower.

Sap-wood, nearly white. Heart-wood, dark brown, strongly resinous, small, hard, close, about 60 lbs. per cubic foot. Pores very minute and numerous. Rays fine, short, indistinct. According to Gamble, the wood is used as a substitute for Sandalwood. The resin is distilled into a tar-like substance, used as a wood preservative "by the Moormen of Puttalam."

According to a statement made to me by a Vedda, meat hung in the smoke of burning wood of this species becomes affected, and if eaten will act as a purgative. Trimen says the leaves contain an alkaloid that is bitter and astringent, but has none of the properties of Cocaine.

Common in the dry zone, especially in the Eastern Province.

No. 114. **E. LUCIDUM** I. p. 191.

Bata-kirilla, S. Chiru chemmanatti, T.

A small much branched shrub, often occurring as an undergrowth. Bark pale, or ashen, thin. Leaves 2-3 inches narrowly oval-lanceolate, acute or rounded at base, tapering to a thin obtuse apex, smooth on both sides; entire (?). Petiole very short, rather stout. Midrib rather prominent. Lat.-veins "horizontal." Stipules, early-falling.

Flowers solitary, small, pale greenish-yellow, on rather long stalks. Sepals 5, lanceolate; Petals 5 broad, or oblong. Styles nearly united throughout their length. Fruit a drupe, about ½ inch, ovate, and grooved.

The leaves, crushed, are used as a cure for worms in children, and is said to lessen hunger.

Occurs both in the wet and dry zones up to about 1,000.

Closely allied to the foregoing two, and of the same genus, is the well-known Coca (*E. Coca*) of Peru and Bolivia, which was brought to Ceylon in 1870.

I found Coca flourishing and freely fruiting in certain parts of the Ratnapura District in 1890, but, fortunately as it now appears, it did not become a popular product, though when first introduced and brought here for commercial cultivation, as many as 25,000 seeds were disposed of in 1887 to 100 purchasers. It is hardly necessary to add that the useful, but dangerous drug Cocaine, is obtained from the dried leaves of this plant.

(Coca, like Indian Hemp, is now a prohibited crop. C.D.)

XXVII. ZYGOPHYLLACEAE.

This order is represented in Ceylon by one Genus, and a solitary species.

No. 115. **TRIBULUS TERRESTRIS** I. p. 194.

Nerenchi, S. Nerrungali, Chirunerinchi, T.

A small postrate creeping plant, with few hairy branches. Leaves opposite, pinnate, with 3 up to 6 pair of small leaflets, attached by very short stalks. Leaflets about ¼ or ⅓ inch, oblong, slightly pointed at apex, entire, faintly silky above, very silky below. Stipules, lanceolate, pointed. Flowers about ¾ inch diam., bright canary-yellow, very showy, solitary on slightly woolly stalks. Sepals 5, narrow, acute; Petals 5 much larger than sepals, rounded; Stamens 10, three opposite to the sepals, with a gland at the base; Stigma 5 rayed. Fruit hard

armed with stiff sharp spines, giving the whole the appearance of a caltrop, and capable of puncturing bicycle tyres. Seeds many, minute, and separated by transverse partitions.

Medicinal.—Water, thickened by the addition of the leaves of this plant, and the root taken with the seeds of the Ginjili in powdered form, added to sheep's milk and honey, are used in India as well as Ceylon in native medicine.

Very common in the dry low-country, and often occurs as a way-side weed. Common in India and other tropical countries.

XXVIII. GERANACEAE.

This order is well represented in Ceylon, though none of its members produce trees. We have five Genera, viz.: 1, *Geranium*; 2, *Oxalix;* 3, *Biophytum;* 4, *Impatiens* and 5, *Hydrocera.* A large proportion of our total of 29 species (excluding introductions) is endemic; thus, of *Biophytums* we have three peculiar to Ceylon, and 15 belonging to "*Impatiens*"—mostly hill forms.

No. 116. **OXALIS CORNICULATA** I. p. 196.

Hin-embul-embiliya, S. Puliyarai, T.

The Indian Sorrel.

A slender creeping weed, "rooting at the nodes," much divided into branches. Leaves alternate, very variable in size according to soil conditions, trifoliolate, each section top-shaped, with their points uniting on the apex of the petiole and radiating therefrom. Leaflets obcordate at ends, entire, softly hairy on margins and midribs, Petiole variable, ½—2 inches, slender hairy, often tinged with dull pink. Veining of leaflets indistinct; gland-dotted. Stipules hairy. Flowers small, under ½ inch, rich yellow, on erect stalks longer than leaves; axillary. Sepals 5, lanceolate, pink, hairy. Petals 5, exceeding sepals, slightly joined at base, Stamens 10, with 5 inner longer than outer. Fruit a 5-angled narrowly oblong capsule with "beaked" apex; pubescent. The capsule bursts like a relaxed spring scattering the seeds when ripe. These are minute, brown, and are covered "by a white fleshy aril."

The leaves and plant generally are slightly acid, and said to be antiscorbutic. The leaves are used for removing corns (*Nadkarni*) and "the fresh juice of the plant" is believed to

counteract the intoxication of Datura (*Kanny Lall Dey.*) According to Dr. Gunawardana, it cures dysentery, dyspepsia, and fever, and that preparations of it are used to cure piles, anæmia, and tympanites.

A common weed, found at all elevations but apparently absent in the arid zone.

Closely allied to the foregoing, is the pestiferous "*O. violacea*," that is now a troublesome weed up-country. It is much like the above on a very much larger scale, and has exceedingly pretty flowers of a delicate violet colour. It reproduces itself both by seed and bulbils, so that its eradication is a matter of great difficulty and cost. Its history in Ceylon is obscure, as the plant is a native of the United States, but how it came here is not clear. Moon records it however as in Ceylon in his time (he published his work on Ceylon plants in 1824). (I have observed a variation in the leaf of this species, which may indicate a second variety of *violacea* in Ceylon.) It is commonly known as the "Manickwatte weed."

No. 116A. **AVERRHOA BILIMBI**

Bilimbi or Bilin, S. Pilimbi, T.

This is an introduction in Ceylon, and is a native of the Moluccas. It is easily recognised by its compound leaves and small cucumber-like fruits, that grow in small clusters on the stem and the larger branches. It is a favourite with the people, and is often found in low-country gardens. The fruits are acid, and are used in curries, pickles, and preserves.

No. 116B. **A. CARAMBOLA**

Kamaranga, S. Tamarta, T.

Like the last, this is an introduction of Moluccan origin. Its fruits are borne in abundance on the branches, of a golden yellow colour, about 3 to 5 inches long, torpedo-shaped, and winged along the angles. It is exceedingly acid, and is useful for cleaning brass, or removing stains. The fruit is relished as a preserve and sometimes eaten stewed.

Trimen gives the date of introduction of the two foregoing as "before 1678."

None of our Balsams (*Impatiens*) are of any economic or medicinal value.

XXIX RUTACEAE

The Orange Family, exclusive of introductions, is well represented, in Ceylon, though we have only two endemic species. There are 13 Genera, viz.: 1. *Euodia*, 2. *Zanthoxylum*, 3. *Toddalia*, 4. *Acronychia*, 5. *Glycosmis*, 6. *Micromelum*, 7. *Murraya*, 8. *Clausena*, 9. *Limonia*, 10. *Luvunga*, 11. *Paramignya*, 12. *Atalantia*, and 13. *Feronia*, covering 23 species. The majority of these are confined to the low-country, especially to the dry zone, and few strictly speaking, can be classed as timber trees. I exclude from this work the introduced Oranges and Limes, as they are too well-known.

No. 117. **EUODIA ROXBURGHIANA** I. p. 214

Lunu-ankenda, S.

A slender oppositely-branched tree, with pale, grey, smooth bark.

Leaves opposite, trifoliate, leaflets 3—4 inches long, oval, tapering at base, more or less acuminate, entire; stalks very short, stout, midrib prominent below, faintly hairy when immature, lat.-veins horizontal, prominent. Petiole about as long as leaflet, stipules absent. Flowers, male and female. Males with stamens longer than petals; Females with stamens shorter than petals, but both small pale-greenish; in crowded clusters "at ends of opposite branches of axillary pubescent panicles." Fruit of four (or less) carpels, ovoid with hemispherical seeds of shining blue-black.

Wood pale, or greyish-brown, rather soft, weight about 50 lbs. per cubic foot. Pores small, even. Rays fine, short, rather wide apart. Timber suitable for light ornamental work: is easily and nicely turned.

Moderately common in the damp forests of the west of the Island, where I have obtained it up to about 6,000 feet altitude; but the tree nowhere attains any bulk. Occurs in India, Sumatra and Java.

No. 118. **TODDALIA ACULEATA** I. p. 215.

Kudu-miris, S. Kandai, T.

A horribly prickly scrambling shrub. Bark dark brown, thin, rather smooth. Prickles sharp, recurved, present in petioles.

Leaves trifoliate, the central longest, 2 inches by $\frac{7}{8}$ inch, ovate oblong, tapering to base and apex, where it is abruptly rounded into a bluntly acuminate point, faintly crenate, or sometimes entire, glabrous, conspicuously dotted with large translucent glands. Leaflet stalks very short. Petiole, $\frac{3}{4}$ inch, flat or grooved above, dilated at base, softly fibrous, hairy, armed; midrib prominent below, often prickly, raised above. Lat.-veins many, nearly horizontal, obscurely uniting within margin. Flowers minute, pale creamy-white, on short slender stalks in axillary (and sometimes) terminal racemes. Sepals 5, small, pointed. Petals 5, oblong, thickened to tip, longer in females. Stamens 5 alternating with petals. Fruits globose, grooved, glandular, dull orange coloured, and very aromatic. Seeds reniform, compressed, pungent.

The plant is used in native preparations for rheumatism and swellings, and is said to be tonic, diaphoretic, and stimulant. It is even alleged to be "superior to quinine" (Nadkani.) The root bark, separated from the white woody root was formerly known in European medicine as "Lopez root" but its use is now discontinued (*Kanny Lall Dey.*)

According to the Tamils, the juice of the flowers and flower buds, applied to the stings of wasps, produces immediate relief.

An exceedingly common plant from sea level to 6,000 feet. I have even procured it on the summit of Kunadiyaparuwitta mountain, and in the dry jungles of the Eastern Province.

Also in Mauritius, India, China and Philippines.

No. 119 **ACRONYCHIA LAURIFOLIA** I. p. 216.

Ankenda, S.

Small tree often dividing into more than one stem. Bark pale grey, smooth. Branchlets opposite; twigs leaf-scarred. Leaves opposite, each pair at right angles with next; variable in size, about 6 in. by 3 in., oblong ovate, tapering at base, rounded or shortly acuminate at apex; entire; glabrous, shining green above, paler below, gland-dotted. Petiole $1\frac{1}{4}$ in., stiff swelled at base of blade where it is grooved. Midrib prominent below, partially raised above. Lat.-veins about 10, subopposite, forking widely much below margin. Nerves widely netted. Aromatic. Flowers about $\frac{3}{4}$ inch, yellowish-green, in pyramidal divaricate corymbose cymes on long axillary stalks. Sepals and Petals 4, stamens 8. Fruit small, rough, glandular.

Wood close, pale yellowish-white but of no great size. Weight about 48 lbs. In much favour by goldsmiths for charcoal, as it burns clean. The bark is used for poultices in cases of ulcer.

Fairly common up to 6,000 ft. in the wet or damp forests. Often found in ravines but nowhere very plentiful.

No. 120. **GLYCOSMIS PENTAPHYLLA** I. p. 217.

Dodan-penna, S. Kulapunnai, T.

A small unarmed tree often hardly more than a shrub. Bark thin, pale brown or mottled.

Leaves attenuate, imparipinnate, with 3-5 leaflet (sometimes 1) on very short stalks. Leaflet usually attenuate, variable in size, 2—5 inches long, ovate or oval, tapering to base, acuminate; "entire or faintly denticulate"; glabrous; rich green. Rachis (stalk bearing leaflets) with sharp edges.

Flowers about ½ an inch, pure white, highly scented, in axillary pubescent panicles, about 1—4 inches long, crowded in clusters. Sepals 5, overlapping. Petals 5, lanceolate or acute. Stamens 10, alternating longer and shorter. Ovary on a broad stalk, "5-celled," with one ovule in each cell. Style, thick and fleshy. Fruit, a small globular berry, about ⅓ of an inch in diam., smooth, creamy. Seeds covered with thin coat. Seed-leaves (cotyledons) green. Wood dense, smooth, hard, and fine-grained. Pale yellowish-white. Small, but useful for tool handles.

Moderately common in the dry country, where it is generally found as an under-shrub. I suspect this wood to be the same as the Veddas use for axe-handles. Found in India and Burma.

No. 121. **MURRAYA KOENIGII** I. p. 220.

Karapincha, S. Karivempu, T. Curry Leaf, E.

Generally a small shrub, but occasionally, though rarely, growing to 15 feet in height. Stem slender; bark thin, smooth, brown or mottled with grey; young parts densely pubescent. Leaves crowded, almost forming rosette at ends of twigs. Leaves imparipinnate. Rachis, 5 to 10 inches, swelled at base. Leaflets variable in number, usually 8 to 12 or more pairs, and end one which is largest, generally about 1¼ in. by ⅝, oblong, unequally lobed; the lower leaflets very oblique at base, upper more rounded; tapering to more or less acuminate apex. Margin unevenly crenate, slightly reflexed. Whole leaf much gland-dotted and of an aromatic odour. Stalk of leaflet short, about $\frac{1}{16}$ of an inch, hairy. Lat.-veins about 6, inconspicuous, thin, arching within margin, slightly prominent above. Veins and nerves pubescent above, midrib hairy below. Partially leafless in dry weather. Flowers ½ inch in diam.,

white, scented, on short stalks in flat corymbose terminal cymes. Sepals 5, minute, separate. Petals, narrow, erect, smooth, glandular. Stamens 10, in alternate lengths. Ovary stalkless, 2-celled. Berry globular, dark, glandular, 2-seeded.

Wood very small, hard, brownish-yellow, but not used. The plant is chiefly esteemed for its leaves, which enter largely into curries and in "mulligatawny soups" owing to their aromatic flavour.

Locally common in the dry districts, where it may be found growing gregariously. Much cultivated in low-country gardens.

No. 122. **M. EXOTICA** I. p. 219.

Etteria, S. Konji, T.

I have not collected notes on this plant, so quote from Trimen and Gamble.

A small tree, with smooth, yellowish-white bark, and slender, somewhat drooping, branches.

Leaves imparipinnate, with 3—7 leaflets, alternate or sub-opposite, oval or rhomboidal-oval, acute at base, obtuse; shining. Terminal leaflet largest. Rachis, 4—7 inches long. Flowers $\frac{1}{2}$ to $\frac{3}{4}$ inches diam., white, very sweet scented, campanulate on short stalks in 1 to 4 clusters from axils of upper leaves. Petals 5, oval-oblong, clouded. Ovary on a short stalk ('gynophore') 2-celled. Fruit a berry about $\frac{3}{4}$ inch long, ovoid, pointed, 1-celled, 1 or 2 seeds. Wood light yellow, close grained, very hard. Pores small; sometimes in short radial lines. Rays fine, numerous. Weight 61 lbs. per cubic foot.

Has the appearance of boxwood, (*Buxus*) and might be suitable for scales, foot-rules and the like.

Occurs "up to 3,000 feet." Also in India, China, Tropical Australia and the Pacific.

The cultivated variety, "*M. buxifolia,*" is often found in gardens about Colombo and is grown for the sake of its delightfully fragrant flowers.

It, however, rarely becomes more than a bush of 8-12 feet in height.

No. 123. **LIMONIA ALATA** I. p. 223.

Tumpat Kurundu, S.

A small tree with spines (often in 2's). Bark thick, pale ashy or white.

Leaves trifoliate, variable in size, oval, tapering to base, obtuse at apex; shining glossy, entire or nearly so; on very short stalks. Central leaflet largest; strongly lemon-scented. Petiole, with a narrow wing. Flowers small, about ½ inch diam.; white, in small axillary (or terminal) panicles. Sepals broad, 5, pubescent; Petals 5, oblong, also "pubescent outside." Stamens 8 to 10. Ovary not stalked, 5-celled. Fruit nearly round, strongly glandular, about one inch in diam., full of seeds, very bitter, very orange-like.

Wood, yellowish, smooth, even grained, hard and heavy, but never attaining a large size. Suitable for small tool handles if carefully seasoned.

Common in the dry country only, where it assumes considerable variability of form, from a small tree to bush. Occurs in South India.

No. 124. **ATALANTIA MONOPHYLLA** I. p. 226.

Locally, Apassu, S. Perumkuruntu, or *Kattu Naragam, T.*

A small tree with pale-brown smooth bark. Branchlets strongly armed with sharp, acute thorns or spines from ½ to an inch long, usually very oblique with the stem. Leaves simple, alternate, very variable in length, about 1½—3⅓ inches, lanceolate-oval, tapering to base and apex, or two-lobed at apex; entire; stiff. Petiole short, stout, pubescent, mid-rib prominent below. Lat.-veins many, rather oblique. Flowers small, about ½ inch, white, scented, arranged in axillary corymbs, on slender stalks. Sepals 3—5, irregularly divided; Petals "obovate-oblong," 4, sometimes 5, recurved; stamens 6—10, more or less united into a tube; Bracts minute, ciliate; Ovary 4-celled. Fruit nearly spherical about ½ inch diam., usually with remains of flower attached to base; 4-celled, 1 to 5 seeded, with rather thick skin.

Wood pale yellowish, or nearly white, very close-grained, hard but rarely large. Suitable for scales, and small tool handles. Weight about 60 lbs. per cubic foot. Pores small, unevenly distributed. Rays fine, many, wavy. Annular rings distinct, pale.

The berries "make a nice pickle" says *Nadkani,* who adds that they yield a warm oil which is considered to be a valuable application in chronic rheumatism.

Fairly common in the dry country. Also India to Philippines.

No. 125. **A. MISSIONIS** I. p. 227

Pamburu, S. Kuruntu, T.

A small spine-thorny much branched tree, with angled branchlets. Bark, pale grey. Very orange-like in general appearance. Leaves 3 to 4 inches long, oblong, or ovate-oblong, gradually tapered at base, obtuse or rounded at apex; faintly crenate, but more often entire; undulate; rather stiff; glandular, with pellucid dots. Petiole rather short. Lat.-veins indistinct, midrib pale. Flowers numerous, about ½ inch in diam., white, scented, in erect panicles about 1 to 2 inches long. Sepals 4 or 5, small, with pointed lobes, Petals 4 or 5, narrow, recurved, quickly falling. Stamens 8—10, slender, distinct; Anthers narrowly oblong; Ovary 4—5 celled on a short stalk. Fruit an orange-like berry, about 1 inch in diam., thick skinned, 4 to 5 celled. Seeds many, surrounded with gummy fluid.

Wood rarely large, but I am indebted to the late Mr. George de Saram for access to a fine sample nearly a foot in diameter of a pale yellowish-white colour, close-grained and hard. The timber is suitable for cabinet work, scales and ornamental frames. Weight about 45 lbs. per cubic foot. Pores small, evenly distributed. Rays many, very fine, wavy. Annular rings forming a distinct white line.

Moderately common in the dry country, but nowhere abundant. I have not found it in the Kalutara District, though recorded by Moon from Panadura. Also in India in Western Ghats.

[Articles made of this handsome wood were sent to the Paris Exhibition of 1900.]

No. 126. **FERONIA ELEPHANTUM** I. p. 228.

Diwul or *Jiwul, S. Vilar, Vilartti, T. Wood-apple, E.*

A moderate-sized or smallish, erect tree, with many branches. Bark pale or greyish, armed with strong sharp axillary spines. Leaves alternate, imparipinnate, 1—4 pair opposite leaflets, with a bladed rachis. Leaflets, on very short stalks, about 1½ inches long, oval or ovate; entire, smooth; lowest leaflets largest. Flowers small, many, greenish with dull red or purple stains, and dark, red anthers, arranged in panicle-like cymes in the "axils of fallen leaves." Stalks pubescent. Sepals 5, small; Petals 5, overlapping or spreading, ovate, smooth; Stamens up to 12, with very short filaments

and large anthers. "Disk finely woolly." Fruit large, hard, woody, spherical, about 2½ inches diam., scurfy outside, and containing an acid pulp that is eaten and specially relished by elephants.

Wood, close, hard, even-grained, yellowish white, about 60 lbs. per cubic foot, but rarely large; durable. Used for posts and rafters. Bark affords a strong adhesive gum. Pores of wood small, in radial rows, "joined by narrow white concentric bands." Rays many, distinct, fine. Annular rings white, clear.

The fruit is aromatic and antiscorbutic, and from it an astringent jelly is made. The gum pulverised and mixed with honey, is, according to Dr. Gunawardene, given in dysentery and diarrhœa.

Very common in the dry country. Also in India and Java. Closely allied to the last is the introduced species which follows.

No. 126A. **ÆGLE MARMELOS** I. p. 229.

Beli, S. Vilvam, T. Bengal Quince or *Slime-apple*, or *Bael Fruit.*

A middle-size tree with pale bark, armed with sharp axillary spines. Leaves alternate, 3 foliolate, (sometimes 5) ovate-lanceolate; margins crenate. Flowers rather small, pale, greenish, honey-scented, arranged in short panicles. Easily distinguished by the large hard-shelled greyish or yellowish-grey fruits. The seeds are enclosed in a viscous mass surrounded by a pale orange-coloured aromatic pulp.

The fruits are prized for their admitted value in medicine, and efficiency in dysentery and diarrhœa, the preparations being official in British and Indian Pharmacopœias. The fresh juice of the leaves is used as being antibilious, and a febrifuge. According to Dr. Goonewardene, the bark and unripe fruits are astringent, ripe fruits are tonic; leaves astringent, aromatic and carminative. Many native medicinal preparations are made from this valuable plant.

Wood very pale yellowish white, about 40 lbs. per cubic foot. Very seldom used.

[Indian "rose water" is distilled from the flowers.—C. D.]

Cultivated in gardens.—Indian.

XXX. SIMARUBACEAE.

The order is represented in Ceylon by three genera, viz., 1. *Ailantus*, 2. *Samadera* and 3. *Suriana*, covering as many species, of which none is peculiar to this country. An introduced species, to which reference will be found, has become semi-wild in parts of the country, but should only be regarded as a stranger.

No. 127. **AILANTUS* MALABARICA** I. p. 230.

Kumbalu, Wal-bilin, S. Peru T.

A tall erect (? deciduous) tree with cylindrical stem. Bark thick, rough, greyish-white, often with grains of bitter resin. Branches few, branchlets leaf-scarred, with leaves crowding at ends. Leaves pinnate (see note) on long rather slender rachis of about 14 inches in length, slightly enlarged at base. Leaflets 9 pairs, opposite or sub-opposite, on short stalks, about 3—4 inches long, narrowly ovate-oblong, unevenly bladed, upper leaflets rounded at base, lower acute, tapering to an attenuate apex; glabrous above, pustular-glaucous below. The margin is slightly reflexed, faintly but distinctly notched, with a glandular, aromatic, pungent pore in the axil of the notch. This gland is slightly reddish in colour and tooth-like. Midrib of leaflet, prominent below, distinct above, thin. Lat.-veins opposite nearly horizontal, suddenly curving within margin. Flowers polygamous, small, white, shortly stalked in long, axillary, slender panicles, as long as leaves. Sepals small, hairy acute; Petals 5, oval-oblong; stamens 10, or fewer; Ovary usually 3-celled, with an ovule in each. Fruit a papery, nerved, flat, narrowly oval disk ('Samara') with the flattened seed in the centre. Wood very pale, white, spongy, quickly rotting, about 24 lbs. per cubic foot. Pores large, sparse subdivided. Rays, broad rather short.

At one time the timber of this soft tree was in much demand for tea boxes, for which it is really unsuitable, but as it was easily sawed it was impressed into use. The resin or gum has a fragrant odour, and is used in dysentery in a powdered form. The bitter bark is used in dyspepsia.

At one time abundant in the Kegalla District north of the Maha Oya, but now rather scarce. Also in Malabar.

It is generically allied to the large Indian tree known as the "Tree of Heaven"! (*A. excelsa*) famous as a tonic, and yielding "Ailantic acid."

* "Ailan-thus" of many Botanists.

Note.—I observe that Trimen says the leaflets are 16 to 20 in number. My examples are 9 pairs and Brandis figures it (p. 126, fig. 61, "Indian Trees") as having 4 pairs. The genera have no stipules.

No. 128. **SAMADERA INDICA** I. p. 231.

Titta-samadara, S.

A small tree, but more usually a bush, with brown bark and smooth shoots and branches. Leaves rather large, 6 to 10 inches long, oblong, rounded or obtuse at base, rather shortly acuminate, completely glabrous; entire, dark green; apple-green when young. Petiole short curved, thick. Midrib prominent below, conspicuous, Lat.-veins slender Y-shaped, with shorter and less distinct veins between.

Flowers about 1½ in. (or larger) in diam., pinkish yellow, bisexual, arranged in variable numbers on a long stalk emerging from the leaf axil. Sepals 4—5, rather broad; Petals 4-5 narrowly oblong, obtuse at end, Stamens 8, with a short basal scale; Ovary on a short stalk, 4-celled. Fruit large, about 2-inches, oval, tapering to the stalk, woody or spongy-woody, containing a large seed.

The whole plant is intensely bitter, and in particular the seed and leaf-buds, resembling quassia.

An infusion, made from crushed leaf-buds and seeds, affords an excellent means of ridding rooms of fleas. It is a febrifuge.

The wood is rarely large enough for any building purpose, but is said to be useful as a match-wood. Gamble gives its weight at 26 lbs. per cubic foot, and says that it is light yellow with small scanty pores, and has very fine, closely-packed uniform rays.

Occurs near water in many parts of the West coast of Ceylon up to 1,000 feet, but nowhere very abundant. Also in South Western India, and has Madagascan affinities.

No. 128A. **BRUCEA SUMATRANA** I. p. 231.

Is an introduced plant, belonging to a genus found in Abyssinia and in China. It is found more or less wild in the Kegalla district north of the Maha Oya, and westwards to Negombo. The seeds known as "Macassar Kernels" are alleged to be of great value as a cure for dysentery.

The plant, in Ceylon, is a small erect slender little tree, rarely more than five feet high, with crowded pinnate leaves.

The flowers are small, on racemes placed among and below and between the leaves. The bitter fruits are shot-like of a purple black colour. I have heard the name "Titta-Kohomba" applied to this species, but suspect it to be invented.

Note.—The whole of this order has no stipules.

XXXI. OCHNACEAE.

A small order in Ceylon, consisting of two Genera, viz., *Ochna* and *Gomphia*. Only one species (*Ochna rufescens*) is endemic.

No. 129. **OCHNA SQUARROSA** I. p. 233.
Mal-Kera, S. Chilanti, T.

A small slender, whippy tree, or bush. Leaves variable in size, from two to five inches long. Lanceolate or narrowly oval, tapering acutely to both ends; finely serrate with teeth finely spinous; smooth on both sides, glossy. Leaf-buds scaled. Stipules distinct, lanceolate, and dilated at base. Petiole short Midrib pale, conspicuous. Lat.-veins numerous, fine, rather pellucid. Flowers bisexual, large, about two inches in diameter, bright yellow, scented, arranged in umbellate panicles on slender stalks about half as long as the flower is wide. Sepals 5, "persistent," oval, veined; Petals 5, longer than sepals, broad; Stamens many, or 10, with filaments shorter than anthers. Fruit a carpel, 3 to 6, ovoid, stalkless, black, more or less enclosed by thickened sepals.

Wood very hard, tough, close, elastic, of a brownish-red colour, but never attaining a large size. Pores, small, numerous. Rays not distinct. Chiefly used for ox-goads.

Usually found near slab rock in the dry country, but not very plentiful. Also India and Malaya.

No. 130. **O. WIGHTIANA** I. p. 233.
Bo-Kera, S. Kat-Kari, T.

Usually a shrub, with slender, straight stems. Much like the last, but leaves are smaller, and flowers small, about ½ inch in diam., bright yellow, often solitary.

Wood very hard, pale yellowish, small.

Occurs very sparingly in the dry country, and has much the same habit as the last. Sometimes used, when large enough, for posts.

Also in South India.

No. 131. **GOMPHIA ANGUSTIFOLIA** I. p. 235

Bo-Kera, S.

A small tree with thin red-brown bark and erect stem. Leaves 2-5 inches long, lanceolate, tapering to both ends; finely serrate, thin, glossy, shining. Petiole very short or concealed by leaf-blade. Midrib slender. Lat.-veins very numerous, pellucid. Two distinct intramarginal veins traverse both leaf-blades below the serration; stipules small, deciduous.

Flowers about ½ inch diam., yellow, with dull red sepals, on slender stalks in "pyramidal terminal or axillary panicles." Sepals 5, overlapping, and persistent. Petals 5, considerably longer than sepals, obtuse; stamens 10; anthers large opening by terminal pores; style longer than stamens. Fruit, 5 carpels attached to stout stalk (gynophore) about ⅓ of an inch, shining purplish-black. "Embryo green."

Wood very hard, close, durable, red or reddish-brown. Pores minute, fine, many. Rays fine.

Timber useful for posts, wall-plates and rafters, but rarely attains much size. It resists the attacks of white ants.

Common, but not very plentiful in the wet districts up to 1,500 feet. Sometimes found in the dry zone, where it is rare. Fairly abundant in Sabaragamuwa up to 1,500 ft. altitude. Also South Western India and Malaya.

XXXII. BURSERACEAE.

This is small family in Ceylon, divided into three Genera, viz.: 1. *Balsamodendrum;* 2. *Canarium* and 3. *Filicium*, all of which belong to the Low-country, in both dry and wet zones. Two species alone—*Canarium brunneum* and *C. zeylanicum* are endemic. The order has Arabian, African, Indian and Javan affinities.

No. 132. **BALSAMODENDRUM CAUDATUM** I. p. 236

Ensalu, S. Kilivai, T.

A small deciduous tree, usually much branched with thin, much exfoliating, reddish, papery, bark, that gives the stem a curious flaky appearance. Young twigs smooth.

Leaves imparipinnate, with usually 3-pairs of leaflets and an end one. Rachis 3 to 8 inches long, smooth, rather swelled at base. Leaflets variable, 1 to 3 inches, ovate, unequally lobed at base, tapering to a tailed apex; entire, glabrous, rather dead green in colour. Flowers polygamous, small, about ½ inch

diam., dull pinkish, arranged in many long, slender, terminal cymes, usually appearing before the new leaves form.

Sepals 4 (sometimes 5) campanulate, with short, pointed lobes; Petals 4 (or 5) narrow, erect, "with a recurved point"; Stamens 8—10, alternate in length ("longer in the male.") Fruit "pendulous, broadly ovoid, blunt, slightly compressed, $\frac{3}{8}$ inches, supported on small persistent calyx, valves wholly deciduous, each readily splitting down the centre."

The plant is fragrantly resinous, and is used as incense-wood, and in consequence it is to be looked for when exploring monastic ruins.

In the Northern Province, in the Mullaittivu District, I have found this plant used for live fences, but under those conditions it appears to assume a more slender habit than in the wild dry jungles.

Allied to this species, is the well-known Myrrh (*B. Myrrha*) of Arabia. The "Balm of Gilead," and "Gugul gum" are both obtained from resins drawn from plants of this genus. *B. Berryi* (*Mul-kilivai, Tamil*) is another, and occurs as a hedge plant in Jaffna. It may be distinguished by its short spinous lateral branchlets, on which grow the small crenate-serrate leaves. The bark in this peels off in silvery shining scales.

No. 133. **CANARIUM BRUNNEUM** I. p. 238. Pl. XXIII.

Maha-Bulumora, S.

A lofty erect tree, with thin wide-spreading buttresses. Bark dark brown, rough, not furrowed. Branches many. Young parts pubescent. Leaves rather crowded, imparipinuate, large, rachis about 1 foot; leaflets up to 5 pairs and an end one; leaflets about $1\frac{1}{2}$—4 inches long, oblong-ovate, rounded or obtuse at base, rather unequal, tapering to a blunt, acuminate apex; entire; glabrous; rich dark-green above.

Leaflet-stalk about $\frac{1}{2}$ inch, faintly angled; midrib rather thin, pale yellowish-green above; Lat.-veins 7—10, nearly opposite, oblique, conspicuous; stipules absent; leaf-buds pubescent.

Flowers small, about $\frac{1}{3}$ inch in diam., brownish-white, densely tomentose on thick fleshy calyx and stalks; arranged on long reddish tomentose axillary panicles. Sepals 5, pointed; Petals 5, nearly as long as sepals, stout and thick, the two forming a cup-like structure with 10 stamens inserted thereon within. Filaments short, anthers very large, conical. Ovary flask-shaped, hairy, 2-celled. Fruit a drupe, about 2 inches long, broadly ovate, shortly pointed, tomentose, dull orange-red

outside. Seed solitary, narrowly ovate, pointed, containing much crumpled cotyledons.

Wood pale, or straw colour, brittle, splintering, rather light. Used for mine planks.

Sparingly found in the wet districts up to about 1,000 feet. Moderately abundant at lower. base of the Adam's Peak range.

No. 134. **C. ZEYLANICUM** I. p. 239.

Kekuna, Dik-kekuna, S. Pakkilipal, T.

"A very large much branched tree" with far-spreading web-like deep-buttressed base. Bark strongly scented with myrrh, pale creamy-grey, soft, thin, smooth. Young parts much covered with reddish pubescense or scurf. Leaves rather crowded at ends of branches, imparipinnate. Rachis about 6 inches (much longer in young plants and shoots) armed at base with two clasping wink-like blades. Leaflets 3 pairs, opposite, and an end one; about 5 inches long, ovate-oblong, faintly cordate at base, suddenly acute; glabrous; rather stiff; dark green above, paler below; margins recurved, entire. Leaflet-stalk short, about $\frac{1}{3}$ inch stiff, woolly; Midrib prominent below, yellowish, raised above. Lat.-veins about 15, sub-opposite, rather oblique, arching and uniting within margin, stiff, depressed above. Stipules absent, and replaced by the clasping lobes referred to. Flowers, males many; females few, small (smaller in males than females) pale greenish yellow; arranged "in narrow, rufous-tomentose terminal panicles."

Calyx in male and female 3-lobed, cup-shaped. Petals 3, much longer than sepals; thick, pointed. Stamens in males 6, rudimentary in females. Ovary 3-celled. Fruit a torpedo-shaped drupe, about $1\frac{1}{2}$ inches long, dark purplish-black with glaucous surface. Stone intensely hard, and containing a delicately flavoured kernel, much sought after and eaten.

Wood very soft, pale and brownish-white, light, about 27 lbs. per cubic foot, strongly scented with myrrh, and containing balsamic resinous granules. Very quickly rotting. This wood was at one time largely used for tea box manufacture, but sometimes its odour makes it most unsuitable. Owing to its resinousness it is sometimes passed off as Hora.

Pores indistinct and much surrounded by soft spongy tissue that obscures the rays and rings, giving a cloudy appearance under a moderately strong lens.

Occurs in some abundance in the low wet zone forests, especially where the soil is on or near rock. In the dry country it is rare, and smaller.

The Java Almond (*C. commune*) or "Rata Kekuna," is an introduced tree of this genus. Its seeds are oily.

No. 135. **FILICIUM DECIPIENS** I. p. 240.

Pehimbiya, S. Chittirai Vempu, T.

An exceedingly ornamental and beautiful tree, but rarely of very large size. Bark reddish-grey, rather rough. Twigs much leaf-scarred; young parts smooth. Leaves curiously fern-like, clustering, pinnate. Rachis about 10 inches, bladed, swelled at base. Leaflets 6—8 pairs, opposite, sub-opposite or alternate, very narrowly oblong, tapering unequally at base, acute or emarginate at apex; entire; glabrous, shining, with very short stalk (or sessile). Midrib prominent; Lat.-veins parallel, many fine.

Flowers very small, pale pinkish, arranged in axillary panicles about as long as leaves. Sepals 5, acute; Petals 5 (very small in the female; longer than sepals; Stamens in males long, small and barren in females. Fruit a small purple, glossy, pointed ovoid drupe.

Wood very hard, close, durable, of a reddish colour, and taking a fine polish. Weight about 65 lbs. per cubic foot. Suitable for beams and posts.

Native ploughs are made out of this wood, owing to its toughness and durability.

Pores radial, small. Rays very numerous but irregularly spaced.

Occurs in the finest form on the confines of the dry country, especially at the foot of the Uva hills and lower Matale. Often planted as an ornamental tree, and as such occurs in Colombo and Kandy. Also in the Western Ghats of India.

The fruits are said to be poisonous.

[The botanical name and popular name—"false fern tree"—are attributable to the fern-like form of the leaves—C.D.]

XXXIII. MELIACEAE.

This important Order, which supplies several highly valuable timber trees, is represented in Ceylon by 12 Genera. viz: 1. *Munronia*, 2. *Melia*, 3. *Azadirachta*, 4. *Cipadessa*, 5. *Aglaia*, 6. *Dysoxylum*, 7. *Pseudocarpa*, 8. *Amoora*, 9. *Walsura*, 10. *Carapa*, 11. *Chickrassia*, and 12. *Chloroxylon*. Of these we have one genus—PSEUDOCARPA—peculiar to this Island only, and three other species that are endemic, making a total of 4 endemics.

out of altogether 14 species. The endemics are *Munronia pumila*, *Aglaia apiocarpa*, *Pseudocarpa Championi*, and *Walsura Gardneri*.

No. 136. **MUNRONIA PUMILA** I. p. 242.

Bin-kohomba, S. Nela vempu T.

A small plant, rarely over a foot in height, without branches. Leaves crowded, imparipinnate, on a pubescent rachis. Leaflets 1 or 2 pairs and an end one, ovate, "unequal at base" tapering to acute apex; vaguely lobed on margin or entire; finely pubescent above, very silky beneath. Terminal leaflet much larger than others. Leaflet stalk very short. Midrib pubescent below. Lat.-veins and nerves obscured by hair. Flowers rather large, nearly 2 inches in diam., white, arranged in pubescent axillary short racemes. Sepals 5, deeply cleft, narrowly oblong, hairy, persistent. Petals 5, joined within tube, clawed, oval, hairy. Stamens forming a tube "with 10 spreading filiform teeth at mouth." Ovary 5-celled, with 2 ovules in each. Fruit a 5-lobed capsule, hairy. Seeds small, brown, "narrowly winged."

Is much esteem as a tonic. The juice of the young leaves are said to be used in "mild" leprosy.

The whole plant is extremly bitter.

Common in the dry country, especially among rocks. I have obtained it mostly in the Eastern Province, and have found it near "Westminster Abbey" and the valley of the Kumbukkan River.

No. 137. **MELIA DUBIA** I. p. 243.

Lunumidella, Wal-kohomba, S. Malaivempu, T.

A tall erect deciduous tree with few widespreading boughs. Bark, brownish thin, rather smooth.

Young parts stellate-mealy. Leaves bipinnate, (or tripinnate) crowding at ends of branches.

Rachis long, 12 to 30 inches stout, swollen at base, smooth. Pinnae, about 6 pairs, wide, opposite or sub-opposite. Leaflets 5, or fewer, with an end one, ovate, tapering at base, acute or acuminate at apex, glabrous; crenate on margin. Stipules absent. Flowers many, rather small, white with a faint sickly odour, arranged in corymbose panicles of about 6 or more inches in length. Calyx deeply divided into 5 lanceolate "stellate-mealy" segments. Petals 5, overlapping, narrowly oblong, reflexed, externally stellate, internally pubescent. Staminal tube "with 20 teeth in spreading pairs." Anthers

"nearly sessile". Style long. Ovary 5-celled, with 2 ovules in each. Fruit a very olive-like drupe, containing a large, hard, bony, pointed, stone, surround by a thin fleshy coat.

Wood cedar-like, soft, about 26 lbs. per cubic foot. Pores round, large, open. Rays very pale, fine, rather wide apart. Annular rings very distinct.

The timber is very suitable for ceiling boards and dadoes, but is not hard enough for structural work.

It is in much demand for tea-boxes, for which it is very suitable, but the supply is hardly sufficient to meet the needs of a very large market.

The cultivation of Lunumidella might be very well extended, especially on lands that come within the intermediate zone and below 2,000 feet altitude. The seeds are difficult to germinate owing to the intensely hard stone in which they are enclosed. The best plan is to make nursery beds of rich soil, and plant the seeds to a depth of about 1½ inches, and over the whole spread some dry straw to a thickness of 4 inches, and then set fire to the straw. As soon as it has burned itself out, water freely, and repeat the watering lightly till the seeds come up, if the weather is dry. There is a good deal of "luck" over this operation, but it saves time, and results in about 50 per cent. of germination.

Naturally, this plant grows in secondary jungle, never as far as I know being found in true forest land. It is also much grown in gardens from about sea level to 1,500 feet. Also in India, Tropical Africa and Australia.

No. 138. **AZADIRACHTA INDICA** I. p. 244.

Kohomba, S. Vempu, T. The Neem, or *Margosa Tree, E.*

An extremely handsome tree, with rather short stem, and large graceful crown. Stem often rather bent; bark smooth, brown, with a purplish tinge. Branchlets many; very young parts smooth and leaf-scarred lower down.

Leaves crowding at twig ends, imparipinnate; rachis about 9 inches, smooth, pale, rather abruptly thickened at base. Leaflets about up to 8 pairs, opposite, or sub-opposite, 2—4 inches long, unequally lobed, oblique at base, tapering to apex, or finely acute; serrate; smooth, rather thin; pale, soft green, bitter. Leaflets-stalk very short, midrib curved, pale above. Lat.-veins many, pellucid, forking.

Flowers small, about ¾ inch in diam., white sometimes with a very pale shade of violet, beautifully sweet-scented; arranged "in lax, narrow axillary panicles 5—8 inches long."

Sepals 5, deeply cut, rounded, ciliate; Petals 5, "spathulate-oblong," also ciliate; Staminal tube toothed, with anthers within, opposite the teeth. Ovary 3-celled, with 2 ovules in each. Fruits a small olive-shaped drupe about ¾ inch long, at first greenish yellow but becoming dark purple with maturity. Stone hard: 1 seeded.

Wood light chestnut-brown with belts of darker colour. Pores small nearly circular, often clustering. Rays fine, distinct, rather close. Annular rings irregular, indistinct—Gamble says "doubtful"—apparently inter-crossing. Weight about 52 lbs. per cubic foot.

Wood very suitable for cabinets, panels, ornamental ceilings and over-mantels. Takes a fine polish, and is a durable timber resisting insect attacks or borers. Rarely very large.

The Margosa tree enters largely into native medicine. "The powdered bark and fresh leaves are made official in the Pharmacopœa of India" (*Kanny Lall Dey*). According to *Dr. Gunawardana*, the presence of the tree is a prophylactic against malaria. The bark is used in intermittent form, and the leaves are used as a poultice for ulcers and boils. The leaf-juice, given with salt, is a remedy for intestinal worms, while the gummy exudation is employed in catarrhal affections. The oil is offensive in odour, and known as "*Vepennai*", and is largely used by Tamils for outward application as a kind of embrocation. In *Dr. Gunawardana's* work on "Medicinal Plants of Ceylon" he gives, as a remedy "to prevent hair decay", the following: "Prepare the oil, expressing the sundried seeds of '*Azadirachta indica*' without exposing to the fire. Take this oil and pour two drops into the nostrils as snuff, and drink cow's milk at body temperature every morning for one month, to cure the premature decay and falling off of the hair." Some might prefer the decay and loss!

The oil applied with camphor is very useful in cases of foul ulcers in animals, and can be safely used for such purposes.

Widely distributed in the low dry country, but only as a garden plant. It is frequently found in places that once were in occupation and long abandoned; hence it has been supposed to be "wild" by some, but though it grows freely, it is certainly an introduction in Ceylon.

In 1906 I found this species to be seriously affected by a pest that killed back the young branches. Of these I sent examples to Mr. E. E. Green, who discovered the presence of a scale insect, which he determined as "*Lecaniodaspis Azadirachtae.*" The disease is wide-spread.

No. 139. **AGLAIA ROXBURGHIANA** I. p. 246.

Kirikon S. Kannakompu, T.

A rather large tree with sinuous swellings on the stem. Bark thin, reddish-brown, or slightly orange. Twigs slender cylindrical, pale, faintly streaked. Leaves imparipinnate alternate. Rachis about 3½ in. swelled at base, smooth. Leaflets 2 pairs and an end one, about 3¾ inches by 1½, narrowly ovate, acute at base, shortly pointed at apex; entire, glabrous, thin, gland-dotted above; terminal leaflet larger than others. Leaflet stalk about ¼ inch, with flat scurf-scales above. Midrib prominent below. Lat.-veins about 10, thin, uniting. Intermediate reticulation fine. Stipules absent.

Flowers small "polygamo-dioecious," yellow, arranged in spreading axillary racemes longer than leaves. Calyx deeply cut, with 5 overlapping sepals. Petals 5, nearly round concave. Staminal tube "thickened below each sessile anther." Anthers 5, Ovary 2 celled. Fruit a berry, about ¾ inches long, ovoid, orange coloured, enclosing one or two seeds that are covered with an acid pulp, which is eaten.

Wood, according to Trimen, (for I have not seen it in use) "hard, heavy, smooth, close, brown." Occurs in the dry zone in the east, at the foot of the Uvan mountains, but not very common. Also in South India, Java, Sumatra and the Moluccas. Dr. Foxworthy (Philippine Journal of Science, Vol. IV, No. 4, p. 477) says the wood is bright red and used for spokes.

No. 140. **DYSOXYLUM BINECTARIFERUM** I. p. 247.

I have heard the name "Bulu-mora" applied to this, but I am doubtful as to its correctness.

A large erect tree with few large branches. Twigs and young parts sparsely but finely pubescent.

Leaves alternate imparipinnate. Rachis 6—12 inches swelled at base, finely pubescent, somewhat angled. Leaflets 6-8, rather large, 5 to 7 inches long, alternate, oval, tapering at base, rather unequally lobed, tapering to acuminate apex, entire, smooth, rather thick; dull or dead-green. Leaflet-stalk short. Midrib prominent, nerves indistinct. Stipules absent.

Flowers about ½ inch (or less) in diameter, few, greenish, arranged on "short, pubescent, articulated peduncles (flower-stalks) in narrow supra-axillary panicles" of about 5 inches length. Calyx cup-shaped, 4 lobed. Petals 4, rather acute with wide base, sparsely and finely pubescent outside. Staminal tube more or less angled, with adherent anthers within. Ovary

4-celled, "hairy" (*Brandis*). Fruit a grooved capsule about 2½ inches long, with orange-coloured, thick coat, dividing into 4 or 5 cells, with a large solitary bright-brown seed in each.

Wood (I quote from Gamble, as I have not seen it in use) reddish-grey, rough, close-grained. Pores large and moderate-sized, often sub-divided. Rays moderately broad, red, wavy, irregularly distributed. Weight 44 lbs. per cubic foot (Indian examples).

Occurs in no great abundance in the wet forests up to 2,000 feet; my specimens were from Kitulgalla.

Also India to Burmah.

No. 141. I. p. 248. Pl. XXIV.

PSEUDOCARAPA CHAMPIONI

Gonapana, S.

A large erect tree. Bark grey, rough, pale reddish brown in twigs, fading into green at ends. Young parts sparsely pubescent. Leaves pinnate. Rachis about 4 inches. Leaflets 3 pairs, opposite, on short stalks tinged with brown at their bases. Leaflets large, 3 to 4 inches long, ovate, or narrowly top-shaped, much tapered to base, more or less rounded at apex; glabrous, entire, somewhat reflexed. Midrib prominent above. Lat.-veins about 9, sub-opposite, oblique, rather inconspicuous. Nerves obscure. Flowers small, yellow, about ½ inch in diam., in rather short "supra-axillary racemose panicles." Calyx indistinctly 4-lobed. Petals 4, oval, pointed at apex. Staminal tube erect, swelled at base, yellow, with mouth divided into 8 bilobed, short, teeth-like divisions, immediately within which are the short-filamented oval or ovate anthers. Style long and reaching up to the staminal ring. Ovary 4-celled with 2 ovules in each. Fruit a capsule, rather top-shaped, about 1 inch long, smooth. Seeds brown and partly covered with a rusty brown aril.

Wood dull or dark red, close, hard, heavy. Suitable for beams, posts and joists.

An endemic species, that I have only found in this country round the Dolosbage hill. Trimen records it from Deltota, Dikoya and Hunasgiriya.

Note.—The Sinhalese name of Gonapana I have also heard applied to *Garcinia spicata*, which, of course, is a very different plant, though the leaves slightly resemble this particular species.

No. 142. **AMOORA ROHITUKA** I. p. 24.

Hingul, S.

A moderately large tree, straight with drooping branches. Bark smooth, thin, greyish. Young parts softly silky. Leaves imparipinnate. Rachis long, 12 to 30 inches, stout; much enlarged at base.

Leaflets opposite, about 8 pairs and one small terminal, remainder large, about 3 to 5 inches long, very unequal at base, acute and obtuse at apex, entire, quite glabrous; nerves prominent below. Leaflet-stalk rather long.

Young leaves strongly tinged with claret-colour, or purple. Flowers polygamous, small, yellow, males numerous, females few, arranged on "spicate branches of large spreading, supra-axillary panicles;" the females are much larger than the males, in "drooping spikes." Sepals 5, rotundate, downy ciliate; Petals 3, rotundate, very thick, concave. Anthers 6, attached to base of staminal tube. Ovary 3-celled, 2 ovules in each. Fruit a nearly round capsule, smooth, with thick, reddish valves, enclosing spongy material within. Seeds 3, large, about 1 inch, smooth, shining brown, oval, pointed with a fleshy, yellow ("scarlet" *Brandis*) aril.

Wood reddish brown, or dark brown, hard, close, durable, weighing about 40 lbs. per cubic foot. Used for shingles. Pores small. Rays rather broad, distinct, evenly distributed. The seeds yield an oil, but apparently not in much use.

Occurs sparingly in the Central Province and possibly in Uva. Also in India and Malaya.

No. 143. **WALSURA PISCIDIA** I. p. 250.

Kiri-kon, Molpetta, S. Chadavakku, T.

A small erect tree with cylindrical stem. Bark pale brown, thin, nearly smooth, shallowly longitudinally furrowed. Branches forming a compact crown; twigs numerous, slender, ovate at ends with spreading hair. Leaves alternate, imparipinnate; Rachis 2—3 inches long, thin. Leaflets one pair, opposite, and a terminal one, this last being the largest, about 3 inches long; ovate, acute, broadly acute at base, rounded or obtuse at apex; entire; completely glabrous; rich glossy-green above, apple-green below. Leaflet-stalk $\frac{1}{3}$ of an inch, slightly kneed at base of blade, midrib slender, prominent below, depressed above. Lat.-veins 6—7 pairs, opposite or sub-opposite, thin, equally distinct on both surfaces. Nerves closely netted. Leaf buds hairy.

Flowers on short stalks about ⅓ of an inch in diam., pale pinkish white; arranged in dense, long-stalked, pubescent, axillary or terminal paniculate cymes. Calyx 5 toothed, pubescent. Petals 5, finely pubescent outside. Stamens 10 almost separated from each other, hairy within. Ovary "sunk in disk," 2-celled with 2 ovules in each. Fruit small, oval, tomentose, pale orange berries. Seeds solitary, surrounded by a pale soft succulent aril, of agreeable flavour.

Wood hard, close, and durable; of brownish-red colour, heavy. Suitable for beams, roofing, and door frames. The bark is said to be a fish-poison, hence the adaptation of the specific name of this species. Occurs in the dry parts of the Sabaragamuwa Province, and the North-east of Ceylon. Also W. India.

No. 144. **CARAPA MOLUCCENSIS** I. p. 251.

Mudu-nelun, S. (Nevill). Kandalanga, T. (Gamble). The Cannon-ball Tree. E. *

A small tree. Bark thin, grey, separating in flakes, smooth. Leaves alternate, abruptly pinnate. Rachis about 5 inches, cylindrical, tinged with brown. Leaflets one or two pairs, opposite, very shortly stalked. Leaflets 2—4 inches obvate-oblong, tapering to base; entire; glossy, light green, glabrous. Midrib rather prominent; Lat.-veins oblique. Flowers small, about ½ an inch in diam., pinkish yellow, few, placed in small terminal panicles. Sepals 4, triangular; Petals 4, broad. Staminal tubes inflated with 8 double-dentate lobes at mouth. Ovary 4-celled, with many ovules in each.

Fruits large, 4-6 inches, nearly spherical, grooved with 4 distinct divisional grooves, hard, thick, brown, smooth. Seeds congested, pink.

Wood reddish, hard, rather heavy (Indian examples, quoted by *Gamble*, 41 lbs. per cubic foot) used in Burma for posts, tool-handles and spokes. Gamble says, "pores small, often in short radial lines. Rays prominent, moderately broad, numerous, equidistant. Annual rings distinctly marked."

A clear brown resin is obtained from the bark; the latter bitter and astringent and used in curing diarrhœa. An oil extracted from the seeds is used as a tonic hair oil.

Occurs in Mangrove swamps round our west coast. but is scarce. Also in India, Tropical Africa and North Australia.

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* Not to be confused with *Couroupita guianensis* (one of the *Myrtaceæ*) found in cultivation in Colombo and Peradeniya where it was introduced in 1881.

No. 145. **CHICKRASSIA TABULARIS** I. p. 252.

Hulan-hik, S. Agalai, Kaloti, T. Chittagong wood, E.

A large, erect, handsome tree with cylindrical stem. Bark rich, dark brown, much furrowed. Young parts and branchlet ends pubescent. Leaves imparipinnate, large. Rachis about 10 inches, dilated at base, cylindrical. Leaflets 10—16 or more usually 12, alternate, unequally bladed, about 2—5 inches, ovate, uneven at base, acuminate or acute at apex; entire; softly tomentose (sometimes glabrous above) especially below; dark, rich green above, paler below.

Flowers about 1 inch in diam., greenish, arranged in "large terminal pyramidal panicles." Sepals 4 to 5, shallow, rounded and hairy outside. Petals 4 or 5 narrowly oblong. Staminal tube short, with 10 short teeth, anthers on edge of tube. Ovary 3-celled (or more) with many ovules in each cell. Fruit a broad oval capsule, about 1½ inch long, woody, brown, separating from the axis. Seeds many, winged.

Wood very handsome, red-brown with a satin lustre, close, hard, very durable. Suitable for ornamental work, panels, tops of tables, cabinets, &c.

Weight about 45 lbs. per cubic foot. Pores rather small, round or oval and subdivided. Rays fine, rather wavy, distinct, uniform, rather close. Annual rings distinct.

According to Trimen the finely carved pillars in the Audience Hall (the present District Court) at Kandy are made of this wood, thus bearing testimony to its durability.

The bark is astringent, with a pungent odour, and the flowers, according to *Gamble*, give a red or yellow dye.

Occurs sparingly in the intermediate zone, extending into the Kandyan country. The best examples I have seen were in the Moneragala District, but not in abundance. Sometimes in wet forests.

No. 146. **CHLOROXYLON SWIETENIA** I. p. 253.

Buruta, S. Mutirai, T. Satinwood, E.

A moderately tall erect tree with cylindrical stem, often attaining a large circumference. Bark greyish, or dull brown, variable, in some examples much vertically furrowed, in others nearly smooth, this variability apparently depending on soil conditions.

Branchlets purplish brown, lenticellate, leaf-scarred, and ending in pale green, finely silvery tomentose.

Leaves irregularly spiral in arrangement, often crowded, or rather distant. Rachis 4-8 inches, swelled at base, pubescent or sparsely silvery-hairy. Leaflets pinnately arranged, alternate or sub-opposite, about 12 pairs, variable in size, about 1 inch by $\frac{7}{16}$ inch, oblong, very unequally bladed, the upper (*i.e.* those facing the end of the rachis) being very obtuse at base, and the lower narrowly oblique, rounded or acute at apex; entire; glabrous; much gland-dotted; dull ashen-green above, paler below. Leaflet-stalk very short, about 1/10 of an inch. Midrib faint, above; Lat.-veins about 4, obscure, faintly distinct above, looping.

Nerves hardly visible. When crushed, the leaves have a disagreeably aromatic odour.

Flowers small, about $\frac{1}{2}$ inch in diam., creamy white, arranged in small, highly-pubescent, terminal, pyramidal panicles. Sepals 5, deeply cut, small, oval; Petals 5, clawed, oval, "sagittate at base"; Stamens 10, distinct; Ovary 3-celled, depressed, many ovules.

Fruit an ovoid husk-like capsule about 1 inch long. Seeds with a narrow-oblong papery wing, thin.

Wood beautifully grained lustrous creamy yellow, with cloudy or silvery shades. Still more beautifully marked is what is called "Flowered Satinwood"; hard, close, very durable. Pores small, slightly fimbriated, in short rows of from 2 to 6, followed by an interval. Rays parallel, rather wide apart, fine, distinct, shining. Annual rings distinct. Weight 56 lbs. per cubic foot when well-seasoned.

This magnificent timber has long been known as one of our finest ornamental woods, and has been very largely exported to Europe and elsewhere for many years. It is used for all classes of furniture; and is unrivalled for panels. As a building timber it can scarcely be surpassed, and owing to its extreme durability it was selected for the construction of the first bridge over the Mahaweliganga that was begun in 1826 and completed in 1833.

This bridge was removed in the present century, when much of the original satinwood was still found to be in excellent preservation, and was again made use of for furniture. It has been used for Railway sleepers, for which purpose it is much too valuable.

Its value in the Island has been known from very early times, for Percival writing in 1803, says "it is very much employed by the Dutch in their tables, chairs and couches." In 1858 the imports into England had reached 248 tons, valued at

£2,487, and since that time trade in this beautiful wood has largely increased, with a larger European market.

Essentially a dry-zone plant, and found only up to 1,000 feet altitude. Common.

The form known as "Flowered Satinwood" is not, as far as I am aware, the product of a variety, but appears to be due to abnormal changes in growth.

The following introduced plants, belonging to this order, have become established in Ceylon.

No. 146A. **CEDRELA TOONA** I. p. 252.

Handani Vempu, T. Red Toon, Red Cedar, Indian Mahogany, E.

A moderately large tree; bark reddish brown, smooth except in old trees when it exfoliates in scales.

Leaves rather crowded, paripinnate, large, on stout rachis. Leaflets opposite, or sub-opposite, 5—10 pairs, large 3 to 5 inches long, ovate-lanceolate, unequally bladed, apex acute; entire; with stalks about ½ inch long. Flowers scented like honey, small, white. The wood is cedar-red, rather soft, shining, and takes a fine polish; very suitable for panels, ceilings, dadoes, and cabinet work. In great demand for tea boxes. Weight about 35 lbs. (Indian examples) per cubic foot.

Affords an astringent bark, and resinous gum. Introduced into Ceylon about 1852, and cultivated on up-country estates, where it grows freely, but is much affected by a caterpillar—*Terastia meticulosalis*—that bores into the young branches.

I have seen very fine samples of wood from this species grown in the Passara district.

[Valued as a cabinet-wood in Australia.—C.D.]

No. 146B. **SWIETENIA MAHAGONI**

The Mahogany tree.

This well-known plant, known chiefly because of its magnificent timber that is largely used for furniture, is a native of Central America. It was introduced into the Botanic Gardens at Calcutta from West Indian plants in 1795, and here, "before 1843" (*Trimen*). In 1849, Mr. Dyke successfully introduced it into Jaffna, where it may be said to have established itself; thus proving the soundness of Mr. Dyke's opinion expressed in his Diary for 18th October, 1848, when he wrote: "I am convinced that mahogany...will grow luxuriantly in many of the localities where the satin, palu and ebony grows." Its cultivation has, in a modified form, been extended,

even to a few trees grown in Colombo, but apparently its success in the dry country is assured.

No. 146C. *S. macrophylla* is a still later introduction locally called "Long-leafed Mahogany." It has been successfully grown near Kegalle, Kurunegala and Rambukkana. Its timber is very suitable for cabinet work, panels, &c.

XXXV.—OLACINEAE.

This family is represented in Ceylon by ten genera and thirteen species, of which two only— *Olax Zeylanica* and *Apodytes Gardneriana* are endemic. But few here are of economic value. Our genera consists of 1. *Ximenia*, 2. *Olax*, 3. *Strombosia*, 4. *Opilia*, 5. *Cansjera*, 6. *Lasianthera*, 7. *Gomphandra*, 8. *Apodytes*, 9. *Mappia* and 10. *Pyrenacantha*. They are nearly all shrubs or small trees, and some are climbers.

No. 147. **OLAX ZEYLANICA** I. p. 257.

Mella, S.

A small tree or many-branched bush, with yellowish, smooth bark, (almost glistening in young wood), "ridged transversely." Leaves alternate numerous, narrowly oblong, or ovate-oblong, tapering to base, finely acute, sometimes obtuse at apex; entire; glossy; more or less yellowish. Petiole very short, stout. Midrib prominent below. Lat.-veins oblique, inconspicuous. Nerves fine. Flowers few, small, about ¼ inch diam., yellowish, arranged in small axillary racemes. Calyx small at first, enlarging with the fruit, 5 lobed. Petals 5, oblong. Stamens (3 fertile) and staminodes "rather shorter than petals. Fruit a bright scarlet, glossy, ovoid drupe, about ½ an inch (or less) long, attached to the now much enlarged calyx.

The leaves are eaten and said to be a "cooling" form of salad.

Common in the Kalutara District and the damp parts of the west of Ceylon up to 1,000 feet. Also recorded from Ritigala, in the dry zone.

No. 148. **STROMBOSIA ZEYLANICA** I. p. 257.

Pub-beriya (?) *S.*

I have not met with this plant, and quota from Trimen and Brandis.

"A moderate-sized or large tree, erect, with drooping branches. Bark smooth, thin, yellowish. Young parts glabrous.

Leaves 4-6 ins. long lanceolate, often unequal sided, acute at base, shortly acuminate, acute, entire, rather thick, glabrous and shining, paler beneath. Petiole ½ inch, glabrous; Lat.-veins oblique.

Flowers small (bisexual) pale greenish-white, nearly sessile, in small axillary fascicles. Calyx, cup-shaped, 5 toothed; Petals 5, distinct, erect, oblong, glabrous outside, hairy within; Anthers appearing as if sessile in centre of petals. Fruit oblong-ovoid, drupe ¾—1 inch, crowned, when young, by persistent limb of calyx, smooth, or slightly warted." Wood, soft, shining, pale, yellowish-brown.

I am unacquainted with its uses. Recorded from Hantana.

No. 149. **LASIANTHERA APICALIS** I. p. 260.

Urukanu, Uruhonda, S.

A large erect tree, with clear cylindrical stem. Twigs and young parts smooth. Branches drooping. Bark greyish, smooth. Leaves large, about 7—8 inches long, alternate, oblong or lanceolate-oblong, acute at base, shortly acuminate, entire, rather thick, very glossy and smooth. Peitiole about ¾ of an inch, strong. Midrib very conspicuous below. Lat.-veins less so. Nerves obscure.

Flowers very minute, stalk-less, about ¼ of an inch diam., green, faintly tinged with purple, arranged "together in a head surrounded by 4 ovate pubescent bracts." Calyx cup-shaped, 5 lobed, pubescent. Petals 5, very much longer than sepals, oblong. Stamens 5, distinct and alternate with petals; Anthers concealed by hairs. Ovary 1-celled, with 2 ovules. Fruits are ovoid or torpedo-shaped drupes about 2 inches long, smooth, purplish green at base fading into pale greenish white, containing large stones with excavated sides.

Wood willowish white, loose-grained soft, and quickly decaying. Weight about 34 lbs. per cubic foot. Much used for tea boxes, but is very inferior, and seasons badly.

Occurs in some abundance in the wet forests of the Pasdum Korale, and through the lower Adam's Peak Forests and the Singha Raja. A resinous wax exudes from the bark in old trees, which is inflammable and slightly scented when burned.

XXXVI.—ILICINEAE.

A small order consisting of one genus and 3 species, all of which are common to India as well as Ceylon.

It may be of interest to note that the product known as Mate or "Paraguay Tea" is made from the leaves of *Ilex paraguâyensis*, is one of this family.

No. 150. **ILEX WIGHTIANA** I. p. 265

Andun-wenna, S.

A large, tall, erect tree, with pale white or ashen cylindrical stem. Leaves alternate, large, about 3 to 6 inches long, oval, tapering or acute at base, acuminate or acute at apex, smooth; Petiole very short, about $\frac{1}{4}$-inch. Midrib stout. Lat.-veins and nerves prominent below. Stipules absent. Flowers dioecious, many, very small, about $\frac{1}{4}$-inch in diam., white, arranged in small clusters (umbels) in "axillary, stalked paniculate cymes" of about 2 inches in length. Calyx 4 or 5 lobed, lobes rounded, "ciliate." Petals 5, ovate; Stamens 5, shorter than petals, and inserted on petal base; Ovary 3 (or 6) celled, with one ovule in each. Fruit a small, globular, apiculate, red, drupe, with 5 or 6 minute stones, "furrowed on back."

Wood pale white or slightly creamy, close grained but rather soft and light. Used for tea boxes and packing material.

I have only met with this plant in the Pasdun Korale, where it occurs very sparingly. It is apparently not well-known, as I could not learn if it is used for any other purposes than those stated.

XXXVII.—CELASTRACEAE.

This family is represented in Ceylon by eleven genera, viz.: 1. *Euonymus*, 2. *Glyptopetalum*, 3. *Microtropis*, 4. *Kokoona*, 5. *Pleurostylia*, 6. *Elæodendron*, 7. *Celastrus*, 8. *Gymnosporia*, 9. *Kurrimia*, 10. *Hippocratea* and 11. *Salacia;* affording 19 species, of which 6 are endemic. The majority of the plants under this order are shrubs, or small trees, while a few are climbers.

No. 151. **KOKOONA ZEYLANICA** I. p. 270.

Kokun, Wana-potu, Potu-eta, S.

A tall slender erect tree, with grey rough bark, which last when chipped from the base or buttresses of the tree will be found of a rich crome or yellow within. Branches rather free and crowding into a small head. Young shoots smooth. Leaves opposite, moderately large, 2—4$\frac{1}{2}$ inches, oblong, eared at base, rounded or truncate at apex, faintly serrate along margins, or

sometimes completely entire, rather stiff; darker above than below, gland-dotted below, with minute scale over each gland. Petiole slender, about ½ inch. Midrib prominent; Lat.-veins slender. Stipules persistent, small, triangular. Flowers about ½ inch in diam., yellowish-brown, arranged in short axillary panicles. Calyx 5 lobed, cup-shaped, shallow, smooth. Petals 5, stout, concave, "dotted within." Stamens 5, inserted on disk. Ovary 3 celled, with 2 pairs of ovules in each. Fruit, a wing-like narrowly oblong, papery capsule, at the base of which is the compressed seed, the whole being tinged with orange. The seeds contain an acrid oil that is obtained by expression and is much used as a preventative against leeches. During the pilgrimages to Adam's Peak, on the Ratnapura side of the mountain, this oil is quite one of the features of the little temporary booths that are built for the occasion, the oil being sold to pilgrims, under the name of "Potu-eta-tel."

Wood, dull brownish-yellow, brittle, and splintering, not durable. Timber used for mine planks and props, and I have seen it used for tea boxes. I have not examined its structure.

The yellow part of the bark, referred to above, is used by Tamil women for application to the face, in the same way as turmeric is used, and also by jewellers for polishing gold.

Common locally in our wet forests from 1,000 to 3,000 feet, on the western and central parts of Ceylon. Also in South India.

No. 152 **PLEUROSTYLIA WIGHTII.** I. p. 271.

Panaka, S. Chiru piyari, T.

A small tree with bushy crown. Bark rough, (nodular) pale grey.

Leaves opposite, about 3 inches long, lanceolate-oblong or narrowly oval, tapering at base, rounded or obtuse at apex; entire; thickish, glossy-green. Petiole very short. Nerving rather fine. Stipules very small, early falling.

Flowers minute, less than ¼ inch diam., greenish; arranged in "small axillary," (Brandis says "below the leaves"), shortly stalked paniculate cymes." Calyx 4 or 5 lobed; lobes obtuse, glabrous, shallow. Petals 5, round, spreading. Stamens "shorter than petals," and outside the disk. Ovary 2-celled, with 2 ovules in each. Fruit a pure white oval or ovoid berry, with attached to it the persistent calyx, smooth.

Wood, Trimen says, is "pale brown, close-grained, smooth; rather heavy." I have not seen it in use.

Common in the dry country near the coast. Also S. India and in Madagascar.

No. 153. **ELÆODENDRON GLAUCUM** I. p. 217.

Neralu, S. Payari, Perun-payari, T.

A moderately big tree, sometimes, but rarely, a large tree. Bark greyish, or brownish-grey, rough ("warted") thick, hard, boughs large, many-branched, forking in twos.

Leaves opposite, variable in size and shape, from 1 to 3 inches long, not unlike tea leaves; ovate or oval, tapering at base, obtuse or twisted at apex; margin entire or serrate-crenate; smooth, waxy (glaucous). Stipules small, deciduous. Petiole short, about one-third of an inch. Nerves much netted.

Flowers very minute, many, yellowish, or yellowish-green, arranged in "divaricate axillary paniculate" lax cymes. Calyx 5 lobed, deeply divided. Petals 5, oblong, "obtuse, distant." Stamens, inserted under edge of disk, 5, with recurved filaments. Ovary 2 celled, with 2 ovules in each. Fruit a yellowish-green oval drupe, about ½ inch long, enclosing a bony 1-2 seeded stone.

Wood light brown with much pale sapwood, close-grained, smooth. Weight about 45 lbs. per cubic foot. Suitable for cabinet work. Pores, many, small. Rays very numerous, fine, not conspicuous. Annual rings, none or invisible.

The bark is said to be poisonous, but is used externally for swellings.

Occurs in some abundance in the dry zone from the coast to the foot of the hills. The largest examples I have found have been in lover Uva.

Also in India, Andamans, and Malaya.

No. 154. **CELASTRUS PANICULATUS** I. p. 272.

Duhudu, S.

A large creeping shrub. Bark much furrowed, yellowish, thick. Young branches lenticelled; ends smooth. Leaves alternate, about 3 inches long, broadly oval or top-shaped, tapering at base, rounded and suddenly acuminate at apex.

Margins from the first ⅓ of the leaf minutely crenate-serrate, entire at base, glabrous. Stipules absent.

Petiole about ⅓ of an inch, rather slender, sometimes sinuous. Midrib prominent below. Lat.-veins about 5 sub-opposite oblique. Nerves prominent below, widely netted.

Flowers small, polygamous numerous, about ⅓ inch in diam., light yellow, arranged in rather large, terminal panicles. Flower-stalks slender, pubescent. Calyx 5 lobed, "shallow, unequal." Petals 5, broad below, oblong, acute. Stamens 5,

placed on edge of disk. Ovary 3 celled, (or 2-4) with 2 ovules in each. Stigma "deeply, 3-lobed."

Fruit a 3-valved capsule opening like a tripod, and attached at base, each valve being ovoid and bright yellow. Seeds small "cinnamon-brown," 3 to 6, enclosed in a scarlet aril.

The wood is not used here, as it is usually too small; soft, and pinkish yellow in colour.

Medicinal uses. The seeds, by distillation, yield an oil which according to *Kanny Lall Dey* "is the best remedy, for Beriberi." *MacMillan* says that the bark is "considered to strengthen the brain, purify the blood, and cure sores, &c." The seeds have a hot taste.

Occurs in the low wet country, but not abundantly.

Also India, and Burma.

No. 155. **KURRIMIA ZEYLANICA** I. p. 274.

Pelan, Et-heraliya, Uru-honda, S. Konnai, T.

A tall, erect, fairly cylindrical-stemmed tree. Bark rather smooth, about $\frac{3}{4}$ inch thick, dull ashen grey; flaking. Crown rather open. Twigs reddish, glabrous and green at ends.

Leaves alternate, large, 4 to 10 inches long, oblong or ovate-lanceolate, rounded at base, tapering to a more or less elongated, sometimes twisted apex, entire, rather stiff, dark glossy-green above, paler below, very pale in young leaves. Stipules large, deciduous, horny, finely acute, stiff. Petiole about $1\frac{1}{2}$ inches, thickened at base, Smooth. Midrib fine, prominent below, raised above. Lat.-veins about 12 (first pair opposite) sub-opposite, oblique, narrowly tapering within margin.

Nerves horizontal, parallel, giving the whole leaf a strong resemblance to a Dipterocarp.

Flowers about $\frac{1}{3}$ of an inch in diam., pale green, on a hardly apparent stalk, arranged in a long, slender, smooth terminal panicle. Calyx 5-lobed, deeply cleft, acute. Petals 5, exceeding sepals in length, concave, rounded. Stamens 5, "inserted on disk ('under', vide *Brandis.*)" Ovary 2 celled, with 2 ovules in each. Fruits reddish-brown, ovoid, leathery capsules, about 1 in. long, containing brown erect seeds almost completely surrounded by acid greenish arils. Much eaten by birds.

Wood brownish or yellowish-brown, moderately hard, even-grained, rather heavy. Used for floors, rafters, and wall plates. Fairly durable.

Endemic. Occurs in moderate abundance in the Sabaragamuwa Province, Pasdun Korale, and Galle forests. Also

occasionally in the Eastern Province, but here the leaves are distinctly smaller.

No. 156. **SALACIA RETICULATA** I. p. 277.

Himbutu-wel, Hibbotu, Kottala-Himbutu, S.

A bushy climber, much branched. Bark rather smooth, yellowish or greyish-yellow. "Young parts glabrous."

Leaves opposite, about 3 to 4½ inches long, oval, rather narrow at base, rounded and shortly acuminate at apex, nearly entire or slightly crenate-serrate on margins; stipules absent; petiole short, about ¼ inch; Midrib prominent below, and whole venation strongly and prominently reticulate (netted) beneath. Glossy green above, paler below.

Flowers small, inconspicuous, pale greenish-yellow arranged "2-10 together on woody axillary tubercles." Calyx obscurely 5-lobed; petals 5, spreading; stamens 3-4 or 2, more or less "combined with disk"; Ovary 2 or 3-celled, with 2 ovules in each. Fruit a large berry about 1½ inches in diam., nearly spherical, with a leathery, orange skin, containing 1—4 large yellowish-brown seeds, surrounded by a succulent pulp, which is eaten.

The woody stem and root are said to be given in diabetes. Fairly common in open land in the damp country up to 2,000 feet. Frequently met with in Bahamas.

This plant appears to be much sought after by a large mealy "coccus," especially in the Balangoda country.

XXXVIII.—RHAMNACEAE.

This order, better known as the Buckthorn family is widely distributed throughout the world.

In Ceylon it is represented by 7 genera, viz.: 1. *Ventilago;* 2. *Zizyphus;* 3. *Rhamnus;* 4. *Scutia;* 5. *Sageretia;* 6. *Colubrina* and 7. *Gouania;* covering 12 species of which only two—*Zizyphus napeca* and *Rhamnus Arnottianus* are endemic.

Our species are mostly small trees and shrubs, many of which are excessively thorny, and only a few are economic.

No. 157. **VENTILAGO MADERASPATANA** 1: p. 279.

Yakkada-wel, S. Vempadam, T.

A much branched powerful woody climber, often scrambling over tall trees. Branchlets and young parts finely pubescent. Leaves alternate, rather variable in size, 1½—4 inches

long, oblong-ovate or ovate, nearly rounded at base, arching to an acuminate apex; upper half of the leaf margin crenate-serrate, lower half entire; thin glossy pale green above, dull green below. Stipules short, about $\frac{1}{8}$ inch claw-like, acute. Petiole about $\frac{1}{4}$ inch, slender, sparsely pubescent, flaccid. Midrib thin, prominent below, faintly tinged with rose-red, distinct above. Lat.-veins about 7, irregular, much arched, not uniting, more prominent above than below. Nerves thin, close, pellucid, at right angles to midrib.

Flowers numerous, very small, less than $\frac{1}{4}$ inch diam., pale greenish, on short pubescent stalks arranged in "clusters on the branches of large spreading, drooping pubescent terminal panicles." Calyx 5 lobed, erect, pointed, pubescent. Petals 5, small shorter than Calyx 2-lobed, Stamens 5, equalling petals. Ovary 2 celled. Fruit light, and about the size of a pea, to which is attached a narrowly oblong, veined, pubescent, wing of about $1\frac{1}{4}$ inches length.

Used locally for rough cordage. In India a dye is extracted from the root. The dyers of Mysore obtain an orange red dye from the bark of this species.

Common in both wet and dry parts of Ceylon up to 1,000 feet altitude, but more abundant in dry country. Much eaten by elephants.

No. 158. **ZIZYPHUS JUJUBA** I. p. 280.

Massan, Maha-debara, S. Ilantai, T. Sometimes Yelandi, T.

A small erect tree with pale brown or dark grey bark, much longitudinally furrowed. Branches regularly forking into Y-like branchlets, slender, armed with straight or recurved sharp thorns (stipular spines). Young parts woolly-pubescent. Crown domed, and rather broader than tree is tall.

Leaves alternate, rather distant, about $1\frac{3}{4}$ inches by $1\frac{1}{2}$, broadly ovate, often unequally bladed, rounded at base, slightly emarginate at apex, glabrous, dark green above, densely woolly-pubescent or felt-like below, faintly denticulate along margins. Petiole about $\frac{1}{2}$ inch, faintly channelled, pubescent. Midrib and two strong primary basal nerves prominent below, pubescent and pale greenish, depressed above. Central lat.-veins many, short, becoming more distinct as they approach apex; two lateral basal veins giving about 10 curved veins towards the leaf-margins. Nerves fine, obscure, hidden by pubescence. Leaf-buds densely rufous-tomentose.

Flowers small about $\frac{1}{8}$ inch diam., pale grennish white, arranged in small axillary clusters or short cymes, on woolly

stalks. Sepals 5, externally woolly, acute. Petals 5, small, narrow, recurved, white. Stamens 5, immediately within petals, filaments curved. Anthers small, opening by marginal slits. Disk proportionately large lobed, 10 grooved. Ovary 2 celled, seated within disk. Style 2 3-fid.

Fruit a drupe, about ½ inch in diam., spherical, smooth, containing a hard 2-celled stone coated with sweetish pulp, seeds brownish, noduled.

Wood hard, close, tough, durable, of a reddish brown colour, weighing about 45 lbs. per cubic foot; used for saddle trees (*Gamble*) oil-mills, posts for buildings. Fruits eaten.

Pores, rather large, sometimes twin, open, rather distant. Rays numerous, fine pale, straight. Rings indistinct. Timber rarely large. Leaf-eating catterpillars attack the plant considerably, frequently almost denuding it of foliage.

The dry leaves are used in asthma, and are a supposed remedy for heart disease! The bark contains tannin (Ziziphotannic acid), and a crystallizable substance, Ziziphic acid, has been isolated from a watery extract of the wood; (*Kanny Lall Dey*); the powdered bark is (in India) used as a dressing for wounds.

Widely distributed, especially in the dry zone up to about 1,000 feet altitude. Also China (where it is cultivated for its fruit) India, Australia and Trop. Africa.

Note.—The horribly thorny and common Hin-era-miniya or Eraminiya of the Sinhalese (*Z. Oenoplia* can hardly claim to be economic. It is used for making temporary hedges round paddy fields, and often branches of it are laid across freshly made field-bunds to keep them from being trodden down. The purple-black fruits are eaten, and have a sweetish taste. It is called in Tamil districts *Churai*. Chiefly found in dry and intermediate zone.

No. 159. **Z. XYLOPYRA** I. p. 282.

Kakuru, S. Nari-ilantai, T.

A large straggling shrub or small tree. Bark greyish or reddish-brown. Young branches woolly, or woolly-pubescent. Leaves variable in size, 1—3 inches long, broadly ovate or oblong oval, very unequally lobed, rounded or cordate or oblique at base, obtuse at apex; finely serrate along margins, densely coated below with pale yellowish tomentum, faintly pubescent above. Petiole ¼-inch, woolly. Primary basal nerves 3—5, prominent below. Midrib with few lat.-veins towards apex.

Basal nerves also with lateral nerves extending towards margin. Spines (prickles) "when present, one straight, the other curved" (*Trimen*).

Flowers small, greenish white on stalks, about ¼ inch in "dense, woolly, axillary panicles." Sepals 5, broad, "very woolly outside"; Petals 5. Ovary 3-celled, and "styles 3."

Fruit about 1 inch, a nearly spherical drupe, coated with grey tomentum, with large 3-celled hard stone, with a nodular or furrowed surface. Seeds 3.

Wood (in Ceylon it is limited in size) hard, yellowish-brown, smooth, rather heavy, about 49 lbs. per cubic foot (*Gamble*), used for agricultural tool handles. Makes a fine charcoal.

Pores, according to Gamble, small and moderate-sized, in patches of soft tissue. Rays very numerous, fine.

The fruit yields a black dye, and is not eaten.

Occurs in the dry zone. I have met with it near Hiripitiya in the North-Western Province, and again in the Vedirata.

Also Central and Western India, and Philippines.

No. 160. **COLUBRINA ASIATICA** I. p. 285.

Tel-hiriya, S. Mayirmanikkam, T.

A spreading scrambling shrub. without thorns and smooth young parts. Leaves 2—2½ inches long, rounded at base, or subcordate, acuminate at apex. Margins crenate-serrate, completely glabrous, thin. Petiole about ½ inch, slender. Midrib distinct on both sides. Lat.-veins about 5 (first pair basal), oblique; nerves inconspicuous. Flowers small, greenish-yellow, in very short few-flowered axillary cymes, with short slender flower-stalks.

Calyx 5 lobed, faintly hairy, becoming attached to fruit-base. Petals 5, clawed; Stamens 5, disk "fleshy, filling calyx tube", lobed; Ovary surrounded by disk, 3 celled. Fruit a spherical capsule, half enclosed in the calyx, smooth, small, containing greyish seeds.

I have included this plant only because its bark is said to contain an oil that is valued as a remedy for rheumatic pains.

Occurs in the dry zone. My examples are from Okanda, in the Panama Pattu, Eastern Province.

Also India, China, New Guinea, Australia and West Africa. The so-called "Snakewood" is obtained from an allied species growing in Martinique.

XXXIX.—AMPELIDEAE.

The Grape family is represented in Ceylon by two Genera only—*Vitis* and *Leea*, affording 20 species, of which 5 are peculiar to the island.

Hardly any of our forms are of economical value, but it is a matter for experiment to decide if some of our wild forms might not be used for grafting stocks for the superior kinds so well known all over the world and celebrated from the very earliest times. The Grape Vine (*Vitis vinifera*) has been cultivated in many parts of the Island, though the date of its introduction into Ceylon appears to be uncertain; but probably Catholic Fathers were responsible for its growth, particularly in the Jaffna Dictrict.

Tennent, in his reference (Vol II. p. 36) to the "honours and gifts" heaped upon Admiral Spilburg, and refers to "Wine made from grapes grown at Kandy," but the statement is not sufficiently authenticated to place it above suspicion.

Its cultivation, however, has not been on a very extended scale, and "exhaustive efforts made by W. H. Nock at the Hakgala Gardens in growing vines in a glass house ended in a failure as regards production of fruit. (*MacMillan*). On the other hand I have known quite a large crop of white grapes being obtained from a vine grown in Dumbara, near Kandy, and I have seen the plant growing in lower Maskeliya.

[Good grapes are produced in Kalpentyn.—C.D.]

No. 161. **VITIS QUADRANGULARIS** I. p. 289.

Hiressa, S. Pirandai, T.

A trailing quadrangular-stemmed plant, smooth, green, and much branched, rather distantly jointed, fleshy. Leaves few, small, 1—2 inches long, round or deltoid or flattened at base, obtuse at apex, fleshy, glabrous, widely spinous-crenate. Petiole about ½ an inch, nearly quadrangular. Stipules small, wide, oval. Tendrils, long, undivided. Flowers small, yellowish, arranged "in small umbels on branches of a short paniculate cyme."

Calyx barely lobed, cup-shaped. Petals 4 (or 5) ovate. Stamens 4 (or 5) short. Fruit a small red berry with minute seeds.

The stems and leaves are eaten, curried. A juice extracted from the stem is used for eye and ear diseases, and is also employed as a mild purgative.

Very common in the dry country, especially in the Hambantota District. Often found creeping over hedge plants,

Also in India, Malaya, Tropical Africa and Arabia.

Note.—Easily separable from "*V. glyptocarpa*" by the latter having distinct wings on the stem angles, and ribbed seeds.

No. 162. **V. ADNATA** I. p. 290.

Wal-diya-labu, S.

A slender trailing plant, with cylindrical stem, more or less orange-tomentose, or glabrous.

Leaves rather large, often longer than broad, about 2-3 inches, cordate at base, rarely lobed, shortly acuminate, bristly-serrate, densely tomentose below, with orange tomentum, nearly glabrous above. Tendrils forked, quite woolly. Stipules broad, hairy, "membranous."

Flowers small, green or greenish-yellow. Cymes short, tomentose, opposite to fully developed leaves. Fruit a round berry, about $1\frac{1}{3}$ of an inch long, black with one seed.

Native cattle doctors use this for one of their remedies, but I have been unable to discover if it is used alone, or in conjunction with other compounds.

Occurs in the lower western part of the Ratnapura District, but only very occasionally; also in India, Burma, Malaya to New Guinea and Madagascar.

No. 163. **V. LINNAEI** I p. 271.

Walniviti, S. Kaddu-muntiri, T.

A climbing shrub with, in old stems, smooth bark, densely pubescent on young wood or branches.

Leaves variable, $1\frac{1}{2}$—4 inches, round or ovate, much cordate at base, more or less palmately lobed, with lobes varying from 1 to 5, "irregularly dentate," glandular-pubescent below, and finely pubescent above. Tendrils stout, pubescent, often branched. Petiole densely pubescent, $\frac{1}{2}$ to 1 inch long. When crushed the leaves are not unlike the domestic grape in odour. Flowers greenish, on long spreading or slightly unequal stalks, cymes as long as petiole, 3-5 branched, pubescent. Fruit a berry about $\frac{3}{8}$ inch, blue, with a fine waxy grape-like "bloom."

The wood of the stem is used for making an oil that is said to be effective in ulcers and sores.

Occurs rather abundantly in the dry zone, often climbing over tall bushes.

Also in Central and Western India.

No. 164. **LEEA SAMBUCINA** I. p. 297.

Gurulla or *Burulla*, *S.*

A plant of variable size, from 5 to 10 feet high, erect, or shrubby, not climbing. Stems cylindrical, branching, slightly warted, otherwise glabrous.

Leaves large, alternate, pinnate or bipinnate. Rachis long, much thickened at base and at points. Leaflets 2—3, opposite, 4—8 inches long, oblong, or lanceolate-oblong, tapering to base, acuminate, margins rather deeply serrate; glabrous, rather glossy, bronzy when young. Stipules large, deciduous, "uniting to petiole," sheathing. Midrib and lateral veins very conspicuous, arched, strong. Tendrils absent.

Flowers small, about $\frac{1}{3}$ of an inch diam., pale white tinged with green, on short stalks "in large branched corymbose cymes opposite the terminal leaf." Calyx cup-shaped, 5 lobed; Petals 5 "hooded at apex," reflexed. Stamens 5, "tube of stamens large, dome-shaped." Ovary 6 celled, with 1 ovule in each. Fruit a berry, about $\frac{1}{2}$ inch diam., oblated, smooth, purplish black.

Wood pale white, very soft, not used.

Plant said to be used to expel worms in children, and as a cure for ringworm. The fruit is also used to remove warts, Trimen says that the plant has a bad reputation among the Sinhalese as having a bad influence on cattle, but I have not heard this confirmed.

Common in both wet and dry zones, but in the latter only on the banks of streams. Often gregarious.

Also India, Andamans, Malaya and Burma.

XL.—SAPINDACEAE.

This is a large order in Ceylon, represented by 11 Genera, viz.:

1. *Cardiospermum*, 2. *Hemigyrosa*, 3. *Allophylus*, 4. *Schleichera*, 5. *Gleniea*, 6. *Sapindus*, 7. *Nephelium*, 8. *Pometia*, 9. *Harpullia*, 10. *Dodonœa* and 11. *Turpinia*.

These afford 19 species; of which five are endemic. *Gleniea* is monotypic and indigenous.

No. 165. **CARDIOSPERMUM HALICACABUM** I. p. 299.

Penela-wel, S.

A creeping or sub-scandent herb. Stem cylindrical at base, quickly dividing into long deeply furrowed shoots and branches. Young parts much grooved, green and faintly hairy on raised sides.

Leaves distinctly alternate, biternate, with each division triangular in outline, apicular one largest, consisting of two opposite, shortly-stalked, ovate, deeply crenate-serrate lobes, and a lobe terminal; the whole leaf about 3½ inches by 4½. Dark glaucous green above, paler below; margins faintly ciliate. Petiole long, 2—3 inches, spreading, much grooved or furrowed, faintly silky-hairy in very young petioles. Midribs of leaflets very prominent below, slightly raised above. Lat.-veins oblique, strongly prominent below, faintly hairy, distinct above. Stipules, none.

Flowers minute, about 1-6 of an inch, white, with a yellowish edge to the scales within the petals, arranged in small cymes at the end of a long, thin, stiff, axillary, spreading stalk that has, immediately below the cyme, two tendril-like curving processes that attach themselves after the manner of tendrils. Sepals 4, 2 ovate and 2 round, deeply cleft with scales at their base. Petals 4, with an inner crested scale of which two are conspicuous. Stamens 8; filaments hairy, ex-centric. Ovary 3-celled with one ovule in each. Stigmas 3. Fruit a 3-angled bladed capsule. Seeds round, blackish with a conspicuous white "heart-shaped" aril attached.

Wood. Central portion greenish, fading into a pale yellow outer layer. Pores very irregular, small in heartwood, becoming larger towards the rind and unevenly distributed. Rays indistinct.

The root is said to be emetic, laxative, and stomachic. Used in nervous diseases and rheumatism.

Common up to about 1,500 feet altitude in both wet and dry zones, usually in open ground. Plentiful in Southern Province.

Also throughout the tropics, but mostly South American.

Our *C. Corindum* differs from this by its much larger (2 inch) capsules. It occurs in the Magam Pattu, S.P.

No. 166. **ALLOPHYLUS COBBE** I. p. 303.

Kobbe, Bu-kobbe, S. Kbobevel, (Vedda.) Amari, T.

A slender small tree, with pale yellowish or greyish smooth bark. Branches and young parts pubescent.

Leaves spreading, trifoliate, central longest, about 5 inches, narrowly oval, acute at base, tapering and accuminate at apex, slightly serrate, pubescent above and paler below than above. Lateral leaflets shortly stalked. Rachis (or petiole) about 4 inches, cylindrical, pubescent. Lat.-veins oblique, with small clusters of hair in the axils. Stipules, none.

Flowers minute, pale green, shortly stalked in clusters on the slender branches of spicate axillary panicles. Sepals 4, 2 larger and 2 smaller. Petals 4, broad in the middle with a basal hairy scale. Ovary finely hairy, 2 lobed, 2 celled, with one ovule in each. "Stigmas recurved." Fruit ovoid, about ¼ inch, smooth, bright shining red.

Wood tough, very springy, greyish, used by the Veddas (at *Henebedda*) for bows ("Seligmann.")

Pores small, scanty. Rays moderately broad, short, joined by numerous white parallel and equidistant concentric lines. Weight 40 lbs. per cubic ft. (*Gamble.*) The leaf and fresh bark used for poultices. Fairly common in wet and dry zones up to 1,000 feet, but not abundant, and never attaining a large size. The fruits are said to be eaten, but I cannot confirm this. In the Vedda country the plant appears to have smaller leaves, and is often quite glabrous.

Also in India, Andamans and Malaya.

No. 167. **SCHLEICHERA TRIJUGA** I. p. 304.

Kon, S. Kula, Puvu, T. The Ceylon Oak, E.

A large deciduous, erect, handsome tree, with large crown, Bark smooth, greyish, often brownish grey, rather thick. Branchlets and buds pubescent. Twigs leaf-scarred. Leaves abruptly pinnate, very variable in shape and size of leaflets. Rachis 3—8 inches long, much swelled at base, stiff, hairy-pubescent, becoming woody with age. Leaflets opposite, 2—4 pairs, the last pair being largest, varying from 3—7 inches in length, on shortly swelled stalks; ovate, or ovate-oblong, or narrowly oval, acute at base, tapering and acuminate at apex, or obtuse or bluntly acute at apex, often unequally bladed; smooth dark glossy-green above, paler below; entire; conspicuously undulate on the margins. Stipules none. Midrib direct, strong, very prominent below, sparsely hairy, pale and distinct above. Lat.-veins 10—12, strong, pale on both sides, widely curving and uniting within the margins. Nerves distinct above. Young leaves very oak-like.

Flowers polygamo—diœcious, small, green or yellowish. Calyx 4—6 lobed, acute. Petals none. Stamen 6—8, filaments

hairy. Disk flat. Ovary 3-celled with 1 ovule in each (erect.) Fruit about 1 inch, ovoid, pointed at apex. Seeds 1 to 2, brown, covered by a succulent sweetish-acid aril.

Wood dull pale red, darker in the heart-wood, and much pale in the sapwood. Hard, fairly durable, but liable to crack unless very carefully seasoned.

Has been used for Railway sleepers in Ceylon, but owing to the very unequal exposure of the wood, it has not been found satisfactory for that particular purpose. Well suited for beams and trusses, and in India is used for oil, rice and sugar mills and agricultural implements (*Gamble.*) Weight about 60 lbs. per cubic foot. Difficult to saw. Is subject to the attacks of a stem-boring beetle (*Diapus impressus*), dead trees being also bored into by the Carpenter Bee.

The wood pores are small, few, oval and often sub-divided. Rays many, very fine, close, rather wavy. Annular rings indistinct.

The seeds contain an oil, known as "Kon-tel" obtained by pressing. This is said to be employed for "Macassar oil." Lac is also obtained from the young branches, and is much prized in India.

The oil is said to be a hair stimulent, a cure for itch, and an illuminant. Leaf-juice used in giddiness.

Common up to 2,000 feet, but more plentiful in the dry country at low levels.

Also India, Burma and Indo-Malayan countries.

No. 168. **GLENIEA ZEYLANICA** I. p. 305, Pl. xxv.
Wal-mora, S. Kuma, T.

A rather low, broadly crowned tree, with twisted and irregular stem. Bark pale, creamy or ashen, thin. Leaves pinnate; Rachis 1 to 3 inches long, smooth, swelled at base. Leaflets opposite or alternate, often only a single pair, or as many as three, when they are alternate, very variable in size, 3—5 inches long, oblong or narrowly oval, tapernig at base, obtuse, sometimes unequally bladed, obtuse at apex; entire; undulated; completely glabrous, stiff, dark green above. Leaflet stalks short, swollen. Midrib sometimes curved, prominent below, distinct, and yellowish above. Lat.-veins about 6, much arched, uniting, conspicuous. Nerves widely netted, prominent above. Stipules, none.

Flowers very small, pale greenish-yellow, on short stalks in clusters, on long faintly hairy terminal or axillary spikes—

terminal in "the male tree, and mostly axillary in the bisexual" (*Trimen*). Calyx 5-lobed, valvate, acute, pubescent. Petals very small, deciduous, hairy. Stamens in males 8, slender, radiating beyond calyx-lobes, with minute anther-cells; short in bisexual flowers. Ovary 3-celled with one ovule in each. Fruit, oblate-spherical in shape, about 1 inch diam., 2 or 3 lobed, green, smooth, containing one to three smooth, brownish seeds, without arils.

Wood pale, or yellowish white, close grained, smooth, rather heavy, suitable for posts and rafters, but rarely obtainable in long pieces.

Endemic. Common in the dry zone, and plentiful in the Eastern Province up to the foot of the hills.

No. 169. **SAPINDUS EMARGINATUS** I. p. 307.

Penela, S. Panalai, Neykkoddan, Panalai, T.
The Soap-nut Tree, E.

A moderately large tree with irregularly spreading broad crown. Stem rather contorted; bark rough, pale or white; ends of shoots, smooth. Leaves alternate, pinnate; Rachis 3—4 inches, stout, smooth, enlarged at base. Leaflets 2—4 pairs, subopposite on short thickened stalks; rather large, 2—4 inches long, elliptic, or oval-oblong, tapering or round at base, rounded at apex, entire, glabrous above, more or less densely pubescent below; stiff; pale green. Midrib prominent below, distinct above, direct. Lat.-veins 8—10 prominent; nerves hidden by pubescence. Stipules, none.

Flowers polygamous, small, dull greenish-white, "in large much-branched spreading terminal panicles." Sepals 4—5, oblong, erect. Petals exceeding sepals in length, 4—5, narrowly oblong, silky on margins, and with a central silky tuft. Stamens in males, 8. Disk lobed, concave. Ovary tomentose, 2—3 celled, with 1 ovule in each, lobed. Fruit a small round drupe, about ½ an inch diam., thick, containing a hard black seed.

Wood, yellowish, hard, close, about 64 lbs. per cubic foot, used for building cart frames. Rarely long enough for house building materials.

The seeds contain a semi-solid mass which is used as a substitute for soap, and also in domestic medicine. In small doses they are used as emetic, and in larger quantities they are purgative. The root is said to be an expectorant. According to *Nadkarni*, the fruits contain 11½ per cent. of 'Saponine.' He adds "made into plaster with vinegar, it [the seed kernel] is applied externally for bites of reptiles, and to scrofulous swel-

lings." He also states that the juice of the bark and fruit is applied to the nose in lock-jaw!

Common in the dry zone, especially in the East.

Also India and Burma.

I am not aware if the hard seeds of this plant are here made use of for beads, necklaces and buttons, as in some countries where this genus occurs. MacMillan refers to *Sapindus saponaria* (a Jamaican *species*) in his list of Ornamental Seeds.

No. 170. **NEPHELIUM LONGANA** I. p. 309.

Mora, S. Nurai, T. Longan, E.

A large tree with erect cylindrical stem and domed crown. Bark rather thin, sometimes flaking, pale yellowish-grey, or ashen.

Leaves pinnate, Rachis about 6 inches long, finely stellate-pubescent, thickened at base. Leaflets 7-10, narrowly oblong or oblong-lanceolate, unequal or acute at base, abruptly acute or sub-obtuse at apex; entire; shining green above, pale, or faintly glaucous below, rather brittle; attached to short swelled stalks. Midrib rather thin. Veining below minutely netted.

Flowers polygamous, small about $\frac{1}{3}$ of an inch diam., dull pale yellow, on pubescent stalks in clusters on branches of large, lax, pyramidal, pubescent, terminal panicles. Calyx deeply 5-6 lobed, densely pubescent; Petals 5, narrowly oblong, equal to sepals in length, pubescent; stamens 10 in. males, 5-8 in. bisexual ones, and longer in former than latter, filaments hairy; Ovary 2-3 celled with 1 ovule in each, hairy. Fruit almost sperical, about $\frac{1}{2}$ in. diam., yellowish, slightly rough with minute stellate-hairy nodules. Seeds solitary, completely coated with a pulpy succulent aril, of a sweet flavour, and with an odour of ether. They are readily eaten by human beings, monkeys, and birds.

Wood reddish towards the centre, paler near the bark, hard, heavy, (about 60 lbs. per cubic foot). Used for posts, wall-plates, and rafters, in temporary buildings, and is said to make good furniture.

Pores small, many, evenly distributed. Rays fine.

Wavy bands, broader than the rays, divide the wood into a succession of concentric strata (*Gamble*).

The bark is used in mild fevers, and the fresh juice is applied in cases of earache.

Occurs in dry and intermediate zones, and occasionally found in the wet forests up to 2,500 feet.

Also South India, Burma, Malaya and Southern China.

No. 170A. The familiar "Rambutan" (*Sin.*)—*N. lappaceum*—is closely allied to the Mora, its crimson or orange-yellow prickly fruit making it easily recognizable. It is a Malayan species and was introduced into Ceylon in the early part of the last century. It has since been largely cultivated, and has become a regular market fruit in season.

170B. The "Litchi" (*N. Litchi*) is a small bushy member of this Genus, a native of China that was introduced into Ceylon in 1802. Though much more delicately flavoured than the last, it is strangely enough little grown in this country.

Its fruits are a little larger than the "Mora," and have a reddish-brown nodular rind. The veining of the leaflets on the under side shows the lat.-veins in a double series—alternately long and short. The leaflets are also acute at apex, or acuminate. Dried, the fruits serve as a dessert, and for such purposes are largely exported into England.

No. 171. **POMETIA EXIMIA** I. p. 310.

Gal-mora, Bulu-mora, Na imbul, S.

An exceedingly beautiful tree with spreading branches and dome-shaped crown. Stem erect, rather heavily buttressed at the base. Bark smooth, thin, pinkish-brown exfoliating in small flakes. Young shoots and twigs pale brownish-hairy.

Leaves large, pinnate, Rachis 12 to 15 inches long (much longer in young plants) very brownish-hairy, stout, dilated at base. Leaflets 6 to 10 pairs, opposite, on stout hairy stalks; narrowly oblong, unequal and rounded (sometimes cordate) at base, acute or acuminate at apex. Margins widely dentate, glabrous above. Midrib stout, conspicuous, very prominent below, hairy above and below. Lat.-veins very prominent parallel, hairy. Stipules replaced by a deciduous supplement to the leaf.

Flowers; polygamous, small, numerous, brownish or yellowish-brown, with green petals, on slender stalks arranged in "little stalked, unilateral cymes on the elongated branches of large, much-branched, pubescent, pendulous, terminal panicles."

Calyx, 5 lobed, small, triangular. Petals 5, shorter than sepals, stamens 5, in males the filaments are long, inserted within the disk. Ovary 2-celled, one ovule in each. Fruits, ovoid, about 1 inch, smooth, red, fleshy; seed brown, enclosed in a soft almost liquid aril.

Wood pale-reddish, slightly tinged with yellow, moderately hard, liable to splinter, weighing about 45 lbs. per cubic foot.

Suitable for rafters, reepers, ceiling boards, but shy of direct exposure to sun and rain. I have seen it used for tea boxes, and it is probably suitable with careful seasoning. A fairly durable wood. Pores large, irregularly scattered, sometimes divided. Rays indistinct, parallel. Annular rings doubtfully shown by concentric lines.

Found in the wet forests from 1,500 to 3,000 feet altitude, generally in deep rocky ravines, but nowhere very common. Also in the Andamans and Malay Islands.

I have heard the name "Bulu-mora" (which is applied to *Canarium brunneum*) given to this species, owing to a general resemblance.

No. 172. **HARPULLIA IMBRICATA** I. p. 311.

Pundalu, Na-imbul, S.

A tall erect tree with whitish smooth bark. Twigs prominently leaf-scarred, finely pubescent.

Leaves large, pinnate. Rachis slender about 6—10 inches long, cylindrical pubescent. Leaflets sub-opposite, or alternate, 4—5 pair, on stout short stalks, variable in length, about 3—6 inches long, narrowly oblong or lanceolate, acute at base, unequal acuminate; entire, smooth, glossy above. Midrib thin, direct, prominent below. Lat.-veins many, short below, largest towards apex, conspicuous below.

Flowers polygamo-dioecious, large, nearly $\frac{3}{4}$ inch in diam., rich yellow, on "very lax, drooping axillary panicles, 2-12 inches long." Flower-stalks long, minutely pubescent. Bracts leafy, linear-lanceolate" Sepals 5, erect, broad, obtuse, pubescent. Petals 5, erect, oblong, recurved with long "claw." Stamens 5, longer in males than in bisexual flowers, glabrous. Style very long, twisted stigma. Ovary 2-celled with 2 ovules in each. Fruit a pendulous two-lobed capsule of brilliant orange colour. Seeds large, shining black, with small yellowish aril.

Wood. I have never seen the timber of this species made use of. Foxworthy, who follows Trimen in separating this species from *H. cupanoides* though Brandis makes *H. cupanoides* to be synonymous with *H. imbricata*, speaking of *cupanoides* says "the wood is white and soft. Pores moderate-sized, scanty, in whitish patches; Rays fine, numerous," but gives no uses.

Occurs above 2,000 feet to 3,000 in the moderately wet country. Also Western Ghats of India, Andamans and Java.

Trimen says the fruits are used for washing.

The Sinhalese name of "Na-imbul" is probably due to the similarity between this species and the last.

No. 173. **DODONAEA VISCOSA** I. p. 312.

Werella, Eta-Werella, S. Virali, T.

A small bushy tree, but most frequently a bushy shrub. Stems sometimes as thick as a man's arm, rather closely furrowed. Branches, twigs many. Bark, red-brown.

Leaves simple, alternate, erect, numerous, about 3 inches long, narrowly oblong or lanceolate, much tapered at base, shortly rounded or obtuse at apex, entire; smooth, glabrous. Young leaves appear to be coated with thin varnish, and leaf-buds more so. Petiole very short. Midrib thin, prominent. Lat.-veins numerous, irregular.

Flowers polygamous, small, pale yellowish, on slender stalks in short axillary panicles. Sepals 5, pointed, distinct. Petals none. Stamens about as long as sepals, 8 in males, shorter in dioecious flowers; anthers large, longer than filaments. Ovary 3-celled (or 4) with 2 ovules in each. Fruit a 3-angled papery, veined, straw-coloured capsule about ½ an inch diam. Seeds nearly black.

Wood very hard, close, durable, bark brown towards centre. Very suitable for tool handles and small fittings such as handles for cabinet drawers.

Pores minute, fimbriated, evenly scattered. Rays very thin, close, straight. Concentric pale lines faintly distinct.

Occurs generally gregariously from sea level to 5,000 feet in open land. I have obtained fairly large examples in the Eastern Province near the coast, and at Bandarawela. A tropical plant of wide distribution.

The young leaves, gathered much in the same way as tea is plucked, and allowed to steep in boiling water, afford a most useful embrocation for sprains and bruises in man and domestic animals.

In Australia this plant is called "Lignum-Vitae," and "Switch Sorrel" in Jamaica.

No. 174. **TURPINIA POMIFERA** I. p. 313.

Eta-hirilla, Kankumbala, Kukulman, S.

A moderately large tree, with erect stem. Bark greyish, or brown mottled with grey, rather thick; shoots and twigs smooth.

Leaves opposite, imparipinnate; Rachis variable, about 3 to 8 inches long. Leaflets 1 to 4 pairs, and an end one, rather large, roughly arrow-shaped, tapering to base, acuminate at apex; minutely serrate, quite smooth, glossy green (pinkish when very young). Stipules rather large, early falling, triangular.

Flowers bisexual, small, many, pale white, on smooth stalks in axillary and terminal panicles. Calyx 5-lobed, deeply cut, "finely ciliate, obtuse." Petals 5, narrowly oval, as long as sepals. Stamens 5, "shorter than petals." Ovary 2- (or 3-) celled with 2 (or more, *Trimen*) ovules in each.

Fruit spherical, about 1 inch in diam., nearly purple when quite ripe, greyish green when immature. Seeds deep brown, angular, glossy.

Wood pale, very soft, light. Sometimes used for tea boxes; not durable.

Common in the wet forests of Sabaragamuwa, and parts of the Western Province. Also South India, Malaya, and China.

Trimen also gives "Eta-hirilla" as another name in Sinhalese for this plant but I have not heard it applied.

XLI.—SABIACEAE.

A small order in Ceylon, and represented by a single genus only—*Meliosma*—with only 3 species, none of which are peculiar to the country.

No. 175. **MELIOSMA SIMPLICIFOLIA** I. p. 315.

Elbedda, S.

A smallish tree, with straight rather slender stem. Bark greyish, or nearly white, smooth, except on branches, these being much leaf-scarred.

Leaves simple, large, alternate, variable in size, 5 to 14 inches long, narrowly oval, or oblong-lanceolate, tapering finely to base, and acuminate apex; entire, rather thin, smooth above. Petiole about 1 inch, thickened at base, smooth. Lat.-veins parallel, many, prominent, much arched, more or less pubescent. Nerves, parallel. Stipules absent.

Flowers bisexual, many, very minute, short stalked, pale yellowish-white, in wide-spreading axillary and terminal pubescent panicles. Sepals or bracteoles "in all 5-13" (*Trimen*) hairy. Petals 3 larger and 2 smaller, the latter "bifid."

Stamens, 2 fertile attached to the smaller petals, 3 sterile opposite the larger. Ovary 2-celled, with 2 ovules in each.

Fruit a nearly spherical drupe, about ¼ inch in diam. Seed a solitary stone, round.

Wood reddish-brown, rather hard, splits easily, light, even-grained, unsuitable for buildings but suitable for light temporary structures.

Pores small, solitary, or in short rows. Rays broad, numerous, wavy.

Plentiful in Uva, especially between Bibile and Monera-gala, generally found near water.

Also India and Upper Burma.

No. 176. **M. ARNOTTIANA** I. p. 315.

A rather tall straight deciduous tree, extremely handsome when covered with flowers. Branches spreading rather wide. Bark greyish, young parts hairy.

Leaves imparipinnate as distinct from last, large. Rachis 4—8 inches long, drooping, finely rusty-pubescent. Leaflets about 4—7 pairs, nearly opposite, about 3 inches long, lanceolate, acute or rounded at base, "usually caudate-acuminate" at apex; entire; glabrous. Leaflet stalk about ½ an inch long; midrib rusty tomentose above and below, with tomentum extending to veins below. Flowers very small, soft yellowish-white, on very short stems, crowded, in many pyramidal, tomentose, drooping, axillary and terminal panicles, longer than leaves.

"Bractlets and sepals about 5, ciliate." Petals 5, the larger ones nearly round, and the smaller minute and divided. Fruit small about ¼ inch diam., or less.

Wood very soft, almost spongy; worthless except for floats.

Fairly common at high altitudes. Plentiful from Pattipola to Haputale.

XLII.—ANACARDIACEAE.

This large order, rendered familiar because it includes the well-known Mango and Cashew-nut trees, is represented in Ceylon by 7 Genera, viz., 1. *Buchanania*, 2. *Mangifera*, 3. *Odina*, 4. *Semicarpus*, 5. *Nothopegia*, 6. *Campnosperma* and 7. *Spondias*, making in all 19 species, of which as many as 15 are endemic. These do not include the many "importations" that have come to the country since its European occupation.

No. 177. **BUCHANANIA ANGUSTIFOLIA** I. p. 316.

A middle-sized tree, with young shoots slightly pubescent or glabrous; leaves alternate, simple, elliptic or linear oblong, acute at base, obtuse at apex, glabrous, on both sides rather thick, about 4—7 inches long. Stipules, none. Petiole ½ to 1¼ inches, stout. Midrib pronounced.

Flowers bisexual, small, white on very short stalks in perfectly glabrous, axillary, crowded panicles, about as long as leaves. Sepals 5, persistent, smooth. Petals 5, oblong-oval recurved. Stamens 10. "Ovary pilose." Fruit about ½ inch, an ovid drupe, compressed.

Occurs sparingly in the country between Haputale and Belihuloya, from 2,000 to 3,000 feet altitude, but appears to be little known. I am unacquainted with its timber.

I have introduced this species into this work as bearing upon a plant named "Kiripalu" mentioned in the Rajavaliya, where (p. 49, Gunasekera's Edition) it says that King Bhatiya-tissa "caused the Palu Dagoba to be built at the foot of a "Kiripalu tree."

Clough identifies it with *Buchanania latifolia*, and Gunasekera, probably following Clough, gives the same scientific name in his Glossary, but *B. latifolia* is not, or has not, so far, been recorded from Ceylon. According to Gamble, the Garhwal name for *B. latifolia* is "*payala*," and the name "Pyal" is also applied to it in Bombay. The seeds of this are eaten by natives as almonds, and they extract from it an oil called "Cheromjee oil." But since the name "Kiripalu" does not occur in Trimen's Flora or his catalogue, and Willis does not give it, Clough's identification becomes doubtful.

No. 178. **MANGIFERA ZEYLANICA** I. p. 317.

Etamba, Wal-amba, S. Kaddumanga, T.

A tall handsome erect tree, with cylindrical stem. Bark brown, varying from brownish to pale grey, rather thick, nearly smooth. Branchlets many, making a compact, close, crown.

Leaves rather crowded, alternate, variable in length from 2 to 7 inches, oblong or oval oblong or lanceolate, finely tapered at base, rounded at apex, occasionally very shortly acuminate; entire, completely glabrous stiff; rather pervaded with the smell of turpentine when crushed. Stipules absent. Petiole about ½ inch, rather stiff. Midrib prominent, rather pale above. Lat.-veins (?) 12, arching within margin. Nerves much netted.

Flowers polygamous, small, about ⅓ inch diam., yellowish white or creamy, on jointed stalk in smooth erect terminal

panicles. Sepals 5, oval, smooth. Petals 5, much longer than sepals, veined, clawed. Stamens 5—8, of which only one very short one is fertile. Ovary 1-celled with one ovule.

Fruit a narrowly oval drupe from 1 to 2 inches long, enclosing a compressed narrowly oval stone imbedded in a fleshy, harshly-acid mass. The fruit varies in colour from a rich green to a purplish green.

I have obtained an example in which the fruit was plum-coloured. Fruits eaten by monkeys and birds, it being a favourite with our "Toucan" (*Tockus Singalensis.*)

Wood pale greyish-white, soft, loose, quickly rotting, about 32 lbs. per cubic foot. In much demand for Tea boxes, as the wood is easily sawed and cuts economically. If carefully seasoned, the wood is suitable for "backings," lining material, and the like.

The bark is said to be a remedy for diarrhœa.

A widely-distributed endemic, occurring in both dry and wet zones up to 2,000 feet.

Its local English name is the "Wild Mango" but fruits are seldom if ever eaten as they are most unpalatable, and tinctured with the odour of turpentine.

No. 179. **ODINA WODIER** I. p. 318.

Hik, S. Odi, T.

A smallish deciduous tree, with moderately straight stem. Bark smooth, rather thick, pale brown or greyish-brown. Young branches and shoots finely stellate-pubescent, or completely glabrous.

Leaves imparipinnate, rather variable in length of rachis, which may be from 4 to 12 ins. long, cylindrical, and much dilated at base. Leaflets 2—6 pairs and an end one. Leaflets opposite and very short-stalked; 3—5 (or more) inches long, lanceolate somewhat unequal at base, rounded or acute, tapering to a sharp or caudate-acuminate apex; entire, or "faintly crenate," smooth, bright green, pink when very young.

Flowers unisexual (generally dicœcious) appearing when the tree is leafless, small, greenish or pinkish yellow, on short stalks in "small clusters on elongated, slightly branched stellate-pubescent axillary panicles." Calyx 4-lobed, persistent, hairy. Petals 4, oblong-oval, longer than sepals. Stamens in males 8, inserted beneath and outside disk. Female stamens small and barren. Ovary large, 1-celled, smooth.

The Heart-wood, which is restricted in quantity, is reddish-brown or dull cedar-brown in colour, hard, close and suitable for wheel-spokes, window-frames and cabinet work. It was once used for scabbards. Weight about 48 lbs. per cubic foot.

Pores rather small, often duplicated or divided, evenly scattered.

Rays very fine, bending near the pores.

A gargle is made from a decoction of the bark, and is used for sore-throat, and also applied to sores.

A gelatinous gum exudes from the bark, which Gamble says is used by the Nepalese for paper sizing, and by weavers in cloth printing. He quotes a local authority for saying that the gum is also used, mixed with lime, for white-washing.

Fairly common in the dry and wet zones, up to 1,000 feet, and very often found as a fence plant.

Also India, the Andamans and Burma.

No. 180. **SEMECARPUS SUBPELTATA** I. p. 320.

Maha-Badulla, -S.

A rather tall erect tree, with pale smooth bark and cylindrical stem. Branches much leaf-scarred.

Leaves alternate, very large. 10-16 inches long, oblong or lanceolate oblong, "peltate at base," rounded at apex, and then suddenly acuminate, entire; stiff, thick, rich dark green above (coppery when very young) paler below.

Stipules absent. Petiole large, very stout, about 1½ inches long; Midrib very prominent below. Lat.-veins horizontal, variable combining with a marginal nerve running parallel with the margin.

Flowers rather small, (for characters of flower, see note at end of genus) pale creamy, easily detached from the long supporting panicles that appear both as axillary and from old wood. Fruit a drupe, much wider than deep, faintly corrugated or smooth.

Wood dull ashen white, rather loose-grained, soft, light and quickly decaying. Was in demand for Tea box manufacture; but is entirely unsuitable owing to the presence of a corrosive acid in the wood. An endemic species, found sparingly in the wet forests of the Western, Southern and Sabaragamuwa Provinces up to about 1,500 feet altitude.

No. 181. **S. CORIACEA** I. p. 321.

Badulla, S.

A rather tall even-stemmed erect tree with smooth pale bark. Branches and twigs thick at ends, scarred.

Leaves crowded at ends of twigs, about 4-7 inches long, oblong, much tapered to base, rounded or notched at the apex, entire, very stiff, glossy dark green.

Petiole about ½ inch (or less) thick; Midrib strong, prominent below; lat.-veins slightly oblique, curving within margin, prominent. Nerves distinct below.

Flowers large, ¾ inch diam., greenish white, in short stout, branched, faintly-hairy terminal panicles.

Fruit a small dumpy drupe, wider than deep, often mottled with dull brown spots.

Wood pale, nearly white, with a faint sickly odour when freshly sawn; very soft, quickly rotting, light.

An endemic hill species, and moderately common in Uva and Sabaragamuwa.

This is another of the undesirable tea-box woods, that have been used in that trade. Like the last, it contains an acid destructive to tea lead. The bark, when wounded, exudes a juice known to the Sinhalese as "Badullakiri," that has a blistering effect if it comes in contact with the skin. When the juice dries, it turns black, not unlike tar.

No. 182. **S. GARDNERI** I. p. 322.

Badulla, S.

A tallish slender tree with cylindrical stem. Bark greyish, distinctly marked with thin longitudinal grooves or furrows. Leaves large, narrowly oblong, or lanceolate oblong, "acute or slightly rounded at base," shortly acuminate at apex; entire, pliable, bright shining green above, dull below. Petiole rather long, 1½ inches stiff. Midrib very conspicuous below, wide. Lat.-veins horizontal, prominent. Nerves close, finely netted. Flowers of two sizes: males small; bisexual ones ½ inch diam., greenish-white, arranged in few-branched smooth long (8-12 inches) terminal and axillary panicles. Fruit about an inch in diam., bluntly pointed, seated in a cup-shaped "receptacle."

Wood pale pinkish white when freshly sawn, fading to a dull white, soft, loose-grained, light, quickly rotting. Used for tea-boxes, but quite unsuitable, and should be avoided for this purpose. Like the last, the wounded bark exudes a juice that blackens on drying, and is said to blister the skin.

An endemic species, common in our wet zone forests up to about 3,000 feet.

No. 183. **S. OBSCURA** I. p. 324.

Badulla, S.

I quote Trimen's description, as I have not met with the tree, which is our only dry zone example of the genus.

"A moderate-sized or large tree, glabrous throughout. Leaves rather crowded at ends of branches, 4 to 8 inches long, oblong or obvate-long, much tapering at base, rounded or obtuse or bluntly acuminate; coriaceous with a narrow cartilaginous margin, shining above. Petiole variable, $\frac{1}{4}$ to $\frac{3}{4}$ inch, or scarcely any; Lat.-veins nearly horizontal; intermediate reticulations prominent beneath.

Flowers $\frac{1}{8}$ inch, pale green. Panicles terminal, of male 4 to 8 inches, of bisexual much shorter, slender, much branched. Fruit a drupe $\frac{1}{2}$ to $\frac{3}{4}$ inch, ovoid, slightly compressed, more or less obliquely acuminate; receptacle $\frac{1}{4}$ to $\frac{3}{8}$ inch wide, cup-shaped."

I have no knowledge of the woods or its uses, but I regard it as probable that it is soft and likely to come into the "Teabox-wood class."

Note on the Genus.—Exclusive of varieties, the genus Semecarpus is represented by 13 species in Ceylon, all of which are endemic. In India, *S. Anacardium*, (Shen-kotti, *Tamil*) known as the "Marking Ink" tree, the unripe fruits of which are used for this purpose. The juice when dried is also made use of as a varnish. The seeds, known as "Malacca-beans" or "Marshnuts," are said to stimulate the mental powers!

Our forms have polygamous and diœcious flowers, of which the males are usually smaller. The Calyx is 5-lobed and deciduous. Petals 5. Stamens, 5. Ovary 1-celled, with a solitary pendulous ovule. The fruit is always seated in a more or less enlarged cup or receptable, sometimes coloured bright pink. Our members of this genus are mostly trees.

No. 184. **NOTHOPEGIA COLEBROOKIANA** I. p. 325.

Bala, S.

A moderate-sized tree with erect rather sharply buttressed stem. Bark thin, smooth, pale greyish-brown, often ashen. Branches straight, ending in slender irregularly clustered twigs. Leaves alternate, variable in size, 4 to 8 inches long,

narrowly ovate lanceolate, acute at base, tapering and suddenly acuminate at apex; entire; complete glabrous, rather stiff. Petiole about three-quarter inch, curved into an elongated S, pale. Midrib direct, stiff, prominent below, raised above. Lat.-veins many, nearly opposite, suddenly arching within margin. Rarely uniting. Intermediate lat.-veins distinct. Nerves parallel, inconspicuous above. Young leaves tinged with deep Roman purple, very beautiful and conspicuous. Flowers very small, greenish white, on exceedingly short stalks, arranged in short erect axillary racemes (longer in male flowered racemes). Calyx 4-lobed, persistent. Petals 4, oblong. Stamens 4. Ovary 1-celled, with one ovule. Fruit a small top-shaped purple drupe, about half inch long, sweet, said to be eaten.

Wood pale yellow, smooth, even-grained, heavy, but not durable. Used for posts, props, and scaffoldings, but I have not seen it sawn for structural work.

The bark contains an acrid pale juice that can be used as an invisible ink, which on drying becomes a permanent black. It is supposed to have been one of the "Secret Inks" of the ancients.

Occurs in the wet zone up into the hills, but nowhere very common, and generally found near streams. I have also found it in the dry country, in Lower Uva.

Also in the Western Ghats of India.

No. 185. **CAMPNOSPERMA ZEYLANICUM** I. p. 326.

Aridda, S.

A rather tall erect tree with cylindrical stem, low-buttressed, with wide spreading surface roots. Bark about half inch thick, smooth, pale or creamy white and compact. Twigs many, smooth, close. Leaves crowded at ends of twigs, more or less sub-opposite, variable in size, about 8 inches by 3½, narrowly elliptical, tapering at base, rounded, or abruptly surrounded or suddenly acute at apex, entire, margins sometimes incurved, glabrous, dark green above, pitted below with minute dots of stellate hair or scales. Petiol short, stiff, thick, rather woody. Midrib large, prominent below, depressed above. Lat.-veins about 20, horizontal, faint above, arching within the margin into a network. Intermediate lat.-veins distinct below, breaking up into branch veins.

Flowers small, bisexual, white or pale greenish white, short stalked, "in erect axillary spicate racemes." Calyx 3-lobed persistent, deeply divided. Petals 3, erect, triangular. Stamens 6.

Ovary 1-celled, with 1 ovule. Fruit a small drupe, ovate, pulpy, reddish or purple in colour, containing a small hard stone.

Wood rather hard, easily worked, smooth, fairly durable and light; weight about 34 lbs. per cubic foot. In great favor as a tea-box wood, for which it is well suited in all respects. Shortly after its introduction to the tea-box market, its popularity threatened to bring about the extermination of the species, and in consequence, many forests, where this tree was locally gregarious, became exhausted. It is unsuitable for structural work.

This is an endemic and occurs in the very wet forests of the Western, Southern, Central and Sabaragamuwa Provinces up to about 1,000 feet altitude, after which it is rare. It is usually found on poor soils, often in large masses.

No. 186. **SPONDIAS MANGIFERA** I. p. 327.

Embarella, S. Am-pallai, Kattuma, T. Hog-plum, E.

A small or middle-sized deciduous tree, with erect stem, and pale white smooth thick bark. Branch-ends smooth.

Leaves imparipinnate. Rachis long, about 12 inches, cylindrical, much enlarged at base, smooth or faintly grooved. Leaflets about 5 pairs and one terminal, pairs opposite or nearly so, on very short stalks, large, 3 to 6 inches long, oblong-oval, rounded (often unequal) at base, more or less suddenly acuminate at apex; entire; smooth, thin. Midrib prominent below. Lat.-veins many, pellucid, horizontal, connecting with a conspicuous intra-marginal vein. Flowers polygamous, small, about $\frac{1}{4}$ inch diam., light green tinged with pink, or white, on exceedingly short stalks, clustering on large erect pyramidal panicles, which appear when the tree is leafless. Calyx 5-lobed, *not* persistent. Petals 5, bent. Stamens 10. Disk lobed, large. Ovary seated in disk, 5-celled, with ovule in each. Fruit large, 2 inches, ovoid, smooth yellow, juicy, of a coarse acid flavour. The fruits are used for chutneys and jams.

Wood pale or light grey, very soft, perishable, light, about 26 lbs. per cubic foot, suitable for floating material. Pores very large, often divided, numerous. Rays pale, rather fine, uneven.

The fruit-pulp is used as an astringent for bilious dyspepsia, and as an anti-scorbutic. *Nadkarni* says, that by some it is considered that the fruits are an antidote for wounds caused by poisoned arrows. A thin gum obtained from the bark is insipid, and demulcent.

I suspect this plant to be an introduction, as it is generally found more or less established in gardens in the low-country. I am not acquainted with it as a forest plant.

Common in India.

Note on additions under this Order.

Of the introduced plants belonging to this family, the Mango is probably the most justly celebrated on account of its delicious fruits. The date of its introduction is unknown, but is probably of very early date. This species, generally spoken of as 'Amba' by the Sinhalese, and 'Manga' by the Tamil, has many cultivated varieties, distinguished by their varying shapes of fruit, which extend from a comparatively small roundly-pointed ovate drupe to the nearly spherical, and from the kidney-shaped to the long oval. These varieties are too numerous to record here. The wood of the mango is in much demand by furniture builders for lining, backing, and shelf-boards. Some years ago, previous to the introduction of the metal brake, mango-wood blocks were used by the Railway as being the most suitable material for this purpose.

The botanical name of the Mango is *Mangifera indica.*

The next most popular member of the order that has been brought to Ceylon is the Cashew-nut tree (*Anacardium occidentale*), which is probably of Portuguese introduction, and has now become so widespread as to be regarded by many as native here, though its indigenous home is South America. The Vernacular name "Kaju" is probably an adaptation of the Portuguese name (*Trimen*), the Brazilian being *Acajoba*, thus pointing to the place of the plant's origin.

Its well-known and much esteemed nuts are a favourite dessert, while the oil extracted therefrom, as well as from the pericarp, is of medicinal value.

The timber of the Kaju tree was at one time suggested as suitable for tea boxes; but apart from its other uses, the tree rarely attains a size sufficient for planking of any suitable width.

Kaju wood makes an exceedingly inferior fuel, though often offered for sale for that purpose.

Another introduction into Ceylon, and one that belongs to and the small order Moringeæ, is the familiar "Murunga" (*Moringa pterygosperma*) known to Europeans as the "Drum-stick" or "Horseradish tree." Like the Kaju, this is of very early introduction to this country, and probably of Indian origin, though the order with its limited species has affinities in Arabia and North African countries. Here, it is cultivated in

gardens, chiefly in the dry zone, for the sake of its long stick-like fruits which are much relished in curries. The roots rather resemble our European Horse-radish, and make a good substitute for it.

The seeds afford a fine bland oil, known as "Ben Oil" which is used as a lubricant for delicate mechanisms such as watches, and by perfumers for extracting the odours of flowers.

The leaves are said to be useful for wounds from dog-bites. The wood is not used.

POLYPETALAE CALYCIFLORAE.

XLIII. CONNARACAE.

A small order in Ceylon, represented by 3 Genera, viz.: 1. *Rourea*, 2. *Connarus* and 3. *Ellipanthus*, making 4 species in all, of which 2 are endemic. The endemics are *Connarus Championii*, and *Ellipanthus Thwaitesii*, neither of which has economic importance.

No. 187. **ROUREA SANTALOIDES** II. p. 1.

Kirindi-wel, S.

A scrambling, hardly erect, shrub, with slender branches. Bark rich purplish brown, pubescent at ends of shoots and on buds. Leaves imparipinnate, alternate. Rachis 4—6 inches long, slender, smooth, swelled at base. Leaflets about 3 pairs and 1 end one, on short stalks, opposite, or sub-opposite; about 2½—3 inches long, narrowly ovate, acute or rounded at base, tapering and acuminate at apex; entire, glabrous, glossy above.

Midrib prominent below, narrow above. Lat.-veins 6—8, oblique, arching within margin. Nerves and lateral-veins prominent below.

Flowers regular, about ¼ inch diam., white or faintly pinkish, on slender, kneed stalks, arranged in single or double erect, slender, racemose panicles. Calyx 5-lobed, segments "orbicular, glabrous." Petals 5, much longer than sepals, ovate and "spreading." Stamens 10, erect. Fruit a solitary follicle, and about 1 inch long, surrounded at the base by a leathery cup enclosing a single seed, surrounded by a small semi-solid yellowish aril.

The plant affords a strong rough cordage, used for tying fences, and sometimes for buffaloe-ropes.

Occurs in open land in the low-country up to 2,000 feet, but apparently not a forest plant.

No. 188. **CONNARUS MONOCARPUS** II. p. 2.

Radaliya, S. Chettupulu-kodi, T.

A low much-branched straggling bush, with many erect reddish-pubescent shoots.

Leaves alternate, imparipinnate. Rachis 2—4 inches, erect, swelled at base, pubescent, rather stiff. Leaflets 1 to 3 sub-opposite pairs and an end one, on short, stout, grooved stalks, about 2—3 inches long, ovate oblong, rounded, or slightly tapered at base, tapering to obtuse or acute apex; entire, rather glossy above, glabrous.

Midrib strongly pronounced below, distinct above, Lat.-veins about 5, nearly opposite, oblique, prominent below and clear above. Nerves not prominent.

Flowers rather small, about ⅓ inch diam., white, on much pubescent stalks, "crowded in erect irregularly pyramidal" terminal pubescent panicles. Calyx 5, lobes narrow, acute, densely pubescent. Petals 5, erect, much longer than sepals, faintly pubescent. Stamens 10, with 5 complete anthers and 5 "abortive." Ovary highly pubescent.

Fruit an erect follicle, irregularly elongated, conical and acute, brilliant red, exceedingly like a capsicum, about 2 inches long, containing a large solitary, shining, purplish-black seed covered at its base by a pulpy semi-solid yellow aril.

The bark and wood are used for ulcers and boils.

Occurs in both the dry and wet zones up to about 2,000 feet altitude, but only in open land.

Also in Western India.

XLIV. LEGUMINOSAE.

This vast order, of which examples are to be found practically all over the world, is represented in Ceylon by 64 Genera, and 207 species, excluding the domesticated importations. It is our second largest order—the Grasses having 240 species,—but is poor in endemics, these being only 12 in number.

The order divides itself into three great sub-divisions, viz.:

(*a*) PAPILIONACEÆ, with more or less winged flowers.

(*b*) CÆSALPINIEÆ, in which the upper petal is inside in bud.

(*c*) MIMOSEÆ, in which the flowers are more or less in a ball-like mass.

In the wood structure of the LEGUMINOSÆ the wood-fibres have simple, *not* bordered pits—a characteristic of importance where wood identification is concerned.

Another general characteristic of the order is, that in its larger forms, the heart-wood is, with few exceptions, dark. Gamble, in dealing with the woods of this order, makes seven distinct groups, basing his subdivisions on certain definite conditions under which the pores and rays dispose themselves, and their size and outline.

I have attempted to describe only those plants that are of economic use, and hence it will be observed that there are many gaps in the sequence of my descriptions. As I have already pointed out this work does not include plants that are of merely botanical interest.

Following the primary sub-divisions of the Order as given above, the PAPILIONACEÆ in Ceylon are represented by 47 genera, giving 159 species, of which 9 are endemic. These genera are: 1. *Rothia*, 2. *Heylandia*, 3. *Crotalaria*, 4. *Parochetus*, 5. *Indigofera*, 6. *Psoralea*, 7. *Mundulea*, 8. *Tephrosia*, 9. *Sesbania*, 10. *Zornia*, 11. *Stylosanthes*, 12. *Smithia*, 13. *Æschynomene*, 14. *Ormocarpum*, 15. *Eleiotis*, 16. *Pycnospora*, 17. *Pseudarthria*, 18. *Uraria*, 19. *Alyssicarpus*, 20. *Desmodium*, 21. *Abrus*, 22. *Shuteria*, 23. *Dumasia*, 24. *Glycine*, 25. *Teramnus*, 26. *Mucuna*, 27. *Erythrina*, 28. *Strongylodon*, 29. *Galactia*, 30. *Butea*, 31. *Canavalia*, 32. *Dioclea*, 33. *Phaseolus*, 34. *Vigna*, 35. *Clitoria*, 36. *Dolichos*, 37. *Atylosia*, 38. *Dunbaria*, 39. *Eirosema*, 40. *Rhynchosia*, 41. *Flemingia*, 42. *Dalbergia*, 43. *Pterocarpus*, 44. *Pongamia*, 45. *Derris*, 46. *Sophora* and 47. *Pericopsis*.

The species that of recent years have been introduced both as edible, ornamental, and manurial, are very considerable, but are not all added in the plants described by Trimen, and are here only alluded to in a supplement to my own descriptions.

No. 189. **CROTALARIA RETUSA** II. p. 15.

Kaha-andana-hiriya, *S.* *Kilukiluppai*, *T.*

A few-branched shrub, about 3-4 feet high, short pale stem and faintly pubescent branches and ends of shoots, otherwise glabrous. Leaves rather small, 1-3 inches, on short pubescent stalk, narrowly oblong, tapering to base, obtuse or notched at apex, glabrous above, finely pubescent below. Stipules very small.

Flowers about 1¼-1½ inch, rich canary-yellow, on curved pubescent stalks, in erect terminal racemes. Calyx smooth, tubular, "companulate segments, triangular, acute." Petals much produced beyond calyx tube, wings shorter than standard.

Stamens monadelphous (*i.e.* filaments uniting below into a sheath, leaving their ends free like the teeth of a comb). Style curved. Pod 1-2 inches, oblong-boat-shaped, with curved apex, smooth, green, rather horny. Seeds many. When dry, the pods become creamy, and rattle when shaken.

Fibre very tough, and probably might be much improved by cultivation.

Common in open land in dry and wet zones.

Also found in most tropical countries.

No. 190. **C. VERRUCOSA** II. p. 15.

Nil-andana-hiriya, S. Kilukiluppai, T.

Very much like the last, but differing in having quadrangular branches, deltoid leaves, and purple or bluish-purple flowers.

The leaves are said to be used for bowel complaints, in parts of the country.

Occurs in open places, more or less like a weed, in the dry and wet zone, but mostly at a low altitude. Tropics generally.

No. 191. **C. JUNCEA** II. p. 16.

Hana, S. San, or Sunn Hemp of Commerce.

An annual plant, about 4 to 5 feet high, with slender finely pubescent cylindrical stem. Branches rather few.

Leaves variable, 1-4 inches long, rather wide apart, narrowly lanceolate-oblong, acute at base, acute or sub-acute at apex, silvery, pubescent on both sides, entire (?) Petiole about ½ of an inch, stout. Stipules obscure, or none. Flowers large, about 1 inch, rich yellow, on long, bent, slender pubescent stalks, in erect terminal racemes.

Calyx pale-white, hairy, with deep lobes, and two small bracts. Corolla strongly papilionaceous. Pod about 1¼ inch long, cylindrical, or club-shaped, densely white-hairy, containing about 12 kidney-shaped seeds.

I have only found this plant in a cultivated form. It produces a fine strong fibre, locally in demand for making fishing nets.

The stems are light, pale brown-white, and after the removal of the bark appear to be highly inflammable, and might be useful for matches.

Planted in the North-Western Province and Jaffna.

No. 192 **C. STRIATA** II. p. 8.

A few-branched plant, 2 to 4 feet high; with young parts finely soft-pubescent. Branches rather long.

Leaves tri-foliolate. Leaflets 2 to 3 inches long, oval, tapering at base, rounded or finely tapered at apex, "apiculate," smooth above, sometimes glaucous or finely pubescent below; thin, entire. Petiole about three inches, thickened at base, pubescent. Stipules, none.

Flowers about one inch, many, yellow, with fine purplish veins, arranged in erect racemes, or terminating with the end of the plant, or branches. Standard much up-turned, narrow. Pod, about two inches or less, smooth, narrowly oblong, cylindrical, light brown, containing 20 to 30 dark brown seeds.

Now much valued as a green manure, and cultivated accordingly. In its natural state, it occurs in open land, and road-sides, up to 2,000 feet elevation.

Also in the tropics generally.

No. 193. **C. LABURNIFOLIA** II. p. 19.

Yak-beriya, S.

A plant about 3 to 4 feet high, erect, with smooth stem. Leaves tri-foliolate, nearly two inches long, oval, finely acute at base, obtuse at apex, with midrib extending beyond the end of the blade (mucrorate). Smooth leaflets on short stalks. Petiole about two inches; stipules, none.

Flowers about 1½ inch, distinct, pale yellow, with a purplish tinge along the keel, rather stiff, one inch; stalks, in long slender terminal racemes. Pod much inflated, oblong, about two inches long, rather horny. Seeds about 20.

The whole plant is said to be used for gargles for sore-throat, or inflammation of the mouth. Also in external application for sores.

Occurs in waste places in the low-country and often wrongly called "Andana-hiriya."

Also India and Malayan countries.

[The Genus *Indigofera* is well represented in Ceylon, no less than 16 species being recorded for the country, but none

are endemic. They are all herbs or small shrubs, mostly distributed in the Low-country, often abundant within restricted areas.]

The more important species are:—

No. 194. **INDIGOFERA ASPALATHOIDES** Vol. II. p. 23.

Rat-kohomba, S. Shivanarvempu, T.

A low, much-branched shrub, with spreading branches. Young branches or twigs covered with easily detached pure white hair, which when rubbed off discloses a smooth purplish bark below.

Leaves very small, crowded, leaflets about 5, or less, about 1-10 of an inch, narrowly oblong, dotted with a few white or silvery hairs, rather thick. Petiole scarcely visible, and veining inconspicuous.

Flowers solitary, dark pink, on slender stalks longer than leaves. Pod "about ½ inch," narrow, straight, light brown, with seeds in partitions.

It is of medicinal value; the young leaves and shoots being demulcent. According to *Nadkarni* the whole plant rubbed with butter is used for tumours, and the ashes serve to remove dandruff.

It is common in the dry country about Jaffna and Batticaloa, in sandy soils.

Trimen remarks that in this species the leaflets look like simple leaves in fascicles, thus differing from other members of the genus.

No. 195. **I. TINCTORIA** Vol. II. p. 26.

Nil-awari, S. Nilam, T. Indigo, E.

A shrub about 3 or 4 feet high, with many silvery twiggy branches that are slightly or much coated with fine hairs.

Leaves alternate, imparipinnate, from 1 to 2 inches long. Leaflets 5 to 10, opposite, and one terminal, narrowly oval-acute at base, rounded towards the apex, and ending in an apiculate tip; glabrous above, finely silvery hairy below. Petiole, very short. Midrib distinct above; lateral veins inconspicuous. Stipules small, narrow, slightly notched. The fresh leaves are bright green, but become a dull ashen grey on drying.

Flowers pink, small, arranged in short axillary, erect racemes. Calyx "very shallow, silvery-hairy." Pods narrow, straight, or slightly curved at apex, constricted round the enclosed seeds, which number about 8.

Probably introduced, and has become wild. Not uncommon, and occurs in the low dry country.

In the early part of the last century an attempt was made to start a business in Indigo in Ceylon, and a factory at Tangalla was contemplated by a Mr. J. Tranchell, who Bennett, in his "Ceylon and its Capabilities" describes as "a Swedish gentleman of great ability."

He proposed to Sir Ed. Barnes that a joint-stock company should be formed, and the plan was not only approved, but Barnes "consented to become the patron." Two thousand acres of land in the Tangalla district were to be used, but the scheme came to nothing. Tranchell died in 1828.

In Jaffna, the natives use the leaves of this plant for a dye. The plant is believed, according to *Kanny Lall Dey*, to be "a preventative of hydrophobia, administered internally in infusion, and the juice applied externally to the part bitten." The root, boiled in milk, is used as a purgative (*Nadkarni.*).

No. 196. **ÆSCHYNOMENE ASPERA** Vol. II. p. 38.

Maha-diya-Siyambala, S. Takke or Attuneddi, T. Pith-Plant or Sola Plant, E.

A sub-floating bush, with stout spongy stem, usually growing horizontally on the water of marshes, the stems turning up at ends.

Leaves pinnate, with rather long (5-inch) rachis, and very numerous minute leaflets of unequal lobes. The stipules are conspicuous, about ½ inch long, membraneous, rather harsh.

Flowers large, yellow, on hairy stalks, arranged in axillary corymbose panicles shorter than leaves." Calyx hairy, with lower lip divided into 3, and the upper rounded. Petals hairy. Pod rather long, straight, more or less jointed.

This plant affords the pith from which the well-known "Sola Topees" are made, and as this material is very spongy, it is sometimes used as a substitute for lint, in surgical cases.

Very common in the dry country, in Tanks.

No. 197. **ABRUS PRECATORIUS** Vol. II. p. 57.

Olinda-wel, S. Kuntumani, T. Crab's-eyes, or Indian Liquorice, E.

A slender twiner, with many stems, rarely of any considerable thickness. Leaves pinnate, on thin rachis of about 3 inches in length. Leaflets opposite, about 10 pairs, hardly overlapping, about ½ an inch, oval, rounded at base, faintly

obtuse, or sometimes slightly spiculate, glabrous, entire, on very short (one-sixteenth of an inch) stalks.

Midrib distinct below; lat.-veins hardly distinguishable.

Flowers small, pale violet, on short stalks, crowded on "knob-like branches." Keel longer than wings, curved. Stamens 9, forming a tube at base. Pod, about 1½ inches long, containing about 5 oval seeds that are of a brilliant scarlet colour, with a jet black top, the whole having an enamel surface.

The seeds are used as weights by native jewellers, but contain an acrid poison. Powdered, and injected under the skin, this poison has been used for secretly killing cattle. The active principle, 'Abrin,' is difficult to isolate, and hence poisoning by this means is not readily detected.

The plant has a number of medicinal uses. An extract from the root is used to relieve coughs; a solution prepared from the seed kernels, after prolonged maceration, is used, according to *Dey*, to produce purulent ophthalmia. The leaves, crushed, and reduced to an ointment, relieves local pain in swellings, and rheumatism, while a mild purgative is obtained from a preparation of the root.

Dr. G. Gunawardena, in speaking of the medicinal properties of this plant, remarks that the boiled seeds are tonic and aphrodisiac; raw seeds are poisonous, drastic purgative, and emetic. Roots are emetic, laxative, and anti-poisonous; leaves are stimulant.

The plant is fairly common, especially in the dry country. It occasionally occurs at altitudes from 1,000 to 2,000 feet in the western part of the Island.

The seeds weigh approximately 2 grains, and strung together, make handsome ornaments.

The true Spanish Liquorice is obtained from *Glycyrrhiza glabra*, another leguminous plant, but one that occurs in the warmer parts of Europe, and is unknown here in a wild state. It is famous as a remedy for coughs and sore-throat.

Dr. F. N. Windsor in his work on Indian Toxicology, referring to *Abrus precatorius* remarks, that "'Abrin' is destroyed in the stomach, and only acts as a poison when introduced endermically or hypodermically; and that a physiological test for its presence depends on the fact that a watery infusion will cause purulent ophthalmia."

This plant was at one time believed to be a foreteller of rain, and was hence called the "weather plant."

No. 198. **MUCUNA PRURIENS** Vol. II. p. 62.

Archariya-pala, S. Punaik-kali, T. Cowhage, or *Cowitch-plant, E.*

A stout twiner, with slender branching, young parts more or less hair-coated. Leaves large, 3-foliolate, with rachis about 5 inches long. Leaflets about 4 inches long, end one smallest, angular, oval. Lateral leaflets unequal, acute, finely hairy or pubescent above, densely silvery hairy below. Leaflet stalks short, hairy. Midrib prominent, and extending beyond apex (mucronate).

Flowers rather large, about 2-inches, dark purple, with a greenish yellow keel, usually in pairs or 3's, in long slender racemes. Bracts early falling, lanceolate, hairy. Calyx silky, lower segments considerably longer than upper.

Pod stout, about 3 inches, "with a longitudinal rib along the whole length of each valve, but without wings." More or less densely coated with pale orange bristle-like irritating hairs. Seeds in partitions, rather large, dull reddish brown, dotted and mottled with black spots.

The hairs on the seed pods mixed with honey afford a vermifuge, but being highly irritable, this remedy is attended with some danger. The seeds have been regarded as a nerve tonic, and the root is alleged to be useful in paralysis (*K. L. Dey*).

According to *Nadkarni*, the seed applied to the injured spot, is said to absorb the poison from a scorpion sting. It is also used in the preparation of aphrodisiacs. Dr. Gunawardana states that the root, made into a paste, is applied in dropsy.

The plant is moderately common in the dry zone in the east of Ceylon, and occurs near back-waters. It is found throughout the Tropics.

No. 199. **ERYTHRINA INDICA** Vol. II. p. 63.

Erabadu, S. Mullu-muruku, T.

Sometimes called the "Indian Coral tree." A large quick-growing tree, with thin smooth yellowish or greenish grey bark. Shoots with stellate hair. Twigs armed with black prickles, much leaf scarred.

Leaves deciduous, trifoliolate, on a long smooth rachis, without prickles, much swelled at base. Leaflets about 5 inches, round, or round-ovate, acute at apex, quite smooth on both

sides; bright green. Leaflet-stalk short, stout. Stipules absent (?) Midrib and lateral veins prominent below.

Flowers large, scarlet, with crimson wings, arranged in groups along a stout stiff raceme of nearly a foot in length. Calyx tubular, unevenly splitting. Petals unequal, with wings shorter than keel. Stamens united in clusters, projecting beyond the top of the flower. Pod cylindrical, terminating in a sharp beak; bark brown. Seeds up to 8, rather large.

Wood very light, about 18 lbs. per cubic foot, pale nearly bone-white. Pores very large, usually subdivided. Medullary rays short, or irregular. The timber is suitable only for small parcel-boxes.

Grown easily from cuttings and much cultivated for fences in gardens. Also useful as a shade tree, and a prop-plant for creepers.

It can hardly be called wild in Ceylon, being invariably found in or near occupied ground.

Occurs in India and Malaya, to Polynesia.

A white flowered variety of this species, according to *Nairne* is said to grow at Salsette.

Its medicinal purposes are stated to be many. The bark is antibilious, and is useful in ophthalmia.

The inner part of the bark, coated with ghee, and held over a flame, forms a fine soot, used for watery eyes. The leaf-juice is a vermifuge, and injected into the ear, affords relief in ear-ache.

Externally applied, the leaves relieve pains in the joints, and swellings. The bark and leaves contain the alkaloid "Erythrine," which is poisonous.

No. 200. **E. OVALIFOLIA** Vol. II. p. 64.

Yak-erabadu, S.

A medium sized tree, with short stem and wide-spreading branches. Bark dull creamy, over a skin of green, much studded with purple-black prickles, on raised oval bases. Branches very prickly, pinkish green at ends, and on shoots.

Leaves trifoliolate alternate, with rachis about 5 inches long, swelled at base, grooved above; armed with sharp pale-based prickles. One or more glandular nodules, or stipels, occur below the axil of the leaflet stalk. Leaflets opposite, terminal one longest; ovate oblong, more or less acute at base, rounded or shortly abrupt at apex, entire; margin reflexed, thin, white below, dull green above. Midrib of leaflet prominent below,

distinct above, studded with a few, or many, erect, black-tipped spines. Lat.-veins about 7, first pair basal, arched, obscurely fading into margin; sometimes spinous. Stipules small, scale-like; early falling. Flowers large, with crimson standard and purple wings and keel, arranged as in the last.

Two bracts occur just below the calyx, which latter when in bud, ends in a curved apex.

Pod on short stalk, about 10 inches long, cylindrical, finely downy. Seeds about 10, divided by partitions, black.

Wood very soft, quickly decomposing, much like last in structure; not used.

Rather common near streams in the dry zone.

Occurs in Bengal, Burma, Malay Archipelago, and Polynesia.

The well-known "Dadap" (*E. lithosperma*)—a native of Java, and widely cultivated in Ceylon as a Green Manure, is another member of this genus.

A second introduction, the "Bois immortelle" (*E. umbrosa*) is a native of Tropical South America, and is used as a shade tree for Cocoa. It was introduced in 1881, and has become a common plant in Matale, Dumbara, and elsewhere where Cocoa flourishes.

No. 201. **BUTEA FRONDOSA** (Vol. II. p. 66.

Gas-Kela, S. Parasu, T. Parasang in the N.C.P.

A small tree with bent irregular stem and branching. Bark very thick, greyish, detaching in flakes. Young parts and shoots highly pubescent.

Leaves large, three-foliolate. Rachis about 8 inches, dilated at base, highly pubescent when young. Leaflets variable in size, about 6 inches, often up to 10 inches long, (the terminal one being the largest) broadly ovoid or rhomboidal, obtuse at apex, stiff. Midrib very prominent, Lat.-veins and nerves conspicuous below, more or less tomentose, according to maturity.

Flowers, large, orange or scarlet, white when in bud, silky outside, arranged in axillary or terminal racemes and appearing before the leaves. Pod stiff, about 8 inches long, pubescent and distinctly veined. Seed large, solitary, oval, flat, of a brownish colour.

Wood about 38 lbs. per cubic foot, dull, white, soft. Pores large. Rays pale, broad.

The bark exudes a rich gum, known as "Bengal Kino" in India, which is rich in tannic and gallic acids, and is a most powerful astringent. The seeds are laxative, and reduced into a paste afford a remedy for ringworm. The flowers yield a yellow dye. The wood makes a charcoal that possesses decolorising properties.

This handsome-flowered tree is confined to the dry country, and is found in "talawa lands" in Lower Uva, where it is subgregarious. Occurs in parts of the Eastern, Northern and North-Central Provinces.

No. 202. **DALBERGIA LANCEOLARIA** Vol. II. p. 88.
Bol-mara, S. Veluruvai, Kugala-Vargai (local E.P. name), T.

A tall erect tree, slightly buttressed at base. Bark smooth, ashen grey, rather thick, brown when cut. Branches scanty, rather short. Twigs cylindrical, greyish, smooth. Leaves pinnate, alternate. Rachis about 6 inches, dilated at base. Leaflets about 7 or 8 pair, alternate, about 1½ inches by ⅞ inches oblong-ovate, rounded or sub-acute at base, obtuse or emarginate at apex, entire, glabrous above, slightly glaucous below attached by stalks about ⅓ of an inch long. Midrib prominent below, lat.-veins about eight, pellucid, inconspicuous.

Flowers small, pale violet with brownish-purple calyx, very numerous, in short axillary panicles on small stalks. Calyx-tube hairy, and divided into lanceolate segments, of which the lowest is the longest. Stamens in two masses of 5. Pod about 2½ inches, straight, greenish, flat, and strongly nerved. Seeds often solitary or up to four in number, enclosed in waxy matter, (sometimes absent), oval or kidney-shaped, flat.

Wood pale, has no heart-wood, moderately hard, suitable for packing cases, but not durable. Weight (according to *Gamble*) 33 to 44 lbs. per cubic foot. He—Gamble—says that the pores are scanty, large and moderate sized, often oval and subdivided, very prominent on longitudinal section. Rays fine, numerous, regularly distributed, joined by very fine short white bars.

The timber is not much used in Ceylon, owing to its undurability, but according to *Beddome*, is useful for building purposes.

It occurs in the dry country in the East and North of Ceylon. I have met with it in the Hambantota District, where the name of *Bol-mara* is applied to it, to distinguish it from the *Albizzia*—"Mara."

Occurs in India, from Ajmere to Behar.

No. 203. **PTEROCARPUS MARSUPIUM** Vol. II. p. 90

Gammalu, S. Venkai, T. Indian Kino, E.

A large tree, with wide spreading branches, but usually crooked in the stem. Bark thick, greyish, or yellowish-grey. Young parts smooth. Leaves pinnate, without stipules. Rachis about 4 inches, smooth, dilated at base, cylindrical. Leaflets about 6, alternate (on stalks about ⅓ of an inch long) 2 to 3½ inches, tapering or acute at base, emarginate or bilobed at apex, glabrous, glossy above, finely soft-hairy when very young. Midrib prominent below. Lat.-veins distinct, parallel, numerous, intermediate nerves distinct.

Flowers about two-third of an inch in diam., on short stalks, bright yellow (or white) arranged in lax terminal panicles.

Calyx with short unequal velvety segments. Petals with claws and crinkled margins, stamens 10, with the sheath deeply 2-fid. Bracts small, deciduous. Pod about one inch, much curved, and lined with a stiff veined wing.

Seed solitary, small, kidney-shaped.

Wood (heart-wood) dark brown, streaked with darker shades; very hard and durable. Weight about 56 lbs. per cubic foot. Pores moderately large, evenly scattered, simple, or subdivided. Rays very fine, indistinct, close.

The wood is very suitable for buildings, door or window frames, and for furniture; takes a very fine polish, but owing to the presence of gum is liable to "spot."

The gum known as "Kino" (not to be confounded with that obtained from *Butea frondosa*) is in use in the European and American pharmacopœias, and is obtained by incision of the bark. It contains a special tannin called "Kino-tannic acid," that is powerfully astringent, and is used in cases of diarrhœa. In its raw state, the gum assumes a dark red colour, in glistening fragments of a peculiarly astringent taste.

The distribution of this plant in Ceylon is peculiar. It affects "Talawa" lands, almost gregariously in places, in Lower Uva, and it also occurs in grassy lands near Nawalapitiya. But for the difficulty in getting it in long pieces, it would be one of our best building timbers.

No. 204. **PONGAMIA GLABRA** Vol. II p. 91.

Magul Karanda, S. Punku, T.

A moderately large tree. Bark smooth, grey, or greenish grey. Leaves imparipinnate, large; rachis about 4-5 inches

long. Leaflets from 2 to 4 pairs, and one end one, rather large, about 4 or 5 inches, lanceolate, or oval, tapering at base, acute at apex, glabrous, glossy, thin, entire. Stalks thick, midrib and lat.-veins fine. Flowers nearly 1 inch, pink, with a greenish tinge (sometimes very pale) with purplish calyx, arranged in axillary racemes, often in pairs. Calyx campanulate in shape. Petals much extended beyond calyx, with broad slandard. Stamens 10, with one filament free at the base, remainder monadelphous. Pod hard and woody, much flattened, with one seed within.

The genus is monotypic.

Wood pale, yellowish white, rather light, 42 lbs. per cubic foot, not durable, and very liable to boring insects. In Lower Bengal the timber is used for oil-mills but I am unaware of its being employed in Ceylon.

The seeds give a yellowish-brown oil, of bitter flavour, known as "Hongay-oil", that possesses antiseptic and cleansing properties. It is used in skin diseases. Mixed with lime-juice in equal parts, an embrocation for rheumatism is made from it.

The seed is also made into a meal, or oil-cake, known as "Hoongay cake" that is used as a manure. It contains about 3 per cent. of Nitrogen. (*Wagner*).

This plant is widely distributed in Ceylon up to about 2,000 feet altitude, flourishing by the sides of rivers and streams. It is frequently to be found growing near tanks in the dry zone.

Occurs throughout the tropical parts of Asia, and extends to North Australia, and the Fiji Islands.

No. 205. **DERRIS ULIGINOSA** Vol. II. p. 92.

Kala-wel, S.

A large powerful climber with stem 2 to 3 inches in diameter. Bark dull dark grey, studded with lenticels. Leaves imparipinnate; rachis about 4 inches, stout. Leaflets up to three pairs and end one, rather large, from 2 to 3 inches; ovate-oval, rounded at base, obtuse or bluntly acuminate at apex, entire, glabrous, thick. Midrib rather stout, minor reticulation close, fine. Flowers often occuring on old wood, rather small, pink, on short stalks in simple racemes.

Calyx "finely pilose truncate with obscure segments; stamens monadelphous, or diadelphous" (*Trimen*). Pod obliquely oval or almost orbicular, shortly pointed, glabrous, and veined. Seed about half-an-inch, flat kidney-shaped.

The stem is fibrous, and affords an excellent substitute for string. A fish poison is obtained from the stem, by crushing it, and introducing the fragments into "Fish Kraals."

Common in the dry country, especially near streams and rivers.

Also in India, tropical China, Northern Australia and Madagascar.

No. 206. **PERICOPSIS MOONIANA** Vol. II p. 97. XXX

Nedun, *S.* Often wrongly pronounced *Nandun*.

A very large handsome tree, with rather short erect trunk and large branches. Bark pale, with a faint pinkish-brown tinge, flaking off in thin scales. In very old trees the bark is greyish, or greyish-brown.

Leaves pinnate, large, of a curiously offensive odour when crushed. Rachis up to 10 inches in length, stout, smooth, dilated at base. Leaflets 3 to 4 pairs, about 3 inches long, alternately placed, on short stalks; oval or ovate, rounded at base, acuminate at apex, entire, smooth, shining above, pale below.

Flowers about 1 inch, deep purple, or purplish-black, arranged in terminal and axillary panicles.

Calyx with deep segments. Petals equal, keel 'slightly coherent.' Stamens 10, free. Stigma, small. Pod 5—6 inches, pale brown, or creamy, with darker stains, veiny, distinctly pointed at apex, containing up to 6 seeds (often abortive). Seeds dull orange, ½ an inch in diam., smooth, flat.

Wood a rich vandyke brown colour closely inter-mixed with markings of a darker shade, often in most erratic outline, giving the whole an exceedingly handsome appearance. Takes a very fine polish, cuts clean, and turns easily. Very durable.

Weight about 70 lbs. per cubic foot. Pores moderately large, often divided, fimbriated, sometimes in short strings or clusters. Rays very thin, pale, close, direct. Annular rings indistinct.

This magnificent timber is in great favour for furniture, but it is doubtful if the supply can keep pace with the demand, unless steps are taken to prevent extermination. The species is peculiar to Ceylon, and confined to a comparatively small area in the country.

It occurs up the valley of the Kaluganga and its branches, and again in the watershed of the Ginganga and Nilweli Ganga, but rarely above 1,000 feet altitude. It is easily grown from seed but does not flourish away from water.

It probably was once moderately common in the wet zone, till its value as a furniture wood was appreciated, and it is much to be desired that efforts should be made in planting it up in suitable localities. It is moderately quick growing, but requires attention in removing superfluous branches, in order to improve the stem, as its tendency is to branch freely.

The largest specimens of *Nedun* that I have seen, grew at Niriella, in the Ratnapura District, some being as large as 12 feet in circumference at 6 feet from the ground.

The species is confined to Ceylon, and the genus is monotypic. This is all the more reason why it should be more carefully preserved, and plantations of it extended.

CAESALPINIEAE.

The second great division of the LEGUNIMOSÆ is the *Cæsalpinieae*, of which the following are the Ceylon genera:

48. *Cæsalpinia*, 49, *Peltophorum*, 50. *Mezoneurum*, 51. *Cassia*, 52. *Cynometra*, 53. *Dialium*, 54. *Crudia*, 55. *Saraca*, 56. *Humboldtia*, and 57. *Bauhinia*.

In their flower structure, the petals are usually rather unequal, the upper one being within the bud. The stamens are distinct, and usually 10 in number.

No. 207. **CAESALPINIA BONDUC** Vol. II. p. 98.

Kumburu-wel, S. Punaikkalaichchi, T.

Note.—The identification of this species appears to be somewhat confused. I have therefore compared Trimen's description with that of Brandis, and where either differ from my own notes, I quote the authority adopted.

A wide-spreading scrambling bush, rarely erect. Stems dull, green at ends, slightly striate in young wood; horribly prickly. Leaves bipinnate, large; main rachis about 20 inches in largest leaves, cylindrical, prickly below, with a solitary erect spinous thorn between each pair of laterals; finely stellate-pubescent, of a golden chestnut tint.

Laterals leaf-branches, opposite, about 8 pairs, armed with prickles.

Leaflets opposite, about 8 pairs, 1¼ inches long (largest) oblong, or oval oblong, rounded or acute or mucronate at apex, entire, sparcely hairy above, distantly pubescent below, and on margins.

Leaflet-stalks very short, golden pubescent. Midrib thin, pubescent on both sides, prominent below. Lat.-veins faintly prominent above, arching within margin. Stipules large, foliar, often very leaf-like, "cut into large segments" (*Brandis*) "with expanded flattened base" (*Trimen*).

Flowers moderate-sized; yellow, in many-flowered axillary racemes. "Bracts linear-lanceolate, spreading, longer than buds" (*Brandis*). "Flower-stalk as long as calyx" (*Trimen*). Racemes shortly stalked. Petals clawed, upper smallest. Stamens 10, filaments rusty tomentose. Pod on short stalk, coriaceous, very strongly spinous, about 3 inches long by 1½ wide, ovoid, slightly beaked. Seeds large, ovoid, or nearly spherical, from 1 to 2 in each pod, very hard, pale grey when dry. "Lead-coloured, shining" (*Brandis*).

The seeds (sometimes made into buttons), are used in native medicine, and are supposed to contain valuable properties that are effective in fevers.

With alum and roasted arecanut, a dentifrice is made from the seeds, useful in gum-boils, and an oil from the seeds is used as an embrocation.

The tender leaves, boiled with castor oil, are said to relieve glandular swellings. The root is also used in various remedies for nervous complaints, and is regarded as a tonic.

Fairly common in the dry zone, near the sea, but not in forest land.

Occurs in India, Malaya, the West Indies, and Polynesia.

Allied to the foregoing is *C. Sappan*, or SAPPAN WOOD (the *Pattangi* of the Sinhalese) which is better known as a dye-wood. It is an introduction of very early date into Ceylon, and was at one time largely exported from this country, but owing to the discovery of chemical dyes, the trade at the present day is small; but this notwithstanding, our exports of Sappan in 1922 amounted to 9,758 cwts. valued at Rs. 11,147, falling in 1929 to 1,222 cwts. valued at Rs. 7,335.

Gamble states that Sappan wood takes a fine polish, and does not warp or crack. He gives the weight at 60 lbs. per cubic foot, and adds that the pores are isolated, and enclosed in narrow rings.

The ornamental *Peacock flower*, (C. PULCHERRIMA so well-known in gardens, is another member of this genus.

Divi-divi (C. CORIARIA), a valuable tan plant, is another introduced species into Ceylon. It is a native of Central America and the West Indies, and has been cultivated here

for the pods which are rich in tannin. According to *Mac millan*, the yield is from 40 to 80 lbs. per tree annually, and the value in England from £9 to 11 per ton. Taking the maximum value at £11 per ton, and the pound sterling at Rs. 15, and allowing that the plants are spaced at 32 feet, the yield per acre amounts to 1,640 lbs. as a maximum, worth, also at a maximum, Rs. 121.25 per acre, from which must be deducted the working expenses and transport charges.

Divi-divi was cultivated in the Batticaloa district in coconut land, some years ago, but apparently it has not proved an attractive enterprise.

PELTOPHORUM FERRUGINEUM

No. 208. II. p. 101. Pl. XXXII

Iya-Vakai, T.

A tall erect handsome tree. Bark greyish or dull brownish-grey, ends of shoots and branches coated with soft tomentum. Leaves abruptly bipinnate, large, with the main rachis up to a foot in length, dilated at base, and grooved above, rusty pubescent. Laterals variable in number, and about 4 inches in length. Leaflets about 12 pair, on very short stalks, about ½ to 1 inch in length, oblong, but unequal sided, rather stiff. Midrib rusty pubescent below. Stipules small, quickly falling.

Flowers large, very handsome, golden yellow, slightly scented, arranged in large erect terminal and axillary panicles coated with sticky pubesce. Flower stalk "shorter than calyx." Calyx cut to about half way, sub-equal. Petals large, crisped with "hair on the claw and back." Stamens 10. Stigma large. Pod nearly three inches long, tapering at base, "obtuse or sub-acute at apex," reddish-brown, longitudinally veined, winged. Seed greyish, small, flat or compressed.

I have not seen the wood of this plant made use of as a timber. It is apparently an excellent fuel tree and easily grown, but is subject to attack from large boring grubs (*Hyposidra*).

Occurs in the eastern dry zone. I have found it wild, in some abundance, near the coast North of Valaichenai in the Eastern Province. It is now much planted as an ornamental tree.

Also found in the Andamans, Malay Peninsula and North Australia.

No. 209. **CASSIA FISTULA** Vol. II. p. 103.

Ehala, S. Tirrukonal, Kavani, T. Indian Laburnum, E.

An erect slender tree of moderate size. Bark greyish brown, often tinged with red brown in very old trees. Branches and twigs leaf-scarred. Leaves alternate, pinnate on rachis, of 8 to 12 inches long. Rachis suddenly dilated at base. Leaflets opposite, about 7 pairs of which the terminal pair is the largest. Above 4½ by 1¾ inches, narrowly oval, acute at base, tapering to a broadly acute apex, entire, glabrous and shining above, faintly and distantly hairy below. Leaf-stalk about a quarter inch, wrinkled. Midrib slender, prominent below, distinct above. Lat.-veins many, thin, irregular, pellucid, very oblique. Nerves many, closely netted. Leaflet margins pellucid. Stipules minute, bristle-like.

Flowers large, about 2 inches rich pale-yellow arranged in "very long, stalked, lax, pendulous axillary racemes."

Bracts lanceolate, early falling. Petals large, veined, concave. "Three lowest stamens with very long doubly curved filaments," ten in all. "Four lateral stamens with short straight filaments and versatile anthers, opening by pores at base." Pod often 2½ feet long but averaging 15 inches, cylindrical, nearly straight and rod-like, hanging by short stalks; hard, purplish black outside, containing up to 100 seeds in narrow partitions, the seed being imbedded in a brown waxy pulp. Seeds black, or orange brown, ovoid, about one-third inch, horny.

The pulp that surrounds the seeds is a mild laxative and is used in medicine. It is also used as an ingredient with Senna. In native medicine, the leaves ground into a paste are used for ringworm; tender leaves, boiled, are used as a purgative; a decoction made from the flowers is used in stomach trouble; and the bark as a tonic.

The wood is (unfortunately) small, but makes most excellent and durable posts and rafters. Weight about 60 lbs. per cubic foot, dark red, often grained with brown.

Pores rather small, uniform, evenly distributed. Annular rings very faint, in thin concentric circles. Rays bent, fine, numerous.

Abundant in the dry zone as a forest tree, and easily distinguished by its handsome yellow flowers and long pendulous seed-pods. Sometimes found in gardens under cultivation.

Occurs in Southern India, China and Malaya.

No. 210. **C. MARGINATA** Vol. II. p. 104.

Ratu-wa, S. Vakai, T.

A small but very shapely tree, with wide-spreading drooping branches. Bark brown, longitudinally fissured. Young parts tomentose.

Leaves large, main rachis about 10 inches, slender, grooved above.—Leaflets 10 to 15 pair, on short stalks, about 1 inch, unequally bladed at base, oblong, "emarginate and apiculate at apex; glabrous above, pubescent below." Stipules large, pubescent; early falling.

Flowers under 1 inch, salmon-pink on pubescent stalks "in close pedunculate supra-axillary racemes."

Calyx silky, with 2 longer segments longer than remainder.

Pod about 1 foot, cylindrical, nearly one inch in diam., with numerous seeds in partitions. Seeds brown, about ⅓ of an inch, flat, hard.

Wood pale brown, indistinctly grained, hard, close, durable, about 60 lbs. per cubic foot in weight.

"Pores moderate-sized and large, joined by narrow undulating, irregular, white bands of soft tissue" (*Gamble.*)

Very suitable for posts for building, but rarely obtainable in much length.

Common in the dry zone round Ceylon. In the Southern portion of the Eastern Province it attains its largest size.

Also in South India.

NOTE:—It will be noted that in the foregoing two species of this genus, the pods are cylindrical. The remaining species are flat-podded.

No. 211. **C. OCCIDETALIS** Vol. II. p. 105.

Peni-tora, S. Ponnantakarai, T. Negro Coffee, E.

A plant from a foot to 3 feet high, woody at base, rather widely branched. Young parts smooth, stained with a purplish tinge.

Leaves alternate; rachis about 7 inches, swelled at base, with a conspicuous beadlike dark gland near the base. Rachis grooved above, faintly hairy within the groove. Leaflets opposite, 5 pairs, the last longest, 1 to 3 inches, ovate-oblong, or narrowly oblong, rounded at base, finely attenuate at apex, blades in terminal pair unevenly lobed at base; margins finely hairy. Smooth above, under-surface faintly glaucous. Stipules

large, acuminate, early falling. Midrib of leaflet prominent below, slightly nodulous, tinged with purple at the base. Lat.-veins about 6, arching below margin.

Flowers about 1¼ inches, rich orange-yellow, on stalks about half the width of the flower, in 2's or 3's in the leaf axils. Calyx segments nearly glabrous. Stamens 10, of which 7 carry perfect or fertile anthers, and 3 are barren and erect.

Pod about 4 inches long, "compressed between the seeds," bluntly pointed. Seeds about 30 hard, horny, glossy, of olive-green colour.

The seeds have been used as a substitute for Coffee, and this fact was first made known by Dr. Livingstone, who found it cultivated in the interior of Africa.

The leaves and roots are purgative; the former, applied externally, being also used for itch and ringworm, owing to the presence of chrysophanic acid in their composition.

An exceedingly common weed in open places in the low-country, often growing gregariously.

No. 212. **C. SOPHERA** Vol. II. p. 105.

Uru-tora, S. Takarai, T. Senna Cassia, E.

A large bush with semi-erect stem, and few wide branches. Bark dull smoke-brown, leaf scarred. Branches green at ends, smooth.

Leaves alternate, abruptly pinnate. Rachis 14 to 24 inches long, broadly channelled above, interrupted at the nodes, much swelled at base, dull orange, faintly pubescent when young; provided with a large solitary gland, as in last.

Leaflets large, about 13 pairs or more, up to 5 inches long, oblong, unevenly lobed at base, obtuse or faintly mucronate at apex; shortly stalked, glabrous, faintly glaucous below. Midrib direct, prominent below, distinct above. Lat.-veins about 15, broadly curving within margin. Stipules forming a pair of stiff scale-like acute pointed sheaths, that appear to attract ants. Leaflets conspicuously close at nightfall.

Flowers about 1 inch, yellow, or orange yellow, clustering at the apex of a long, stiff, axillary raceme. Pods 4 inches, stout, stiff "with very numerous small seeds separated by partitions."

The young leaf or flower buds, crushed and reduced to a moist paste, is a valuable remedy for mange in horses or dogs. It is said to be an expectorant.

A fairly common weed in damp open ground, and abandoned Owitta lands.

Occurs throughout the Tropics.

No. 213. **C. TORA** Vol. II. p. 106.

Peti-tora, E. Tagarai, T. The Foetid Cassia, E.

A small herb up to 2 feet high, with spreading branches. Rachis about 2 to 3 ins. long, grooved above, faintly pubescent, with a gland between the nodes of the first pair of leaflets. Leaflets about three pairs opposite, from ¾ to 1½ inches long (end pair largest), tapering unequally at base, rather top-shaped, apiculate, smooth above, finely soft-hairy below, thin; stipules, long, rather stiff.

Flowers about or under 1 inch in diam., orange yellow, arranged in ones or twos, in the leaf axils, on their slender stalk. Calyx smooth with two segments predominating. Two upper petals 2-lobed, rest entire; stamens 10, the barren ones, minute. Pod rather large, six inches long, straplike, "quadrangular" with many seeds, lightly partitioned. Seeds brown, not compressed, hard, scurfy.

The seeds and leaves posses chrysophanic acid in their composition, and consequently they are useful for outward application in ring-worm.

When bruised, the whole plant is oppressively foetid in odour, so that preparations made from the leaves are not popular, though effective.

An exceedingly common weed in the Low-country in both wet and dry zones.

No. 214. **C. AURICULATA** Vol. II. p. 106, Pl. XXXIII.

Ranawara, S. Avary, T. Tanner's Cassia, E.

A bush or small tree, with brownish smooth bark. Young twigs spotted with lenticels.

Leaves rather crowded at ends of branches. Rachis about 5 to 6 inches, slightly dilated at base, channelled above, pubescent, with a gland between each pair of leaflets. Leaflets up to 12 pair, opposite, nearly oblong, about 1 to 1¼ in. by 7-16, uneven at base, rounded or emarginate at apex, mucronate, entire, glabrous; dull green above, pale below. Midrib with a few hairs on under-side. Lat.-veins 6, arching to and uniting below margin. Leaflet-stalk about 1-16, hairy.

Stipules large, auriculate, "reniform—rotund" terminating in a narrow tail-like claw, strongly nerved.

Flowers large, about 2 inches in diam., yellow, in axillary racemes crowding at branch ends.

Pod 3 to 4 inches long, about 1 inch wide; papery, convexed over the enclosed seed, dull leather-brown, often barren. Seeds about 20, or fewer.

The wood is not used as a timber, but is suitable for handles for small tools. The bark is rich in tannin, and is exported for that purpose in considerable quantities. The seeds with their testa and kernels are finely powdered and blown into the eyes for conjunctivitis. The flowers and leaves, according to *Dr. Gunawardana* are made into a Tea, that is prescribed in Diabetes. The leaves, infused, make a decoction that I have seen the village people in the dry country drink as a remedy for fever. It is also sometimes called "Matara Tea," under which title Trimen refers to it.

Very abundant throughout the dry-zone, and quite a common plant near the coast.

Also common in the Deccan. Extensively used in India for tanning and dyeing.

No. 215. **C. SIAMEA** Vol. II. p. 104.

Wa, Aramana, S. Vakai, T.

A small tree with close crown. Bark dull dark brown, sometimes blended with dark grey. Young parts smooth, freckled with lenticels.

Leaves alternate; rachis variable in length, about 13 inches, swelled at base, channelled above with interruptions at the nodes. Leaflets 11 or 12 pair, (6 in. to 10 *Trimen*) of which the first pair is the smallest, the largest being about 3¼ by 1 inch, narrowly lanceolate, arched and acute, or rounded at base, abruptly rounded at apex, shortly mucronate, entire; margins thickened, and tinged with yellow; dark green, and glabrous above, paler and finely hairy below. Leaflet-stalk about ⅜ of an inch, faintly grooved. Midrib conspicuous below, depressed above, yellowish. Lat.-veins numerous, fine, slightly raised above. Stipules small spike-like, early falling.

Flowers about 1½ inches diam., pale yellow, on soft stalks "crowded at ends of stout pedunculate axillary and terminal corymbose racemes or panicles, the whole forming together a very large pyramidal terminal inflorescence" Calyx pubescent. Petals, clawed, distinct. Stamens two, long and fertile, 8 much

shorter, and infertile. Pod 8 to 13 inches long, by half-an-inch wide, thickened along the "back," tapering to base, beaked at apex; usually purplish brown on one side, and greenish on the other. Seeds 10 to 15, flat.

Wood about 62 lbs. to the cubic foot, very handsome heart wood, dark brown mottled with cream colour. Makes very handsome tops to small tables, or panels for cabinets. Takes a fine polish, durable.

Affords a splendid fuel, and was at one time in great demand for firewood for the railway.

The wood structure, according to Gamble, shows that the pores are large and moderate sized, joined by concentric, light-coloured wavy bands of soft tissue, which alternate with black belts of firm texture, in which the fine, light-coloured uniform and equidistant medullary rays are prominent.

Moderately (once commonly) distributed in the Valley of the Maha Oya, and the Kurunegala district, but owing to its popularity as a fuel has now become scarce. Rarely found above 2,000 ft. alt.

Occurs in Siam, probably indigenous in Burma, and Malay Peninsula, and cultivated in India.

No. 216. **C. TIMORIENSIS** Vol. II. p. 104.

A small tree, or slender stemmed bush, rapidly dividing into many irregularly distributed branches. Bark pale ashen-brown. Young shoots and branch-ends finely pubescent.

Leaves alternate, pinnate. Rachis variable in length, about 9 inches, swelled at base, grooved above, reddish-brown, densely pubescent, slender, drooping.

Leaflets on short finely pubescent stalks, about 18 pairs, 1¾ inches long by ⅝ inch, oblong, rounded at base, arched to apex, mucronate, entire, silky-hairy on both sides, margins slightly thickened. Midrib thick, densely silky hairy below, inconspicuous above. Lat.-veins about 8, sub-opposite, much arched and lost in minor marginal reticulation. Stipules ¾ inch, narrow, acute, pubescent, orange red.

The wood, according to *Gamble* from a Ceylon specimen, weighed 57 lbs. per cubic foot. He describes it as dark brown, nearly black, and of similar structure to *C. Siamea;* and that it is used in Ceylon for buildings and furniture; but I am very sceptical about this, and suspect that a wrongly named sample got into the Ceylon collection that *Gamble* took his data from.

From my own observations I find this plant to be very rare, occuring only in parts of the Western Province and Western Sabaragamuwa, and rarely more than a slender bush.

I include it here for further study by botanists, and verification as to timber.

Occurs in Burmah, Malaya, Philippines and Northern Australia.

Note.—The Generic named *Cassia* as given here, is not to be confounded with the 'Cassia' of scripture, which is a Cinnamon.

No. 217. **CYNOMETRA RAMIFLORA** Vol. II. p. 111.

Gal-mendora, Opulu, S. Attukadupuli, T.

A small slender-stemmed tree, with smooth brownish bark. Branches drooping.

Leaves forming twin leaflets, attached at their bases, to a short, thick, subwoody rachis, about ¼ inch long.

Leaflets 5 to 6 inches, lanceolate, or linear-lanceolate, very unequally bladed, tapering to a fine suddenly obtuse apex; completely glabrous and entire. Midrib stout; lat.-veins and nerves distinct, but not prominent. Flowers small, white, on slender stalks, in corymbose or short racemes, axillary, or from axils of fallen leaves. Calyx cut to base, glabrous; petals 5, lanceolate; stamens 10, spreading, much longer than petals. Pod about 1 inch, roughly wrinkled, fleshy, dull-rusty in colour.

Wood hard, close, red. Said to produce a purple dye. I am unacquainted with the timber, which is said to be used in house building in the Sundarabans.

Rather rare. Occurs near streams in the dry zone.

Also in India, Malaya, and Andamana. The 'Nam-nam' (*C. caulifora*) is an introduction from Malaya to this country, and is occasionally found in gardens in the Western Province. It produces a fruit that is eaten, but is not very palatable. The fruit is also pickled.

MacMillan says that the flat seeds yield a medicinal oil.

No. 218. **DIALIUM OVOIDEUM** Vol. II. p. 112.

Gal-siyambala (lit. Rock Tamarind) S.
Kaddupulli, T. Velvet Tamarind, E.

A moderately large tree, with pale brown or light reddish-grey bark. Branches, slender, smooth.

Leaves rather small, imparipinnate. Rachis from 2 to 3 inches, thin, cylindrical, smooth. Leaflets 2 pairs, and a

terminal one, alternate, about 1 inch, on short stalks, lanceolate or ovate, "round at base, bluntly acuminate," dark glossy green.

Flowers very small, white, arranged in erect many forked "pyramidal terminal panicles." Flowerstalks short. Calyx deeply cut, segments lanceolate, finely ciliate. Petals absent. Stamens 2, with large anthers; ovary with 2 ovules. Pod nearly an inch in diameter, and nearly round, densely coated with velvety brown hair. Seed solitary, coated with a fine spongy matter of a sweetish-acid flavor.

The wood is very hard, dark-red, strong and handsome, according to Trimen.

This plant is curiously distributed. I have found it at Moneragalla in Uva, and on the summit of "Westminster Abbey," and Trimen records it from east of Kandy. It is endemic. Its ally, *D. Guineense*, is the "Velvet Tamarind" of Sierra Leone. A Brazilian species (*D. floribundum*), with fruits as big as a marble, differs from our form by containing two seeds, instead of one. It, too, is esteemed for its fruit.

No. 219. **SARACA INDICA** Vol. II. p. 144.

Diya-ratmal, Diya-ratambala, Ankaranda, S. Asogam, T. The Asoka tree, E.

A moderately large tree with spreading branches. Bark reddish, or reddish grey, furrowed.

Leaves abruptly pinnate, large, on straight-spreading rachis. Rachis about 9 inches, stout, "corky and flexible at base." Leaflets wide apart, about 6 pairs, large, about 9 inches long, by 1½ wide, linear, much tapered to apex, stiff, smooth, entire, attached to rachis by short swelled stalks. Dark green when old, very pale apple-green when young. Stipules about ½ an inch, ovate, rigid, shedding soon after the leaf hardens.

Flowers when newly-opened are yellow, changing to orange, and ultimately to red; about 1 inch in diam., very sweet scented, arranged in dense corymbs, both axillary, and terminal.

Calyx petaloid, with tube divided into 4 oval segments. Petals, absent. Stamens with long filaments "inserted on a fleshy lobed ring at the mouth of the calyx-tube." Ovary pubescent; style short. Pod about 9 inches by 2, tapering at both ends, leathery, veined, containing two or three ovoid seeds.

Wood reddish brown, about 58 lbs. per cubic foot, rather soft, not durable. Pores, small. Rays "indistinct crossed by numerous fine, wavy, concentric lines." (*Gamble.*)

The bark is astringent, and used by Indian medical practitioners, especially in hæmorrhagia. (*Dey*).

Dr. Gunawardana states that the flowers pounded and mixed with water are useful in hæmorrhagic dysentery.

Not every common in a wild state. Occurs by streams in the intermediate zone, and the confines of the dry country up to 1,000 feet. "Is cultivated for its beauty and sweet scent."

Occurs in Malaya, India and Burma.

No. 220. **TAMARINDUS INDICA** Vol. II. p. 114.

Siyambala, S. Puli, T. Tamarind, E.

A very large and beautiful tree, with rather short convoluted stem, and wide-spreading branches.

Bark rather thick, brownish, or dark grey, fissured with longitudinal and horizontal cracks. Leaves, alternate, pinnate, on rather small rachis. Leaflets about 10 to 15 pairs. Flowers small, yellowish, veined with purple, arranged in lax terminal racemes, with 10 to 15 flowers in each. Calyx divided into 4 segments. Petals 3, unequal, the two lower being minute, and scale-like. Three perfect stamens, with their filaments joined in the middle. Pod about 4 inches, thick, stout, greyish or rusty, filled with acid pulp, traversed by stringy fibre. Seeds about ½ an inch, brown, shining, hard, somewhat compressed.

Wood pale near the rind, becoming yellowish, streaked with brownish red, often in curious patterns. Hard, close smooth, capable of taking a very fine polish; Weight from 70 to 80 lbs. per cubic foot.

In very old trees the heartwood is often streaked and blotched with irregular patches and blotches of black, in cloudy masses, adding much to the beauty of the wood when made into panels or furniture, for which purpose the timber of this tree is in considerable demand. It is very durable and insect proof.—Pores rather small, solitary, or in groups, surrounded with minute patches of soft tissue, "which are often confluent, forming irregular and oblique bands" (*Gamble*). Rays, numerous, fine. Annular rings hardly distinguishable.

The fruits of this well-known plant, made up into large dome-like masses are to be found in nearly every bazaar, as the pleasant acid enters largely into the diet of the people. It is officinal in the British Pharmacopæa. The pulp contains cream of tartar, tartaric, citric, and acetic acid, combined with a trace of malic acid. The quantity of Tamarind imported into Ceylon from India in 1929, amounted to 63,486 cwts., valued at 392,000 rupees.

The fruit-pulp is cooling, laxative, and carminative, and is largely used in home medicine. It is also of use in the prevention of scurvy. The powdered seeds are astringent, and mixed with gum, makes a strong cement. The ash from the bark is reputed to be digestive.

This very handsome tree is cultivated in Ceylon up to about 2,000 feet altitude, but is more plentiful in dry districts than wet. It is slow growing, but attains an immense size.

Widely distributed in the tropical world. Supposed to be indigenous in Africa.

The famous "White Man's Tree" at Cottiar, where Robert Knox and his father were supposed to have been captured, (though this is not strictly correct) is a Tamarind. In 1906 I measured this historical plant, and found it to be approximately 85 feet high, 104 feet from end of the longest branch on one side to end of the longest on the other, *i.e.* between extreme perpendiculars, and 32 feet 9 inches in girth, at 5 feet above the ground.

The centre of this great tree is probably quite hollow, and within the last few years many of its largest branches have died, and have been removed.

At the foot of the tree is a stone tablet, erected by Sir S. M. Burrows, on which is the following inscription:

THIS IS THE WHITE MAN'S TREE UNDER WHICH ROBERT KNOX WAS CAPTURED A.D. 1659.

No. 221. **HUMBOLDTIA LAURIFOLIA** Vol. II. p. 115.
Gal-karanda, S.

A small tree, but more often a bush, with drooping branches. Bark dark greyish-brown, rather thin.

The branches are almost invariably hollow, the pith being destroyed by ants which occupy the tube-like cavity, so formed.

Leaves alternate, pinnate, Rachis about 6 inches long, cylindrical, swelled at base. Leaflets about 5 pairs, on short stalks, rather large, 2 to 4 inches, ovate, unequal at base, entire, glabrous, dark green, very pale when young. Stipules very large, deeply cleft, forming two erect stiff, pointed blades.

Flowers nearly 1 inch, white, with pinkish calyx, slightly scented, on short pubescent stalks, in erect axillary racemes about 5 inches long. Bracts greenish, persistent. Calyx-segments 5, thin, recurved. Petals 5, "clawed, spreading." Stamens 5,

often less, inserted at the mouth of the calyx-tube, erect, much longer than petals. Style, long. Pod large, about 4 inches long, pointed, smooth, rather flat.

Wood greyish-white, hard, close, but rarely of any large size. Suitable for posts, and warrachchies; fairly durable.

Common in the wet forests up to 2,000 feet, especially in the Ratnapura District.

Also occurs in South India.

No. 222. **BAUHINIA RACEMOSA** Vol. II. p. 116.

Mayila, S. Atti, T.

A smallish deciduous tree, with rather stout stem. Bark, dark brown, much fissured, rough.

Leaves bilobed, about 1½ inches long, wider than long, forming two broad ovals joined by the midrib, thus making a butterfly-shaped leaf; glabrous, entire, paler below than above; strongly 9-nerved from the base, with fine intermediate netted nerving. Petiole nearly as long as division between leaf-lobes, slender, pale.

Flowers rather small, white, or faintly yellowish on short stalks, in loose erect terminal racemes. Calyx 'reflexed, 2 or 3-toothed at end.' Petals 5, narrow, acute, wide-spreading. Stamens 10, longer than the petals. Style, none. Pod long, about 10 inches, blunt, smooth, leathery, hanging. Seeds up to 20.

Wood light brown, darkening towards centre, hard, but not durable. Weight about 50 lbs. per cubic foot.

Pores radial, small. 'Narrow white irregular bands of softer tissue alternate with darker bands in which the very numerous, fine, uniform and equi-distant medullary rays are distinctly visible.' (*Gamble.*)

The tough bark is used for making coarse rope, and can be used as tinder, as it burns slowly.

This is supposed to be an unlucky tree, and therefore should not be used in house building!

Very common in the dry zone; often much browsed on by elephants.

Of this genus we have in cultivated form, several species with extremely beautiful flowers, such as *B. triandra* or Mountain Ebony, with pink and purple flowers. *B. candida*, with white flowers; *B. anguina* with curious flattened snake-like stems, with small white flowers in long racemes; *B. purpurea*, with its large deep pink flowers.

No. 223. **B. TOMENTOSA** Vol. II. p. 116.

Petan, Kaha-Petan, S. Tiruvatti, T.

A slender erect bush, rarely more than 12 feet high. Bark pale brownish, or yellowish, grey, furrowed. Young parts purplish. Leaves alternate, 1½-2 inches long, bi-lobed at apex, uniting for 2/3 of length; base broad, almost round; apex of lobes hardly ovate; dark apple green above, dull green below; entire; glabrous above, hairy on nerves and veins below. Lobes prominently 3-veined, with rather few thin oblique lat.-veins, prominent below. Petiole, ¾-1 inch, thin, shallowly channelled above, dilated at both ends, rather hairy, green. Stipules very narrow, claw-like, early falling.

Flowers large, rich yellow, with deep narrow spot at base. Peduncle short, finely hairy. Bracts narrow, calyx large, pubescent, finely veined, and tinged on margin with dark purple. Style long. Pod about 6 inches, narrow, pubescent; seeds, bright, ovoid, about 12 or less.

The plant is anti-dysenteric, the buds and dry leaves being used. The seeds according to *Nadkarni* made into a paste with vinegar is efficacious in wounds caused by poisonous animals.

I suspect the plant to be a mere introduction here, as it is not found in a wild state.

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§ 3. MIMOSEÆ.

The third great division of the *Leguminosæ*—the sub-order MIMOSEÆ—is divided into the following genera, viz.:—

58, *Neptunia*. 59, *Entada*. 60, *Adenanthera*. 61, *Dichrostachys*. 62, *Acacia*. 63, *Albizzia* and 64, *Pithecolobium*, thus concluding the whole of this great and important order.

No. 224. **ENTADA SCANDENS** Vol. II. p. 119.

Pus-wel, S. Gilla Nuts, E.

A very large powerful climber, often growing to an extraordinary length, frequently much twisted into spiral lengths. Bark brownish, often very rough near the base with nodules.

Leaf bipinnate; main rachis about 10 inches, dividing into a prehensile bifid tendril, by which it climbs. Secondary leaf-branches (*pinnæ*) 2 to 3 pair, about 3 inches long, with enlarged base. Leaflets about 4 pair, up to 2 inches long, ovate, or oblong, tapering at base, more or less rounded at apex, entire, smooth, darker above than below, with prominent lat.-veins.

Flowers small, pale greenish white, on very short stalks, crowded "in long, narrow, peduculate axillary spikes 6—10 in. long." Pods very large, pendulous, straight or curved, often 3 feet long by 3 inches wide; woody, brown, compressed between the seeds. Seeds very large, from 1½ to 2½ inches in diameter, rich glossy purple-brown, hard, and durable, suitable for wax vesta boxes.

The stem, cut into short lengths, and pounded with a wooden mallet, affords an excellent fibrous string, not unlike "gunny," suitable for binding creeping plants to stakes.

The seeds contain *Saponin*, and are used as an emetic. The juice of the stem is said to be a fish poison.

The seeds are water-carried, and in this way are transported to great distances. I picked up a seed of this species on the shore of a small uninhabited Maldivian island in perfect condition.

Very common in both dry and wet zones, up to 2,000 ft. Also in India and the tropics.

No. 225. **ADENANTHERA PAVONINA** Vol. II. p. 120.

Maditiya, Manchardi, S. Arnai-Kundumani, T. Bead tree, E.

A moderately tall erect tree with cylindrical even stem. Bark smooth, pale brown or greyish, young parts smooth, dull green.

Leaves large, alternate, bipinnate. Main richis 12 to 15 inches long, much swelled at base, furrowed above, stout. Laterals, opposite or sub-opposite, bronzed, also dilated at base. Leaflets rather distant, alternate, about 4 pairs, rather large, about 2 inches, ovate-oblong, unequally lobed at base, rounded at both ends, very slightly apiculate or mucronate, entire, nearly glabrous, sparsely dotted with fine hair below, margins faintly thickened. Petiole about ⅛ slender minutely wrinkled. Midrib thin, prominent below, inconspicuous above. Lat.-veins about 8, hair-like, arching, and mingling with finer nerves within margin. Stipules absent.

Flowers small, greenish white, on short horizontal stalks, arranged in axillary spicate racemes, much shorter than the main leaf rachis. Calyx faintly lobed; Petals 5, equal, slightly attached at base. Stamens 10, as long as petals; "Anthers with an ovoid gland on summit."

Pod about 8 inches, tapering at base, smooth, pale brown, Seeds about 10 in each pod, nearly ½ an inch in diam., round,

hard, brilliant glossy scarlet, shining; used by gold and silver-smiths for weights, each seed being approximately 4 grains in weight.

Wood pinkish brown, close, easily worked, and affords an excellent fuel. Weight about 41 lbs. per cubic foot. Pores small, in radial lines. Rays very numerous, fine. Dr. Foxworthy says that it is used for house building and for cabinet work, and that a yellow or brownish dye is obtained from its wood.

Mounted in silver, the seeds make handsome necklaces, and similar ornaments. The pounded seed, mixed with borax, affords an adhesive.

A very useful shade tree, easily grown, and coppices well. Worth attention for fuel for estates.

Commonly found in gardens, in the west of Ceylon.

Also India, Malaya and Philippines.

No. 226. **A. BICOLOR** Vol. II. p. 120. Pl. XXXIV.

Mas-mora, Kankumala, S.

A small or medium-sized tree, irregularly branched, with rather large dense crown. Bark dull brown, or reddish, frequently scaling off in flakes. Branchlets slender, reddish, olivaceous in tender shoots.

Leaves alternate, bipinnate, main rachis about 9 inches, much swelled below. Lateral branches (pinnae) opposite, in 3 pairs, the last being longest. Leaflets alternate, about 4 on one side, and 3 on the other, variable in size, the largest leaflets being about 1½ inches long, ovate, sub-acute at base, becoming shortly acuminate at apex, entire or sinnate, glabrous, faintly glaucous below. Stalks about ⅛ of an inch. Midrib prominent below, depressed above. Lat.—Veins 6, opposite or nearly opposite, distinct below. Stipules, none. The young shoots when first open are strongly tinged with rose-pink, or purplish.

Flowers small, about ¾ of an inch, pale greenish pink with dull yellow anthers, arranged in axillary, spicate, many flowered erect racemes. Pod about 5 inches, usually much spirally twisted, thin, much compressed round seeds, rather papery.—Seeds about ½ an inch long or less, ovate or round, bright red below, glossy black over the upper half.

After shedding the seeds, the pods, which at this stage are deep chocolate brown outside, twist up into contorted spirals, exposing a yellowish glossy interior.

Wood moderately hard, but rarely of any large size; little used. Suitable for packing cases.

Occurs sparingly in the wet forests in the west and south of the Island.

Also found in Malacca.

No. 227. **DICHROSTACHYS CINEREA** Vol. II. p. 121.

Andara, S. Vidattal, T.

A bush or small tree, with spinous branchlets.

Bark yellowish, or pale yellowish brown, fibrous, furrowed longitudinally, rather thin. Leaves abruptly pinnate, small. Rachis about 1½ inches, thin, with a minute gland at the base of each lateral. Leaflets minute, about 20 pair, each about ⅛ of an inch, close, sessile, very narrow, sub-acute at apex.

Flowers like miniature Japanese lanterns, drooping, the flowers in each spike being divided into fertile and infertile masses, upper and lower respectively, and these yellow and magenta-pink, the yellow colored ones being fertile.

Pod about 2½ inches long, very narrow, smooth, brown.

The wood is intensely hard and tough, but unfortunately never much thicker than a man's arm; dark red; close; weight about 70 lbs. per cubic foot. Pores small; rays short, rather broad. An excellent wood for tool handles, tent pegs, and sticks.

Common only in the dry country at low altitude, and easily recognised by its curious and beautiful little tassel-like flower. Also Central India and the Deccan, Tropical Africa and North Australia.

ACACIA.

For convenience of easy identification I subjoin the following key to tho genus as represented in Ceylon.

(i) Trees or Shrubs.

(*a*) *Flowers* in compact axillary heads.
Pod much constricted.
Spines, ½ to 2 in. *Leaflets* 12 to 15 pair, ½ to ¾ in..... *A. arabica.*

Pod not constricted cylindrical.
Spines 1 inch, thin. *Leaflets* 10 to 12 pair, ⅛ in..... *A. planifrons.*

Pod flat, or compressed between seeds.
Spines 1 to 2 in. *Leaflets* 5 to 8 pair glabrous..... *A. eburnea.*

Spines 3½ ins. *Leaflets* 8 to 16 pair tomentose.....

A. tomentosa.

(*b*) *Flower* heads in panicles.

Spines small. *Leaflets* 15 to 20 pair, $\frac{1}{8}$ to $\frac{1}{4}$ in.....
A. leucophloea.

(*c*) *Flowers* in spikes.

Spines, small, hooked. *Leaflets* 20 to 30 pair $\frac{1}{8}$ in.....
A. Sundra.

Spines, small, straight, twin. *Leaflets* 15 to 20 pair.....
A. ferruginea.

(ii) CLIMBERS.

Prickles, decurved. *Leaflets* 10 to 20 pair, $\frac{1}{2}$ in.....
A. caesia.

Prickles, straight. Leaflets 40 to 50 pair $\frac{1}{8}$ inch.....
A. pennata.

No. 228. **A. ARABICA** Vol. II. p. 122.

Karuvel, T. Babul of India, Gum Arabic, E.

I quote from Trimen and Brandis, as I have not seen this rare tree in Ceylon.

A shrub or small tree, with straight branchlets, young parts pubescent. Leaves small, rachis 2 to $2\frac{1}{2}$ in. pubescent. Spines variable, from small to 2 inches, slender, spreading white. Pinnae 3 to 5 pair, 1 to $1\frac{1}{4}$ in. Leaflets 12 to 15 pair, half of an inch, strap shaped.

Flowers in dense globular heads, 2 to 5 together from the axils, creamy. Pod 4 to 6 inches, straight, 8 to 12 seeded, strongly constricted between the seeds. Seeds densely covered with fine grey down.

Sap-wood large, pale; heartwood, pinkish white, turning reddish brown on exposure; hard, mottled with dark streaks. Weight 50 to 56 lbs. per cubic foot, used in India for wheels, oil presses, rice-pounders, and tool handles; very durable. Pores sometimes large, oval and subdivided. Rays fine, short, numerous (*Gamble.*)

The bark is astringent and is used for dyeing and tanning. Unripe pods are used for making ink, also used for folder. The gum is darker than that of the true Gum Arabic, but not very inferior as an adhesive.

This plant is recorded from Jaffna and Trincomalee as apparently wild, but probably introduced. It belongs to Africa, and occurs in Egypt, Arabia, Scind and the Northern Deccan.

No. 229. **A. PLANIFRONS** Vol. II. p. 123. Pl. XXXV.

Odai, Udai, T. Umbrella tree, E.

A small erect tree, with flat crown, from which it gets its English name. Bark thick pale or dull ashen grey, smooth. See key for leaves. Spines widely spreading, very acute, nearly white tipped with a brown point, often, mixed with short recurved thorn-like ones. Flowers small, pale creamy white in dense round heads, on thin slender stalks. Pod about 2 in., cylindrical, much bent round, smooth.

Affords a most excellent fuel. Branches are used for fences. Wood hard, yellow and close.

Common and abundant at Mannar, and eastward towards Murungan. Perhaps might be regarded as so gregarious as to be considered the dominating species at Mannar. Largely exported to South India for fuel.

No. 230. **A. EBURNEA** Vol. II. p. 124.

Gini-andara, S. Udai-vel, Kaludai, T.
Cockspur Thorn, E.

A bush or small tree, with many brownish-purple barked branches, rarely growing to any size.

For leaves, see key. Stipular spines, straight, formidable, often 3 inches long, finely pointed, white.

Flowers in dense spherical heads, rich deep yellow, on a slender stalk, with bracts about midway.

Pod about 4 inches long, curved, pointed, "compressed between the seeds," distinctly veined. Seeds about 8 or 10.

Wood very hard, close, pale yellowish, but never of any large size. Weight 52 lbs. (*Gamble*); suitable for small tool handles.

Abundant between Puttalam and Mannar, and in the South, in the Hambantota District. Also in India and Arabia.

No. 231. **A. TOMENTOSA** Vol. II. p. 124.

Anaimulli, T. Elephant Thorn, Jungle Nail, E.

A bush with immense spines. Bark dull yellowish grey, spotted with lenticels and becoming dull purple along the twigs. Young parts 'tomentose.'

The spines are often over 3 inches long, varying in colour from grey to soot-black, very finely pointed, finely pubescent when young. Leaves as in key.

Flowers about ½ an inch in diam., in a ball-like head, white. Pod very much bent, about 5 inches long, blunt, glabrous with age, at first pubescent, dull copper-red. Seeds olive green, ovoid, nearly ½ an inch, about 6 in number.

Wood little used, except for rude fences to keep off cattle and wild animals. Hard, close, heavy; of a pale brown colour.

Uncommon. Occurs only in the very dry country. Also India and Java.

No. 232. **A. LEUCOPHLŒA** Vol. II. p. 125.

Maha-andara, Katu-andara, S. Vel-vel, Velam, T.

A deciduous tree, large with contorted stem. Bark thick, very rough, light brown, or yellowish, dark in very old trees. Branches forming a dense spreading crown. Young parts pubescent.

Spines straight, small. Leaves as in key. Rachis marked with a small flat reddish gland, placed at the junction of the pinnæ.

Flowers-heads small, spherical, about one-third of an inch in diam., bright soft yellow, numerous on densely pubescent stalks in terminal tomentose panicles.

Pod very narrow, about 5 inches long, pendulous, nearly straight, densely tomentose. Seeds small, many.

Wood hard, red-brown streaked with shades of light and dark brown. Weight (Indian) 50 to 59 lbs. per cubic foot. Pores rather small, in patches; rays pale, fine, "often slightly bent."

I have not seen the wood used in Ceylon for timber, but according to Dr. Foxworthy it is liable to insect attack. It makes an excellent fuel.

The bark is used in arrack distillation, and also as a dye, and for tanning. It "also affords a coarse fibre."

Fairly abundant in the dry country, in the North of Ceylon. I have met with it in the Hambantota district, but in no great quantity.

Also Punjab, Central and South India, and Burma.

No. 233. **A. SUNDRA** Vol. II. p. 125.

Possibly identical with A. Catechu.
Rat-kihiri, S. Kodali-murunkai, T.

A smallish tree with dark brown bark. Young wood smooth, purple.

Leaf rachis about 5 inches, "with large sessile glands between the bases of each pair of pinnæ" grooved above, and with prickles (sometimes without) below. Pinnae about 1½ inches, "9 to 18" pairs. Spines small, black, hooked, sometimes absent. See key for leaflets.

Flowers small, yellowish, or tinged with pink, on very short stems, on erect axillary spikes of 3 to 4 inches in length. Pod, thin, 4 to 5 inches long, narrow, nearly straight, tapering at base and apex, dark brown, distinctly veined, smooth or compressed between seeds.

Seeds compresed, about six, pale greenish, oval.

According to Brandis in *A. Catecu* the rachis is covered with spreading hair, whereas in *Sundra* the rachis is glabrous.

I am unacquainted with the wood, and quote from Trimen, who says it is red, extremely hard, and bitter.

Uncommon, recorded from the country between Mannar and Vavuniya, and also found by Thwaites in the dry country east of Balangoda. I found it—or what I take to be identical—near Kataragama.

Also in India from Nepal to Sikkim.

Of our climbing *Acacias*, *A caesia* (*"Hinguru," S.*) is exceedingly common in the dry and intermediate zones, up to about 2,000 feet altitude. This abominably thorny climber often covers quite large pieces of ground with an impenetrable thorny mass, that defies the movements of large animals and man alike.

A decoction made from the root is said to be useful in cattle murrain.

A. pennata is a less, dense bushy creeper than the last, and easily distinguished by its feather-like leaves. It occurs in the dry and intermediate zones, up to 2,000 feet, but is not very abundant.

Of the important tan-producing *Acacias* the following species have been introduced into Ceylon.

(i) *A. dealbata* or "Sliver Wattle." An Australian species with yellow scented flowers, much grown around Nuwara Eliya.

(ii) *A. cultiformis*, or "knife-leaved Acacia." A large yellow-flowered bush.

(iii) *A. decurrens*, or "Black Wattle." A large tree now common at Hakgalla and Nuwara Eliya. Yellow flowered, and with minute seeds.

(iv) *A. pycnantha*, or "Golden Wattle." A smallish tree with flowers in dense masses, and rich bark.

Though much has been done towards the cultivation of these valued plants they have not been worked on a really large scale in Ceylon, as a commercial enterprise. It is possible that much of the patna land in Uva might be planted up with wattle, both as a source of tan supply, and secondarily as fuel.

No. 234. **ALBIZZIA LEBBEK** Vol. II. p. 128.

Mara, S. Kona, Vakai, T. Indian Walnut, E.

A tree with rather short or moderate stem, and large crown of wide spreading branches. Bark pale or greyish. Smaller branches and twigs grey, with few large lenticels.

Leaves alternate large, erect, swelled at base, and bearing a large scar-like depressed gland close to the swollen end; rachis about 9 inches long. Laterals in two pairs, each abruptly pinnate. Leaflets 5 or 6 pairs, 1¼ inch long, oblong, nearly rhomboidal, abruptly rounded at base, obtuse or emarginate at apex, unequally bladed, entire, glabrous above, and glossy green, margined with pale yellow; glaucous, ashen and faintly hairy below. Petioles 1-16 of an inch. Midrib prominent. Lat.-veins about 5, arching within margin. Nerves indistinct.

Flowers nearly one inch long, pale greenish white, in solitary or 1 to 4 clusters in a corymbose terminal panicle. Flower stalks slender, lax.

Calyx smooth, shortly-notched, tubular. Corolla much longer than calyx, "connate half way up." Stamens in a cluster about 1 inch long, many. Pod large, straw-yellow, or faintly greenish, about 7 inches long, by 2; oblong, strongly margined, flat, conspicuously veined, tapering at base, rounded at apex, papery inside.

Seeds about 12 or less, flat, oval, distantly placed.

Wood fairly hard; heart wood dark-brown, with paler or darker streaks. Sapwood pale yellowish white.

Pores few, large, frequently subdivided. Rays very fine, numerous.

Weight (recorded by *Gamble*) 42 lbs. per cubic foot.

Timber suitable for cabinet work, and used in house building. Seasons well, and free from cracks.

Not common. Occurs in the Trincomalee District, and parts of the North-Central Province.

Occurs in India, and Africa; planted in Egypt.

No. 235. **A. ODORATISSIMA** Vol. II. p. 129.

Huri, Suriya-mara, S. Ponnai-murankai, T. also Karu-vagai.

A large tree, with rather short trunk, and many erect spreading branches. Bark yellowish grey, rough, paler on branches. Twigs cylindrical, somewhat compressed and pubescent at ends. Leaves alternate, rather irregularly arranged. Main rachis about 4—6 in. long, with a large oval gland near the base, and one below the terminal pair of laterals. Laterals 3 or 4 pairs, opposite, or sub-opposite, finely hairy. Leaflets up to 16 pairs, about $\frac{7}{8}$ of an inch long, on very short stalks, oblong, rounded at base, shortly apiculate, unequally bladed, finely-hairy below, entire; dark green above, paler below, midrib and lat.-veins inconspicuous above, distinct below. Stipules, small, hairy.

Flower heads about $\frac{1}{2}$ an inch, white, very sweet-scented. Flowers on pubescent stalks, 3 or 4 together in terminal panicles. Calyx segments shallowly cut, densely pubescent; Corolla in 4 lobes, pubescent; Stamens many, much produced beyond petals.—Pod about 5 or 7 inches long, by one inch or more wide, on short stalk rounded at end, veined, tomentose when unripe. Seeds flat, small, 6 or 10. Sap-wood pale; heart-wood umber-brown, fading into creamy yellow, sometimes dark-brown, very handsome, and takes a fine polish. Moderately hard, durable, about 56 lbs. per cubic foot. In much favour for furniture making. Suitable for doors, panels and cabinet work. Pores large, evenly distributed, often double, enclosed in narrow tissue. Rays wavy, short, fine. Exudes a reddish gum, from the bark.

Moderately common in the dry and intermediate zones, up to 1,500 feet altitude.

Also in India, Burma and Malacca.

No. 236. **A. STIPULATA** Vol. II. p. 129.

Mara, Hulan-mara, Kabal-mara, S. The 'Saw' Tree, 'Indian Rosewood,' E.

A large rather, slender, tree with an uneven crown. Bark grey, fairly smooth, finely pubescent at ends of young branches. Lenticels many in young wood.

Leaves large, alternate; main rachis about 7 inches, with a prominent gland near base, and a smaller gland between each pair of laterals. Rachis enlarged at base, finely but sparsely hairy. Laterals from 10 to 15 pairs, first pair shortest, terminal pair longest.

Leaflets small, about ¼ to ½ an inch long, from 20 to 40 pairs, oblong, rounded at base, abruptly pointed at apex, unequally bladed, entire, margins finely ciliate. Petiole extremely short, midrib rather prominent below. The whole leaf when young is exceedingly beautiful in its golden-yellow colour, and dark rachis.

Stipules very large, foliar, completely enclosing the young leaf when in bud, dark red, or pinkish orange.

The plant can be readily distinguished by these remarkable stipules alone.

Flowers on short stalks, white, with pink and white stamens, scented, arranged in (1—4 together) rather small terminal or axillary panicles. Calyx tubular, obscurely toothed.—Corolla lobes acute, recurved; Stamens indefinite, much longer than corolla, filaments stained pink half way. Pods about 8 inches long, shortly stalked, flat, tapered at base, rounded or blunt at apex, brown.

Seeds 10 or 12, flat, horny.

Sapwood considerable, pale, soft. Heartwood dark brown, tinged with shades of deep Vandyke brown, very handsome; takes a fine polish and is insect-proof. Weight about 42 lbs. per cubic foot. Pores rather large, often subdivided. Rays short, fine. Annual rings more or less clearly defined.

A fine cabinet wood, and has been used for tea boxes. Suitable for ornamental frames for pictures, table-tops, and panels.

According to Gamble, it gives a gum, used by the Napalese for sizing paper.

Found up to about 3,000 feet in the wet zone, not uncommon in the forest belts in the Uva patna country.

Also in sub-tropical, and tropical Asia, and Malay Archipelago, Burma and Nicobars.

The roots of this plant are rich in nodules that fix the nitrogen of the air, and hence its suitability as a green manure, as well as a shade tree. In *Watt and Mann's* work on "The Pests and Blights of the Tea Plant", special reference is made to the benefit the tea plant gets from this tree being used for shade, and also for terracing.

No. 237. **A. AMARA** Vol. II. p. 130.

Uyil, Thuringi, T.

The "Wheel Tree" (*Cordiner*)— probably from the Tamil name.

A small tree, rather slender, many branched. Bark of twigs greenish, thin, scurfy, with many lenticels. Young parts finely hairy. Stem-bark, greyish-brown, furrowed.

Leaves alternate; main rachis about 4 inches long, swelled at base, grooved above, slightly hairy, and provided with a small circular gland midway between base and first pair of laterals. Pinnae 7 or 8 (or more) pairs, pubescent. Leaflets small, graduated, so as to give the pinnae a narrowly elliptical general outline. Leaflets about 15 to 20 pairs, about three-sixteenth of an inch long, on stalks of about one-fortieth of an inch, narrowly oblong, unequal at base, rounded at apex, entire; margins with a few fine hairs; slightly glaucous below.

Stipules minute, about ½ an inch, acute, hairy.

Flowers short-stalked, in close heads, pinkish, scented. "Peduncles solitary, or 2 or 3 ascending from axils of young leaves, and not forming a panicle." (*Trimen*). Calyx tubular, obscurely toothed; Corolla pubescent, twice as long as calyx. Stamens over ½ inch in length. Pod about 4 inches long by ¾ inch wide, acute at base, suddenly pointed and apiculate, purplish, very thin, veined. Seeds about 8, small.

Heartwood dark purplish brown, mottled, hard, close-grained, durable. *Gamble* gives the weight at 61 lbs. per cubic foot, and describes the structure as having small pores, in patches of white tissue, frequently joined. Rays very fine and numerous.

Suitable for house building.

Very rare in Ceylon, and only found in dry districts.

My specimens were collected in the Trincomalee district, and in the N. C. P.

Also found in Western India, and Tropical Africa.

Albizzia moluccana, a native of Java and the Moluccas, is an introduction into Ceylon, and was brought here in or about 1880. It is much grown up-country as a shade tree for tea, and is of considerable importance, as it supplies, through its roots, nitrogen to the soil. It is fast-growing, but its wood is very soft and decays quickly.

No. 238. **PITHECOLOBIUM BIGEMINUM** Vol. II. p. 132.

Kalatiya, S.

A small slender tree, with few rather wide-reaching branches. Bark smooth, brown, young parts dull green, glossy.

Leaves rather crowded at ends of twigs, or unevenly distributed. Rachis 6 inches, smooth, grooved above, having

an oval gland near base, and a smaller one at the junction of the laterals. Laterals 2 pairs, first pair much shorter than the higher, distant.

Leaflets large, one or two pairs on the lower pinnae, much smaller than the next above. Largest leaflets terminal, about 3 inches oval or ovate lanceolate, on short petiole, dark glossy green. Stipules absent.

Flowers in small creamy-white tassel-like clusters of 2 or 4, arranged "on long branches of slender pubescent panicles."

Calyx pubescent, with conspicuous segments. Corolla much longer than calyx, with narrow segments. Stamens in a clustering bunch, much produced forward. Pod 5 inches, very contorted and twisted, narrow, blunt at apex, brownish outside and red within, not compressed. Seeds 8. The pod, on opening, possesses a curious offensive smell, that disappears on drying.

Wood very pale, and deficient in heartwood, and not durable. I have seen rafters and posts of this wood, but as the timber decays quickly, such material is undesirable. Possibly suitable for pencils.

Fairly common in the wet forests on the West and South of Ceylon, up to 3,000 feet altitude.

Also in India from Nepal to Sikkim

One introduction belonging to this genus is *P. dulce*, well-known in the "Madras Thorn," and much used as a hedge plant. If left to grow naturally, it becomes a large tree attaining a height of 30 feet, and a girth of 4 or 5 in very old trees.

I secured a specimen of the wood from one of these trees that had been cut down for widening a street at Mutwal. It was of an olive brown colour, beautifully grained, and mottled like Bird's-eye Maple, and extraordinarily handsome, hard, smooth, and well suited for ornamental panels.

It is a native of Tropical South America, and was introduced into Ceylon more than a century ago.

A second is the "Inga-Saman" or the Rain Tree, (*P. Saman*) so familiar in Colombo, and along our Government cart road sides. It was introduced here about 75 years ago, and flourishes in both wet and dry districts, becoming a very large, and exceedingly handsome as a shade tree. The stem is never very long, but attains a large girth. The heartwood is a dark smoke-brown, and could probably be used for furniture, though the timber lacks lustre, and is not particularly hard. The wood burns badly.

It seeds less freely in wet districts than in the moderately dry. It is a native of Central and Tropical South America.

Examples of introductions into Ceylon of this great order are very numerous, especially now that cover crops have been found so useful, both for manurial purposes and for the prevention of soil erosion. A complete descriptive analysis of all these introductions would unduly swell this volume. A brief enumeration may however be of some use when referring to familiar plants.

(*a*) *Ulex europeus*.—Gorse, Furze, or Whin.

(*b*) *Trifolium repens*.—White Clover.

(*c*) *T. arvense*.—Hare's-foot Trefoil.

(*d*) *Arachis hypogaea*.—Rata-kaju, S. Pea-nut, Monkey-nut, Groundnut.

(*e*) *Cicer arietinum*.—Kadala, *S*. Chick-pea, Bengal Gram.

(*f*) *Pisum sativum*.—Pea. Bola-kadala, S.

(*g*) *Phaseolus lunatus*.—Lima Bean. Potu-dambala, S.

(*h*) *P. vulgaris*.—Bonchi, *S*. Runner and French bean.

(*i*) *Vigna catiang. var. sinensis*—Me-Karral, *S*. Cowpea.

(*j*) *Dolichos biflorus*.—Kollu, *S*. Horse-gram.

(*k*) *Caganus indicus*.—Rata-tora, *S*. Thavarai Parippu, *T*. Dhal, *S*.

Besides cover-crops the Leguminous plants of special interests are also introductions to Ceylon. The chief of these is *Pterocarpus indicus* or the Padouk, that forms such a handsome feature of many of our roads about Colombo.

It becomes an immense tree, rather short stemmed, with many wide-spreading graceful branches that end in drooping twigs. It blooms in great profusion in March and April, in masses of yellow flowers that are slightly scented, but it does not seed equally abundantly. The pods are nearly circular in outline, about 1½ inches in diam., silky pubescent, when young.

The wood of this magnificent tree is dark red, close-grained, hard, and slightly aromatic. It is suitable for furniture, as it works well. It has been used for sleepers and building purposes, and is recommended for Railway carriages. Its natural home is Burma, and the Andamans.

Our well-known, and much admired "Flamboyante" or "Gold Mohur" tree (*Poinciana regia*) is Madagascan, introduced into Ceylon in the early part of the last century. Its great

panicles of scarlet, orange and flame-red flowers are very magnificent when the tree is in a mass of bloom, and arouses the admiration of travellers, and artists. It grows freely and becomes a large tree, but its timber is of little value.

Parkinsonia aculeata is another introduction from Tropical America that has become a favourite ornamental tree, and is often found near gardens in the South of the Island. It produces large rich yellow flowers in axillary racemes, but rarely attains any large size of stem, and consequently is grown chiefly as a hedge plant, or for ornament.

The superb *Amherstia nobilis*, with its great orchid-like flowers, has been claimed as the most beautiful of flowering trees. It is a native of Burma, and was brought to this country in 1860.

As a thing of beauty it is perhaps unrivalled, but unfortunately it does not seed here.

The common "Sensitive Plant" (*Mimosa pudica*) so familiar on account of its sensitive leaves, is now a pestiferous weed in Ceylon. It is a native of South America, and was spread through much of the low country of the Island, especially in damp localities, often covering the soil as with a thorny mat. The seeds are very hard, and as these appear to pass through the digestive machinery of goats unharmed, the plant becomes easily spread.

It is known to the Sinhalese as "Nidi-kumba."

XLV.—ROSACEAE

The order is represented in Ceylon by seven Genera, viz:—

1 *Pygeum*, 2 *Rubus*, 3 *Potentilla*, 4 *Alchemilla*, 5 *Poterium*, 6 *Agrimonia* and 7 *Photinia*.

Of these *Pygeum*, and *Photinia*, may be classed as trees, the others being shrubs and herbs.

The order has three endemic species in this island.

No. 239. **PYGEUM ZEYLANICUM** Vol. II. p. 134.

Golu-mora, Kankumbal-ketiya, Unanu, S.

A fairly large tree, with erect straight stem, often up to 5 feet in girth. Bark dull reddish, much freckled with ashen grey. Branches rather few, horizontal, terminating in many slender drooping branchlets.

Young parts densely pubescent with shaggy rufous hair, mottled in slightly older wood, with large longitudinal lenticels.

Leaves alternate, about 9 inches by three, oblong, acute or abrupt at base, gradually tapering to fine acute, apex, sparcely coated above with solitary sub-scabrous hair that springs from the veins and nerves. Copiously hairy with chestnut-brown hair below. Two large conspicuous glands occupy the base of the leaf, one on each side of the midrib. Petiole short, about ½ inch rather thick, grooved above, hairy in young leaves. Mid-rib direct, prominent below, distinct above. Lat.-veins oblique about nine pairs, sub-opposite uniting into loops, pale above, prominent. Stipules about ½ inch, narrowly lancelote, acute, shaggy with hair on the outside.

Flowers about ½ inch, pale creamy white on short woolly stalks, in small erect tomentose racemes, Calyx wooly, small, 5 or 6 segmented. Petals "difficult to distinguish from the clayx lobes," 6, woolly. Stamens 12.

Ovary very hairy. Fruit two-lobed, or buttock-like, about 1 inch across, rusty. Seeds when crushed have a strong smell of bruised peach leaves.

Wood yellowish, close, even grained, easily worked, heavy, (?) 65 lbs. per cubic foot, suitable for ceilings, rafters, etc.

A wet-zone plant growing from near sea-level to about 3,000 feet. The largest I have seen were in the Yakdessa district, where it is tolerably common.

It is the only endemic tree belonging to the *Rosaceae* in Ceylon.

The common Rose, and its many familiar varieties are all introductions from Europe, China and elsewhere, as is also the Peach (*Prunus persica*), the Strawberry (*Fragaria vesca*), and the Loquat (*Photinia japonica*). All these may be regarded as garden plants and flourish in the country, but perhaps are at their best at altitudes of over 4,000 feet.

XLVII.—CRASSULACEAE.

This small order is represented by 1 Genus—*Kalanchoe*—in Ceylon, and the introduced *Bryophyllum calycinum* known to the Sinhalese as "Akapana" or "Ratagowa," is probably its chief member here. This common plant is frequently to be found almost wild in the dry country, growing near rock. Its fleshy, stout leaves produce plants from the "bays" of leaf-margins, and apparently rarely from the seed. The leaves are eaten, and contain tartaric acid. Rendered pliable by heating, the leaves are applied to bruises and boils.

L.—RHIZOPHORACEAE.

The mangrove family is represented in Ceylon by 1, *Rhizophora;* 2, *Ceriops;* 3, *Bruguiera;* 4, *Carallia;* 5, *Weihea;* and 6. *Anisophyllea.*

Only two species are endemic, viz, *Carallia calycina,* and *Anisophyllea zeylanica,* both of which are trees, but they do not live gregariously in swamps after the manner of the typical Mangrove.

No. 240. **RHIZOPHORA MUCRONATA** Vol. II. p. 151.

Kadol, S. Kandal, T. Mangrove, E.

A moderately large tree, with many wide-spreading twiggy branches, short stem and masses of contorted aerial roots.—Bark brown, often ashen, thick, much leaf-scarred at ends of twigs.

Leaves large, opposite, about 5 inches long, oval, tapering to base and apex, where the point of the leaf is brown and almost thorn-like; entire, perfectly glabrous on both sides, rather thick and stiff. Stipules large, nearly 2 inches long, early falling, smooth. Petiole very stout, about ½ an inch long, purplish stained. Midrib large, stout, conspicuous.

Lat.-Veins and nerves indistinct.

Flowers about ¾ inch in diam., white, with pale yellowish sepals, in twos, on drooping stalks of about 1½ inch in length.

Bracts hard, stout; Calyx 4 lobed, persisting at the base of the fruit; Corolla 4 lobed, thick, narrow, hairy inside; Stamens 8.—Fruit more or less conical, pendulous, from which emerges the embryo in a long spearlike process before falling. The embryo is thus practically germinated in air, and quickly produces a fresh plant.

The wood is dark red, close, tough and hard. Weight about 66 lbs. per cubic foot, well suited for building purposes, and capable of being turned. It is much valued in Africa for its timber. Pores very small, numerous, surrounded by soft tissue. Rays fine, numerous, wavy. Sapwood pale red. Affords a most excellent fuel. Bark affords a valuable tan.

Occurs gregariously in back waters all round the coast, but never in fresh water.

Also in tidal estuaries throughout most of the Eastern Tropical world.

No. 241. **R. CANDELARIA** Vol. II. p. 151.

Kadol, S. Kandal, T.

A bushy tree, much like the last but smaller, and with much shorter stem. It also differs in having sessile flowers.

Leaves opposite, about 6 inches long, lanceolate, or lanceolate-oval, tapered at base, finely acute, and shortly mucronate at apex; entire, completely glabrous, smooth, rather stiff, faintly "dotted beneath." Petiole 1 inch or over, strong. Midrib stout, rather pronounced on both sides. Stipules large, nearly 3 inches long.

Flowers small, white, with greenish sepals, appearing from "the axils of fallen leaves." Calyx lobes 4, oblong, acute; petals 4, flat, narrow; stamens 11. Fruits like the last, but slightly smaller.

The wood is very much like the last named, but much smaller in size, hence its not being in use for timber. Both this species and the last afford bark rich in tannin, but while both these species are gregarious and cover considerable areas of tidal mud-land in Ceylon, it is possible that the supply could be quickly exhausted; and where the quantity required is so great, it is doubtful if this country could complete with other lands where the mangrove swamps can be measured by square miles, as in the case of Borneo, for example.

No. 242. **BRUGUIERA GYMNORHIZA** Vol. II. p. 153.

Pat-kadol, S.

A small tree in Ceylon (attains 80 feet in India) less markedly aerial-rooted than the true mangrove; with smooth bark, much leaf-scarred on the branches. Leaves opposite, rather crowded, about 4 to 7 inches long, elliptic-lanceolate, tapering to base and apex, but *not* mucronate; entire, shining, thick, glossy green above much paler below. Petiole about 1 inch, stout. Midrib strongly pronounced.

Flowers solitary on short bent stalk, about 1 inch, orange, or orange yellow. Calyx deeply cut into 8 to 14 persistent, claw-like lobes, often tinged with pink. Petals 10 to 14, hairy at base, bi-lobed, with a bristle-like appendix to each lobe, and a third hair placed in the axil of the lobes. Stamens 22, often more.

Style long. Ovary 3-celled, embryo extending from fruit, but much shorter than in the true mangroves. Fruit, red.

Wood dull dark-red, hard, close, but rarely large. Suitable for cabinets and small mountings, as the wood takes a fine polish. *Gamble* gives the weight at 54 lbs., and states that the

pores are small, oval, and sub-divided. Rays fine, distinct, slightly wavy, pale, numerous.

Common in mangrove swamps round the coast of Ceylon, and like the last two, is rich in tannin.

It produces a black dye.

Common in tidal estuaries throughout the Tropics of the East.

No. 243. **CARALLIA INTEGERRIMA** Vol. II. p. 155.

Dawata, S. Karalli, (*Telagu,*) from which it takes its generic name.

A large tree with erect stem, often of considerable size. Branches widespread. Bark pale brownish grey. Aerial roots often formed in masses in the angles of the larger branches. Leaves opposite, about 4 inches long, ovate or obovate-oval, tapering to base, rounded or shortly acuminate at apex, nearly always entire, margins somewhat recurved, glossy green above, dotted with a few "glandular dots beneath."

Petiole about $\frac{1}{4}$ to $\frac{1}{2}$ an inch long, rather thick. Midrib pronounced, and prominent below. Lat.-veins indistinct.

Stipules about $\frac{3}{4}$ inch, completely covering leaf bud. Flowers minute, pale creamy white, on very short stalks, in small heads, "on stout branches of axillary trichotomous cymes." Calyx, smooth, 8-lobed; petals very small, round, 7 or 8. Stamens 14 or 16, very short; style thick. Fruits small, red, about $\frac{1}{4}$ inch in diam., containing one seed.

Wood very handsome if carefully seasoned and properly cut, but liable to crack. Pale yellowish-red with conspicuous silver graining. Cut into short lengths, oblique with the axis, this wood makes most beautiful panels, especially if French polished.

Great care, however, must be taken in the seasoning, which should be done in partial shade after first removing the bark, and then tightly binding the logs at their ends with hoop-iron, to prevent them from splitting open.

The weight is about 48 lbs. per cubic foot.

Pores rather large, clustering, separated by thick lines of the medullary rays, which are in broad and narrow masses. Rays long, rather straight, hence the beautiful "figuring" of the wood when polished.

Common especially in sandy "Cinnamon soils" in the south and west of Ceylon. Fairly abundant in Colombo, and the Kelani Valley.

Also India, Burma, Malaya and Tropical Australia.

No. 244. **C. CALYCINA** Vol. II. p. 155, Pl. XXXVI.

Ubberiya, S.

An immense tree, with very large wide-spreading branches. Bark yellowish brown, or greyish brown, rough, nodular.

Leaves opposite, about 3 inches long, ovate, rather tapered to base, rounded or very shortly and abruptly acute at apex; entire, rather thick, somewhat arched in section from centre to margins, dark glossy green above, paler and slightly gland-dotted below. Petiole about ½ an inch, stout midrib equally distinct on both sides. Lat.-veins about 8 pairs, oblique, uniting each with next succeeding within the margin, making a series of loops; stipules large, acute green.

Flowers small, white, with pinkish tinge in each petal, few, on stout stalks, arranged in an axillary, erect few-branched short cyme. Bracts rounded, claw-like, quickly falling. Calyx 4-lobed, acute, with slightly reflexed margins at tips. Petals 4, opening out between the divisions of the calyx segments, much fimbriated along the margins, clawed. Stamens 8, in long and short series, the shorter with the filaments curved over the anthers. Style long. Fruit small, smooth, red.

Wood yellowish red, becoming dark red-brown in well-seasoned examples, beautifully marbled with "silver graining," very durable, and capable of taking a fine polish. Weight about 56 lbs. per cubic foot. Difficult to season as it is liable to split.

An excellent building timber, provided it is not directly exposed to sun and rain. Panels for cabinets, especially if the wood is cut oblique with its axis, are very oak-like and handsome.

This is an endemic species in Ceylon, and not very abundant. It occurs in the Valley of the Gin Ganga, in the Singha Raja Forest, and towards the Kitulgalla country, but nowhere in abundance. Trimen states that it extends up to 5,000 feet, but this is contrary to my observations.

No. 245. **ANISOPHYLLEA ZEYLANICA** Vol. II. p. 157.

Weli-penna, Weli-piyana, S.

A small or medium-sized erect tree, with slender stem. Bark grey when young, becoming brown with maturity, smooth, finely scaled. Branches rather erect, slender, pubescent at tips.

Leaves alternate, of two kinds, large and small, the smaller falling early. The larger leaves are about 6 inches by 2, strongly resembling the Cinnamon leaf, ovate, rounded at base, arching and suddenly acuminate at apex, glabrous, entire, rather thin, but stiff.

Petiole short, about ½ inch, thick, curved, olivaceous green. Midrib absent, replaced by 5 strong nerves springing from the base, all prominent below, and depressed above. Nerves horizontal, distinct below, hidden above.

The young tender leaves are a dull delicate pink, softly silky-hairy above, quickly becoming glabrous.

Stipules absent.

Flowers small, pale, or dead greenish-white, on very short thinly hairy stalks, "arranged in 2 or 3 very short super-posed or supra-axillary racemes." Calyx 4-lobed, lobes pointed; Petals 4, deeply gashed into irregular fimbriations; stamens 8; ovary 4-celled with a pendulous ovule in each. Fruit about one inch long, much furrowed, tough.

Wood pale greyish-brown, mottled with silvery white, moderately hard, easily split. Weight about 45 lbs. per cubic foot. The timber is often used for shingles, but unless treated with preservatives is not very lasting, and splinters. Sometimes used for tea boxes. Makes very handsome panels for small cabinets, as it can be "worked up" and takes a good polish. Pores rather small, containing a white substance that gives the name "Weli" (sand) to this timber in Sinhalese. Rays in two series, broad and narrow, the latter hair-like.

Fairly common in the wet zone, up to 3,000 feet altitude. Peculiar to Ceylon.

LI.—COMBRETACEAE.

This important order is represented in Ceylon by five Genera, mostly trees, viz.

1. *Terminalia;* 2.*Anogeissus;* 3.*Lumnitzera;* 4. *Combretum;* and 5. *Gyrocarpus.*

They are practically all low-country plants.

No. 246. TERMINALIA BELERICA Vol. II. p. 159.

Bulu, S. Tanti, Tantrik-kai, T. The Beleric Myrobalan, E.

A tall, erect, stately tree. Stem cylindrical, buttressed at base; branches horizontal. Bark pale sepia-brown, widely furrowed with broad longitudinal furrows. Ends of twigs smooth, slightly glaucous.

Leaves deciduous, clustered at ends of branches, large, 5 to 6 inches by 3, broadly ovate, acute at base, rounded or emarginate, or slightly acuminate at apex; entire, quite glabrous in old leaves, or sparcely dotted on both sides with solitary hairs.—Petiole long, 2 in., stout, distantly solitary-hairy.

Midrib prominent below, raised above, pale. Lat.-veins about 8, uniting towards the upper half of the leaf into compressed loops. Nerves abundant. Leaf-margin, pellucid, stipules short, conical, fulvous-hairy.

Flowers small, greenish-yellow, scented. Male flowers "shortly pedicellate," females, or bisexual flowers, with hardly any stalk, in axillary racemes. Calyx 4 or 5, triangular-lobed, tomentose. Petals absent. Stamens 8 or 10, rather longer than the calyx tube. Ovary 1-celled.

Fruit a drupe, about 1½ inches long, ovoid, pubescent with yellowish tomentum. Seed solitary, hard, woody, faintly angled.

Wood pale greyish-yellow, or brownish, rather close, moderately hard, but very subject to shot-hole boring beetles, unless preservatives are used.

Timber cuts neatly, suitable for rafters, &c., but must be tarred or "treated." Pores both large and small, scanty, frequently divided, joined by bands of soft tissue. Rays fine; rings indistinct.

The fruits are strongly astringent, and affords the "Beleric Myrobalans" of Commerce that are used for dyeing and tanning. The ripe fruit is valuable as an astringent, and the unripe as a purgative.

In native medicine, the fruits of this plant in addition to those of *Terminalia chebula*, and *Phyllanthus Emblica*, enter into the composition of the "Tipal Kashaya"—a decoction employed in many diseases. The kernels of the seeds are supposed to be narcotic, and an oil expressed therefrom is used for the hair.

The leaves, *Gamble* informs us, can be used as an antiseptic, and a wood preservative.—An insoluble gum is obtained from the bark, probably of use as an astringent.

Not uncommon in both wet and intermediate zones, but nowhere plentiful.

Also occurs in India, Malaya and Burma.

No. 247. **T. CHEBULA** Vol. II. p. 159.

Aralu, S. Kadukkai, T. The 'Arula' of Knox. The Chebulic Myrobalam, or *Gall-nut, E.*

A moderate size tree with slender crooked stem, and spreading branches. Bark thick, greyish, or brownish-grey. Young twigs and shoots pubescent.

Leaves alternate or sub-opposite, about 5 inches broadly ovate, rounded or cordate at base, obtuse at apex thick, pubescent on both sides especially in young leaves. Rather distinct.

Petiole short, marked below the leaf-blade with 2 (or 4) glands, immediately below the leaf-blades; pubescent. Midrib stout. Lat.-veins opposite, or sub-opposite, rather oblique.

Flowers small, pale greenish-white, offensive smelling, much resembling last, 'but spikes are all terminal,' and hairy-pubescent. Fruit ovoid, tapering to base obtuse at apex, more or less indicating five angles or lobes, but very variable. Stone oblong, hard, distinctly 5-angled, horny; with narrow cavity for kernel.

Wood greyish-brown, tinged with purplish, or yellow or greenish tinges, hard, moderately durable. Weight about 62 lbs. per cubic foot. Suitable for house building, and used for furniture. Rarely procurable in long straight lengths. Pores small, solitary, or in groups, sometimes sub-divided. Rays fine, numerous, stopping at or bent round the pores.

Occurs often gregariously in the dry zone, extending up to about 2,000 feet. Plentiful in Lower Uva, the Meda Korale of Sabaragamuwa, East of Balangoda, and in the North, and parts of the Central Province.

It supplies the Gall-nuts of commerce or the 'Black Myrobalams' that are used as a valuable tanning material; the better qualities containing about 25 per cent of Gallo-tannic acid. The leaf-galls are also rich in tannic acid, and are of use in dyeing. Chebulic and Chebulinic acid are important acids that have been isolated by chemists in their researches into the properties of this commercial fruit.

Knox, who wrote in 1681, speaks of the 'Arula' as 'a tree as big as an Apple-tree, bears a berry somewhat like an Olive, but shaped at each end: its skin is of a reddish-green colour, which covereth an hard stone. They (the Sinhalese) make use of it for Physic in Purges; and also to dye black colour: which they do after this manner; they take the fruit and beat it to pieces in mortars, and put it thus beaten into water; and after it has been soaking a day or two, it changeth the water, that looks like beer. They then dip their cloth in it, or what they mean to dye, and dry it in the sun. And then they dip it in black mud, and so let it lie about an hour, then take it and wash it in water; and now it will appear of a pale black. Then being dry, they dip it again into the aforesaid dye, and it becomes a very good black.

"Another use there is of this water. It is this: Let any rusty iron lie a whole night in it, and it will become bright; and the water look black like ink, insomuch that men may write with it." (Knox's Historical Relation, Ryan's Ed. p. 27).

Occurs in India, Malaya and Burma.

No. 248. **T. PARVIFLORA** Vol. II. p. 160.

Hampalanda, S.

A small erect tree, with brownish or greyish bark, flaking off in large scales. Shoots and young parts, smooth.

Leaves sub-opposite, small, about 3 in. by 1¼ in., ovate-oblong, nearly acute at base, shortly and bluntly acuminate at apex, entire, glabrous, dull green above. Petiole ½ inch, flattened above. Midrib stout, prominent below, distinct above. Lat.-veins 7 or 8 irregular, arching obliquely but not uniting. Nerves closely reticulated. Stipules absent.

Flowers very small, without stalks, yellow, arranged in "spikes in terminal and axillary panicles," finely hairy

Bracts small, pubescent. Calyx pubescent, 4 (or 5) segments, acute. Petals, none. Stamens 8 (occasionally 10.)

Fruits like small olives, dotted over with white spots, Seed narrowly ovoid, strongly 5-angled, hard and bony.

Wood reddish-brown in the heart, paler towards the sap-wood, close, fairly hard, rather heavy; not durable. Suitable for flooring, but should not be exposed to damp.

This endemic tree occurs in the wet zone up to about 4,000 feet, but is not common.

No. 249. **T. GLABRA** Vol. II. p. 160.

Kumbuk, S. Marutu, T.

A water-loving tree, often of immense size.

Trunk rather short; giving out large boughs often 3 and 4 feet in girth, that spread into smaller branches forming a wide crown. Bark thick, smooth, pinkish-brown and gray, flaking off in large scales, below which the surface often appears almost glossy. Young branches and twigs softly-pubescent.

Leaves nearly opposite, variable in size, averagely 5 inch in length, oblong or ovate, rounded obtusely at base, round at apex, nearly entire, sometimes crenulate, hard; dead green above, rather paler below. Petiole about quarter of an inch, with one or two glands below the leaf-blade. Midrib distinct above, prominent below. Lat.-veins opposite or sub-opposite, about 12, arched or oblique, pellucid.

Flowers small, greenish-white, honey scented, sessile on spikes in axilary and terminal panicles. Calyx-limb faintly pubescent or glabrous, 4 or 5 segmented. Petals, none. Stamens longer than calyx, about 10. Fruit an ovoid, 5-rayed drupe, the rays being wing-like, stiff, and veined. The fruits are about 1½ inches long, acute at base, rather blunt and of a leather-brown colour when dry.

Wood brown, much clouded with paler and darker shades rather lustreless, straight-grained, fibrous, tough, about 62 lbs. per cubic foot, very durable.

Pores large, nearly circular, evenly distributed, often subdivided, surrounded by a ring of hard tissue. Rays very fine, indistinct. Annular rings (?) very irregular, often converging.

The timber of this fine tree has been used for bridge planks with considerable success, but as the seasoning is difficult, it is found liable to warp.

It is very suitable for house building, and makes handsome furniture. A wooden statue of Walagam Bahu, at Dambulla Rock Temple, is alleged to be of kumbuk.

The tree is one that cuts up badly, as much is lost by the enormous buttresses, and the great amount of sapwood. This is, however, compensated for by the immense girth. I have measured a stem of 35 feet in girth at 6 feet from the base.

The bark is valued in native medicine, as astringent, tonic, and cooling. Reduced to ashes, the bark produces almost pure lime. Bruised fragments of fresh kumbuk bark, thrown into turbid water, will precipitate mud, and for this reason the tree is often planted near wells, as it is believed to purify the water.

It is widely distributed in Ceylon, in both wet and dry zones, up to 2,000 feet, but always near water. The Kumbukkan Aru has perhaps the largest examples of this tree in Ceylon, the banks being completely fringed for many miles from its mouth with these magnificent trees.

Also in Central India, and South Behar. There appears to be some conflict over the scientific name of this species. *Brandis*, who gives an excellent drawing calls it '*T. Arjuna*,' following *Beddome*, while *Trimen* says that this is "a quite unnecessary synonym." *Gamble*, however, in his Manual of Indian Timbers (1881 Edition) makes *T. tomentosa* to be 'kumbuk,' and synonymous with *T. alata*. *Thwaites*, in his enumeration of Ceylon Plants, gives *T. glabra* as being 'kumbuk,' adding his reasons for regarding *T. tomentosa* as only a variety. As it may be of importance to determine if there are two distinct species of this valuable timber tree in Ceylon, the following differences may be noted as a guide to collectors.

In *T. tomentosa* the leaf is acute at base, with *one* lobe produced beyond the other, and forming a tapering attachment to the petiole. Its fruits are broadly ovate in outline, and not terminating in lobes beyond the apex of the fruit.

In *T. Arjuna-T. glabra*, the base of the leaf has no prolongation of blade on one side; and the fruits are narrowly ovoid in outline, tapering to base.

In both the fruits are 5-winged.

T. tomentosa, as the name implies, has the young leaves clothed with short rust-coloured pubescence.

The timber of *T. tomentosa* has been recommended for paving blocks.—*Gamble* records its being tried for railway sleepers, with satisfactory results.

Our well-known Indian Almond (*T. Catappa*) the Kotamba of the *Sinhalese*, is an introduction into Ceylon. It is a Malayan form, and is often planted locally. The kernels of the fruits afford a relished dessert. The tree is deciduous, and consequently a rather untidy garden tree.

No. 250. **ANOGEISSUS LATIFOLIA** Vol. II. p. 162.

Dawu, S. Vekkali, or *Vellainarga, T.*

A smallish tree, with slender stem and few thin branches. Bark smooth, pale ashen, or nearly white.

Young parts very smooth. Leaves sub-opposite or alternate about 3 inches or less in length, broadly oblong, variable at base from cordate to round, rounded at apex, or obtuse, sometimes acute, entire, pale bluish-green above, rose-pink when very young.

Petiole about ½ inch, slender, grooved above. Midrib prominent below, stained with pink. Lat.-veins and nerves pellucid. Stipules, absent.

Flowers small, pale green, 'sessile in small dense heads on slender slightly pubescent penduncles' (*Trimen.*)

Calyx-limb with 5 short segments. Petals absent, stamens in two rows, 10, inserted on the calyx-limb.

Ovary one-celled, with two ovules. Fruit small, nearly round, with a broad wing ending in a beak formed by the persisting calyx tube. Seed solitary.

Sapwood pale, rather considerable. Heartwood small purplish brown, smooth, close, very hard, but liable to crack. Weight about 65 lbs. per cubic foot; durable.

Foxworthy says that the pores are small, very numerous, surrounded either singly, or in loose patches, by wood parenchyma, the patches arranged obliquely or transversely in a roughly concentric fashion. Rays, fine, numerous.

The wood is suitable for house building if not exposed, and is used for poles, and tool handles.

The leaves contain tannin, and a gum obtained from the stem is said to be used in cloth printing.

The plant is gregarious in Ceylon, and occurs in Talawa lands in lower Uva, especially in gravelly soils.

Also in Central India.

No. 251. **LUMNITZERA RACEMOSA** Vol. II. p. 162.

Beriya, S.

Usually a small tree, occasionally up to 20 feet. Bark smooth, purplish black, exfoliating in small scales in old trees; young parts smooth.

Leaves alternate, without petioles, narrowly oblong, tapering finely at base, rounded at apex, smooth, glossy, dark green above, fleshy. Midrib, prominent below; lat.-veins and nerves inconspicuous. Stipules absent.

Flowers small, white, in short axillary spikes, without stalks, Calyx tube rather long, smooth, 5 shallow segments; petals 5, oblong, pointed; stamens 10, as long as petals.

Fruit about half an inch, narrowly ovoid, carrying with it the persistent calyx.

Trimen says the wood is pale reddish-grey, smooth and shining, rather heavy, very strong and durable, but of small size. Foxworthy adds it is sometimes used for house posts, and important as a firewood.

It occurs in tidal swamps, in company with the mangrove, round our west and south coast.

Allied to the above is *L. coccinea*, but easily distinguished by its bright scarlet petals, and stamens, which are about double the length of the petals. Like the last, it is found in mangrove swamps in the south of Ceylon, but is not plentiful. It appears to be a larger tree than *L. racemosa*, but little used for timber.

Both species are found in India and Burma.

No. 252. **GYROCARPUS JACQUINI** Vol. II. p. 165.

Hia, S. Thinakku, T.

A smallish tree, with erect cylindrical stem, and small loose-leafed crown. Bark smooth, greenish-white; young parts and buds highly pubescent, much leaf-scarred on twigs.

Leaves alternate, and clustering, large, about 6 inches long, broadly ovate, tapered at base, acute at apex, smooth above, very densely stellate, hairy below.

Petiole long, slender, from 3 to 5 inches, smooth, or pubescent. Three conspicuous veins spring from the base of the leaf giving a crow's-foot appearance, by which, with the *winged* fruits, this species may be easily identified.

Stipules absent.

Flowers small, pale creamy yellow, unisexual, male and female on the same tree (*monoecious*) or polygamous, usually with female flowers fewer than males. Flowers arranged in clusters in many-branched cymes, growing from ends of twigs. In males, the Calyx has 4 to 7 segments, hairy. Petals absent. Stamens 4, alternately with 4 staminodes. In the female flower the Calyx has 2 large persistent lobes, that become wings, rather like a Dipterocarp, but are more or less pubescent, longitudinally ribbed, about 3 inches long. The ovary is one-celled, with one ovule. Seed narrowly ovate, hard, 'bony.'

Wood pale greyish-white, shining, very soft and light; weight about 24 lbs. per cubic foot.

Very useful for rafts or floats, but otherwise the wood is too perishable for other purposes.

Pores large, evenly distributed, often subdivided. Rays short, rather broad and distinct.

Found in some abundance in the dry forests, but only at low levels. Fairly common in the Hambantota district, and between Maha Oya and Alutnuwara. I have obtained it in the driest parts of Sabaragamuwa, and also near Moneragalla.

Found throughout most of the tropics.

LII.—MYRTACEAE.

This very large order is not well represented in Ceylon in point of number of genera, as we have only 4, though one genus —Eugenia—affords no less than 43 species, of which 29 are peculiar to Ceylon, thus exceeding in endemic numbers any other genus in the Island. The five genera are: 1. *Rhodomyrtus*, 2. *Eugenia*, 3. *Barringtonia* and 4. *Careya*. This is of course exclusive of introductions, which include the true Myrtle, the Guava, the Blue Gum, and others less familiar.

Rhodomyrtus tomentosa has no claim to being more than an interesting montane species, common at very high altitudes, but is little better than a small much-branched bush. Its fruits are eaten.

No. 253. **EUGENIA AQUEA** Vol. II. p. 169

Wal-jambu, S. Kosdamba (locally).

A moderate-sized tree, very much branched, forming a close crown. Bark smooth, greyish, rather thin. Twigs compressed, smooth, tinged when young with pink. Leaves very variable in size, from $1\frac{3}{4}$ to 8 inches or larger, oblong, or ovate-oblong, more or less tapering at base, rounded or subcordate; rounded abruptly at apex, entire; margins slightly reflexed, pale or pellucid along the edges; stiff, dark glossy-green above, dull apple-green below; gland-dotted. Petiole very short, about 1/8 of an inch, pink-stained when young. Midrib rather thin, prominent below.

Lat.-veins about 8, rather distant, inconspicuous. Intramarginal vein obscure. Stipules, none.

Flowers purplish-pink or white in cymes (3 to 10 flowered) "on short, stout, quadrangular stalks, terminal, and from upper axils." Calyx-tube tubular with 4-5 rather broad segments with membranous margins" Petals 4, broad, rather long, Stamens indefinite. Fruit from one-third to one inch in diam., globose, dark glossy purple, strongly marked with remains of persistent calyx limb.

Wood (from an example from the C. Prov.) pale greyish, nearly white, dense, close, even. Pores small, rather distant. Rays distinct, pale, rather wide apart. Annular rings, close, visible.

A valuable wood for posts and rafters and said to be very durable.

Fairly common in the wet and moderately wet forests up to 5,000 feet, but is so variable in the size and shape of its foliage as to confuse it with many of our local "Dambas."

Also found in Burma and Bengal.

No. 254. **E. SPICATA** Vol. II. p. 171.

Marang, Maranda, S. Marungi, T.

A low scraggy tree, rarely becoming tall, except in well sheltered land. Stem very contorted. Branches many, irregular. Bark yellowish-red. Scaling off in irregular flakes.

Leaves opposite, about $2\frac{1}{2}$ inches, up to 4, lanceolate, or narrowly lanceolate, tapering at base, and apex, finely acuminate, entire, stiff, dark glossy green above, dull below, completely glabrous. Petiole 3/8 of an inch, faintly grooved above. Midrib slender, pale and rather depressed above, prominent below. Lateral-veins many, inconspicuous, fine,

scarcely visible. Intramarginal vein, distinct above. When very young, the whole foliage is tinged with a beautiful carmine pink, passing through many shades of bronzed yellow to green; very beautiful.

Flowers small, white, crowded in axillary and terminal cymes. Flower stalks very short.

Calyx tube glandular, segments rounded. Petals 4 or 5 small. Stamens indefinite, profuse. Fruit round, about ¼ inch, pure white, and crowned with remains of persistent calyx. Seed solitary, aromatic.

Wood hard, close, brownish-red, heavy.

The timber is so rarely straight that it is not much used in structural work. Straight shoots afford excellent tool handles. A very fine fuel timber.

Fairly common, and in places gregarious. Occurs in abundance in the Galagama country in Sabaragamuwa, and common between Nugetenna and the hills above Alutnuwara.

Its fruits are eaten by birds, so that its presence at Ritigalla can thus be accounted for.

Occurs in Southern India and Malaya.

No. 255. **E. SUBAVENIS** Vol. II. p. 173.

Hin-damba, Weli-damba Si.

A moderately tall tree with many close branches. Bark ashen, or brownish, paler on twigs. Twigs compressed, slightly angled, smooth.

Leaves opposite, small, variable in size, about 1⅞ inches by 1¼, broadly ovate, abrupt, or tapering at base, obtuse or rounded at apex, occasionally tapered, very stiff, entire; margins curved, glabrous, dark shining green above, paler below. Petiole short, ¼ inch, stout, flat, or grooved above, tinged with dull pink, Midrib thick, stiff, prominent below, slightly depressed above. Lat.-veins 10 to 14, nearly horizontal, thin, prominent below, terminating in a fine continuous intermarginal vein. Nerves inconspicuous. Stipules none.

Flowers small, sessile, white with crimson calyx, in axillary cymes. Calyx tube short. Fruits small, nearly round, calyx-crowned

Wood greyish brown, tough, rather fibrous, heavy about 50 lbs. (?) per cubic foot; difficult to saw.

Timber excellent for posts, rafters, and weather boards, stands moisture well, and is fairly durable.

Common in the hill country, over 4,000 feet altitude, often nearly gregarious.

Peculiar to Ceylon.

No. 256. **E. GARDNERI** Vol. II. p. 174.

Damba or *Dambu, S. Nirnaval, T.*

A small or medium sized tree with many branches and copious twigs. Bark smooth, greyish. Twigs usually cylindrical. Leaves opposite rather large, about 3½ inches, oval, acute at base, tapering at apex, smooth and glossy above, entire, pale bright green.

Petiole ½ inch. Midrib prominent below, rather flat above. Lat.-veins many, fine, pellucid. Intra-marginal vein conspicuous.

Flowers small, nearly white, sessile, numerous, arranged in rather short axillary and terminal cymes.

Calyx "truncate, with obscure segments." Stamens many. Fruit spherical, about ½ inch in diam., not crowned.

Wood yellowish, or ashen with a yellowish tinge, fairly close, fibrous, heavy, without lustre, durable.

I have seen shingles made from what was presumably this wood, but I have not seen the timber generally used. Said to make good beams.

Fairly common in the wet zone over 2,000 feet, but not generally distributed.

Also in South India and Western Ghats.

No. 257. **E. SYLVESTRIS** Vol. II. p. 175.

Alubo, S.

A large tree, rather conspicuously buttressed at base, with cylindrical or fluted stem. Bark thick, the outer surface scaling off in large thin papery scales, very pale ashen. Twigs pale, cylindrical. Crown, compact.

Leaves large opposite, rather variable in size, about 5 inches, often 7 inches long, by 3¼ wide, ovate—oblong, more or less acute at base, rounded and suddenly bluntly acuminate at apex, entire, margins slightly reflexed, stiff, completely glabrous, dark glossy-green above, much paler below. Young foliage tinged with varying shades of dull pink.

Petiole about ¾ inch, flat, grooved, slightly widened at base of leaf-blade. Midrib rather depressed above, strongly

prominent below. Lat.-veins numerous, horizontal, thin, equally prominent on both sides. Nerves obscure. Intramarginal vein distinct. Stipules none.

Flowers small, sessile, white, in close clusters in cymes. Fruit spherical, deep purple-black, much eaten by pigeons.

Wood, pale reddish-ashen, smooth, close, tough, durable. Weight about 50 lbs. per cubic foot(?).

The timber is much used in buildings for roofing work, and beams. It resists moisture, but warps unless shade-seasoned.

Fairly common in the wet forests of the South and West up to 3,000 feet.—Galle District, plentiful.

Peculiar to Ceylon.

No. 258. **E. CORDIFOLIA** Vol. II. p. 176.

Damba, S.

A medium-sized tree with irregular stem. Twigs cylindrical, very stout, smooth. Bark pale brownish, flaking. Leaves large, 4 to 8 inches, broadly oval, cordate at base, rounded and shortly or bluntly acuminate, stiff, hard, entire, margins thick, recurved; dark glossy green above. Petiole stout, very short. Midrib strongly pronounced below, hidden or depressed above. Lat.-veins conspicuous below, many, uniting with very distinct intramarginal vein.

Flowers about 1 inch, white, very shortly stalked, in terminal and axillary cymes. Fruit about 1 inch in diam., strongly crowned with persistent calyx tube; nearly round, rather guava-like.

Wood apparently little used. Moderately hard, tough, fibrous; dull brown or dull ashen-brown.

Fairly common in the wet forests in the West of Ceylon, extending up to the Adam's Peak range. I have obtained it at the summit of Kunadiyaparawitta (5,186 ft. alt.)

An endemic species.

No. 259. **E. NEESIANA** Vol. II. p. 177.

Panukera, Panu-damba, S.

A large tree, much branched, with cylindrical or faintly compressed twigs. Bark dull reddish brown, rather smooth, flaking in thin small flakes.

Leaves opposite, about 3 or 4 inches long, lanceolate or oblong, cordate or rounded at base, shortly acuminate, entire,

glossy and shining on both sides. Petiole about $\frac{1}{8}$ inch or nearly absent. Midrib conspicuous below. Lat-veins parallel, numerous, ending in nearly pellucid intramarginal vein.

Flowers about $\frac{3}{4}$ inch, white, in axillary and terminal cymes. Fruits about $\frac{1}{2}$ an inch, spherical, purplish.

Wood brownish grey, moderately hard, with wavy grain. Very liable to warp, and apparently for this reason is not popular as a building timber.

Opinions differ widely as to the quality and value of this wood, some carpenters asserting that it is useless, and others the reverse.

Common in the Ratnapura district.

Endemic.

No. 260. **E. OPERCULATA** Vol. II. p. 179.

Bata-damba, S.

A large tree, many branched, and broadly crowned.

Twigs stout, rather compressed, smooth. Bark thick, pale greyish-brown, and flaking in irregular scales.

Leaves opposite, rather large, up to 6 inches long, ovate-lanceolate or oval, tapering at base, obtuse or shortly acuminate; entire, glossy, stiff, rich green above, paler below. Petiole $\frac{1}{2}$ inch, stout; midrib prominent below, pale. Lat.-veins, few, conspicuous, curved, pellucid, uniting in intramarginal vein indistinctly. Leaves aromatic.

Flowers in 3's, creamy white, arranged in cymes "coming from axils of fallen leaves." Fruit small, spongy.

Wood reddish-grey, close, rather hard, wavy in graining, tough, difficult to saw. Weight about 44 lbs. per cubic foot. An excellent building timber, durable, and stands damp very well.

Rather common in the wet districts up to 4,000 feet. Occurs in North India, Burma, South China and Malaya.

No. 261. **E. JAMBOLANA** Vol. II. p. 179.

Ma-dan, Maha-dan, S. Naval, Perun-Naval, T.

"Black Plum, E.

A large tree, often growing to a great size in the dry zone. Stem rather short, robust, broad.

Branches large, wide-spreading ending in many somewhat compressed twigs. Bark pale grey or brownish grey, exfoliating in small uneven flakes. Branchlets and twigs smooth, leaf-scarred.

Leaves opposite, 3½ inches by 2, broadly ovate, or ovate-oval, rounded, or slightly tapered at base, rounded and suddenly bluntly acuminate, entire, completely glabrous, or faintly glaucous; bright apple-green above.

Petiole ¾ inch, slender, channelled above, curved, pale olive-green, or tinged with pink when young. Midrib stiff, equally prominent on both sides. Lat.-veins numerous, slender, nearly horizontal, pellucid, uniting in a distinct intramarginal vein.

Stipules absent. Flowers small, white, faintly honey-scented on short stalks arranged in cymes from 3 to 4 inches long. Calyx top-shaped, obscurely segmented, compressed round base of fruit after the petals fall. Fruit about ½ an inch, ovoid or sub-ovoid, of a rich glossy purplish-black colour, containing a spongy tissue of pleasing flavour. The berries are much eaten by birds and monkeys.

Wood dull grey, with a slightly reddish tinge, uneven in graining, hard, coarse but durable, and resists moisture. Weight about 55 lbs. per cubic foot. Hollow trunks of this wood are often used for "*Kottus*," or cylinders to serve as wells, the cylinder being driven into damp soil for the purpose.

The pores are rather small, oval, often subdivided, many. Rays very fine, close, numerous. Rings very indistinct.

The timber is suitable for beams, joists and posts, especially where there is the possibility of the wood being subjected to moisture.

The bark is astringent, and used in gargles. The seed has the reputation of being a remedy in diabetes. The glucoside "*Jambulin*" is found in the seeds, which also contains Gallic Acid (*Dey*).

In Native medicine, a decoction of the bark is used in chronic diarrhoea and dysentery (*Gunawardana.*) The leaves are eaten by the Tussore Silkworm.

Common up to 2,500 feet, but more abundant in the dry country. Often found in "Cinnamon Soil" and in the beds of breached tanks. Also occurs in most parts of Tropical Asia.

The foregoing represent the better known and more useful members of this large genus, many of which are probably of great value as timber, but their specific uses have not all been investigated.

Some confusion arises over the Sinhalese name "Damba" or "Dambu" which is applied often to large as well as small-leafed species, more especially by carpenters who are only

acquainted with the wood, and not the tree. Care should be taken, therefore to discriminate when only a name is given, that is in reality only generic.

No. 262. **BARRINGTONIA SPECIOSA** Vol. II. p. 189.

Mudilla, S.

A moderately large and ornamental tree, with shapely crown. Bark dull grey, rather smooth. Branches much leaf-scarred.

Leaves rather crowded, large, about 12 inches long, top-shaped tapering at base, rounded broadly at apex, entire, stiff, coarse, glabrous, dark glossy green on both sides.

Petiole hardly distinct as blade of leaf tapers low. Mid-rib very stout, broad, conspicuous, pale. Lat.-veins rather distinct, conspicuous.

Flowers large, 6 to 8 inches in diam., pale white, with the filaments tinged at ends pink. Calyx close in bud, dividing into 2—3 concave segments veined. Petals 4 (or 5) broadly oval. Stamens numerous, in a ring, nearly or slightly attached to base of petals. Filaments long, erect. Ovary 4-celled with six or more ovules in each cell. Style long.

Flowers on thick stalks on an "erect terminal raceme." Fruits quadrangular, pyramidal with the apex terminating with the calyx lobes that persist, hard leathery, pale brownish. Seeds enclosed in a fibrous mass. Seeds large, ovoid.

Wood pale, soft, porus, suitable for floats, but not durable. The seeds contain an oil, which when mixed with bait, has an intoxicating effect on fish. This plant is rare in a wild state, but is grown for ornamental purposes near the sea coast, and is to be found about Colombo and elsewhere. Also in the Maldives, Malay Islands, Polynesia, and North Queensland.

No. 263. **B. RACEMOSA** Vol. II. p. 189.

Diyamidella, S.

A small water-loving tree with drooping branches. Bark greyish-white, rather smooth, leaf-scarred on branches, and twigs.

Leaves large, crowded, nearly sessile, about 8 to 12 inches long, ovate, or obovate-oval, much tapered at base, acute, minutely crenate-serrate, very glossy above, glabrous. Petiole pinkish, almost entirely bladed, stout, flat. Midrib prominent. Lat.-veins 12, rather distant, with raised leaf-tissue between each pair.

Flowers from 2 to 3 in. in diam., creamy white, with red or pink filaments, faintly scented, pendulous, on short diverging stalks, attached to a long raceme that is terminal, or growing from old wood.

Calyx-limb dividing into 2 or 3 segments, "petals connate at base," more or less oval, and spreading. Filaments many, about 1 inch, straight. Ovules 3 or 4 in each cell.

Fruits about 2½ inches long, oblong, capped by calyx segments, four-lobed, hard, brownish-red when ripe. Seeds large, over 1 inch.

The wood is white, soft, and sometimes used in hut building, but is unsuitable as it quickly decomposes. The bark is astringent, and said to be also emetic; is used in village medicine. The seeds are said to possess similar properties to *Cinchona*.

Moderately common near water in the wet zone, up to 2,000 feet altitude. Also found in South India, Malaya, and Polynesia.

No. 264. **B. ACUTANGULA** Vol. II. p. 191.

Ela-midella, *S. Adampu*, *T.* sometimes *Kolai-adampu*.

A small broad-crowned tree, with erect stem. Bark brownish, or greyish-brown, noduled. Young parts smooth.

Leaves moderately large, 3-6 inches, oblong-oval, much tapered at base, nearly acute at apex, faintly crenate-serrate, lustreless-green above. Petiole ½ inch rather slender. Midrib prominent below, pale. Lat.-veins nearly pellucid, minor nerves reticulate, and distinctly so. Flowers 1 inch in diam., creamy white, with dark crimson stamens. Calyx *not* open in bud, divided into 4 broad ciliate segments.

Petals small. Filaments rather long, many. Fruit square in section, oblong-ovoid, nearly 1½ inches, tapering at base, ending with segments of the calyx.

Wood white, soft, even, not very durable, but moderately hard. Weight 46 lbs. per cubic foot (*Gamble*).

Pores small, sub-divided in radial groups between the broad and very broad, rarely fine, and moderately broad; long pith-rays, which form the greater part of the wood, and show a handsome silver grain on radial section (*Foxworthy*). Timber used in boat building.

The fruits are astringent, and are used for sore throat. The seeds contain *Saponin*, and are used as an expectorant and emetic. The root is a bitter tonic.

Common in the dry zone round tanks, and damp ground. Also occurs in South India, the Seychelles, Malaya, to North Australia.

No. 265. **CAREYA ARBOREA** Vol. II. p. 191.

Kahata, S. Kasaddai or *Kachadai, T. Patina Oak, E.*

A moderately tall tree, but rarely very straight in the stem, few-branched, with irregular crown. Bark dull brown, thick, rather rough, more or less fissured. Leaves large, 6 to 12 inches long, ovate or broadly ovate, much tapered at base, rounded or obtuse at apex, coarsely denticulate—crenate, smooth, rather thick, more or less deciduous. Petiole thick, short, often bladed to base. Midrib stout, pale, Lat.-veins about 12 pair, rather distant, nearly pellucid.

Flowers large, about 4 inches in diam., greenish, with pink or pale pink filaments; rather offensive in scent, crowding on barely distinct stalks, in stiff terminal spikes. Bracts 3, one large, oval, and two narrow lateral ones. Calyx tube campanulate, smooth, adnate to ovary, dividing into 4 stiff segments. Petals 4, about 2 inches long, ovate, with margins recurved. Stamens numerous, in rows, attached at base. Style long; ovary 4-celled with many ovules. Fruits large, orange-like about 3 inches in diam., bright green, crowned with persisting calyx. Seeds imbedded in fleshy tissue.

Wood, dull reddish brown in centre, pale towards the outside, mottled, dense, hard, durable.

Weight about 50 lbs. per cubic foot. Pores oval, of moderate size, often sub-divided. Rays fine, rather close, and bending round pores.

The timber suitable for beams, posts, and planking, and in Burma is used for gunstocks. It polishes well, and makes handsome panels.

The bark is a strong astringent, used in native medicine, and for tanning. It is specially used in hoof disease in cattle, and is quite efficacious. A piece of fresh bark, added to honey, is useful for coughs. Boils and ulcers washed with a decoction made from pounded fresh bark are readily amenable to this treatment.

Fruits eaten cooked in some places. (C.D.)

Common up to 5,000 feet, and often nearly gregarious on Patina Lands. Also found, but less commonly, in the dry country. Occurs in Bengal and Burma.

Of the introduced species, the following are familiar, viz., the "Rose Apple" or "Veli-jambo" (*E. Jambos*) with its pinkish yellow fruits and narrow leaves. The Malay-Apple

(*E. malaccensis*) or "Jambu" bears a mass of crimson flowers, and the fruits are red, with white spongy interior. The little Wax Jambo (*E. javanica*) or Pini-Jambo, has glossy shining pink wax-like fruits, often found in Low-country gardens, and regarded as a pleasing fruit. This, and *E. Jambos*, are of very early introduction and have become quite naturalised in Ceylon. I am informed that at one time *E. malaccensis* was cut out and destroyed, as it was believed to be the cause of Cholera! It appears to afford quite a good hard timber.

Of the other introduced plants under this order, perhaps the most familiar is the Guava (*Psidium Guyava*): the 'Pera' of the Sinhalese, or 'Koya' of the Tamils. Though a native of Tropical America, it has become completely naturalised in many parts of Ceylon, in Balangoda for example, where it is very abundant, and supplies the material for the well-known guava jelly. The fruits are eaten by many different animals, and the seed is thus easily spread, as it passes through the digestive organs unharmed, unless broken by mastication. A second species, *P. cattleianum* or 'Hill-guava,' with claret-coloured fruits, is also an introduction to this country and flourishes in the gardens of the hills. It affords an excellent tart-fruit and delicate jelly.

The Gums (*Eucalypti*) introduced into Ceylon from Australia, are now familiar plants in the Planting Districts, and include 'Iron Bark' (*E. leucoxylon*) 'Karri' (*E. diversicolor*), 'White Gum' (*E. alba*), 'Lemon-scented Gum' (*E. citriodora*), and the tall *E. robusta*, all of which are of importance for fuel or timber. The 'Karri' does not grow to anything like the same size in Ceylon as it does in Western Australia, where it attains an altitude of 300 feet. Its timber is red in colour, hard, strong, and tough, with slightly wavy grain, but is lacking in "figure." Its chief defect is 'Star-shake' which spoils it for very large beams. It stands water.

'Jarrah' (*E. maginata*) is a South West Australian wood, largely imported into Ceylon, and is a most useful timber for sleepers, beams, and general building purposes. The wood is red in colour, close, hard, and heavy, with a certain amount of 'figure.' It will polish, and is therefore suitable for ornamental purposes.

E. citriodora is a variety of *E. maculata*, which is native to New South Wales. Being a durable timber, it is in demand for bridge and ship building in its native country.

Perhaps our commonest gum, is the 'Blue Gum' (*E. Globulus*) now very abundant in the hill districts. [This is the chief source of Eucalyptus oil.—C.D.]

Its timber is of a pale straw-colour, moderately strong, tough, and with a twisted grain, and is used in its native home in ship-building, and very largely for fencing wood. Here, and in the Nilgiri hills it is chiefly used for fuel, as probably our oldest trees are not matured enough to serve as timber for structural work.

Another familiar introduction into Ceylon is the European myrtle (*Myrtus communis*), to be found in many of our gardens up-country, where it is grown as an ornamental plant.

LIII.—MELASTOMACEAE.

This order, in Ceylon is represented by 6 genera, viz, :—1. *Osbeckia*, 2. *Melastoma*, 3. *Kendrickia*, 4. *Sonerila*, 5. *Medinilla* and 6. *Memecylon*, nearly all of which are small shrubs or herbs, and only a few have any claim to be classed as trees.

Though the order has only few genera, it is remarkable that many species are endemic; thus, in *Osbeckia*, 5 are endemic, in *Sonerila*, 8; in *Medinilla* 2, and in *Memecylon* 21, making 36 out of a total of 52 species, or rather over 40 per cent.

Many of our Melastomaceous plants afford handsome flowers, some of which would repay cultivation owing to their beauty, but on the other hand, only a very few are of economic value.

No. 266. **MEMECYLON ARNOTTIANUM** Vol. II. p. 211.

Pinibaru, *S.* (In Pasdun Korale and Ratnapura.)

A small bushy tree, never tall. Bark pale brown, even, smooth. Leaves opposite, small, up to 2 inches in length, ovate, strongly three-nerved, rounded at base, tapering to lengthened apex, entire, on very short petiole.

Young leaves delicately tinged with purple.

The strong three-nerving of the leaf marks a specific characteristic in this species to distinguish it from all other members of the genus.

Flowers solitary, minute, white or faintly greenish white, on erect axillary stalks, from quarter to one inch in length. Calyx divided into four lobes each pointed at apex. Petals 4, Stamens 8. Fruits spherical; about quarter inch in diam., dark bluish black when ripe.

The wood is only suitable for small tool handles and sticks; close, dense, rather wavy in grain.

Occurs in the wet zone, especially in the Ratnapura District, and the adjoining Pasdun Korale.

The species is endemic.

No. 267. **M. HOOKERI** Vol. II. p. 212.

Kevetiya-Kera, S.

A shrub, sometimes—as in the Udugama Forests—becoming a small tree. Bark very pale ashen, smooth, exfoliating in pieces or flakes. Ends of branches and twigs strongly angled with narrow wing-like edges.

Leaves large, from 6 inches to a foot long, opposite, oblong or lanceolate, cordate at base, tapering to a narrow sub-acute apex, entire, glossy above, pale below, of a rich Roman purple colour when young. Petiole very short or absent. Midrib and lateral veins very conspicuous and pronounced, the latter uniting with a strong, conspicuous, intramarginal vein.

Flowers about quarter inch in diam., bluish, or bluish pink on opening, arranged in small crowded axillary clusters. Flower-stalks 'surrounded at base with a little involucre of acute white bractlets, and brown hair-like scales' (*Trimen*). Fruits nearly spherical, about half inch in diam., dark purple.

Wood brownish, very close, hard, with minute pores in irregular masses. Suitable for tool handles and probably for golf sticks. The largest stems about four inches in diam.

Endemic.—Fairly common in the Adam's Peak forests, and at the foot of the hills, but only abundant in very wet districts up to about 1,000 feet altitude, and generally near water.

A variety of this *N. Hookeri*, variety *exaltatum*—may be distinguished by the twigs being free from any webs down the angles formed by the compressed sides, as in the above.

No. 268. **M. PARVIFOLIUM** Vol. II. 213.

A small tree with "very numerous branchlets." Bark pale, or greyish, fissured. Twigs compressed and angled.

Leaves small, about one inch, broadly oval, rounded at apex, tapering at base, entire, stiff, dark green above, margined with an almost rigid cartilaginous edge.

Petiole short, midrib distinct, lat.-veins nearly horizontal and hidden.

Young leaves on opening are red.

Flowers small, white, few with stalks "about as long as the Clayx-tube; Clayx-tube short, limb spreading, cup-shaped; segments shallow, acute" (*Trimen.*)

Fruits about one-third of an inch in diam., nearly black, spherical, crowned with Calyx-limb.

Wood yellowish, hard, dense, closegrained, suitable for posts, rafters, and tool handles, or walking sticks.

An endemic species, moderately common above 3,000 feet.

I have heard no native name for this species, but I fancy it is often confused with our 'Dambas,' owing to its resemblance to the hill *Eugenias*.

No. 269. **M. UMBELLATUM** Vol. II. p. 216.

Kora-kaha, S. Pandikaya, Kaya, T.

A much branched dense bush, with cylindrical stems and twigs. Bark thin, smooth, greyish-brown.

Leaves variable from 1 to 2½ inches long, oblong-oval, tapering at base, sometimes rounded obtuse or obscurely acuminate at apex, entire, dull green above; opposite.

Petiole nearly ¼ of an inch. Midrib distinct, with two intra-marginal veins, one on each side starting from the base of the leaf, and giving a somewhat tri-nerved appearance to the whole.

Lat.-veins very indistinct, few.

Flowers small, brilliant Cambridge blue, exceedingly pretty in their dense clusters arranged in umbellate cymes on old wood, or in the axils of fallen leaves.

Calyx "shallowly campanulate" with triangular segments.

Petals "small, distant, reflexed." Fruit about ¼ inch diam., spherical, crowned with calyx-limb, pale orange or yellowish red.

The wood is pale brown or nearly white, very even grained, smooth, but never of large size. Suitable for walking sticks.

The fresh leaves produce a yellow dye, and the dried leaves afford a fine mulch for garden soils.

Fairly common both in the wet and dry zones, ascending up to about 2,000 ft. altitude. Also occurs in South India.

The leaves of this plant are eaten by the 'Atlas' month.

No. 270. **M. ROSTRATUM.** Vol. II. p. 218.

Kuratiya, Gal-pinibaru, S.

A small slender tree, with many oblique branchlets. Bark pale; twigs nearly quadrangular, smooth.

Leaves small, about 2 inches long, lanceolate, or oval-lanceolate, much tapered at base, and acuminate or tailed at apex, entire, rather stiff. Petiole short, about $\frac{1}{8}$ of an inch or less in length. Midrib thin; lat.-veins obscure.

Flowers minute, faintly bluish in "umbels on a short stout peduncle in axils of both past and present leaves." Disk conspicuously rayed. Fruits very small, purplish, spherical, more or less crowned.

Wood pale yellowish, close, hard, dense, and smooth. Said to make excellent posts.

Occurs in the Yakdessa District, where it attains a considerable size. It is an endemic species. Trimen says 'rather common.'

No. 271. **M. CAPITELLATUM** Vol. II. p. 222. Plate xli.

Dodan-kaha, Weli-kaha, S. Kasa, Vengala-kayam, Katti-kaya, Pavadai-kaya, T.

A bush or shrub, rarely attaining more than a few feet in height, with cylindrical twigs. Bark pale brown, smooth.

Leaves opposite, from $1\frac{1}{2}$ to 3 inches long, narrowly oval oblong, acute at base, tapering to an acuminate apex, entire, thick, glossy green above, pale below. Petiole very short, stout, easily disarticulated. Midrib pronounced,' pale yellowish above. Lat.-veins few, thin, obscure. Intramarginal vein conspicuous in the lower half of the leaf.

Flowers violet, or bluish-violet with tips of segments of the calyx tinged with pink. Calyx-tube erect, stout 4-lobed with minute tooth-like blunt points. Disk-rays winged.

Flowers arranged in close-clustering heads, on a stalk about $\frac{1}{2}$ inch long, in twos, from the axils of the leaves. Fruit a compressed spherical mass about 3/8 of an inch in diam., crowned with persistent calyx segments, dark blackish purple.

Wood very hard, smooth, close and even in grain; suitable for sticks, tool handles and the like. The leaves afford a yellow dye.

Common in the dry zone often forming dense clustering bushes near tanks. Doubtfully endemic.

LIV.—LYTHRACEAE.

This important order is represented in Ceylon by seven genera, viz., 1, *Ammannia;* 2, *Woodfordia;* 3, *Pemphis;* 4, *Lawsonia;* 5, *Lagerstroemia;* 6, *Sonneratia;* and 7, *Axinadra.*

Of these, the last genus alone affords a solitary species that is our only endemic form out of a total of 15 that make up the order.

No. 272. **AMMANNIA BACCIFERA** Vol. II. p. 224.

A low erect shrub with quadrangular smooth stems and many horizontally spreading low branches, diminishing in length upwards.

Leaves opposite, about 1 to 1½ inches long on the stem, shorter on the branches, sessile, narrowly oblong, finely tapered at base, obtuse at apex, soft, entire.

Stipules absent,—characteristic of the order.

Flowers (I quote from *Trimen*) "shortly pedicellate, in loose cymes, forming whorls in the axils; calyx shortly campanulate, segments 4, broad, acute. Petals absent. Stamens 4. Capsule red, longer than the calyx. Seeds minute, convex on one side and plane on the other, with the flat side excavated.

According to *Dey* the freshly bruised leaves are used as a remedy in ringworm and parasitic skin affections. It is supposed to have blistering properties; and is therefore called the Blistering Ammania.

It is found in damp places near the coast in the dry zone, and throughout the Tropics, in the East.

No. 273. **WOODFORDIA FLORIBUNDA** Vol. II. p. 226.

Malitta, S.

A shrub, with few rather long drooping branches. Bark reddish brown, rather fibrous. Young parts finely pubescent. Leaves opposite, variable in length, 2 to 3½ inches long, sessile, narrowly lanceolate, or ovate lanceolate, cordate at base, tapering to fine apex, entire, "velvety on both sides," faintly dotted with minute orange-coloured glands.

Midrib prominent below. Lat-veins distinct above, pellucid, uniting along and within the margin.

Flowers rich red, rather large, arranged in short cymose panicles, on short pubescent stalks. Calyx-tube about ¾ inch,

rather wide, "campanulate at base," pubescent, 6-segmented, segments short. Petals minute, 6, inserted between the teeth of the calyx segments. Stamens trimorphic, 12.

Ovary 2-celled, ovules many. Seeds brown, numerous, tapered oblong in shape.

The flowers are used in Northern India as a dye, and for tanning, as they contain a high percentage of tannic acid, and in consequence they are astringent and employed as such in native medicine.

Gunawardana states that two drachms of the powdered flowers of this plant given with curdled milk are used in dysentery. *Nadkarni* adds, that the powdered flower is sprinkled over ulcers, for diminishing their discharge, and promoting granulation.

Common in Uva, in restricted areas, generally in Patina lands, as for example between Bandarawela and Badulla.

Found in India, China, Africa, and Madagascar.

No. 274. **LAWSONIA ALBA** Vol. II. p. 228.

Marutonti, T. Henna, Camphire, and *Tree-Mignonette, E.*

A moderately large scraggy-branched bush, with branchlets ending in spines. Bark dull reddish brown, rather smooth, Stems small.

Leaves opposite, small, from ½ to 1 inch, lanceolate or oval-lanceolate, much tapered at base, variable from acute to obtuse at apex or even apiculate, thick, entire, completely glabrous, rather dull green above. Petiole very short, often bladed to very base; midrib moderately stout; lat.-veins conspicuous above and uniting intramarginally.

Flowers very numerous, small, creamy-yellow, with pink-tinged sepals, very fragrantly scented, arranged in pyramidal axillary and terminal panicles.

Calyx-tube short, 4 lobed. Petals, 4, inserted at end of calyx-tube; stamens 8 in pairs. Fruit capsular, small, spherical, with style persistent. Seeds many, close, minute, smooth.

This plant produces the famous dye known as Henna, which is used for dyeing the hair, nails, and teeth. The Arabs use Henna for colouring their beards, and the manes and tails of their horses.

The dye is prepared by reducing the leaves and young twigs to a powder, which by adding hot water is turned into a pasty mass. This is spread upon the part to be coloured and allowed to remain for a night, after which it is brushed off

leaving the stain behind. The use of Henna is very remote, as there is evidence of its application in Egyptian nummies. The flowers, being highly scented, are in favour for floral offerings.

Wood pale, greyish brown, close grained, but not, as far as I am aware, made use.

Generally a cultivated plant in gardens in the low-country, especially in dry districts.

Also in India, Egypt, Persia, and wild in Baluchistan.

No. 275. **LAGERSTRŒMIA FLOSREGINÆ** Vol. II. 228

Muruta, S. Pumarathu, T. Pride of India, E.

A fairly large, deciduous tree, with wide-spreading crown. Stem erect, moderately cylindrical. Bark, pale, grayish or dull ashen, exfoliating in scales.

Leaves large, opposite, rather variable in length according to maturity of shoot, from 6 to 12 inches, oblong, or oblong-lanceolate, rounded at base, nearly acute or sub-acute, entire, glabrous, dull green above, paler below, often very dark leaved in examples from wet districts. Petiole about half an inch, stout, tinged with red. Midrib stout, prominent below, conspicuous above. Lat.-veins variable in number, stout, much pronounced below.

Flowers large 3 to 4 inches in diam., rose-coloured, or mauve, sometimes magenta-pink, arranged in very large erect terminal panicles. Flower-stalks thick, pubescent. Calyx-tube stout 6-lobed vertically 12-grooved, scurfy, lobes triangular acute. Petals large, 6, round, inserted on calyx-tube veined, "with a stout petiole-like claw." Stamens many, inserted in rows near base of calyx-tube. Style simple, ovary 6-celled, ovules many. Fruit partly hidden within cup-like calyx, pointed, hard, nearly one inch in diam. Seeds brown, winged.

Wood light red, shining, close grained, hard, durable, well suited for beams, joists, posts, etc. Weight about 45 lbs. per c. ft. *Laslett* speaks of it as a hard lustrous timber, probably second only to teak. It is largely used in construction, and shipbuilding. Pores in irregular chains, connected with pale tissue, round, small; largest near the annular rings. Rays fine, indistinct.

The root is astringent, and used as a remedy for thrush; the bark is purgative, and seeds narcotic.

This handsome tree is fairly common near rivers and streams in the wet zone, up to about 2,000 feet altitude, becoming scarce beyond the intermediate zone. The large handsome flowers appear to be variable in their depth of colour according to rainfall. I have obtained a white flowered example from the banks of the Kelani River near Kitulgalla, but unfortunately some fellings have since destroyed the plant. Occurs in India, and Malaya.

Lagerstoemia indica, Bonnet Flower or "Crape Myrtle" is a bright pink-flowered cultivated garden plant, often found in and near Colombo. It is a native of China and India.

No. 276 **SONNERATIA ACIDA** Vol. II. p. 230.

mangrove

Kirilla, S. Kinnai, T.

A small erect tree, with pale bark, and quadrangular twigs. Leaves opposite, from 2 to 3 inches long, nearly round, or oblong-oval, tapered at base, obtuse or apiculate at apex, entire, rather thick. Petiole very short rather stout. Midrib distinct above, prominent below. Lat.-veins inconspicuous.

Flowers large, about two inches in diam. Solitary, deep rose pink, placed at ends of branches, on thick stalks. Calyx-tube smooth, dividing into six narrow acute lobes longer than tube, enlarging later and surrounding the fruit with a rayed saucer-like base. Petals 6. Stamens numerous, over 200, about two inches long, erect. Style persistent, longer than stamens, forming a conspicuous tapering appendage to the depressed-globular fruit. Seeds small.

The fruits are sub-acid, and are eaten.

The wood is pale, soft, light, easily carved, but not durable. The roots send up aerial shoots of a very spongy character. [These serve as breathing organs.—C.D.] The wood of these roots affords a good substitute for corks, and for lining entomologists' collecting boxes.

A fairly common tree, found in mangrove swamps and tidal streams round our southern and western shores. Also in India, Burma and Andamans.

No. 277. **AXINANDRA ZEYLANICA** Vol. II. p. 231.

A moderately tall tree, with erect cylindrical stem and short branches. Bark smooth, very pale brown, or dull grey. Twigs compressed into four winged prominences, strongly resembling *Memecylon Hookeri* (No. 267).

Leaves rather large, about 8 inches, lanceolate or narrowly oblong, nearly cordate at base, acuminate at apex, stiff, en-

tire, completely glabrous, depressed over midrib and lateral veins, dark glossy green above, and paler below. Petiole stout, very short; midrib prominent below, and distinct above. Lat.-veins numerous, distinct, pellucid.

Flowers very minute, yellowish, with white petals arranged in 'axillary and terminal racemes,' or opposite branched panicles.

Calyx-tube, short, divided into 5 segments; petals 5, stamens 10 erect with almost sessile anthers. Ovary inferior, 6-celled, with one ovule in each cell. Style very short. Fruit, a woody oblong-ovoid capsule, greenish, tinged with rose pink, about $1\frac{1}{4}$ inches long. Seeds compressed, winged at the upper end.

Wood pale, rather hard, even grained, but seemingly not much known, probably because the plant is rare. It occurs in the wet zone, but only in restricted areas up to 2,000 feet. My examples were obtained in Balangoda, Udagama (S.P.), and Kitulgalla, but I have nowhere heard the name 'Kekiriwara' applied to it as recorded by Trimen and Macmillan.

This is our only endemic *Lythraceous* plant.

The well-known Pomegranate (*Punica granatum*) the 'Delun,' and 'Mathalam' of the Sinhalese and Tamils respectively, is an introduced member of this order, and was probably brought to Ceylon many years ago. It is cultivated in the low-country, in both wet and dry zones, both for its fruit and its medicinal properties.

The rind of the fruit and the root-bark are both officinal, and contain tannin up to 25 per cent., and what is named 'Punico-tannic' acid is obtained therefrom.

One of the remedies for Tapeworm in man, a liquid volatile alkaloid named 'Pelletierine', has been isolated from the root-bark (*Dey*). The tan is used for tanning morocco-leather; a red dye is also obtained from the flowers.

LV.—ONAGRACEAE.

This small order is represented in Ceylon by three genera, viz.: 1. *Jussiæa;* 2. *Ludwigia;* and 3. *Trapa;* but none of them contains species peculiar to this island. They are all of them associated with wet ground, and attain no great size.

No. 278. **TRAPA BISPINOSA** Vol. II. p. 235.

Ikiliya, S. "Water Chestnut." (locally called *Wilakattu*, or *Elakattu* (N.C.P.))

An aquatic plant. Stems long, prostrate and submerged, cylindrical, spongy, glabrous.

Leaves crowded, broadly deltoid, about $1\frac{3}{8}$ in. by $1\frac{3}{4}$ in. (broader than long) sub-pelate, or faintly cordate at base, deeply serrate, with serrations often divided, glabrous above, dark green over a purplish bronze; dull pink below and densely hairy. Petiole from 2-7 inches, pinkish, spongy, dilating into a narrowly ovoid float placed about 1 inch below base of blade, above which the petiole is shaggy.

From the axils of the upper leaves there are distinct linear stipules of pale colour, nearly transparent. Below these is a root-like process divided into filiform, dull green, branches. These in turn carry a bladder-like appendage, arranged irregularly with the axils, or upon the filiform branches themselves. When dry, this curious mass emits an offensive sea-weed-like odour.

Flowers few, solitary, axillary, white, on a stout spongy, hairy stalk. Calyx deeply cleft, 4-lobed, faintly hairy outside. Petals 4, white, ovate, very thin. Stamens 4, filaments white, shorter than petals, inserted below ovary. Anthers yellow, deshiscing in longitudinal slits.

Fruits forming under water, somewhat top-shaped, with sides compressed, spreading and terminating into two elongated acute horns with between them a finial-like point corresponding to the base of the style.

The whole fruit is hard and bony, and contains a white albuminous mass that is cooked and eaten.

These fruits are said to be gathered in large numbers during the dry season for food; and according to local testimony take the place of rice, when the latter is unprocurable.

In Kashmir it is an article of food, as also in China. An analysis of the kernels, according to *Dey*, showed the nutritive value to be equal to that of rice. The same authority states that the pericarp of the fruit is rich in manganese.

Very common in tanks and channels in the dry zone.

LVI.—SAMYDACEAE.

This small order is represented in Ceylon by 3 Genera, viz., 1. *Casearia*, 2. *Osmelia* and 3. *Homalium*.

The species are five in number, of which only two are endemic.

No. 279. **CASEARIA ESCULENTA** Vol. II. p. 237.

Wal-waraka, S. Kakaipalai, T.

An erect shrub with thin branches, rarely more than 12 feet high. Bark smooth, greyish, or dull yellowish white. Twigs and shoots glabrous.

Leaves alternate, variable in size from 2 to 6 inches long, narrowly oval, or lanceolate, tapered at base, obtuse or acute at apex, acuminate, entire or nearly so, thick, glabrous, glossy above. Petiole about one-third of an inch, rather stout. Midrib prominent, strong. Lat.-veins few, with many intermediate ones forming a second series. Stipules small, persistent.

Flowers small, dull green, arranged on a raised knot in the axils of the leaves, often after the leaf has fallen. Calyx segments 5, ovate, persisting.

Petals absent. Stamens 6 or 8, with prolonged staminodes alternating therewith. Ovary *superior*, with one cell. Ovules many. Fruit ovoid, broad at base, pointed, dividing into 3 orange-coloured valves. Seeds enclosed by a scarlet aril.

The plant rarely attains sufficient size to yield much volume of timber, but what wood there is is hard, nearly yellow in colour, and durable, but does not appear to be much used. The fruits are eaten, and the bark is regarded as medicinal.

Occurs in both the wet and dry zones. Fairly common in the Batticaloa District, where it flourishes in sandy soils.

Also in South India and Malaya.

An allied Indian species—*C. tomentosa*—affords a hard wood, that is used for making combs.

No. 280. **HOMALIUM ZEYLANICUM** Vol. II. p. 239.

Liyan, S.

A tall straight, erect, slender tree, with rather narrow crown. Bark pale, flaking off in large scales at irregular intervals, roughish.

Leaves alternate, 2 to 6 inches long, oval, tapered to base, acuminate, acute, glabrous, serrate-crenate.

Young leaves pink, or crimson-lake for a short time, becoming purple on midrib below, this tinge more or less persisting. Petiole short. Midrib and lat.-veins all prominent below. Flowers very small, pale greenish white, arranged in "dense corymbose clusters, on a long, narrow, interrupted pendulous panicle from 6 to 9 inches long," (*Trimen*). Calyx-tube attached to lower portion of ovary, 4 or 5 lobed. Petals

oblong or "spathulate oblong," much produced beyond the calyx segments, 4 or 5; stamens 4 or 5, opposite, and longer than petals. Staminodes bilobed, alternating with stamens. Ovary one-celled "with four clusters of pendulous ovules." Fruit small, capsular.

Wood pale brown, darker towards the heart, close, very durable, springy, about 48 lbs. per cubic foot.

Pores minute, more or less embedded in fine tissue arranged in lines between thin indistinct rays.

The timber is well suited for house-building, posts, rafters, and wall plates. It is rather liable to "sag" over long lengths. Sometimes used for shingles. Very suitable for rods or curtain poles.

Fairly common in the wet zone up to 4,000 feet, but is not generally distributed. Usually found in ravines and rocky land.

Also in South India.

LVIII.—CUCURBITACEAE

A very large order of plants in Ceylon, mostly twiners, assisted by solitary tendrils that spring from the leaf axils. The flowers are generally large, monoecious or dioecious, sometimes very large and conspicuous. The Ceylon genera are 17 in number, but the species form a low average in proportion.

Many are introduced species owing to their use in native foods, but little is reliably known as to when and when they were imported. Our local genera are: 1. *Trichosanthes*; 2. *Gymnopetalum;* 3. *Cephalandra;* 4. *Momordica;* 5. *Cucumis;* 6. *Luffa;* 7. *Citrullus;* 8. *Bryonia;* 9. *Mukia;* 10. *Zehneria;* 11. *Melothria;* 12. *Rhynchocarpa;* 13. *Corallocarpus;* 14. *Cerasiocarpum;* 15. *Ctenolepis;* 16. *Gynostemma; and* 17. *Zanonia.*

Our endemics of this order are *Trichosanthes integrifolia, Momordica denudata and Melothria zeylanica.*

No. 281. **TRICHOSANTHES PALMATA** Vol. II. p. 244.

Titta-hondala, S.

A powerful climber, with strong 3 or 2 pronged tendrils, and bluntly-angled stem. Leaves alternate, large, about 6 inches long and wide, deeply lobed, dividing into 3 or 5 dentate-serrate glabrous lobes. Veins prominent beneath, minutely

scaled. Dark green above, paler, or apple-green below. Petiole comparatively short, about 1 inch, scaly.

Flowers diœcious. Male flowers sheathed with bracts, in drooping racemes, about 2 inches in diam., pink. Bracts persistent, glandular, broad at base. Female flowers on short stalks; tube about 2 inches, petals smaller than in the male. Ovary with many pendulous ovules; stigmas 3. Fruit spherical, 'with a blunt nipple,' about $2\frac{1}{2}$ inches in diam., rich scarlet outside. Seeds about $\frac{1}{2}$ inch, compressed, brownish, enclosed in a verdigris-like pulp.

In India the fruit is used as a cathartic; the juice of both the fruit and root-bark, boiled with Gingelly oil, is alleged to relieve headache.

Locally common, but nowhere abundant. Occurs in both dry and wet zones. Also throughout Tropical India.

No. 282 **T. CUCUMERINA** Vol. II. p. 245.

Dummella, S. Pudal, T.

A slender climbing plant, with tendrils 3-forked. Leaves alternate rather variable in size, from 2 to 5 inches long but broader than long, deeply cordate at base, divided into 3 to 7 lobes; lobes rounded, distantly toothed. Smooth above. faintly pubescent, or glabrous beneath. Flowers white, males in racemes; females frequently in the same axil on short stalks. In the male, the Calyx-tube is about an inch long, with small spreading petals; in the female the lower half of the tube is more or less hairy. Fruits torpedo shaped, about 2 inch, greenish, streaked with white, becoming a rich scarlet when quite ripe. Seeds many, enclosed in a red gummy pulp.

The roots made into a decoction are a vermifuge, and the leaves are used for bilious complaints. The fruits are purgative.

A common Low-country plant, but more plentiful in the dry zone.

Also India, Malaya and Tropical Australia.

The familiar 'Snake-gourd' (*T. Anguina*) 'Patola,' *S.* 'Podivilankai,' *T.* is well-known as a curry-vegetable, and is much eaten. The mottled green and white fruits, which are very snake-like in appearance, often attain a length of 5 feet, a stone being attached to the end so as to produce a straight growth. This species is only found in a cultivated form and is grown abundantly in village gardens. It is a native of China, and Malay countries. Its ally, the Viper Gourd of Central America, has a crimson fruit, even longer than our plant.

No. 283. **MOMORDICA CHARANTIA** Vol. II. p. 248.

Karawila, S. Pavakai, T. Bitter gourd, E.

A many-branched sub-twining plant, with simple tendrils. Stems distinctly 5-angled and rough. Terminal shoots hairy-pubescent. Leaves bitter to the taste, and varying from 2 to 5 inches, deeply cleft at base, and dividing into 7 or more acute, spinous-dentate apiculate lobes. Veins pubescent above and below. Petiole up to 2½ inches, grooved, and slightly winged below leaf base.

Flowers rich yellow, monœcious, solitary, on slender stalks supplemented with at a large bract. Fruits unlike the others in this order, strongly studded with nodular, or more or less pointed, tubecles, ending in a point; at first green, becoming yellowish or orange with maturity. Seeds about ½ an inch, compressed, coated with a bright red soft pulp.

The fruit is eaten as a vegetable in curries, is bitter, and acts as an antibilious laxative. The juice of the leaves is used as a purgative, and are said to be useful in night-blindness!

Though found in a semi-wild state it is probably an 'escape,' as it is nowhere found far from gardens that may or may not have gone out of cultivation. Occurs generally in the low-country, but is cultivated up to 3,000 feet altitude.

No. 284. **M. DIOICA** Vol. II. p. 249.

Tumba-karawila, S. Paluppakai, Tumpai, T.

Stems slender, flattened, shining with tuberous roots. Leaves small, variable 2-4 inches long, 3 or 5 lobed, deeply cordate at base, sparcely dentate. Smooth, glossy. Petiole about 1½ inches, grooved above, pubescent. Veins conspicuous.

Flowers light yellow, dicœcious, the males solitary on long stalk, with a conspicuous bract below.

In the female, the bract is small, and the ovary covered 'with long soft papillae.' Fruit narrowly ovoid, sharply beaked, coated with 'equal-pointed papillae.' Seeds oblong, flattened, covered with a dull red pulp. The fruits are bitter to the taste. They are eaten, cooked, as a wholesome vegetable. The tubers are used for affections of the bowels, while the leaf juice used, in conjunction with sandal-wood, made into an ointment, is said to relieve pains in the head.

Common in the dry zone. Also in India and Malaya.

No. 285. **LUFFA ÆGYPTICA** Vol. II. p. 251.
Niyan-weta-kolu, S. Pikku, Pichukku, T. Loofah or Sponge-gourd, E.

Stems stout, angled, twisted, pubescent over young parts. Leaves nearly round in general out-line, 4 to 10 inches in diam., deeply cordate and dividing into about 7 acute lobes. Margins 'distantly denticulate'; rough on both surfaces. Petiole rather large, up to 4 inches, more or less rough (scabrous). Veins prominent.

Flowers yellow, large, monœcious. Male flowers in racemes longer than leaf. Peduncles, about 1½ or 2 inches in diam., 'with a small fleshy bract near the base, bearing 3 or 4 large immersed glands.' (*Trimen.*)

Female flowers solitary, larger than male, on long stalks. Fruit 8 to 14 inches, cylindrical, tapering at base, broad at apex, ridged near stalk.

Seeds nearly oval, flat, rough on outer side, pale ashen.

This is a fairly common garden plant, cultivated as a vegetable, for which it is suitable when the fruits are very young. With maturity the fruits become tough and fibrous, and afford the well-known bath sponges, though here care is not taken to produce as good 'Loofahs' as those from Japan.

Occurs cultivated in most tropical countries.

No. 286. **L. ACUTANGULA** Vol. II. p. 252.
Weta-kolu, Daraweta-kolu, S. Pey-pichukku, T.

Very much resembling the last, but differing in having 3 stamens instead of 5, and 10 distinct ribs on the fruits. Seeds black.

This species is much cultivated for the sake of the fruit, which is eaten in a very early stage of its growth. The fruits are also found to contain a soluble principle termed *Luffein*, that possess gelatinizing properties.

The seeds are emetic. The juice of the fresh leaf is dropped into the eyes of children in granular conjunctivitis, (*Nadkarni*); and according to *Dr. Gunawardane*, the dried fruit, powdered, and made into snuff, is given to persons suffering from Jaundice.

No. 287. **CITRULLUS COLOCYNTHIS** Vol. II. p. 253.
Yak-komadu, Peykomaddi, T. Colocynth, or Bitter Apple, E.

Stems prostrate, creeping, angled, slender, rough or hairy. Tendrils 2-forked. Leaves small, up to about 4 inches,

triangular in outline, divided into three lobes, of which the middle is the longest, each lobe being again deeply cleft, making smaller and diminishing lobes, more or less dentate and curved inwards. Petiole about 2 inches, stiffly bristly. Flowers large, monoecious, solitary, soft yellow in colour, arranged in leaf axils on roughly hairy short stalks. Male flowers with 3 stamens and 5 petals, united for about half their length. Stamens 5, in three bundles. In the female flower the ovary is 3 to 6 celled, broad; style 3-cleft, large, short.

Fruits almost spherical, about 2 inches across, smooth, deep green, freckled with lines of paler spots; spongy within. Seeds small, brownish.

The spongy interior of the fruit is intensely bitter and affords a watery substance. The drug known in medicine as *Colocynth* consists of this pulp in a dried form after the seeds have been removed.

Its active principle is *Colocynthin*, of an intense bitter taste, and poisonous in large doses. The drug is used as a cathartic, and in powdered form as an insecticide. According to *Dr. Gunawardane* the oil extracted from the seeds is used for snake-bites, and scorpion-stings.

Occurs only in the dry zone in the North and East of Ceylon; uncommon. Also India, Arabia, and Tropical Africa. The *Colocynth* of European medicine is mostly obtained from Mediterranean countries.

Of the more familiar examples of this order that are cultivated for food, the following may be enumerated, and as they can be easily distinguished by their fruits, a short description of the latter is added to assist in identification.

Lagenaria vulgaris. The "Calabash-cucumber," or "Bottle gourd"; Diyalabu, *Sin.;* Churai, *Tam.*

Fruits large, of elongated pear shape, often bottle-shaped, depressed at lower end.

Cucumis sativus. Cucumber. Rata-kekeri, or "Pipinya," *Sin.;* Pipingkai, *Tam. Fruits* about 10 inches (often longer), by 3 inches, usually cylindrical, or of a flat kidney shape. At first yellowish green, becoming brownish orange when old or fully ripened.

Citrullus vulgaris. Water-Melon. Komadu, *Sin.* and *Tam.*

Fruits broadly oval, or nearly round, about 10 inches, dark green, pinkish within, when cut open.

Benincasa cerifera. Ash Pumpkin. Alu-puhul, *Sin.* Puchini or Pusini, *Tam.*

Fruits large, ovoid, generally covered with a waxy 'bloom,' giving it an ashen colour.

Cucurbita maxima. Pumpkin, Wattaka or Ratalabu, *Sin.* Pusini, *Tam.*

Fruits very large, spherical, more or less depressed at base, and apex; broadly ribbed.

Yellowish within, varying from a veined deep green to a pale terra-cotta colour outside, according to ripeness.

Cucurbita moschata. Musk-melon. Seni-kekiri, *Sin.* Fruits ovoid, depressed at both ends, ribbed, streaked with yellow.

Cucurbita Pepo. Vegetable-marrow. Fruits unevenly ovoid, broader at base than apex. Smooth, pale green.

Sechium edule. Chocho or Chayote. Fruits variable in shape, often nodular, cleft or fissured; pale green. This particular vegetable was introduced by Mr. W. Nock from the West Indies in 1884.

LX.—DATISCACEAE.

No. 288. **TETRAMELES NUDIFLORA** Vol. II. p. 265.

Muguna, S.

An immense tree, with large spreading buttresses. Bark pale ashen, smooth, green in young shoots, much leaf-scarred, thick. Ends of twigs softly hairy. Leaves alternate, large, about 7 inches in diam., ovate, acuminate at apex, deeply cordate at base, more or less irregularly dentate towards base, finely pubescent or nearly hairy. Stipules absent. Petiole long, 4 to 5 inches, pubescent. Midrib prominent below. Venation conspicuously netted, prominent.

Flowers small, in panicles at ends of new branches, pale greenish yellow, unisexual. Male flowers with calyx divided into four narrowly oblong segments. Petals absent; stamens 4, opposite the calyx segments, with long filaments. Female flowers with short calyx segments, faintly 8-lobed; ovary pubescent. Fruits very small, flattened, ribbed.

Wood pale straw yellow, soft, quickly decomposing about 28 lbs. per cubic foot. Pores large, irregularly distributed. Rays moderately wide, distinct. Annual rings marked by a belt of closer pores (*Gamble*).

A quick-growing tree, once in great demand for Tea boxes, and become exhausted by that industry.

Very suitable for cigar boxes, and the like. Owing to its softness, parrots and mynas often select these trees for making holes in the stem for their nests.

Mostly confined to the intermediate zone, up to about 1,500 feet altitude, but it occurs sometimes in the dry zone. Also India, Burma and the Andamans.

The order has no other genera in Ceylon.

LXII.—FICOIDEAE.

This order is represented in Ceylon by the following genera:—1, *Sesuvium;* 2, *Trianthema;* 3, *Mollugo;* and 4, *Gisekia.* They are all herbs and mostly not economic in this country, which none of our species is endemic.

No. 289. **SESUVIUM PORTULACASTRUM** Vol. II. p. 268.

Van Kiru Valai, T.

A straggling prostrate-stemmed herb, freely rooting at the nodes and terminating in a clustering much branched head. Leaves opposite, numerous, about 1½-2 inches long, narrow, very thick and fleshy, much tapered at the base, rounded or obtuse at apex, entire, glossy dark green above. Petiole about ⅛ to ¼ inch, stout, broadly margined. Flowers solitary, rather large for the species, about 1 inch or less in diam., pink. Calyx-tube short, tinged with claret colour, 5-segmented. Petals absent. Stamens many, rising from calyx-tube. Ovary 3-celled. Capsule enveloped by calyx. Seeds black, glistening, minute.

The leaves are eaten and said to be cooling. At first they are distinctly saltish in flavour, but this disappears on boiling.

I am doubtful as to the correct native name of this sea-shore plant, which I have obtained on the eastern and south coasts of Ceylon.

'Mangaravalli' is the name I have heard applied in the Eastern Province, but Trimen gives 'Vankiruvalai.'

Common in Tropical sea-coasts. I obtained it in the Maldives, at Hoolooli islet.

No. 290. **MOLLUGO CERVIANA** Vol. II. p. 272.

Patpadakam, T.

A small plant, with short erect slender stems. Leaves very small, arranged in whorls, about ½ an inch long, narrow, stiff, finely pointed, slightly aromatic in smell. Petiole hardly

visible. Flowers small in 3's 'at end of long filiform axillary and terminal panicles.' Sepals 5, oval, and obtuse, with fine membranous margin. Petals absent.

The roots are distinctly aromatic, and when boiled in oil. the oil is said to be useful in rheumatic disorders The flowers and shoots are diaphoretic, and used in fever.

It is, according to Trimen, rather common in the dry country in the north. Also India, to tropical Australia.

LXIII.—UMBELLIFERAE

An order mostly represented by small, or trailing herbs. The Ceylon genera consist of 1, *Hydrocotyle;* 2, *Sanicula;* 3, *Bupleurum;* 4, *Carum;* 5, *Pimpinella;* 6, *Peucedanum;* and 7, *Heracleum.* Many of our most familiar vegetable plants such as Carrot, Parsnip, Coriander, etc., belong to this world-spread order, though in Ceylon it is only represented by two endemic species, both of which occur at high altitudes.

No. 291. **HYDROCOTYLE JAVANICA** Vol. II. p. 275.

Maha-gotukola, S.

Stems long, prostrate, tinged with purple, succulent at ends, pubescent, slender. Leaves large, up to 4 inches diam., nearly round in outline, cordate at base, more or less palmately lobed, coated with sparse stiff hairs on the veining. Margins 'coarsely crenate.' Petiole very long, about 6 inches, erect. Stipules large, strongly membranous. Flowers greenish, in minute globular heads, some 20 or so crowded together. Flower stalks clustering in groups at ends of peduncle or its branches. Calyx without segment; petals narrowly lanceolate and acute; 'ovary much compressed, glabrous; style spreading.' Fruits minute, scarcely $\frac{1}{8}$ of an inch, ridged.

The leaf-stalks have a pungent aromatic flavour, and said to be a remedy for tooth-ache.

It is claimed to be a cooling tonic, and stimulant.

Very common in the wet zone, in damp shady places, and old gardens. Extends up to 7,000 feet altitude.

No. 292. **H. ASIATICA** Vol. II. p. 276.

Gotukola, or *Hin-gotukola, S. Vallarai, T. Indian Pennyroot, E.*

Stems prostrate, thin, cord-like and trailing, smooth. Leaves clustering at root stock, in small clusters, or solitary from the nodes, erect, about 1 to 2 inches in diameter, rather

broader than long, deeply cleft or depressed at base, with basal lobes overlapping and rounded. Margins dentate-crenate. Smooth on both sides, rather pale; thin. Nerves 7, distinct, fine. Petiole about 2 inches; stipules sheathing the base.

Flower extremely minute, dull pink, "nearly sessile" in groups of 3 at ends of erect finely pubescent stalks. Bracts 2, below the flower umbels, obtuse, roughly oval in outline. Fruits minute, hard, with vein-like ribs.

The whole plant is valued in native medicine as being stimulant and tonic in its action.

It is efficacious in eczema and cutaneous diseases.

An ointment prepared with butter, to which the powdered dried leaves of this plant are added, is useful in elephantiasis, while the liquid extract, in small doses, is given internally. It is also a reputed remedy for leprosy. Large doses of the extract are poisonous. In preparing the powdered leaves, according to *Dr. Gunawardane*, care must be taken to avoid sun drying, or its virtue is lost. When fresh, the bruised leaves have a faintly aromatic smell, but the scent is fugacious.

A very common plant, found at all elevations, and almost a weed in grassy places.

Common throughout the tropics.

Of our introduced umbelliferous plants the following are among the better-known:—

Apium graveolens—the common Celery.

Carum Petroselinum, Parsley.

Coriandrum sativum, Coriander, so much used in curries.

Daucus Carota, Carrot.

Incidentally it may be mentioned that the much-valued antiseptic **thymol** is obtained from the seeds of *Carum copticum*,—a plant that has been unsuccessfully grown in Ceylon. It is known also as "Bishop's Weed," or *Ajowan* and is largely cultivated in Eastern India. Thymol is contained in the seed-oil, and is obtained by distillation. The oil is used in rheumatism. The virulently poisonous Hemlock (*Conium maculatum*)—a native of Europe—is a conspicuous member of this large order.

LXIV.—ARALIACEAE.

The order is a small one in Ceylon, being represented by two Genera only, viz., 1. *Polyscias*, and 2. *Heptapleurum*, giving a total of only five species, of which one—*Heptapleurum emarginatum*—is an endemic epiphyte.

No. 293. **HEPTAPLEURUM RACEMOSUM** Vol. II. p. 283.

A tree, with thick greyish bark, much branched. Young wood leaf-scarred and coated with dull orange mealy scurf.

Leaves about 5 inches in length, radiating palmately from a stout cylindrical petiole of about equal length. Leaflets up to nine in number, with conspicuous stalks, oblong-ovate, rounded at base, tapering or twisted at apex, smooth, glossy, rich dark green above, paler below. Entire venation close-netted and pellucid. Petiole much thickened at base.

Flowers on "umbellate stalked racemes, spreading from a stout rachis," axillary or terminal, exceeding the length of the petiole. Flowers greenish, small. Petals 5, ovate, nearly pointed, Calyx hardly distinguishable. Styles uniting and forming a cone. Fruit small, about $\frac{1}{4}$ inch, ribbed vertically.

Wood very pale white, soft, and quickly decaying. Suitable for light packing materials, and small boxes.

Found mostly at high elevations in damp forests, but nowhere very abundant.

Also in South India.

No. 294. **H. EXALTATUM** Vol. II. p. 284.

A large tree with smooth rather thick olive-green or ashen (sometimes mottled) bark. Young parts glossy. Leaves palmate, on strong stout petioles of about ten inches in length. Leaflets radiating, up to nine in number, large, about 9 to 10 inches long, broadly lanceolate, rounded at base, finely tapered to apex, entire. Leaflet-stalks long, about two inch, stout. Midrib very pronounced on both surfaces.

Flowers greenish yellow, small about half inch, in "long-stalked umbels arranged on a stout rachis more than one foot long." Petals 7 to 9; stamens "spreading," styles absent. Fruits seated within margin of calyx limb, ribbed vertically, with 7 distant ribs.

The wood is pale white, slightly ashen, rather soft. I have found it used for tea boxes, but hardly suitable for this purpose.

Fairly common, especially in ravines at altitudes between 3,500 and 6,000 feet. Occurs frequently in Uva. Also in South India.

Of the cultivated forms of the *Araliaceæ*, we have several that are grown as ornamental, hedge plants, conspicuous for their varied forms of leaves.

The Rice-paper plant (*Fatsia papyrifera*), now so abundant about Hakgala and Nuwara Eliya is a Formosan form, introduced into Ceylon in 1856. It affords a pithy stem that is used in China for paper.

LXV.—CORNACEAE.

The order is represented in Ceylon by two Genera, viz., 1. *Alangium* and 2. *Mastixia* representing only 4 species of which one in each genus is endemic.

No. 295. **ALANGIUM LAMARCKII** Vol. II. p. 285.

Mul-anninchil, T.

A shrub or small tree, with grey bark, tough, and generally spinous branchlets. Young shoots pubescent.

Leaves alternate, very variable in shape and size, the largest being about six inch, oblong, or elliptic, or oblong lanceolate, rounded at base, acute or obtuse at apex, entire, smooth above. Petiole short, at first pubescent, afterwards pubescent on underside only. Lat.-veins prominent below, very oblique, with short clusters of hair in their axils. Stipules absent.

Flowers solitary, or in fascicles, rather large, white, scented. Flower-stalk highly pubescent, the pubescense extending to the calyx. Calyx lobes 5, conspicuous, silky. Petals 5 to 10, usually six, one inch long, hairy outside. Stamens numerous (over 20), filaments short, hairy, about equalling petals in length. Ovary 1-celled. Stigma large. Fruit about one inch in diam., purplish, pubescent.

Wood, yellowish towards the outside deepening towards brown in the heart wood. Fine-grained, tough.

Pores small, few; rays close. Rings about one-fifth of an inch apart (*Gamble*). Weight (of Madras examples) stated to be 49 lbs. per cubic foot.

Found sparingly in the intermediate zone, more abundant in the country round Polonnaruwa and lower Uva.

The root bark is emetic, and is used by Indian native practitioners in skin diseases, and leprosy.

Root used in powder form is effective in simple fever.

MASTIXIA TETRANDA

No. 296. Vol. II. p. 287. Plate XLVII.

Maha tawara, S.

A very large tree, with greyish, smooth bark. Twigs stout greenish at ends.

Leaves alternate (sometimes opposite), about 3½ inches long, oblong, or oblong-lanceolate, much tapered at base, tapering to a variable apex, acute in some, or obtuse; entire; completely glabrous, stiff; dark green above, paler below. Stipules absent. Petiole about ¾ inch, oblique with axis of branch, conspicuously channelled above. Midrib prominent below, conspicuous above. Lat.-veins 8-10 sub-opposite, pronounced.

Flowers small, about ¼ inch, yellowish, tinged at the apex of each petal with green, on short pubescent stems, in terminal corymbose panicles.

Calyx shallowly 4 or 5 lobed, closely walling the ovary. Petals 4, broadly ovate, suddenly acute. Stamens 4, diagonally placed; filaments short. Anthers large, yellow. Style very short. Ovule solitary, pendulous. Fruit narrowly ovoid, and crowned with remains of calyx lobes, greenish.

The timber of this species is said to be moderately hard and suitable for packing cases and light wood-work.

Occurs in the wet country towards Ambegamuwa, at about 3,000 to 4,000 feet altitude. It is endemic.

M. TETRANDRA *var* THWAITSII

No. 297. Vol. II. p. 287.

Diyataliya, S.

A large erect tree, with cylindrical stem. Bark often very pale ashen-brown. Young branches quite smooth, dotted with large lenticels.

Leaves as in the last, but much more rounded, smaller, and crowding towards ends of twigs, thick, dark green above, stiff.

The bark is resinous, and produces a white, frosty, inflammable resin.

Fairly common in the wet forests up to 3,000 feet altitude. Abundant in Gillimali, Eratna, and Singha Raja Forests.

Wood yellowish-red, soft, easily split, not durable. Was at one time in considerable demand for tea-box manufacture,

and is suitable for that purpose, and for packing cases. Weight about 46 lbs. per cubic foot.

I am inclined to believe that the wood of the previous species is often confused with this, though the native name, Diyataliya is usually applied throughout the Ratnapura District.

LXVI.—CAPRIFOLIACEAE.

This order so largely represented in Europe has only one Genus in Ceylon, two species, and one recorded variety. Our forms are purely mountain.

No. 298. **VIBURNUM ERUBESCENS** Vol. II. p. 289.

A small deciduous tree, with slender branches. Young twigs slightly pubescent. Bark, thin, greyish.

Leaves opposite, from 3 to 4 inches long, ovate or oval, rounded, or cordate at base, acute and acuminate at apex; entire for the first one-third of the blade, then minutely dentate-serrate to the tip; thin; smooth above, stellate-hairy on venation beneath.

Petiole about ½ an inch; midrib prominent below, rather inconspicuous above. Lat.-veins 5, very oblique, and much curved at base. Stipules absent. Flowers on short stalks, drooping, pinkish-white, arranged in racemose cymes, axillary, numerous. "Calyx-tube adnate to ovary," glabrous, lobes 5, lanceolate. Petals 5, broadly rounded, recurved. Stamens 5, not extending. Ovary with 1 to 3 single-ovuled cells. Fruit small, narrowly ovoid, smooth, red. Seeds deeply grooved.

Wood very close and even grained, hard, reddish. Pores very minute. Rays contorted, very fine. *Gamble* gives the weight per cubic foot at 59 lbs., and says that the timber might serve as a substitute for box wood.

Occurs sparingly at very high altitudes, and in India up to 11,000 feet.

The familiar Honeysuckle (*Lonicera caprifolia*) so well-known round bungalows in Ceylon, belongs to this order, but when it was introduced into this country is uncertain.

LXVII.—RUBIACEAE.

An immense order in Ceylon, represented by 47 Genera, and 138 species, of which 71, or 51½ per cent. are endemic. The Ceylonese Genera are: 1. *Sarcocephalus;* 2. *Anthocep-*

halus; 3. *Adina;* 4. *Stephegyne;* 5. *Nauclea;* 6. *Uncaria;* 7. *Wendlandia;* 8. *Dentella;* 9. *Neurocalyx;* 10. *Allœophania;* 11. *Fergusonia;* 12. *Hedyotis;* 13. *Oldenlandia;* 14. *Anotis;* 15. *Ophiorrhiza;* 16. *Mussœnda;* 17. *Acranthera;* 18. *Leucocodon;* 19. *Urophyllum;* 20. *Schizostigma;* 21. *Webera;* 22. *Byrsophyllum;* 23. *Randia;* 24. *Gardenia;* 25. *Nargedia;* 26. *Scyphostachys;* 27. *Diplospora;* 28. *Scyphiphora;* 29. *Guettarda;* 30. *Timonius;* 31. *Dichilanthe;* 32. *Knoxia;* 33. *Canthium;* 34. *Ixora;* 35. *Pavetta;* 36. *Coffea;* 37. *Morinda;* 38. *Prismatomeris;* 39. *Psychotria;* 40. *Chasalia;* 41. *Geophila;* 42. *Lasianthus;* 43. *Saprosma;* 44. *Hydrophylax;* 45. *Spermacoce;* 46. *Rubia;* and 47. *Galium.*

This order is composed of trees, shrubs and herbs in Ceylon of which the distribution extends from the lowest to the highest altitudes in the Island, and from the wettest to the dryest zones.

No. 299. **SARCOCEPHALUS CORDATUS** Vol. II. p. 292.

Bakmi, S. Vammi, T.

A large semi-deciduous tree. Stem stout, rather short. Bark, pale yellowish brown, or silvery, smooth, ½ inch thick unevenly furrowed. Branches and twigs ashen, much leaf-scarred.

Leaves, opposite, large, about 9 inches by 7, broadly ovate, cordate at base, widely rounded at apex, entire, undullate, softly hairy above when new, stellate hairy below. Petiole large, stout, about 1½ inch, flattened or obscurely grooved above, hairy. Midrib, stout, prominent below, stellate-hairy; conspicuous above. Lat.-veins opposite or sub-opposite, about 8, stout, stellate below, raised above, oblique, arching and uniting within margin. Nerves wide, nearly paralled. Stipules large, about 1 inch, broadly ovate, yellowish, nerved, more or less stellate-pubescent.

Flowers many, making a ball-like terminal head, united by their calyx tubes, pale yellowish, with white styles. Calyx segments 4—5; corolla-tube elongated, 4—5 lobed. Stamens 4—5. Ovary 2-celled. Fruit a fieshy mass, more or less round, hard. Seeds minute.

Wood, turmeric-yellow; bright yellow when freshly cut; close grained, straight, rather soft. Weight about 38 lbs. per cubic foot; inclined to splinter if very dry. Suitable for rafters, king-posts, and packing-case wood. Fairly durable; never very long pieces. The fruits are eaten.

Moderately common in moist soils in the low-country up to 1,200 feet altitude. Also in Malaya and the Phillippines.

ANTHOCEPHALUS CADAMBA

No. 300. Vol. II. p. 293.

Ela-bakmi, Embul-bakmi, S. Vellai-kadampa, T.

A tall, erect, cylindrical-stemmed tree, with thin horizontal branches. Bark greyish, rather smooth, furrrowed with shallow longitudinal fissures.

Leaves, opposite, very variable in size, averagely about 9 by 4½ inches, very much larger when young; ovate oblong, subcordate or abruptly rounded at base; shortly acuminate at apex; entire glabrous, rather thin, obscurely sinuous.

Petiole about 1¼ inches, stout, glabrous. Midrib strongly prominent below, distinct above. Lat.-veins about 12 pairs, sub-opposite for the first half, bracket-axilled further up, all suddenly arching within margin. Nerves distinct, nearly at right angles to veins. Stipules large, lanceolate.

Flowers in spherical heads, scented, yellowish orange, with white styles; Calyx 5-lobed, persistent.

Petals 5, erect. Stamens, 5, ovaries, 4-celled in the upper, and 2-celled in the lower portion, with numerous ovules. Fruits closely packed. Seeds with minute protuberances.

Wood pale yellowish-grey, even grained, closed, rather soft, weight about 40 lbs. per cubic foot.

The timber is not durable, and is suitable only for packing cases, or temporary structures.

Pores oval, large, sub-divided. Rays, numerous, very close, bending near the pores. Rings moderately distinct.

The bark is considered to be useful as a febrifuge, and an infusion of the leaf as a gargle.

Occasional, but not abundant, sometimes in isolated groups in the wet zone up to 2,000 feet altitude, generally to be found near water.

Also throughout India, in the moist areas, and Burma, to Borneo.

The timber of this species was tried for railway sleepers, but was found to be quite unsuitable.

No. 301. **ADINA CORDIFOLIA** Vol. II. p. 293.

Kolon, S. Manjal-Kadampa, T.

A tall erect diciduous tree, with pale rather smooth greyish or brownish thick, flaking, bark. Branches nearly horizontal, ending in leaf-scarred twigs.

Leaves opposite, rather crowded, about 6 inches by 5, broadly ovate, or orbicular, cordate at base, rounded and suddenly acuminate, entire, glabrous above, finely hairy over the entire venation below, especially in immature foliage. Petiole long 2—3½ inches, fairly hairy, pink-stained at base. Midrib prominent below, depressed above. Lat.-veins about 6 or 7, the first pair re-branching with sub-laterals.

Nerves close, prominent. Stipules, large ¾ inch broadly ovate, slightly viscous within, softly hairy outside.

Flowers small, crowded, forming ball-like axillary heads, on a slender stalk, generally two or three together, yellowish or creamy.

Calyx 5-lobed, hairy, "club-shaped." Corolla tube swelled, 5-lobed. Stamens 5, arranged round the mouth of the Corolla. Style long, fine, with round stigma. Capsules hairy, small. Seeds "tailed at both ends."

Wood, pale yellow, smooth, even, and straight-grained; fairly durable, but much subject to attacks from carpenter-bees that bore large galleries into the wood. Is often used for door frames, panels, and posts. Pores minutes, numerous, even. Rays very fine, hardly distinct. Annual rings invisible. Weight about 42 lbs. per cubic foot.

Widely distributed in the dry zone up to the foot of the hills. Very abundant in the Kolonna Korale, which takes its name from this tree.

Also in India and Burma.

I have been told in the Southern Province, that this tree is considered unlucky, and is therefore not appreciated as a timber tree, but this superstition is apparently not general.

No. 302. **STEPHEGYNE PARVIFOLIA** Vol. II. p. 294.

Helamba, S. Salampai, Chelampai, Nir-kadampa, T.

A large tree with stout erect stem. Bark thick, pale grey, often flaking in large flakes. Branching irregularly, sub-dividing into many oppositely twiggy branchlets. Young parts leaf-scarred.

Leaves deciduous, opposite, 3 to 3½ inches long by 2¼, ovoid, or nearly round, abruptly rounded at base, sub-acute at apex, or very obtuse; entire; margin slightly reflexed; glabrous. Petiole rather long, 1-1½ inch, slightly furrowed above, faintly hairy. Lat.-veins about 7, with minute hairy tufts in the angles with the midrib; venation conspicuous below. Nerves rather stout. Stipules about ¾ inch, broadly ovate, always tinged, if not completely coloured, dark pink.

Flowers in close, crowded (not fused) globular heads; yellowish, with white styles; scented. Flower-heads on short stalks with bracts, in cymes of 3, the terminal head having the shortest stalk. Calyx-limb *short*, *not* lobed. Corolla 5-lobed, lobes recurved. Stamens 5, style much elongated; stigma large. Ovary 2-celled.

Capsules confluent. Seeds minute, with a faint wing at both ends.

Wood brownish, more or less tinged with pink, fairly hard, close, even-grained; durable, provided it is not exposed to wet. Turns well, and takes a good polish. Suitable for indoor structural work, and furniture. Weight 40 to 42 lbs. per cubic foot. Pores numerous, small, abundant. Rays, many, extremely fine, rather unequal. Annular rings not very marked, but visible

Common in the dry zone, often near tank bunds, but nowhere abundant.

Also in India and Burma.

No. 303. **S. TUBULOSA** Vol. II. p. 295.

Helamba, *S.*

A smallish, slender erect tree, with pale brown smooth bark. Branches slender, faintly pubescent, leaf-scarred.

Leaves large, about 6 nches by 4, ovate or broadly ovate, nearly cordate at base, tapering at apex; thin; entire; pale green. Petiole about 1 inch, rather stout. Midrib and lat.-veins very prominent below, pubescent. Nerves pellucid, closely netted. Stipules large, 1 inch or over, oval, veined.

Flowers in terminal heads, or axillary; pinkish. Heads nearly globular, about 1 inch diam. Calyx-limb *long*, in contrast to last.

Wood brownish, and apparently much like the last, but I have not seen it employed.

This is a water-loving species and is found in wet land, and 'Waturanas,' in the west of Ceylon, where it occurs more or less gregariously.

Also found in South-west India.

No. 304. **WENDLANDIA NOTONIANA** Vol. II. p. 297.

Wana-idala, or *Rawan-idala*, *S.*

A small or moderately large tree with erect stem (often much bent), and straight shoots. Bark rather thin, reddish-brown, longitudinally furrowed, with shallow groovings.

Shoots slender opposite-branched, sometimes in 3-'s. Twigs rather hispid, young parts pubescent. Leaf-scars, distinct.

Leaves opposite, about 8 inches by 3, smaller in maturity; ovate or rhomboidal-ovate, tapering to base and apex acute or shortly acuminate, entire, distantly hairy above, finely hairy below. Margins sinuate. Petiole about 1 inch, slightly hispid. Midrib prominent below, distinct above. Lat.-veins about 10, sub-opposite, prominent below, finely arching within margins. Nerves inconspicuous.

Stipules large, ovate, distinctly veined hairy.

Young foliage strongly tinged with pink.

Flowers pale white, in large conspicuous terminal panicles. The flowers themselves are very shortly stalked, minute. Calyx-segments 5, minute. Corolla 5-lobed, tubular, lobes "twisted in bud." Stamens 5. Anthers very short. Ovary round, 2-celled with many ovules. Style long, extending. Fruit a capsule with remains of calyx attached. Seed very small, many.

The young plants are curiously like *Chinchona officinalis* and have been mistaken for them when growing in nurseries.

Wood reddish brown, hard, close, durable. Takes a good polish, but unless carefully seasoned is liable to crack. Excellent for posts, rafters and door-frames, and has the merit of being white-ant proof. Weight about 50 lbs. per cubic foot. Pores small; rays rather broad.

Annular rings moderately distinct.

Unfortunately this excellent timber rarely attains large dimensions, or it might be more widely used in house-building.

Fairly common up to high altitudes in damp districts. Often found in chenas, and is frequently obtainable in ravines in Patina country.

Also found in India.

No. 305. **HEDYOTIS FRUTICOSA** Vol. II. p. 304.

Weraniya, S.

A much branched small tree or bush with straight erect cylindrical stems. Bark thin, smooth, pale white, greenish or tinged with dull purple at ends, much scarred with fallen leaves.

Leaves opposite, about 5 inches by 1, narrowly lanceolate tapering to base and narrowly tailed apex; entire, margins nearly pellucid; completely glabrous; dark green above, paler below. Petiole about $\frac{3}{4}$ of an inch, rather stout, deeply grooved

above. Midrib prominent below, depressed above. Lat.-veins about 7 pairs, very oblique, thin, hair-like, rarely uniting at the ends. Stipules large, cartiliginous, triangular, slightly crenate along margins; conspicuous.

Flowers small, white, sessile, heterostylic, in large terminal or axillary cymes often forming a dense head. Calyx-limb more or less campanulate, 4-lobed with margins of lobes distantly hairy, and hairy within; lobes curved outward, rather thick. Stamens 4, within the tube. Anthers tinged with purple. Style long or short, terminating in a conspicuously bifid stigma. Capsule small, "the calyx segments covering the top." Seeds few, minute.

Wood slender, straight, white, and light. Is in much use for temporary fencing in village gardens, and also as "Weraniya-kotu" in building mud walls.

Owing to its straightness and regular cylindrical outline, it is possible that this wood might be considerably used for umbrella handles, as the whole plant can be taken up by the root, and the roots ornamentally "worked."

A decoction made from the leaves is used for inflamed eyes.

Very common in the wet district up to about 1,000 feet altitude, often covering considerable areas of land, usually growing in very poor soil.

It occurs also in South India.

A larger form of this genus, and one of much the same habit is found in the wet forests in the Adam's Peak country.

The genus is represented in Ceylon by 21 species, of which 16, or 76 per cent, are peculiar to the country.

No. 306. **OLDENLANDIA CORYMBOSA** Vol. II. p. 314.

Wal-patpardagam, S.

A many-stemmed small plant, generally about a foot or 15 inches high. Stems cylindrical, smooth, or sometimes faintly shrubby.

Leaves opposite, small, about ½ an inch long, very narrow, tapering at both ends, with rough margins, pale yellowish green. Stipules comb-like, minute, distinct.

Flowers minute, white, in pairs on fine slender stalks, often ½ an inch long. Calyx divided into four narrow segments. Corolla four lobed, pointed, stamens 4, stigma 2, rather conspicuous.

Ovary 2-celled. Capsules minute, smooth, somewhat top-shaped, flattened above.

The root is employed in the form of a decoction and is used as a remedy in fevers both here and in India.

It is a common weed, generally to be found in the dry country in sandy soils up to about 1,000 feet altitude. I found it growing in profusion at the base of the final tower of the 'Westminster Abbey' mountain.

Common in Tropical countries.

No. 307. **O. UMBELLATA** Vol. II. p. 316.

Saya, S. Chaya, T.

Like the last, a small many-stemmed plant, attaining about a foot in length. Stems compressed, somewhat woody at base.

Leaves many, opposite, sessile, or very slightly stalked, about half-an-inch (up to one inch) long, narrow, acute at both ends, somewhat reflexed, with fine bristly hairs along the margins. Stipules short, comb-like.

Flowers umbellate, three or more together, on erect wiry stalks, white. Calyx 4-lobed, finely 'spinous-ciliate.' Capsules nearly round, broad.

The roots produce a dye of a pinkish purple colour, and used at one time to be considerably collected and exported to India. It is known as Indian Madder—not to be comfounded with 'Dyer's Madder,' which is the product of *Rubia tinctoria* and is imported into England from France, Holland and the Levant. Common round our coasts.

The genus *Oldenlandia* is well represented in Ceylon, there being no less than seven species, but none are indigenous, and all are practically low-country forms.

No. 308. **OPHIORRHIZA MUNGOS** Vol. II. p. 320.

Dat-kettiya, Wal-ekaweriya, S.

A small plant rarely exceeding two feet in height, with few branches and cylindrical stem.—Herbaceous.

Leaves about 8 inches long, or less, opposite, broadly lanceolate, tapering at base and extending decurrently on the petiole, acuminate, smooth above, 'finely puberulous' on the venation below. Petiole about 1½ to 2 inches long; midrib prominent below, lat.-veins many, prominent below, depressed above. Stipules short, rather inconspicuous. Flowers

white, small, arranged along the horizontal branches of numerous cymes. "Sub-umbellately arranged in a flat-topped terminal inflorescence."

Calyx segments 5, triangular, short. Corolla-tube dilated below, finely hairy at the mouth. Disk prominent, bracts absent. Capsule small, compressed, wider than long. Seeds brown, minute, many.

Moderately common in the damp forests of the west of the Island right up to high altitudes, locally abundant. Occurs in India and Burma.

This plant is supposed to be one of the herbs that the mongoose resorts to when bitten by the cobra, but I have never heard this singular statement authenticated by any person seeing the animal eating it under any circumstances. Bennett, in his work on Ceylon, records on the authority of a native doctor, that the latter had watched a mongoose, after it had been bitten by a cobra, run to a hedge and there eat of the leaf of the *Ayapana*, which Bennett identifies as *Eupatorium*, but this is a Brazilian Composite, the source of *Ayapana Tea*, and hardly to be considered other than a rare introduction to this Island. Its selection therefore by the mongoose seems doubtful. Petch, in his comprehensive paper on Garcia Da Orta's mongoose plants, makes the important remark that 'when Linnaeus bestowed names on Hermann's Ceylon plants, he names *Wal-ekaweriya*, '*Ophiorrhiza Mungos*.' But the real mongoose plant is *Rat-ekaweriya*, which certainly is not '*O. Mungos*.' On the other hand *Dey* in his important work on the Indigenous Drugs of India, says that 'the roots (of *O. Mungos*) are sold to ignorant people in some places as a charm against snake-bite, the name of the plant having some relation to the fact that the plant is supposed to afford the mongoose an antidote to the bite of poisonous snakes.'

No. 309. **WEBERA CORYMBOSA** Vol. II. p. 328.

Tarana, S. Karanai, T.

A large bush with pale erect stems and slender compressed branches and twigs.

Leaves variable in size, up to 6 inches in length, narrowly oblong, opposite, tapering at both ends, entire; margins sometimes somewhat recurved, dark glossy green above. Buds coated with a thin wax. Petiole ½ inch; midrib prominent below, glossy. Lat.-veins marked at their axils with minute pits.

Flowers white, nearly ½ inch in diam., on short stalks, in terminal paniculate trichotomous cymes. Calyx-limb divided

into 5 lobes, Corolla tube short, 5-lobed, hairy within. Stamens much produced, inserted round mouth of corolla; style somewhat raised, apparently variable. Ovary 2-celled.

Fruit a berry of ⅓ or ½ an inch in diam., spherical, greenish at first, becoming purplish black when ripe.

The wood is yellowish-white, close, hard, and durable but rarely more than a few inches in diameter in the largest specimens. Used for the construction of '*Attuwas*' (granaries) in Kandyan districts, and also for fencing.

A widely distributed plant being found in both the wet and dry zones, and ascending up into the hill country. Also occurs in India and Malaya.

No. 310. **RANDIA DUMETORUM** Vol. II. p. 330.

Kukuruman, S. Karai or *Madukarai, T.*

A small deciduous tree or shrub, with many horizontal branches with short stiff branchlets (often only a boss-like shoot) with abundant rigid acute spines, oppositely placed in pairs above the twigs or branchlets. Leaves in small clusters on the very short branchlets, sometimes in twos, oppositely placed variable in size and outline, from ½ to 2 inches in length, ovate or obovate, much or abruptly tapering at base, obtuse or narrowly ovate at apex, apiculate, smooth, or faintly hairy. Petioles very short; stipules pointed, small. Midrib moderately pronounced, disinct above. Lat.-veins oblique, about 5 pairs.

Flowers 1 inch in diam., pale yellowish-white when opening, turning yellow when fading, sweet-smelling, on short stalks, solitary or in 3's at the ends of the short branchlets, and sometimes on the ends of the spines. Calyx-limb tubular, more or less hairy, with leafy lobes, often with intermediate lobes. Corolla 5-lobed, hairy outside, spreading. Anthers long, "nearly sessile." Ovary 2-celled, ovules many, embedded in copious placentas. Fruit ovoid, rather large, yellowish, prominently crowned with remains of the calyx-limb. Seed flat, with a sub-gelatinous pulp.

The fruit is considered to be a useful emetic, its active priciple being *saponin*. The root-bark is, according to *Dr. Gunawardana*, administered as an emetic in bowel complaints, and enters into various preparations, for diarrhœa, colics, fever, and phlegmatic swellings. According to *Nadkarni*, it is a useful substitute for ipecacuanha.

The wood is hard, brownish, close grained, but little used here expect for fencing. Indian examples give a weight per cubic foot of 48 to 62 lbs.

A fish poison is obtained from the fruits.

A very common dry-zone plant, often growing in great masses of almost impenetrable bush.

Also common in India, Burma, Southern China and East Africa.

This genus is represented in Ceylon by 5 species, one of which—R. GARDNERI—is sub-montane and endemic.

No. 311. **GARDENIA LATIFOLIA** Vol. II. p. 332.

Galis, S. Lakkadai, T.

A small tree, often only a big shrub, generally to be found in damp strong round. Bark greyish, smooth, exfoliating in scales. Branches smooth, ending in wax-coatel buds.

Leaves clustering, rather large, about 5 to 7 inches long, opposite, or in 3's, elliptical or obovate, tapering to base, more or less abruptly obtuse at apex, entire, slightly rough on the veining.

Petiole short, stout. Midrib prominent. Lat.-veins prominent, about 15 to 20 pair, with hairy glands in thin axils below; bright green above, paler below. Stipules "adnate to base of petiole, forming a tube, at first enclosing the young bud."

Flowers large solitary, on short stalks, pale yellowish-white on opening, orange yellow when faded,—fragrant. Calyx campanulate, lobed into 7—9 unequal segments, rigid, much twisted in bud. Corolla-tube about 3 inches 7—9 lobed, lobes large, oblong, obtuse. Anthers on very short stamens, large. Stigma produced, large, three-lobed. Ovary 1-celled, with three placentas. Fruit large, nearly spherical, crowned with remains of Calyx-limb, fleshy. Seeds brown, many, flat, surrounded by pulpy matter. When ripe the fruit becomes slightly speckled with yellowish spots.

The wood is pale white, durable, close grained; but difficult to season, and has a strong tendency to crack longitudinally. Weight about 58 lbs. per cubic foot.

Pores very minute. Rays short, fine. Annual rings distinct. The timber rarely attains a large size, and is only used for making light furniture, such as camp-beds. It is alleged that beds made from this wood never harbour bugs!

I have found this 'Gardenia' growing in moderate profusion in the Pasdun Korale of the Western Province, and (if not a variety,) also in the dry zone in the South of Uva and the Eastern Province. Occurs in Bengal and South India.

A cultivated species known as 'Cape Jasmine' (*G. florida*) is a familiar garden shrub, of old introduction into Ceylon. It is a native of China and justly admired for its beautiful snow-white fragrant flowers.

No. 312. **DIPLOSPORA DALZELLII** Vol. II. p. 336.

Panir, Vellai-maram, T. (lit. the 'white tree'), Gal-seru, S.

A smallish erect tree, frequently with much spirally twisted stem. Bark thin, with very pale, smooth, white or creamy-white bark. Branches irregular, many, ascending. Twigs thin, swelled at the nodes, green at ends, glabrous.

Leaves opposite, about $3\frac{1}{4}$ inch long by $1\frac{5}{8}$ wide, narrowly oblong or lanceolate-oblong, acute at base, tapering to a bluntly acuminate apex, entire, completely glabrous, rather stiff, rich dark, glossy green above, pale or slightly yellowish below. Petiole short, about $\frac{1}{4}$ of an inch, deeply grooved above, smooth. Midrib and lat.-veins, prominent below...Lat.-veins sub-opposite, 6—7, oblique, arching and uniting below the margin. Stipules broad at base ending in a claw-like point, greenish.

Flowers small, pale greenish-white, in "dense axillary cymose clusters." Calyx-limb short, four segments, triangular. Corolla-tube broader in male than in female flowers, four-lobed. Stamens 4 (or 5) inserted at mouth. Anthers produced. Ovary two-celled. Fruit a dark green, berry, spherical, smooth, crowned with calyx-segment. Seed rather large.

Wood nearly ivory-white, smooth, close, probably suitable for wood-engraving, and small ornamental boxes. Liable to split.

Very abundant in the dry-zone, especially in the North-Central and Eastern Provinces where I have obtained the largest examples. Endemic.

No. 313. **TIMONIUS JAMBOSELLA** Vol. II. p. 338.

Angana, Peddimella, S.

A small slender thinly branched erect tree, with pale brownish bark. Leaves variable in size, about 5 inches, often less, broadly lanceolate, or oval, acute at apex, tapered at base, entire, smooth shining bright green above, paler below. Petiole slender. Midrib and lateral veins rather inconspicuous, the latter pellucid, and bearing minute clusters of hair in their axils.

Stipules, pointed, triangular.

Flowers male and female. Females solitary, or up to 3, on slender stalks; males sessile 'on short spreading branches,' yellowish, or nearly white.

Calyx-limb finely silky, 4-lobed. Corolla pubescent outside, smooth within, 4-lobed. Stamens 4, placed in the corolla tube. Anthers narrow. Ovary 12-celled with pendulous ovules one in each cell. Fruits small, somewhat furrowed, nearly round, green, crowned with calyx-ring.

Wood pale greyish-white, close grained, dense, heavy, rarely of large size. Suitable for tool handles, and if carefully seasoned, for scales and foot rules.

Fairly abundant in the wet forests of the Sabaragamuwa Province up to 4,000 feet. The largest examples I have found were in the valleys of the Kelani river and Kaluganga.

Also occurs in Malaya and Mauritius.

No. 314. **CANTHIUM DIDYMUM** Vol. II. p. 343.

Pana-karawu, Pandaru, Porowamara, S. Vatchikuran, Verkoli, T. Ceylon Box-wood, E.

A moderate sized, sparsely branched tree, with dull grey or brownish much furrowed bark. Branches wide spreading, twigs compressed, strongly angled, enlarged at the nodes.

Leaves opposite about 4½ by 2¼ inches, lanceolate-ovate, tapering at base, arching to acute or sub-acute apex, entire, completely glabrous, dull shining, green above, paler below, rather stiff. Petiole ⅝ of an inch, smooth, slightly bladed below base of leaf, greenish when young.

Spines absent. Midrib distinct, slightly raised above, prominent below. Lat.-veins, first pair almost intra-marginal, 2nd and 3rd pair sub-opposite, strong, provided with axillary pores. Pellucid. Stipules conspicuous, at first as long as the petiole, shrinking with maturity and falling.

Flowers small, dull white, in erect or lax corymbose cymes. Calyx limb short, 5-toothed. Corolla tube 5-lobed, acute, shorter than the tube itself, hairy within. Stamens placed at the entrance of the corolla. Ovary 2-celled.

Ovules solitary within each cell. Pendulous. Fruit about ½ an inch, "somewhat didymous," smooth. Seeds black, nodular.

The wood is pale greyish, close grained, fairly hard, rather heavy. Rarely of large size and apparently not much used in Ceylon, but if it is identical with *Plectronia didyma* of Bentham and Hooker, it is used in India for agricultural purposes.

Probably a suitable wood for scales, foot-rules and ornamental boxes.

Occurs in shallow soils overlaying slab rock in the wet zone, moderately common up to about 4,000 feet. Also Indian.

Apparently very variable.

No 315. **C. MONTANUM** Vol. II. p. 343.

Wal-buruta, S.

I quote from Trimen, as I have not obtained any examples of this species. He says, it is a large or moderate-sized tree, bark thin, blackish, flaking off in small pieces. Branchlets, numerous, stout, thickened at nodes, without spines, twigs compressed, glabrous. Leaves 1½—2½ inches, rotundate, rounded at both ends more or less revolute at margin, very stiff, quite glabrous. Veins few, reticulate, prominent beneath. Petiole extremely short and stout. Stipules short, broad, with a stout mucronate apex.

Flowers on long stalks, cymes umbellate on stout peduncles. Calyx segments short, broad, apiculate. Corolla-lobes 5, as long as tube, reflexed. Stamens exserted. Fruit ovoid, ⅜ inch, very slightly didymous.

An endemic species occuring from 4,000 to 7,000 feet, and said to be rather common, and has been used for railway sleepers.

No. 316. **C. PARVIFLORUM** Vol. II. p. 346.

Kara, S. Karai, T.

A small tree with dull brown or greyish brown bark. Branches stout, stiff, with many axillary spines, often as many as 3 inches, one whorl of about 1 inch in length.

Leaves opposite or clustering, very variable in size, from ½ to 2½ inches in length, broadly oval or round ovate, obtuse, entire, glabrous. Petiole short, rather stout. Veining reticulate, conspicuous below. Stipules short, pointed, pale.

Flowers very small, 'always 4-merous' on slender stalks, arranged in cymes. Calyx with 4 acute segments. Corolla tube about as long as its lobes, ovate. Fruit very small, nearly oval, 'slightly didymous,' yellow, containing 2 hard stones.

Chiefly to be found in the dry country, ascending to about 4,000 feet but more plentiful at lower levels.

The timber is very hard, but unfortunately never obtainable in any size more than would be serviceable for posts, for which it is adapted.

Occurs also in South India.

No. 317. **IXORA PARVIFLORA** Vol. II. p. 348.

Maha-ratambala, S. Karankutti, Painkuray, Korivi, T.

A small tree with many irregular branches. Bark thick, flaking off in pieces, dull red brown.

Branchlets smooth, compressed. Leaves 4 or 5 inches long, oblong, rounded at base, suddenly acuminate entire, stiff, shining glossy green above, dull below.

Petiole very short or absent, thick. Midrib pronounced. Lat.-veins and nerves pellucid, inconspicuous. Stipules not very prominent, toothed.

Flowers white, minute, scented, arranged in terminal compound trichotomous cymes. Calyx segments small, "tooth-like," 4. Corolla-tube short, attenuated, lobes 4, twisted in bud, reflexed when open. Stamens 4, inserted at the mouth of the corolla. Stamens very minute; anthers narrow.

Fruit small, round, calyx-scarred, 2-stoned.

Wood scanty, hard, close-grained, smooth of a light or yellowish-brown colour. *Gamble* gives the weight of Indian examples at 57 lbs. per cubic foot, and adds that it is well suited for turning. The pores are minute, rays numerous, fine; annular rings indistinct.

No. 318. **I. COCCINEA** Vol. II. p. 348.

Ratambala, Ratmal, S. Vedchi, T.

A large shrub with many long branches, but never attaining any large size of stem. Bark dark brown. Twigs, compressed, thickened at the nodes, smooth at ends. Leaves about three inches long, oblong or oval-oblong, rounded or nearly cordate at base, acute at apex, dark glossy green above, stiff. Petiole very short, stout. Midrib prominent. Lat.-veins and nerves pellucid. Stipules conspicuously bristle-like.

Flowers brilliant, bright scarlet, on short stalks with long tubes. Calyx and corrolla lobes in 4's. Fruit purplish black, nearly haif-an-inch long.

The leaves are used in native medicine for diarrhœa, and the bark for ulcers. The wood is hard, tough and durable and affords excellent warrachies and tool handles.

Common throughout the Low-country up to about 2,000 feet, in both wet and dry zones. The flowers are used for offertory purposes at shrines and also in devil dances, etc., and are popular as table ornaments.

Also in Burma and India.

No. 319. **MORINDA TINCTORIA** Vol. II. p. 354.

Ahu, S. Manchavanna, T.

A small tree, rarely exceeding 18 inches in girth of stem, with soft deeply furrowed brown dark. Branches irregular, branchlets compressed and thickened at the nodes, growing in opposites or in whorls. Leaves opposite, variable, up to 5 inches in length, by about 1½ inches, lanceolate, or narrowly ovate-lanceolate, much tapered at base and to accuminate apex, entire, glabrous, with maturity, softly, spinous-hairy along midrib and lat.-veins, when immature.

Petiole ½ inch, stout. Midrib prominent on both sides. Lat.-veins oblique, curving within the margins, and bearing copious hair in the axils. Nerves netted. Stipules large, foliar early falling, acute, or bilobed. Flowers white, scented, about ¾ inch in diam., in heads on rather long stalks, sometimes solitary or in 2's or 3's. Calyx-tube short, 5-lobed. Corolla much longer, 5 lobed, anthers nearly closing the mouth of the corolla, oblong. Style long. Stigma deeply cleft. Ovary "2, or spuriously 4-celled" with 2 or 4 ovules.

Fruit fleshy, nearly spherical, 4-stoned.

The wood is of a rich orange colour, varying in examples to yellowish brown, or in others to a dull orange brown. Fairly hard, close, but cracking if much exposed. I have no note of its weight or structure.

The root bark affords a red dye, while the leaves are said to be useful in diarrhœa.

Fairly common in the dry zone, especially in the Southern Province and the Hambantota District.

I suspect that this plant was at one time cultivated, as I have generally found it in abandoned gardens. Abundant near Batticaloa; also in India and Malay. A second species (*A. citrifolia*) with large glossy-green leaves, is found in gardens.

Of our introduced *Rubiaceous* plants, space will not admit of a full list being given here, but a select few call for notice. Of these, the most important is certainly coffee (*Coffea arabica*), which was brought to Ceylon by the Dutch from Java towards the end of the XVII Century. Its regular cultivation, however, in this country was not seriously taken in hand till Barnes established in 1825 the Gangaruwa Estate. Previous to this period however coffee had been planted in the Southern Province on the Gin Ganga, but was not a success there, and was replaced by sugar.

In the Kandyan country coffee at once became a success, and in a few years time it became our staple product. The progress of the enterprise was so rapid and important, that it may be asserted that Ceylon is indebted to coffee for most of our main roads of the interior, and the first section of our railway system, which might have been postponed for a generation had it not been for coffee estates covering so much of the mountain country. The gigantic industry was however destined to fall a victim to a fungoid disease—*Hemileia vastatrix*—that overcame it, and in the early part of the last quarter of the XIXth Century, coffee was doomed, and the trade of Ceylon shattered.

While leaf disease was gaining its deadly hold on Ceylon, through the instrumentality of the Royal Gardens at Kew, *Cinchona*—another *Rubiaceous* plant—was introduced into this Colony. At first *Cinchona* did not appeal to the planting community, and but little progress was made in its regular cultivation, other than the attention it received from Dr. Thwaites and his small staff, till interest was aroused by the results of the sale of a small sample of Ceylon-grown *Cinchona* in London.

From that time on, the success of Cinchona as a commercial product became assured, and much thanks is due to the *Ceylon Observer*, under the guidance of the late Mr. A. M. Ferguson, its Editor, for the vigorous manner in which that Journal advocated the cultivation of this important plant.

But Mr. Ferguson's optimism overshot his judgment, and *Cinchona*, soon came to be overproduced, causing the market to fall to a point when Ceylon could not compete against the richer barks produced in Java and elsewhere. But though this overproduction and other causes destroyed the *Cinchona* enterprise in Ceylon, yet *Cinchona* undoubtedly materially assisted in financially bridging the gulf created by the failure of coffee, till tea had established itself in the very places where coffee and cinchona had flourished before.

Coffee still grows in certain parts of Ceylon, though it is no longer counted on as an important product. Its existence, however, may lead to its recultivation at some future date.

Liberian Coffee (*C. liberica*) was introduced from Tropical West Africa in 1873, to take the place of *C. arabica*, but though it flourished admirability, it did not become a commercial success. *C. robusta* has also been introduced and is cultivated successfully.

It is worthy of attention that "escapes" of *Cinchona succirubra* are still to be found growing wild in some

of the forest lands adjoining properties where Quinine bark trees were once cultivated. In a forest in the Kurunegala district, I have found this particular species growing vigorously, and attaining a stem girth of 38 inches at 3 feet from the ground.

LXX.—COMPOSITAE.

This very large order is represented in Ceylon by the following 36 Genera, viz., *Vernonia*, *Elephantopus*, *Adenostemma*, *Dichrocephala*, *Grangea*, *Myriactis*, *Lagenophora Erigeron*, *Microglossa*, *Conyza*, *Blumea*, *Laggera*, *Epaltes*, *Sphæranthus*, *Blepharispermum*, *Anaphalis*, *Helichrysum Vicoa*, *Chrysogonum*, *Xanthium*, *Siegesbeckia*, *Eclipta*, *Blainvillea*, *Wedelia*, *Spilanthes*, *Bidens*, *Glossogyne*, *Centipeda*, *Artemisia*, *Gynura*, *Emilia*, *Notonia*, *Senecio*, *Crepis*, *Lactuca*. and *Launæa*. The total number of species amount to 78, or an average of only about two of each genus, but of this total no less than 19 are endemic, or nearly 24.3 per cent. Quite a large number of these endemics belong to our highest altitudes.

Of the whole order, few are of economic value in Ceylon outside introductions, to which a passing reference will be found. Many are common weeds of which one in particular is a long-standing pest.

No. 320. **VERNONIA ANTHELMINTICA** Vol. III. p. 9.
Sanninayam, *S. Kadduchchirakam*, *T.*

A many-branched annual of about 2 feet in height. Stem cylindrical, with pubescent young parts.

Leaves alternate, rather large, about 5 inches long, lanceolate, or oval, tapered to base, acute at apex, serrate, rather thin, faintly hairy on both sides.

Flowers soft violet. Flower-heads copious, large, solitary, on moderately long stalks. Bracts narrowly oblong, outer and inner of equal length, and "ultimately reflexed after fruiting."

Corolla-tube narrow, long. Fruit a 10-ribbed achene, black, sparsely hairy, with a short pappus.

Common in the dry zone by houses, and apparently introduced. Also in Malaya, and India.

The dried seeds are a bazaar medicine in India, and are esteemed as a remedy for round worms, and also reputed to be a cure for leucoderma. Locally it is used for fever and convulsions (*Macmillan*).

No. 321. **V. ARBOREA** Vol. III. p. 11.

Kobomella, S.

A tree up to 20 feet high. Stem pale white, or creamy, smooth, or faintly furrowed. Young twigs woolly.

Leaves alternate, about six inches long, lanceolate—oblong, acute (sometimes rounded) at base, tapering at apex, acute, entire, covered below with dense pale close tomentose matter of a creamy, or white colour.

Smooth above, except, when very young. Petiole half inch, often mealy. Flowers pale violet, in small heads many, on short stalk, arranged in large cymes. "Bracts, few, oval, or oblong-oval, obtuse, densely woolly."

Fruit a compressed achene, angled. Pappus pale.

Wood pale, straw yellow, fading on drying. Suitable for small wooden boxes. Timber not durable, easily split. Sometimes used as fuel, but very inferior.

Occurs in damp ground, and along the edges of swamps in the wet zone up to 4,000 feet. Locally abundant. Also in India and Malay countries.

No. 322. **EPALTES DIVARICATA** Vol. III. p. 24.

Hin-mudamahana, S.

A short-stemmed widely branched scraggy plant. Stems faintly hairy, or smooth. Leaves alternate, small, about 1 to 1½ inches long, narrow, fleshy, tapering to a clasping base, obtuse at apex, faintly notched along margins, smooth. Petiole asent. Flowers bisexual rich purple; heads terminal, solitary. Involucre campanulate. Bracts in a series of rows, acuminate, "anther bases sagittate, shortly tailed" (*Trimen.*)

Fruit a smooth achene, without a pappus.

The roots are bitter, and used as an astringent tonic by the Tamils.

A dry-zone plant, and found in moist places such as shallow tanks, but not growing in the water.

Also occur in India, Java and parts of China.

No. 323. **SPHÆRANTHUS INDICUS** Vol. III. p. 26.

Muda-mahana, S. (not to be confused with last) *Vishnu-karandai, T.*

A many-branched plant of about one foot in height. Stem short, winged from the bases of the leaves.

Leaves decurrent, alternate, sessile, about 2 inches long, narrowly oval, tapering at base, obtuse or sub-acute at apex, sharply spinous at ends of marginal serrations, more or less hairy on both sides, glandular, and strongly honey-scented when crushed.

Flowers forming compound heads, purple, on winged stalks, numerous. Bracts very narrow. Florets tubular, outer fertile (female) 3-toothed. Inner sterile, 5-toothed Fruit a pappusless achene, oblong smooth.

The plant is used in native medicine as a vermifuge, and given with honey in coughs.

Occurs in wet lands in the Low-country. Also in South India.

Of our introduced *Compositae* we have very many of which possibly the best known is the pestiferous 'White-Weed,' or 'Goat-weed' (*Ageratum conyzoides*), known to the Sinhalese as *Hulan-tala*, and to the Tamils as *Pu-pillu*. This plant has the reputation of having been introduced into Ceylon, but it is uncertain when, or by whom. It has been justly regarded by planters as one of the worst plant pests that ever came here, the cost of keeping it under control having involved estate owners in many million of rupees. It has practically spread all over Ceylon, and is common at all altitudes.

A second pest of this order, is the now familiar *Mikania scandens*—a native of Tropical America, and appropriately called by the Sinhalese, *Lanka-paluwa*. It was hardly known in the latter part of the last century, but has now become widely spread throughout the wet zone districts of Ceylon. Owing to its rapid growth and power of climbing, it has in many places completely strangled the vegetation it grows upon, often including garden trees and shrubs. On many estates in the country it entails considerable expenditure to check this vigorous weed from over-growing the Tea bushes. It is sometimes used as cattle fodder.

A third introduction belonging to this prolific order, is the so-called 'Wild or Mexican Sunflower' (*Tithonia diversifolia*)—a native of Mexico, introduced into Ceylon in 1851. In many parts of the country, this plant ousted the Lantana, that up till then formed a complete growth to the total exclusion of other plants.

A fourth and final *composite* weed pest is the so-called 'Kurunegala Daisy,' (*Tridax procumbens*) which belongs to South America, but here flourishes too well.

It is an abundant weed in Colombo, and in coconut plantations in the North-Western Province.

Very many of our favourite garden plants belong to this large order, such as *Chrysanthemum*, *China aster*, *Zinnia*, *Dahlia*, *Arthichoke*, *Lettuce*, &c., that are grown in or near most of our houses.

The valuable medicinal products known as *Santonin*, and *Wormwood* are obtained from *Artemisia maritima*, and *A. vulgaris* respectively—both familiar composites in India.

LXXV.—ERICACEAE.

This order is represented in Ceylon by two genera only: *Gaultheria*, and *Rhododendron*, both of which belong to our highest altitudes.

No. 324. **RHODODENDRON ARBOREUM** Vol. III. p. 63.

Ma-ratmal, *S. Billi*, *T.*

A smallish tree with stout, generally much contorted stem. Bark thick, rough, furrowed, and fissured deeply; greyish, or dull brown. Twigs and branches many, stout, leaf-scarred.

Leaves crowded, alternately arranged, large, 5-6 inches, oblong-oval, tapering or slightly rounded at base, acute at apex, entire, more or less recurved along the margins, stiff, smooth, rather glossy above, coated below with dense felt-like hair of a pale or rusty color. Petiole stout, thick, about ½ an inch, smooth. Midrib stout, prominent below, depressed above.

Lat.-veins, conspicuous below, depressed above.

Stipules absent. Flowers large, deep crimson, arranged in a dense terminal mass ('capitulate raceme') above the leaves. Calyx, 5 segments; Corolla 5-lobed, campanulate, nearly 1½ inches wide; Stamens, 10 or more; Anthers opening with an apical pore; Ovary, 10-celled, densely silky, superior. Capsules ovate, longitudinally ribbed, woody.

The wood is dull reddish brown in color, with fairly even grain; weight 42 lbs. per cubic foot, but not of much value as it warps, and is difficult to procure in useful lengths. The pores are evenly distributed, minute. Rays quite distinct, and also the annular rings, which are marked by larger pores.

This is a characteristic mountain plant, occurring on our high-level Patinas in some abundance. It is said to make fairly good fuel and charcoal.

Occurs in the Nilgiri hills, and the higher mountains of India.

LXXVI.—PLUMBAGINACEAE.

No. 325. **PLUMBAGO ZEYLANICA** Vol. III. p. 65.

Ela-netul, S. Chittra, T.

This is our only representative of this small order.

A bushy somewhat scrambling herb, with long roots. Stems wide spreading, smooth, striated. Leaves alternate, variable, about 1½ inches or more long, ovate-oval, tapering to a clasping base, supplemented there by minute stipule-like appendages; much tapered at apex; entire; smooth above, faintly waxy (in some) below, thin, papery.

Flowers, faint violet, or white, with centres of the corolla-lobes streaked with a darker shade of color where the flowers are other than white. Flowers arranged in a dense erect raceme, with both rachis and bracts viscous-glandular. Calyx narrow, studded with viscous glands on the margin. Corolla tube about 1 inch, thin. Lobes 5, oval, much tapered towards the base. Stamens 5, very fine, concealed within the tube, Anthers narrow, compressed. Style produced; stigmas 5. Ovary 1-celled, with one pendulous ovule. Capsule narrow, pointed. Seed solitary.

The roots contain an acrid poisonous principle, known as *Plumbagin*, that is used in native medicines as a stimulant. According to *Dr. Gunawardana* it is a cure for dyspepsia, diarrhœa, rheumatism, and skin diseases, but owing to the highly poisonous character of the drug, its use is attended with danger. *Dr. F. N. Windsor* states that the root-juice acts as a blistering fluid on the skin, and that it is used for criminal purposes.

Often cultivated in gardens for the sake of its flowers.

Common in the tropics.

[*P. Capensis*, with pale blue flowers, is a favourite garden plant.—C.D.]

No. 326. **P. ROSEA** Vol. III. p. 65.

Rat-netul, S. Shivappu-chittra, T.

A much smaller plant than the last, but with larger leaves and red flowers. It is generally cultivated, and is not uncommon in village gardens.

Like the last, it possesses poisonous roots, from which many preparations are made that are said to be of value in rheumatism and skin diseases.

It is also used for blistering, but occasions great pain when so applied.

Cultivated in India.

LXXVIII.—MYRSINACEAE.

The order is represented in Ceylon by 5 genera, viz: *Mæsa*, *Myrsine*, *Embelia*, *Ardisia* and *Ægiceras*, all of which may be considered as bushes, some of them scandent. They are not of economic value generally; some are showy garden plants, (*Ardisia Missionis* for example) and are cultivated.

No. 327. **EMBELIA RIBES** Vol. III. p. 69.

Wel-embiliya, *Walanga-sal*, *S. Vilangam*, *T.*

A large scrambling climber, young branches climbing by their twigs. Old stems often attain 18 inches in circumference, with brown thick bark, studded with conical outgrowths. Branches long, slender, and crawling, terminating in smooth much lenticel-dotted ends. Leaves alternate, large, about 4 inches long, oblong-lanceolate, rounded at base, shortly acuminate, completely smooth, glossy green above, silvery below, entire, minutely glandular, acid to the taste. Petiole, short, glandular. Lat.-veins much hidden.

Flowers greenish, or nearly white, very minute, arranged in axillary long spreading panicles that are more or less pubescent. Flowers, frequently polygamous. Calyx small, with 4 or 5 segments. Corolla lobes deeply cleft, 5, (or 4).

Stamens 5, erect, inserted on the petals, with very short filaments. Style, simple. Ovary, 1-celled, with few ovules attached to a central placenta. Fruits very much like small currants, that become purplish black on drying.

The fruits are regarded as useful in native medicine, as possessing tonic, stomachic, and astringent properties.

According to *Dr. Gunawardana*, the powdered seeds, mixed with honey, are a household remedy among the villagers, as a preventive against worms in children.

It enters into many decoctions in conjunction with other ingredients, as a remedy for tumours, &c.

The dried fruits are often used for adulterating black pepper, their shape, color, and pungency lending much to the deception.

Rather common in the intermediate zone, and extending to about 4,000 feet.

Also occurs in India, China, and Malaya.

I have frequently found village people eating the leaves of this plant when betel leaves were unprocurable.

LXXIX.—SAPOTACEAE.

A very important order in Ceylon, as all our 6 genera afford valuable timber trees. Our genera are *Chrysophyllum*, *Sideroxylon*, *Isonanda*, *Bassia*, *Palaquium*, and *Mimusops*, exclusive of a few introductions. [The most important of the latter is *Acras Sapota*, which yields the popular Sapodilla fruit, and "Chickle Gum" used in the preparation of chewing gum.—C.D.]

No. 328. **CHRYSOPHYLLUM ROXBURGHII** Vol. III. p. 76.

Lawulu, S. Kat-Illuppai, T.

A moderately tall slender tree. Bark thin, dull brown, faintly fissured longitudinally, milky.

Branches slender cylindrical, tinged with red-brown lines. Twigs densely coated at ends with red-brown woolly hair, or easily detached tomentum.

Leaves alternate, about 5 inches long, lanceolate, rounded, unequally lobed at base, suddenly tapering to an acuminate apex; entire; shining above, paler and glossless below. Spreading.

Petiole ½ inch, rather thick, woolly-hairy, becoming greyish, or scurfy-pubescent. Midrib narrow, prominent below, slightly raised above. Lat.-veins very numerous and in double series, the primary veins uniting within the leaf-margin into a distinct pellucid intra-marginal vein.

Flowers minute, pale greenish white, on thin reddish, pubescent stalks, arranged in clusters.

Calyx 5-lobed, unequally segmented. Corolla, 5-lobed, campanulate, rather woolly. Stamens 5, short. Style acute, simple. Fruit large, about 1½ inches, globose, glabrous, tipped with remains of style, yellowish when quite ripe, highly milky, especially when young. Seeds rather large, compressed, half-moon shaped, hard, smoke-brown, glossy, 4 or 5.

The wood is pale or whitish, rather hard, close-grained, weighing about 40 lbs. per cubic foot. Pores small, in radial lines. Rays numerous, fine.

The timber is not much used in Ceylon, except for temporary structures. Suitable for shingles.

Occurs in the western part of Ceylon up to 3,000 feet altitude, but not very common. Also South India, Burma, Malaya, Java and Philippines.

The 'Star-apple' (*C. Cainito*) or 'Rata-lawulu' of the Sinhalese, is a familiar Tropical American species that has been long introduced into Ceylon. It differs from the last by its dark ovate leaves, which are of a coppery yellow colour, below The fruits are much larger (about three inches across) having thin enclosed seeds radially arranged, forming a star, hence the English name.

A second introduced member of this genus is the Date-plum (*C. monopyrenum*). It is a West Indian species, and affords a date-shaped fruit, which is esteemed as a delicacy.

No. 329. **ISONANDRA LANCEOLATA** Vol. III. p. 77.

Molpedda, Kiriwarala, S. and locally *Kirihimbiliya.*

The Sinhalese names are confusing as they vary in different localities.

As the identification of the species is difficult I quote Trimen's analysis of our genus.

"Tree; leaves alternate, entire. Flowers small, sessile, in axillary fascicles; Calyx-segments 4, imbricate. Corolla-lobes 4, imbricate; Stamens 8, inserted in corolla-tube. Ovary, 4-celled. Style simple. Berry ovoid-oblong, pointed. Seed, solitary, long-ovoid, slightly compressed. Embryo large with flat cotyledons in scanty fleshy endosperm."

Our examples of this particular species vary considerably in size of tree, and in length of leaf.

Bark dull brown, rather thin, milky. Stem slender. Branches irregular, terminating in a prolonged series of concave curves, one wave adjoining the next in a direct line, surmounted at the apex of each curve with a more or less crowded cluster of leaves. Leaves 4½ to 5½ inches long; oblong-ovate, or broadly lanceolate, tapering at base, suddenly shortly acuminate at apex, thick, entire, slightly reflexed or undulate along the margin, dark dull green in old leaves, ashen below, more or less felt-like in younger leaves, and tinged with a coppery hue. Petiole about ¾ of an inch, wrinkled, closely hairy. Midrib prominent below, distinct above.

Lat.-veins about 18 pairs (often with intermediate shorter veins) parallel, arching well within margin, distinct above, slightly prominent below, if not obscured. Minor veining indistinct.

The above description varies from Trimen's with regard to length of leaf and petiole, but as these appear to vary on the

same tree, I think this difference cannot be regarded as specifically significant.

Flowers light sulpher yellow in axillary clusters.

Wood (from a branch) pale pinkish white, hard, close. Pores minute, solitary, irregularly scattered, open. Rays indistinct. Annular rings indicated by pale concentric rings. Timber is said to be durable and heavy. Suitable for posts and rafters.

Occurs in the Southern forests in wet localities, also South India.

A careful revision of this genus may indicate that the conspicuous mountain form, now classed as variety '*compta*' is a distinct species.

No. 330 **BASSIA LONGIFOLIA** Vol. III. p. 79.

Mi, S. Illuppai, T.

A very large deciduous tree, deciduous only for a short time, after which the foliage assumes a dark green dense mass. Stems often attaining a diameter of 4 feet; more or less buttressed. Bark dull brown, about $\frac{3}{4}$ thick, furrowed. Ends of young branches pinkish, sparcely 'milky.' The young twigs have the same habit of growth as in the last of forming a series of concave curves, with clusters of leaves at the end of each curve and apex. Leaves about $5\frac{1}{2}$ inches by $1\frac{3}{4}$ inch, narrowly ovate, or ovate-lanceolate, acute at base, tapering to a more or less blunt apex, entire; glabrous above, sometimes slightly glaucous below; margins thickened pellucid. Petiole about 1 inch, slender, thickened at base, obscurely channelled above, cottony-pubescent when very young. Midrib equally prominent on both sides, pale. Lat.-veins about 12, nearly horizontal, or slightly arched, uniting within the margin.

Intermediate nerves netted, distinct above, inconspicuous beneath. Stipules about $\frac{1}{2}$ inch long, narrow, acute, finely hairy, early falling.

Flowers appear below the leaves, solitary, on rather long drooping stalks, yellowish, very sickly in ordour. Calyx, with deeply cleft segments, 4, in an inner and outer series, the inner being enclosed. Corolla, 8 to 12-lobed, thick. Stamens double the corolla, in an upper and lower series, the upper consisting of anthers only, the lower with very short filaments. Anthers toothed. Style much produced. Ovary 8-celled, very hairy. Fruit ovoid, about 2 inches long. Seed large, solitary, narrowly half-moon shaped, beaked, hard, yellowish.

The wood is of a pale sepia-brown colour, darker towards the centre, smooth, takes a fine polish, close, tough and durable. Weight about 62 lbs. per cubic foot. Timber suitable for

beams and trusses, and boat building, as it resists moisture. It is often used for native oil-presses (*Chekkus*) but difficulty is experienced in seasoning, as the wood is apt to crack.

Pores circular, unevenly distributed, often pressing against the rays, slightly tinged with reddish. Rays fine, indistinct, numerous, pale. Annular rings very indistinct, close.

The bark is astringent. The seeds yield a considerable quantity of oil which is used in cooking ('Mi-tel,' S.), and in native medicine. After extracting the oil, the mealy residue ('Arappo,' *T.*) is said to be used as a cattle food in South India. The milky juice of the leaf and fruit is useful in rheumatism.

The flowers are very sweet, and after drying are eaten.

Fairly common in the dry zone, where the tree attains its largest size; also found in gardens up to 2,000 feet altitude. It is probably an introduced species as it does not occur as a forest plant, though common in long abandoned lands.

This plant is closely allied to the *Mahwa* tree of India, which is there known as "Indian Butter tree," so called as its seeds yield an oil that affords a substitute for butter. Its flower distilled, produce the spirit known as Mahwa Wine.

No. 331. **B. NERIIFOLIA** Vol. III. p. 80 Pl. LIX.

Gan-mi, S.

A smallish tree rather irregular in size, always to be found on the banks of rivers and large streams.

Bark, rather smooth, about one-third of an inch thick, dull brown more or less mottled with grey. Young parts glabrous, studded with lenticels. Leaves variable in length, 4 to 6 inches long by about 1 inch wide, crowded, narrowly ablong or linear, finely tapered at base, obtuse, or suddenly rounded at apex, often mucronate; entire, glabrous, glossy above, dull below. Petiole $\frac{1}{4}$ of an inch; midrib prominent, raised above, thin. Lat.-veins about 15, sub-opposite, uniting within margin. Secondary nerves minute; entire venation pellucid. Stipules about $\frac{1}{4}$ inch long, narrow, bristle-like. Flowers in small clusters in leaf-axils, white, sweet. Calyx-segments narrowly oval, very silky-hairy in the inner ones. Corolla 6-lobed, softly hairy outside. Anthers 12, acute, in one "tier." Style simple, much produced and persisting. Fruit narrowly oval, beaked. Seed large, about 1 inch, brown, glossy, solitary.

The wood is reddish brown, rather handsome, finely grained, but rarely of large size, but suitable for small cabinet work.

Affords an excellent fuel, and makes good posts for fencing. Weight about 47 lbs. per cubic foot.

An endemic species, found in considerable abundance in the wet zone, extending up to 2,000 feet altitude.

Also occurs in the Eastern parts of Ceylon but is not so plentiful.

The bark of the stem yields a small quantity of thick "gutta," the uses of which might be investigated.

No. 331A. **B. FULVA** Vol. III. p. 81.

Wana-mi, S.

A small erect tree, with irregular crown. Stems uneven in outline. Bark rather thick, greyish. Young parts covered with yellowish-red tomentum, extending to the petioles of the leaves.

Leaves alternate, few, small, about 1 inch, broadly ovate, tapered or acute at base, abruptly pointed at apex, thick, entire, glossy above. Petiole about 1 inch, rather stout. Midrib stout, prominent below, inconspicuous above, very hairy beneath, lat.-veins depressed above, tomentose below. Young leaves entirely tomentose when young.

Flowers yellow, apparently growing in clusters from wart-like prominences in the leaf axils. Trimen says "numerous in clusters of 4 to 8." Flower stalks long.

The wood is dark yellowish brown, hard and close. Weight about 46 to 47 lbs. per cubic foot. The timber has the reputation of being excellent for beams, but owing to the variability of the plant, is little used.

It is an endemic species, occurring in the wet forests of Lower Sabaragamuwa, and the Southern Province.

A species very closely resembling the above, locally called "Wana-mi," occurs in the Walallawiti Korale and is said to yield a hard timber.

No. 332. **PALAQUIUM PETIOLARE** Vol. III. p. 82.

Tawenna, S.

A very large tall erect tree with smooth grey bark, that yields gutta copiously upon incision. Branches few, large, terminating in many stout twigs. Leaves alternate, broadly ovate, about 3 to 4 inches long by 2½ wide, rounded, unequally lobed at base, tapering and suddenly acute at apex; entire, glabrous, glossy above. Petiole about 1½ inches, stiff, smooth.

Midrib stout, strongly prominent below at base, narrowing towards apex, the upper one-third being depressed on the upper surface. Lat.-veins about 12 pairs, first 6 or 7 nearly horizontal, upper oblique and finely arched, or branched at the margin; depressed above, prominent below. Nerves very indistinct, parallel.

Flowers pale pink, in small clusters massing in the axils of fallen leaves. Stalks long, 1 to 1½ inches. Calyx lobes 6, in a double series, the outer valvate, and the inner imbricate; segments becoming stiff and woody. Corolla 6 lobed, tube softly hairy within. Staminal filaments alternately long and short, Anthers distinctly 2-horned. Fruit about 1 to 1½ inches diam., spherical, crowned with remains of style, and enclosed in persistent calyx.

The wood is dull red-brown in colour, with but little "figure," moderately hard, dense, durable. Weight approximately 53 lbs. per cubic foot.

The timber is very suitable for structural work, and has been used for decking bridges.

This endemic species is locally abundant in the wet forests of Sabaragamuwa, the Western, and Southern Provinces, where it grows in small gregarious masses up to about 1,500 feet altitude.

In habit and appearance it is much like Hora (*Dipteropus zeylanicus*) and might readily be mistaken for it owing to its tall, pale, cylindrical stems resembling that species.

The gutta is used locally by the village people in conjunction with the wood-oil *Diptexocarpus glandulosus* for catching "fly," in paddy fields.

No. 333. **P. GRANDE** Vol. III. p. 82.

Kirihimbiliya, Kirihiriya, S.

A moderately large tree generally found growing near water. Bark smooth, brownish, rich in gutta. Branches terminating in the same wavy outline described in No. 329, and studded at ends of twigs with warty bosses from which the flowers are formed.

Leaves clustering at ends of twigs, large, 5 to 10 inches in length, broadly ovate, or nearly orbicular, rounded at base or tapering, obtuse or very shortly acuminate at apex, entire, thick, stiff, dark green when mature, rich pink when young. Petiole short, about one inch, stout, nearly woody, flattened above, with a more or less persistent axillary gland. Midrib large, prominent on both sides. Lat.-veins large, about 10

pairs, opposite at first, widely netting within margin. Secondary nerves inconspicuous.

Flowers yellowish, in small drooping 2 to 5 clusters growing from the bosses. Stalks pubescent, rusty red. Calyx segments deeply cleft, rusty pubescent. Corolla much larger than calyx, tube finely hairy within. Staminal filaments nearly equal, or obscurely alternate. Fruit large, spherical, about 1½ in. diam., stoutly stalked, coppery red. Seeds oblong, smooth, glossy, about 6 in each fruit.

The timber is of a reddish brown colour, without 'figure,' close, dense, durable, but rarely obtainable in long pieces. Suitable for structural work, and posts.

This endemic is moderately common in the wet districts of Ceylon up to 5,000 feet, growing generally near streams, but there appears to be considerable variability in the foliage.

I have met with a closely allied form to this in the Kurunegala District (Handurukanda) that appears to be distinct. It has a straight erect stem, and does not effect streamsides like the above. Its wood is paler, dense, and apparently hard and durable.

The Gutta-percha of commerce is obtained from a Malayan form of 'Palaquium' (*Dichopsis*) *Gutta*, which grows to an immense tree. I found it in Borneo, where the method of extracting the latex was by felling the tree, and cutting a series of rings through the bark, at intervals along the stem. The yield of gutta varies very much in proportion to the size of the tree, and ranged from 3 to 6 lbs. in small trees, while the largest are said to be capable of producing up to 60 lbs.

Its value, in cable manufacture, has long been recognised, as Gutta-percha as a lasting and powerful insulator. Notwithstanding its slow growth, its cultivation in suitable localities deserves consideration, as apparently no substitute for this important product has been found, though the wasteful methods of collection must point to the ultimate destruction of the plant.

Note.—Since the foregoing was written, a very important paper by Messrs. H. C. King and A. H. G. Alston on the "Botanical identity of Tawenna and allied timbers" has been published in the Annals of the R. B. Gardens, Peradeniya, Vol. XI., Part 3, 1930.

Reference to this valuable paper will show that there is still some uncertainty in the applicability of certain vernacular names in the genus *Palaquium* and in *Bassia*, and that the timber of *P. Petiolare* is light, while that of *P. Rubiginosum*

is hard, heavy, and durable; moreover the vernacular name Tawenna is associated with the latter, and Kiripedda, and Kirihimbiliya, with *P. Grande* and *P. Petiolare*. This paper is accompanied by important illustrations of the word structure.

No. 333A. **MIMUSOPS ELENGI** Vol. III. p. 86.

Munamal, S. Mukalai, Makil, Vakudam, Vilvapattiri, T.

A very large erect tree, with close dense crown. Bark about quarter inch thick, dull brown, somewhat furrowed with irregular longitudinal fissures. Branches and twigs or young parts felty-pubescent.

Leaves alternate, rather irregular in size, about 3½ to 4 inches long, ovate-oblong, rounded at base, abruptly rounded, and ending in a more or less bluntly acuminate apex; entire, completely glabrous, rich green above, dull below.

Petiole about ¾ inch, slender, felty-pubescent when young. Midrib pale, equally prominent on both sides.

Lat.-veins many, thin, straight, pellucid, inconspicuous. Minor nerves forming oval or oblong loops between the lat.-veins, pellucid. Stipules very small, early falling.

Flowers scented, solitary, or few together, in axillary bundles, white on opening, changing to pale cream, placed on short pubescent stalks. Calyx 8-lobed, lanceolate pubescent outside. Corolla in three series of eight narrow segments in each. Stamens 8, with eight alternate, short, hairy, staminodes. Ovary silky, 6—8 celled. Style simple, produced. Fruit yellow, oval, at first, pubescent. Seed solitary, compressed, glistening brown, about ¾ inch long, oval.

Wood red-brown tinged with pink, very close, hard, polishes well and durable. Suitable for structural work, beams, posts, piles and furniture. Weight 52—60 lbs. per cubic feet.

Gamble, describing the wood structure says, that the pores are small in short lines, which are generally radial. Rays fine, very numerous, uniform and equidistant. Many parallel, wavy concentric bands.

The bark, fruit and seeds are astringent and useful as a gargle. The seeds yield a fatty oil. A fragrant perfume is obtained by distillation of the flowers. The fruits are very sweet and eaten.

Fairly common, especially in the dry zone (Eastern Province) where the tree attains a large size. Often planted.

Also occurs in India, Andamans and Malaya.

No. 333B. **M. HEXANDRA** Vol. III. p. 86.

Palu, S. Palai, T.

A very large tree, often up to 15 feet in girth. Bark very thick, deeply furrowed longitudinally, and fissured across, forming large, oblong scales. The thickeness of the bark is, however, variable, according to the age and situation of the tree. I have obtained examples in which the bark had attained a thickness of 5 inches. General colour of bark greyish.

Boughs few, large, contorted dividing up into many smaller branchlets and twigs that are spinose at ends.

Very young Palu plants are quite unlike the mature tree, and seem to be sub-scandent during their early life, with smooth slender stems from which short spinous branchlets ending in small clusters of leaves appear.

Leaves alternate or clustering very variable in size, from 1½ to 2½ inches long, ovate, much tapering to base, rounded, or two-lobed, at apex, top-shaped, entire, stiff; shining dark green above; margins much or moderately recurved. Petiole about ⅜ of an inch long, grooved above. Lat.-veins horizontal, fine, hair-like conspicuous above, indistinct below, sub-pellucid, arching at ends, and uniting within the margin. Intermediate nerving closely reticulate.

Flowers yellowish, small, in terminal, and axillary clusters, solitary, or 3 and 4 together. Stalks nearly ½ inch long, slender, curved, reddish brown. Calyx 6-lobed, narrow, sub-acute. Corolla 18-lobed, lobes narrowly lanceolate, acuminate, with "six longer than the rest." Stamens 6 (alternate with six staminodes) short. Ovary 12-celled. Fruit a small oval red berry, containing one reddish seed.

Wood.—Heart-wood rich bright chocolate-brown with a slightly fleshy tinge, sparcely streaked with paler shades. Heavy, 68—80 lbs. per cubic foot, close, hard and tough. Very durable. Difficult to saw, and liable to crack in radial and transverse directions, unless most carefully seasoned. Suitable for heavy structural work, beams, joists and sleepers.

Pores minute, close, indistinct, equally scattered.

Rays very close, radial, direct, moderately thick. Rings very obscure, indistinct.

Palu timber has been largely used in Ceylon for Railway sleepers, but owing to its tendency to split, it is not a favourite, though its durability and power of resisting white ants should be considered.

The wood from young trees is much paler than that sawn from old wood, and is very liable to warp unless dried under shade.

It burns slowly to a very fine ash.

The fruits are very sweet, and much sought after by bears, that will frequently climb the trees for them.

'Palu' is a typical dry-zone tree, and found in considerable abundance. The largest examples I have seen are in the Trincomalie district, and from Kowdagalla in the Batticaloa country. Occurs in the dry parts of India, and in that country is much used for house building.

The product known as 'Balata' is obtained from an allied Venezuelan tree—*Mimusops globosa*—which produces a gummy latex. This substance is much used in machine belting.

LXXX.—EBENACEAE.

This valuable order, which contains our richest ornamental woods, is however only represented here by two genera, viz.: *Maba* and *Diospyros*.

The total number of species, so far enumerated, amount to 26, but the proportion of endemics is curiously high, there being 75 per cent. in *Maba*, and 40 per cent. in *Diospyros*.

The identification by local names in this order is very confusing, as we find the name *Homederiya* (*S.*) indiscriminately applied to more than one *Diospyros*, and also to *Heritiera littoralis*, which has no possible alliance with the ebonies.

The confusion in names has probably arisen among cabinet makers, who apply what they consider suitable names to woods of a general similiarity of appearance or marking, thus accounting for *'Kalu'*, *'Kalukeriya,'* *'Kaluwara,'* and *Kalumederiya,'* the word 'Kalu' (*black*) being a representative or characteristic coloring in all these woods.

Our knowledge of the order is however very incomplete, as the material collected is probably insufficient, owing to the fact that in some, notably in *Diospyros quaesita*, the male and female trees are separate. In this particular species—the much treasured Calamander—it was only in recent years that the female flowers were found.

Wright, in his exhaustive paper* on the order, has done much towards a systematic classification, especially as regards

* The Genus *Diospyros* in Ceylon. Annals of the R. B. Gardens, Peradeniya, 1904.

structure of the timber, but no regular systematization of the leaves has been evolved to enable those who have only this material at hand to readily distinguish one species from the next.

No. 334. **MABA BUXIFOLIA** Vol. III. p. 89.

Habara, Kalu-habaraliya, S. Irumpalai, Juvarai, T.

A small dark barked tree or bush, with rather smooth cylindrical stem. Often much mottled with grey. Branches small, twiggy, very irregular. Very young shoots, smooth, or sparcely hairy.

Leaves extremely variable, from $\frac{1}{4}$ of an inch in length to 1 inch, ovate, or top-shaped, much tapering at base, emarginate, or broadly rounded at apex, entire, smooth, rather stiff, glossy. Margins inconspicuously rounded. Petiole exceedingly short, $\frac{1}{8}$ or $\frac{1}{16}$ of an inch, slightly enlarged at base. Midrib prominent below. Lat.-veins and intermediate nerving indistinct.

Flowers minute, white, or faintly tinged with pink, solitary, or 2 or 3, placed in the leaf axils. Calyx divided into 3 segments, enlarging with the fruit, segments short. Corolla-tube campanulate, 3-lobed, hairy without.

Stamens, 6 or more, inserted at base of corolla, unequal.

Ovary 3-celled. Ovules 6. Fruit minute, oval, seated in the enlarged calyx. Red.

The wood is pale white or yellowish in colour, and is occasionally black hearted, but the heartwood is rarely of any great size. The timber is used in temporary house building for rafters and ridge-poles, but is not durable.

A common dry-zone plant, abundant in the Puttalam district, and in the North-Central Province. The largest examples I have obtained were from the Kumari Wanni Pattu.

No. 335. **DIOSPHYROS OVALIFOLIA** Vol. III. p. 91.

Kunumella, Habara, S. Vedukkanari, T.

A small tree. Bark brown, or smoky brown, slightly streaked with grey; rough. Young parts faintly pubescent. Leaves alternate, variable, from $1\frac{1}{2}$ to 5 inches in length, narrowly oval or lanceolate, tapering at base, rounded or obtuse at apex, entire, smooth, rather thin, pale.

Petiole short, about $\frac{1}{4}$ of an inch, stout midrib and veining distinct above. Lat.-veins about 7, oblique, uniting below the

margin with two to three separate large nerves or a network. Minor nerves inconspicuous.

Flowers, male and female, yellowish. Males 3 or more, in close clusters. Females solitary, or in a small short-stalked clusters, in leaf axils, or on young twigs. Calyx in male, 4 or 5-lobed, lobes round. Calyx in female, 4—5-lobed, lobes nearly acute, pubescent.

Corolla in male, 4-5 segmented, lobes obtuse, recurved. Corolla in female, 4-5 segmented, segments short.

Stamens in male 12-20, with short filaments.

Staminodes in female variable, 4 (or 1) up to 7.

Pistil pubescent. Stigmas curiously C shaped with the outer curve of the C lobed, the C's facing each other.

Fruit spherical about ½ inch in diam., waxy green, seated within the enlarged calyx, usually solitary. Seeds, 1 or more; brown, faintly furrowed (striated). Embryo white.

The heart-wood of this ebony is of a dull black color, with a brownish-red tinge, and very variable in size. It is sometimes passed off as true ebony, but is much inferior and incapable of giving the characteristic glisten of the genuine wood.

Posts of this timber are often used in temporary house building, but the wood is not durable.

Fairly common in the dry-zone, especially near Vavuniya, Tissa and north of Madu. Also occurs in Southern India.

No. 336. **D. MONTANA** Vol. III. p. 92.

Mul-Karunkali, Vakkanai, T.

A small deciduous tree, with spine-like branchlets. Bark pale dull yellowish, rather rough, and uneven, often spinous on the stem. Leaves narrowly oblong, or lanceolate-oblong, alternate, about 2 to 3½ inches long, shortly tapered at base or rounded; apex blunt or round; entire, generally glabrous, slightly pubescent when young.

Margins undulate. Petiole, about one-third inch, slender. Midrib prominent below, depressed above. Lat.-veins few, about 5 pairs, opposite, or sub-opposite, very oblique and narrowly arching within the margin, leaving the space between the vein and the margin itself widely netted; rather conspicuous above.

Flowers, male and female. The males pale yellowish white, growing in small 3-flowered cymes, on short stalks. Calyx in males, 4-segmented, triangular, slightly pubescent. Corolla in

males 4-lobed, twisted. Stamens in pairs, or in irregular numbers, up to 16. Anthers brownish. The female flowers are usually in pairs in leaf axils, on short pubescent stalks.

The female calyx is 4-lobed, pubescent, curving towards the flower-stalk with maturity. Corolla, comparatively wide, smooth, 4-lobed. Staminodes variable, small, 4. Styles 4, smooth. Ovary, 8-celled (*Wright*).

Fruit ovate, flattish at base, pointed acutely at apex, smooth, reddish brown, about one-third of an inch in diameter. Seeds smooth, brown, up to 8 in number, "semi-lunar."

The wood is pale yellowish grey with scarcely any heartwood, soft, and possibly suitable for fretwork.

Weight (according to *Gamble*) 44 to 47 lbs. for cubic foot.

I am acquainted with this plant as a dry-zone species, fairly common, but nowhere in the hill country, its specific name notwithstanding.

Occurs in India, Burma, and Tropical Australia.

No. 337. **D. EMBRYOPTERIS** Vol. III. p. 93.

Timbiri, S. Panichchai, T.

A large densely leaved tree, with dark, rather smooth bark. Branches spreading irregularly, stout, terminating in silky ends. Leaves large, alternate, about 6 to 8 inches long, oblong or linear-oblong, tapering or rounded at base, acuminate, or sub-acute at apex; entire; rather stiff, deep green above, paler below, pinkish or yellowish pink when young. Petiole thick, stout, about ½ an inch long. Midrib prominent below, grooved for about ¼ of its length above, yellowish, or distinctly paler than the leaf blades. Lat.-veins variable in number, fine, very oblique, rather concealed, pellucid. Leaf-margin pale, rather thick.

Stipules large, acute.

Flowers male and female, yellowish, scented.

Male flowers small, 2 to 5 in a short pubescent axillary cymes. Calyx 4 or 5-lobed, rounded, or triangular-lobed, pale green, coated with silky hair.

Corolla in males 4 or 5-lobed, stout, triangular, reflexed, silky. Stamens very numerous (up to 60) forming a ring, unequal, short, terminating with reddish anthers. Female calyx 3 to 5-lobed, lobes large, tapering, coated with black, or dark brown hairs; stout.

Female corolla 3 to 5-segmented, thick, pointed or emarginate at apex, rather deeply divided and reflexed, with few

dark hairs near calyx. Staminodes alternate with corolla, short, variable in number. Stigmas, lobed.

Fruits conspicuous, large, about 1½ to 3 inches in diam., globular, depressed or flat on the top, and having remains of stigmas. Usually solitary, coated with a reddish mealy scurf. Seeds large, brown, compressed, variable in number.

The wood, is nearly white with a trace of black heart-wood and a few streaks of black, separated by white or dirty white tissue.

The timber is moderately hard but seldom used.

The fruits afford a strong gummy juice, very rich in tannin, and is used for preserving fishing nets and lines. It is also used medicinally as an astringent, useful in diarrhœa, and internal hæmorrage. A gargle is made from an infusion of the fruit. The unripe fruit contains from 20 to 40 per cent. of tannic acid (*Dey*).

A common dry-zone tree, but usually to be found near streams, or damp ground.

Also India, Malay, and Tenasserim.

Two varieties of this species are recorded; *atrata* with blackish-haired leaves, and *nervosa*, in which the calyx is as long as the fruit, with white flowers. These varieties do not yield ornamental woods as far as I am aware.

No. 338. **D. TOPOSIA** Vol. III. p. 94.

Kaluwella, Kahakala, S.

A small many-branched tree, generally found in very rocky ravines and broken ground. Bark greyish brown, sometimes tinged with greenish-grey, smooth. Ends of branches and shoots smooth.

Leaves many, rather spread, alternate, variable, from 4½ to 8 inches long; oval, or lanceolate tapered at base, acuminate, or sub-acute at apex, rather stiff, entire, dark green above, much paler below.

Petiole about ½ an inch, stout, grooved above. Midrib prominent below, depressed above. Lat.-veins 7, rather oblique, prominent below. Intermediate nerving very distinct, closely netted, pellucid.

Flowers white, small. Males axillary, in cymes; females generally solitary, growing on the lower parts of the shoot. Male calyx 2 to 5-lobed, rather thick. Female calyx, 4-lobed, acute at apex, deeply cleft, pubescent. Male corolla "urceolate, throat very narrow," (*Wright*), 4-lobed. Female corolla 4 segments, triangular, pointed.

Stamens many, about 32, unequal, filaments very short. Staminodes in the female, about 16, forming a ring, short.

Fruit globose, broader at base than above, flat or depressed at apex, yellowish green, pubescent, rather fleshy within. Seeds 4, oblong, rather compressed, brown, smooth.

Wood pale reddish-brown, without appreciable heart-wood; moderately hard, but rarely large enough for ornamental purposes.

Found in the moist part of Sabaragamuwa up to 2,500 feet. I have obtained it in Gilimali, Bambarabotuwa, Balangoda and the Kukulu Korale. Also occurs in India, and the Khasia hills.

No. 339. **D. EBENUM** Vol. III. p. 94.

Kaluwara, S. Karunkali, T. Ebony, E.

A moderately large erect tree with close leafy crown. Stems up to 20 feet. Bark rather thin, dark greyish black, smooth, or finely grooved. Twigs and young parts green at ends, quickly blackening in older wood. Branches cylindrical.

Leaves, many, alternate, rather over-lapping about $3\frac{1}{2}$ inches by $1\frac{1}{8}$ inch, ovate-oblong, or oblong-lanceolate, rounded at base, more or less tapering to an abruptly acuminate apex; entire, completely glabrous, rather thick, glossy dark green above, paler below. Petiole, $\frac{1}{4}$ to $\frac{1}{3}$ of an inch, broad, quickly disarticulating from the blade when dry. Midrib stout, prominent below, depressed above. Lat.-veins few, oblique, distant. Nerves; netted, entire venation pellucid.

There is, however, considerable variation in the size of the leaf, those from dry districts being smaller than those grown at high altitudes, or where the rainfall is considerable.

Flowers pale yellowish white, rarely monecious, usually polygamous; male flowers in "very shortly stalked clusters of 3 to 6" (*Trimen*), "sub-sessile on lower part of young shoots." (*Wright*). Calyx in male, at first minute, green, four segments with blunt apex. In the female it is cup-shaped deeply cleft, horizontal when young, curving downwards, and enlarging with maturity; 3 or 4 segments.

Corolla in the male, tubular, narrowed at throat, rather long, in four segments, stout, apex rounded. In the female the throat is expanded, the lobes four, rounded at ends and recurved, considerably larger than males. Stamens many, about 16 or more, often connate, and with unequal filaments. In the females the staminodes are fewer, opposite and alternate to corolla lobes. Pistil green, stigmas 4 or 5-lobed. Fruit oval

and apiculate, or spherical and depressed, smooth glossy green, surrounded at base by enlarged calyx-segments. Seeds 2—8, hard glossy brown or black, rather large. The timber is at first in young wood pale, soft, white, with very little of the black heart-wood, or with the black colouring irregular. With maturity the white wood forms a collar outside the black, leaving the latter to occupy the greater part of the entire stem. It is this rich black interior that affords the famous ebony timber of Ceylon. It is hard, close-grained, and dense, affording a brilliant black surface in mature and well seasoned logs. The weight varies from 71 lbs. per cubic foot to 80, considerably more in unseasoned wood. The pores are minute, subdivided; oval, rather indefinitely scattered. Rays indistinct, very numerous. Annular rings apparently absent. The wood if not carefully seasoned is liable to split.

The timber is largely used in making ornamental furniture. inlaying, piano keys, brush backs, rulers and walking sticks. Ceylon ebony is perhaps the best known in the world, and is still very largely exported from this country.

It is a widely distributed tree, often found in gregarious masses, and effects rocky land. It is commonest in the dry zone, but ascends to about 4,000 feet.

It is very slow growing, its radial increment being aproximately 1-16th of an inch a year.

Occurs in South India, Sumatra, Malacca, the Malucca Islands and Celebes.

A smoky-black ebony is often found in the market, but it is uncertain if this is obtained from the true *Diospyros Ebenum* or from some other species. Identification by the wood has not been determined sufficiently to constitute a definite guide. A deep glossy jet black colour appears to be characteristic of Ebony in the absence of any other known means of identification.

A variety which I obtained in the Massimbula Forest near Rakwana, appears to be known locally as *Kalukiriya.* The tree is more slender than *D. Ebenum*, loosely branched, and has larger oblong much reticulate-veined leaves. In this form, the wood is creamy in colour, with many narrow parallel strands of black tissue, forming a series of longitudinal layers of about 1-6th of an inch in thickness; very handsome. I have only met with this form once and the material I collected was insufficient to determine its identity. The bark is paler than in *D. Ebenum.*

The name Ebony occurs in the Bible, in Ezekiel xxvii., V. 15, where it refers to the commerce of Tyre, as including

horns of Ivory, 'and Ebony.' In Ceylon, it appears to have first been recorded from Trincomalee. Koenig, in 1776 described it, and later it was identified by Roxburgh in 1795, as occurring on the Coromandel Coast. Many black woods however, owing to their colour, are called Ebony, these coming from different parts of the world; thus we have the 'American Ebony' —*Brya Ebenus*, a leguminous plant growing in Jamaica; "Green Ebony"—*Excaecaria glandulosa*, an Euphorbiacious plant; 'Mountain Ebony,'—*Bauhinia triandra*—another leguminous plant cultivated in the West Indies; and some others of less importance.

No. 340. **D. ATTENUATA** Vol. III. p. 96

Kadumberiya, S.

A small erect tree with dark, rather smooth bark and drooping branches. Leaves alternate, 2 to 5 inches long, oblong, or narrowly ovate, tapering at base, or to an acuminate apex; entire; glabrous. Petiole short, about $\frac{1}{3}$ of an inch, thin. Midrib prominent below, well pronounced above, faintly pubescent or glabrous. Lat.-veins about 7 pairs sub-opposite, rather oblique; between the margin and these veins in a close secondary netting of nerves.

Flowers dioecious, yellowish, or greenish yellow. The fruit in this species in distinctive, being nearly $1\frac{1}{2}$ inches long, tapering to a narrow point, seated on a thin 3-5 cleft calyx. Calyx-lobes coated with sparce black hair. Seeds, 2 or 3, dark glossy brown, oblong, wedge-shaped.

The timber is described by *Wright* as red, with black decaying heartwood, heavy, very compact, possessing a fine grain.

It is however too small a wood to be regarded as a commercial proposition, but is included here as one of our rare ornamental timbers.

This endemic appears to be confined to the Pasdun Korale in the Kalutara District, where it occurs growing near water.

No. 341. **D. GARDNERI** Vol. III. p. 96.

Kadumberiya, S. also Hompenella, Kalu and Homediriya in parts of Sabaragamuwa.

A smallish tree, irregularly branching. Bark blackish, thick, becoming yellow on being cut, the stain extending to the wood shortly after. Branches slender cylindrical, green at ends. Leaves spreading, about 7 inches long by $1\frac{1}{4}$, lanceolate, or narrowly elliptical, acute at base, tapered to a narrowly tailed apex, entire; glossy shining green above, apple-green

below; margin slightly recurved. Petiole short, ¼ inch. Midrib direct, very prominent below, depressed above. Lat.-veins about 6—8 pair, very oblique, depressed above, giving the whole leaf an unevenly 'bullate' surface; the space between the arches of the lat.-veins and the margin are netted, but less swelled. Nerving, pellucid.

Leaf bases sometimes marked with one or more glandular pits. Leaf buds ciliate-hairy.

Flowers, male and female, on separate trees, or polygamous; yellowish white. The male are in small cymes with one flower usually more prominent than the rest. The female flowers are solitary and almost sessile, in leaf axils. Male calyx, pointed at base, green, 4-segmented, segments acute, about half as long as the limb. In the female it rapidly enlarges enclosing about ⅓ of the fruit, broadly lobed, more or less abruptly pointed. Male corolla, tubular, wide at base, constricted below the segments, pubescent, 4-lobed; lobes reflexed. Female corolla, 3-4 segments, spreading. Stamens in male in a double series, the inner shorter than the outer, 12 to 16 'when 12 only, they are usually as 4 pairs, and 4 singles,' (*Wright*), Base of filament large, finely hairy. Staminodes in the female 8, opposite and alternate with the corolla.

Fruit ovate, or ovate-globose, depressed above, apiculate, tomentose in its early stages, smooth with maturity. Seeds 8, smooth, glossy, olive-brown.

The wood is yellowish white, indifferently streaked with dull black strands. These strands are often quite absent, or replaced by cloudy lines of black, giving the wood a curious almost mottled colouring according to the intensity of the marking.

I have only found very large trees so marked, and I think that it is these that are called 'Homediriya' and 'Kalu,' in consequence.

It is an endemic mostly confined to the wet districts, but nowhere in great abundance.

It generally grows near streams.

No. 342. **D. OOCARPA** Vol. III. p. 97.

Kalu-kadumberia, Ela-timbiri, S. Vellai-karunkali, T. Bastard Ebony, E.

A small erect diœcious tree, with rather slender stem. Bark ½ inch thick, pale greyish-brown, smooth. Branches smooth, leaf-scarred at ends, pubescent when young.

Leaves alternate, variable in size, 2½ to 3¼ inches long, oblong-ovate or ovate oval, rounded or obtuse at base, suddenly tapering to petiole, obtuse or blunt at apex; entire, completely glabrous, rather papery. Petiole short, ⅜ inch, pale green, slightly channelled above.

Midrib prominent below, distinct above. Lat.-veins 5 to 8 pair, oblique. Nerves widely netted, pellucid. Flowers yellowish. Males axillary, in a subsessile cyme. Females solitary, or 3's in a cluster. Male calyx hardly lobed, green, slightly pubescent, dark in the female. Male corolla narrow, 3 segments, tapered in the female. Stamens 9 to 12, or 14, unequal. Staminodes in female very short, 3, with barren anthers. Fruit solitary, ovoid, about ¾ inch in diam., glossy, obscurely apiculate. Seeds 6, compressed, grooved longitudinally, brown, shiny, horny.

Timber with coloured heartwood in brownish-black shades, mixing with faint salmon-red-tinged sap-wood, rather handsome, especially in dark examples; moderately hard, close, smooth. *Gamble* gives the weight at 45 lbs. per cubic foot, and states that the pores are of moderate size; rays fine, numerous. Numerous fine wavy concentric lines.

A dry-country plant in Ceylon, scarce. Occurs at Vavuniya, Nalanda and Mihintale. Also found in Mysore and S.W. India.

No. 343. **D. QUÆSITA** Vol. III. p. 97.

Kalumediriya, S. Calamander.

A large erect tree, buttressed, much branched. Bark moderately thick, exfoliating in very large trees, otherwise rather smooth, blackish, or mottled with grey, slightly fissured Young shoots finely pubescent ("adpressed, puberulous," *Trimen*). Branchlets stout.

Leaves large, alternate, 3 to 6 inches long, oblong-lanceolate, tapering to base, obtuse and shortly acuminate at apex; entire, rather thick, dark green above, much paler below. Petiole about ½ inch long, rather stout, quickly disarticulating on drying, flattened. above. Midrib thick, rather prominent. Lat.-veins very inconspicuous, horizontal, about 8 pairs.

Flower dicœcious, males in leaf axils, 3 to 9, "on drooping pedicels.....at very irregular distances" (*Wright*) Male calyx elongated, shortly 5-lobed, narrow, pubescent, (large in female,) becoming a thick broadly 5-lobed cup, with reflexed margins when mature.

Corolla in male 4 to 5-lobed, yellowish, thick, pubescent; much larger in the female where the lobes hardly extend much beyond the calyx lobes that clasp the corolla-tube before the fruit forms. Stamens in the male 16, with white filaments and yellowish-brown anthers. Staminodes in the female flower 5, alternate with corolla lobes.

The fruit—very rarely seen—large, about 2 to 2½ inches long, by 2 inches wide, ovate, slightly depressed at the top, faintly bluish-green, slightly freckled with brown; hard.

Seeds 4 to 10 large, compressed, rather kidney-shaped, brown, hard, horny.

The female flowers I found in Nehettimukalana, in the Atakalan Korale, some years after finding the fruits.

I carefully explored the country between the Karawittaganga, and Yagivella, in order to find if Calamander existed in sufficient quantity to justify operations on an appreciable scale, but nowhere did this species appear to be plentiful.

The area referred to probably represents the richest region for this exceedingly valuable wood that is now becoming more and more scarce. The Dutch appear to have been the earliest Europeans to appreciate Calamander as a furniture wood, and made from it extremely handsome wardrobes and almirahs, some of which are still to be seen preserved as heirlooms in old Sinhalese families.

The wood is of a mellow brown colour, blending through a variety of shades to black, in streaks, inter-striped with faint purplish tinges of colour. Hard, close, highly glossy, with an almost ivory-like surface when carefully polished. Weight approximately 54 lbs. per cubic foot. The pores are of medium size, far, radially scattered. Rays, many, fine, rather close. Annular rings apparently invisible.

The tree is of exceedingly slow growth, and in its infancy appears to be very liable to insect attacks.

Wright observes that the flowers are often closed when the mature pollen is ready for dispersion, hence a further difficulty arises in fertilisation, seeing that the female trees appear to be so far apart.

Calamander is by far the most beautiful of Ceylon's ornamental timbers, but its scarcity is such that there is no prospect of its becoming a commercial product here. From time to time reports are circulated that *Calamander* has been found in the dry-zone forests but this cannot be correct, and possibly refers to *D. Melanoxylon*, which occurs in the dry country.

The species is endemic, and confined to the wet South-West part of Ceylon, and to a restricted area.

I have seen the fruits of a *Diospyros*, locally, called 'Kalumediriya,' that were said to have been grown in a garden near Colombo. These were about 1½ inches in diameter, dark green, and deeply enclosed in a stout cupule. The leaves were quite unlike the true Calamander, being narrowly oblong. I was quite unable to trace the parent tree, but record this interesting case for future botanists to rediscover; it was certainly not opposite leaved, and therefore not likely to be *D. oppositifolia*, which has 'Kalumediriya' for its Sinhalese name.

No. 344. **D. SYLVATICA** Vol. III. p. 98.

Sudu-kadumberiya, S.

A large lofty tree, erect, much buttressed. Bark thick, dark blackish-grey, young twigs nearly glabrous, mottled.

Leaves alternate, rather large, 3 to 6 ins. long, narrowly oblong or oval, tapering to the petiole, or shortly rounded, acuminate, entire; thin rather stiff, shining above.

Petiole short, about ⅓ of an inch, flat above. Midrib prominent below, rather thin, depressed above. Lat.-veins (6—8) and nerves pellucid, depressed above. Reticulation rather wide.

Flowers male and female; the males "in small peduncled clusters; females solitary larger, (*Trimen.*)

Male calyx small, pubescent, 3—4 segments. Much larger in the female, 3 to 5 segments; segments rounded, or abruptly pointed. Male corolla campanulate, smooth, divided into 3 or 4 lobes, white; yellowish in female flowers. Stamens variable, about 22 or less, united into unequally numbered groups, with yellow anthers dehiscing, laterally. Staminodes in the female, 4. Stigmas 3. Fruit at first rich dark green, becoming greyish on ripening, smooth, about ¾ inch in diameter, globose, closely pressed by much enlarged and thickened calyx.

Seed 2—8, oblong, or ovate, brown, glossy.

Timber pale yellowish white, with a variable quantity of black heartwood; is suitable for cabinet work, as it is moderately hard, but apparently is not much used.

Uncommon. Occurs in the West of the Island, and recorded from Hantana. Also South Western India. The flowers are said to be strongly aromatic.

No. 345. **D. MELANOXYLON** Vol. III. p. 99.

Kadumberiya (Wright) Kalu, S. Karunthumbi, T.

A large erect tree. Stems up to 30 feet, cylindrical moderately buttressed. Bark thick, much vertically cracked, exfoli-

ating in scales, dark soothy black within greyish white on the surface; rough.

Twigs stout, yellowish, terminating in greenish bronze.

Leaves very variable even on the same branch, *opposite*—a characteristic of the species. Size 2 to 9 inches, often crowded, ovate or oblong-ovate, or broadly oblong, rounded or tapering at base, obtuse or bluntly rounded at apex, entire, glabrous above, felty below, or smooth; margins somewhat sinuate. Petiole short, about quarter-of-an-inch, thick; green, hairy or smooth, stout. Midrib direct, or curved, prominent below, depressed above, stout. Lat.-veins 6—7, oblique, variable, terminating in irregular series of diminishing curves below margin, prominent below, depressed above, concealed in pubescent leaves. Nerves many, horizontal, fine, inconspicuous.

Flowers, males in short cymes, woolly, cup-shaped. Females solitary, with densely hairy ovary. Male calyx, 3—6 accrescent lobes. Female calyx, 4—7 deep lobes, pubescent, rather crumpled. Male corolla yellowish, constricted at the throat, silky externally. Female corolla yellow, five segments, silky within and without. Stamens 8 to 20 in small groups. Staminodes 8—12 in the female flower.

Fruit solitary, spherical or ovoid, shortly apiculate, hairy or smooth, yellow when quite ripe, about 1 inch in diam. Seeds 4—8, or less, compressed, wrinkled, shining. Timber: This species affords the 'Ebony' of South India. The heart-wood is in unequal masses of black or dead black streaked with purple and surrounded by a large mass of pink or salmon-pink. Sapwood, hard, handsome, suitable for making panels, or furniture. The pores (I quote *Gamble*) are small, scanty, in radial lines. Rays very fine, very numerous, equidistant. Concentric lines visible in sapwood. The weight appears to vary from 48 to 82 lbs. in Indian examples.

The species is rare in Ceylon, occurring apparently only near the foot of the Uva hills, at Ekirian Kumbura, and towards Etimolla, where it is to be found.

I suspect its occurrence near Degalhella, north of Siyambala Anduwa, and near Kataragama, where from both places, I have obtained examples that very closely resemble this form, if not one identical with it. Common in India.

No. 346. **D. INSIGNIS.** Vol. III. p. 100.

Porowamara, Gona, Wal-mediriya, S.

A rather tall slender tree. Bark coming off in thin papery, creamy scales, exposing a dark layer below, giving a streaky general appearance. Branches purplish black, terminating in

green in slender twigs. Leaves alternate, very large (variable) from 4 to 12 inches long, up to 4½ inches wide, lanceolate-oblong, unequal at base, or rounded, or acute, tapering to a more or less abruptly acuminate or acute, or even attenuate apex; entire, thin, rather papery, swelled between nerves or veins; margins sometimes undulate.

Petiole very short, stout, flat above, often hidden by base of leaf blade. Midrib prominent below, strong; conspicuous above. Lat.-veins 8—2, opposite near base, becoming sub-opposite higher up, conspicuous, crossed by rather distant parallel veins, very distinct. Male flowers white, clustering in leaf axils, or on rough nodular excresences on the twigs. Female flowers yellowish white, generally solitary.

Calyx in male, 4-lobed, lobes acute, up-turned, greenish. Female calyx green, becoming very thick at base, lobes 4, slightly acute at points, hard.

Male corolla tubular, constricted at throat, 4-lobed, faintly hairy. Female corolla with 4 recurved segments, silky hairy outside. Stamens unequal, 16-20. Anthers brown, apiculate, rather long. Staminodes 4-5, with barren anthers. Fruit very variable in size, globose—conical, or oval, flat at top, tipped with remains of style; often lobed at apex; green or dark green, with brownish tinging, smooth. Seeds 4 to 8, irregular oval, compressed, rather wrinkled, glossy, dark brown, hard.

Wood, pale dull white, with very restricted black heart-wood, occasional brownish-black streaks. Fairly hard, close, moderately durable, suitable for posts and rafters in temporary buildings. As an ornamental wood it is very inferior, owing to the limited amount of heartwood, and plain appearance of the timber in general. I have no notes as to its structure or weight.

Fairly common in the wet country up to about 2,000 feet, on the western side of Ceylon. Also occurs in South India.

I have found an example of this, or a very closely allied species, cultivated in a garden in the Ratnapura District, where it was called 'Kalumediriya' (*D. quaesita*), though it had no claim to be so called. The twigs are slender, and the leaves pale, and wider apart. The characteristics are strongly those of *insignis*, but the fruit is much smaller, seated in a four-lobed star-like cupule. This particular specimen was about 15 feet high, rather densely branched, and said to have been grown from seed, but where the seed came from I could not ascertain.

I have heard the name 'Porowa-malla' applied to *D. insignis* in parts of the Ratnapura District, where the wood

was in some demand for mine props, and temporary house building.

No. 347. **D. OPPOSITIFOLIA** Vol. III. p. 100.

Kalu mediriya, S.

A small tree with opposite twigs, and slender branchlets, cylindrical, smooth at ends, leaf-scarred. Bark black, faintly fissured. Leaves *opposite*, variable in size, 3 inches by $1\frac{5}{8}$, to $5\frac{1}{4}$ by $2\frac{3}{4}$ inches, oval or ovate, rounded, or shortly tapered at base, obtuse, shortly and bluntly acuminate at apex, thick, stiff, entire, margins recurved, completely glabrous. Petiole $\frac{1}{8}$ to $\frac{1}{4}$ inch long, stout, depressed or channelled above. Midrib direct, raised above, prominent below. Lat.-veins 6 pairs, alternate, oblique, much arched below margin, uniting faintly. Nerves indistinct, parallel, nearly horizontal.

Male and female flowers on same tree. Males in small clusters; females solitary, at short ends.

Male calyx green, 4-lobed, pointed, sub-glabrous. Female calyx pubescent, deeply cleft. Male corolla yellow, 4 segments, rather swelled at base, dotted on the outside with hairs. Female corolla 4-segmented, segments acute, white haired outside. Stamens 8 in pairs, but not united.

Anthers apiculate, hairy at back. Staminodes 4, alternate with corolla lobes. Anthers in females barren.

Fruits solitary, green, unevenly conical, pointed, smooth.

Seeds 2—5 "wedge-shaped, convex surface in contact with carpellary wall," (*Wright*), brown, smooth.

Timber accordingly to *Wright* is invariably hollow, but *Thwaites* says that it resembles that of the true calamander.

I am quite unacquainted with this rare endemic plant, and have taken my description of the leaves from the material in the Hebarium at Peradeniya, and from Wright's exhaustive work on the genus. It appears to be confined to the wet Hiniduma forests, and was first collected in 1853..

No. 348. **D. MOONII** Vol. III. p. 101.

A small erect tree, with dark purplish-black bark. Branching sparcely, ends of twigs and leaf buds silky.

Leaves very large, up to 11 inches, alternate, narrowly oblong, rounded at base, abruptly or shortly acuminate, entire, thick, glabrous, hairy in young leaf, rich dark green above, nearly apple-green below. Petiole very short, $\frac{1}{4}$ inch, thick, slightly S-shaped, stout. Midrib broad, very prominent below,

depressed or grooved above. Lat.-veins very indistinct and hidden.

Flowers, male and female, the former in small clusters round axils of fallen leaves, the latter solitary. Calyx in male, hairy, 5-lobed. Female calyx much flattened, pubescent, 5-lobed, blunt. Margins recurving as fruit expands, when the calyx appears to be adnate to the stem that bears it. Corolla in the male pale white yellowish and 5-lobed in the female. Stamens (?) 5. Fruit compressed spherical, apple-green, with dull brown markings; large, about 1½ inches diam., tipped with remains of style. Seeds up to 10, oval, compressed, striated.

The wood is at first pale when freshly cut, becoming faintly reddish, with few streaks of dull black; irregular in size of heartwood, or quite without any. It is supposed to make ornamental cupboards, but I am unacquainted with it as a generally used furniture wood.

An endemic species. Occasional in swampy lands, or near water in the Pasdun Korale, and Udugama in the S. Province. I have found it up the Maguru Ganga, and in the Singha Raja, but except to hear it once called *Diya-habera*, I am not acquainted with a Sinhalese name for it.

[Willis gives *Kadumberiya* and *Kaluwella*.—C.D.]

No. 349. **D. AFFINIS** Vol. III. p. 102.

I have not seen this plant in a living state, but include it on the authority of *Wright*, who says that it is probably sold as "Bastard Ebony."

A small tree, with young shoots pilose. Leaves alternate, 2 to 3½ inch long, oval, or oblong-ovate, tapered or rounded at base, bluntly acuminate, glabrous, glossy, stiff, entire; margins recurved. Petiole ½ inch long, slender, grooved above, rather wide apart. Lat.-veins about 7 pair, very oblique, variable, conspicuous below.

Flowers male and female, former on nodding stalks in small spreading cymes (*Trimen*), the latter solitary on stout pilose stalks. Male calyx, green, 4-lobed, acute. Female calyx, hairy within, 4-lobed, with undulating margin. Male corolla white or yellowish, 4-lobed, acute, hairy without. Female corolla, tubular, with 4 short yellowish segments. Stamens 6 to 16; reddish anthers. Staminodes in female 6 to 8, at the base of the flower. Fruit quite yellow when ripe, compressed spherical, apiculate, about 1 inch in diam., smooth. Seeds 4, ovoid, grooved, dark shining brown.

Wright asserts that the coloured heart-wood is small, black, but occasionally very good. Probably an excellent ornamental wood.

It occurs in the dry or intermediate country only, and is very rare. Also found in South India.

No 350. **D. CRUMENATA** Vol. III. p. 102.

A moderately large tree. Bark thick, blackish. Twigs and young parts smooth. Leaves alternate, very variable in size, 2 to 6 inches long, oblong, or oblong oval, rounded or shortly tapered at base, rounded and abruptly acuminate at apex, smooth, rather stiff, entire. Petiole nearly ½ inch long, faintly grooved above. Lat.-veins few. Nerves netted, prominent.

Flowers, males in a short 3 to 7 flowered axillary cyme, pale white. Females solitary, in axil of leaf, much braced by erect lobes of the calyx, yellow.

Male calyx cup-shaped, obscurely divided into 4 lobes. Female calyx with 4 erect much-winged hairy lobes, forming bracket-like projections under the flower. Male corolla tubular, 4-lobed, lobes broad and recurved. Female corolla 4-lobed, yellow, margins overlapping, tomentose. Stamens 8 to 14, with brown or yellow anthers. Staminodes 8, opposite, and alternate with, corolla segments. Fruit about 2 inches in diam., spherical or ovoid, seated on much-enlarged calyx, slightly apiculate. Seeds 6-8 or one only, black, shining, hard.

Timber.—Sap-wood greyish when quite dry, smooth, rather hard, even, close. Heartwood very little, black or streaked, handsome. Annular rings distinct. Probably suitable for cabinet work and small furniture.

A very uncommon endemic, occurring near Haputale and parts of the Central Province.

In drawing up the foregoing members of the genus *Diospyros* I have been careful to follow Trimen, Wright and Brandis, where my own notes left a doubt as to identity.

In the present list I have omitted those examples that do not appear to play any part in our domestic economy, but I feel sure that if the whole genus is exhaustively studied, that it will be found that many new forms will be added to the list.

For this last reason I think that a key to the Ceylon species should only be drawn up after a more complete survey of the genus has been made.

The forests of the Rangalla hills may prove to be rich in fresh species, and in like manner an exploration of the dry districts may be found equally fertile in new forms.

I have withheld certain notes I have made as I am unable to identify some of the plants I collected, owing to their imperfection in essential details; but deficient as my material has been, it has convinced me that we have several undescribed forms of this highly valuable family.

LXXXI.—STYRACEAE.

This order is represented in Ceylon by one single large genus—*Symplocos*. The deficiency in genera is, however, compensated for by the richness in species, of which there are no less than 19, and several recorded varieties. Of these 19 species 17 are endemic, or roughly 89 per cent.; thus in the matter of ratio of species to genera comparing more than favourably with *Eugenia*, the stand-out genus of Ceylon. The order is, however, of no conspicuous importance in this country from an economic point of view, the following two examples alone being entitled to special reference.

No. 351. **SYMPLOCOS SPICATA** Vol. III. p.104

Bombu, S. Bombi, T.

A small erect tree sometimes little more than a large bush, with large crown. Bark, thin, smooth, pale or greyish, young parts quite smooth. Leaves alternate 4—6 inches long, oval-lanceolate or narrowly oblong, tapering to base, rather shortly acuminate, blunt or acute at apex, glabrous, rather thick, glossy; margins serrate, or crenate-serrate. Stipules *none*. Petiole about half an inch, stout, grooved above. Midrib prominent below. Let.-veins 7, variable, oblique, pellucid.

Flowers white, faintly scented, in loose branched erect panicles. Flowers with three bracts at base.

Calyx-tube short, five-lobed, lobes minute. Corolla tube much reduced, lobes five, nearly separate, falling soon after opening; segments rather obtuse or round. Stamens numerous up to 40 in rows, filaments variable. Style short, obscurely three-lobed. Ovary adnate to calyx-tube, inferior, usually three-celled with two pendulous ovules. Fruit ovoid, constricted at neck, purplish, much eaten by fruit pigeons. Seeds 3.

The wood is pale yellowish white, smooth easily split, suitable for small light work such as temporary rafters, etc., not durable, light.

The bark is used for bruises, and the leaves are said to be used in dying.

Fairly common in the damp districts, more so at 2,000 feet altitude, where I have found it in nearly gregarious masses. This plant on decaying is said to affect the soil, probably owing to the presence of a fungus on the decaying roots. I have seen examples of fields of young tea that had been planted on land where *Symplocos spicata* had once been abundant, being affected very seriously, 40 per cent. of the plants being killed. The supplies were equally affected, except where the soil had been completely replaced with fresh earth.

The same condition or effect is recorded by *Trimen* for *S. obtusa.*

The name 'Bombu' appears to be very generally applied by Sinhalese carpenters to many woods; but without apparent justification, as the real Bombu is seldom used for building purposes.

Our species occurs in India (Assam), Malaya, China and Japan.

No. 352. **S. CORONATA** Vol. III. p. 111.

Ugudu-hal, S.

A small tree with few branches. Bark dull grey-brown. leaf-scarred near ends of twigs, hairy in young wood and shoots. Leaves large, in crowded clusters of about 6 in each whorl; size about 15 inches by 5, oblong-oval, tapering to a narrow suddenly rounded base, shortly acuminate at apex, glabrous above, nerves and veins hairy-pubescent below. Margins obscurely serrate, fringed with spinose hair. Petiole stout, $\frac{3}{4}$ inch long, flat above, or slightly compressed. Midrib stout, prominent below, nearly hidden above. Lat.-veins about 15 pairs, oblique, very prominent below, hairy, depressed above, much arched within the margin. Nerves conspicuous below, parallel. Leaf buds large. Flowers sessile, in spikes in axils of fallen leaves, pale pinkish white. Fruits ovate, finely pubescent.

The wood of this species is used for tea boxes, but it is easily split, and not durable. It is of a pale straw-colour when freshly sawn, of light weight.

The species is endemic; I found it in wet forests up to 3,000 feet, but nowhere in great abundance.

LXXXII.—OLEACEAE.

A small order in Ceylon having only 4 genera here, viz., *Jasminum*, *Linociera*, *Olea* and *Ligustrum*, most of which are shrubs (some scrambling), or small bushes. Only one species is endemic out of our 12. Several very beautiful jasmines are well-known in our gardens, no doubt imported. Of these, probably the best known is *Jasminum sambac*, (mugrin)—the 'Geta-Pichcha' of the Sinhalese, and 'Malliapu' of the Tamils.

Knox in his "Historical Relation" refers to this plant, and remarks "that the king hath a parcel of (it) brought to him every morning, wrapt in a white cloth hanging upon a staff, and carried by the people whose peculiar office this is. All people that meet these flowers, out of respect to the King, for whose use they are, must turn out of the way.....These Officers hold land of the King for this service, and their office is also to plant these flowers, which they generally do near the rivers where they most delight to grow."

Its flowers are very fragrant, and of a pure white colour, and its leaves are considered valuable as a lactifuge.

A second introduced Jasmine is Spanish Jasmine,—*Jasminum gradiflorum*. It affords the perfume known as 'Otto of Jasmine,' and its leaves, chewed, are used for ulcerated mouths.

No. 353. **LINOCIERA PURPUREA** Vol. III. p. 116.
Geriata, *S. Kattimuruchan*, *T.*

A medium sized erect tree with rather large crown. Stem cylindrical, erect. Bark thin, more or less peeling off in irregular flakes, pale, or greyish-white, smooth. Young parts very smooth.

Leaves alternate, variable in size, 1½ to 3 inches long, ovate, tapering at base, rounded, or blunt at apex, rather stiff, with variable and indistinct veining. Petiole about ½ inch or less, smooth.

Flowers white, in paniculate cymes as long as the leaf. Calyx small, with 4 rounded segments. Corolla deeply cleft, with narrow star-like petals. Stamens 2, filaments short. Stigmas 2. Ovary 2-celled, with 2 ovules (pendulous) in each. Fruit small, hard, ovoid, pointed.

Wood pale brownish, variably streaked with darker graining, hard, close, even, fairly smooth. Weight about 55 lbs. Suitable for sash-bars and light structural work, but is little used.

This is an endemic species, moderately common, generally found near streams. It occurs in the dry country, and met with it in the Kalutara District in the Kaluganga valley.

No. 354. **OLEA GLANDULIFERA** Vol. III. p. 118.
Eta-liyan, *S.* (local, in Haputale hills).

A fairly large tree, erect, with thin spreading crown. Bark thick, greyish, rather rough, often much moss-grown. Branchlets and twigs slender, opposite, faintly scrufy at ends; compressed at nodes. Leaves opposite, variable, 3½ to 4½ inches long by 2 to 2⅓ inch wide, ovate or ovate-oblong, rounded at base, sometimes unequally lobed, tapering at ends to an acute apex; entire; thin, coated above with many minute pale waxy glandular spots, sparingly dotted beneath with spinous waxy hairs. Petiole stout, about ½ inch, channelled above, scrufy. Midrib prominent below, depressed above. Lat.-veins about ten pairs, opposite, or sub-opposite, broadly arching, uniting in wide loops considerably below the margin. Axils of lat.-veins below bearing large marginally-hairy glands, but the presence of these glands is not invariable. Nerves closely reticulate, pellucid. Leaf-buds narrowly spathulate, compressed, scurfy. Flowers white. "Bi-sexual, in terminal and lateral compound pyramidal trichotomous panicles" (*Brandis*). Flowers on short stalks. Calyx small, narrowly lobed. Corrolla-tube short, lobes 4, longer than tube. Stamens 2. Ovary 2-celled, with 2 ovules in each. Stigma large, divided. Fruit ovoid, blunt, rough.

The timber is pale pinkish-white with faint sepia-brown cloudy heart-wood, fading as the wood gets dry. Pores round or oval, sometimes divided; arranged singly or in strings. Rays, pale, distinct, close, straw-coloured. Concentric rings, distinct. Wood rather heavy, suitable for frames, door-frames and rafters. I am indebted to Mr. W. M. Hall, of Glenanore Estate, for my material. A rare species in Ceylon, apparently confined to the hill country.

The well known Olive (*Olea Europea*) is an important member of this genus. It affords the widely-used olive oil of commerce, in addition to the preserve and pickle. The original home of the olive is supposed to have been Western Asia, from which country it has been artificially spread through much of Europe, Northern and South Africa, Australia, California and New Zealand, chiefly for the sake of its valuable oil.

In Ceylon, Sir John G. Fraser introduced it at Bandarawela, but though it grew vigorously it did not fruit, agreeing in this respect with general experience in the cultivation of the Olive in Southern India.

The wood of the Olive is used for making cabinets and small ornamental work.

[*Nyctanthes arbor-tristis*, an introduced species, is a favourite with Buddhists, who use its flowers for temple offerings.—C.D.]

LXXXIII.—SALVADORACEAE.

This small order is represented in Ceylon by two Genera, viz., *Salvadora* and *Azima*.

No. 355. **SALVADORA PERSICA** Vol. III. p. 120.

Malitan, S. Uvay, T. The Mustard Tree, or *Tooth-brush Tree, E.*

A small tree, usually with much twisted or contorted stem, dense crown, and many drooping branches. Bark pale, about one-third of an inch thick, shallowly furrowed. Branches quickly subdividing into smaller and slender glabrous branchlets.

Leaves opposite, about 2½ inches by 1⅛, ovate, rounded or acute at base, tapering, or abruptly rounded at apex, rather thick, entire glabrous, glandular. Petiole about ¾ inch, slender. Midrib prominent on both sides. Lat.-veins, first two pair opposite, oblique, the rest sub-opposite, or irregular. Nerves hidden.

Flowers many, small, pale greenish-white, arranged in axillary and terminal slender panicles; bisexual. Calyx small, short, four lobed. Corolla four lobed, lobes reflexed, deeply cleft. Stamens 4, intermediately with petals, filaments short, anthers large, yellow. Ovary 1-celled, with one erect ovule. Fruits small, currant-like, vinous-red, spherical, smooth.

The foliage and fruit have a strong flavour of mustard, hence its name in English.

The wood is white, soft, and light (38 lbs. per cubic foot in Indian examples. *Gamble.*) Rarely found in sufficient volume to be useful.

The pores are arranged in radial lines, small, surrounded by soft tissue. Rays fine, numerous.

The root bark is said to be useful as a blister, the twigs crushed into brush-like appliance, are used as Persia for tooth-brushes. A thick, green oil, of pungent smell is expressed from the seeds, and is used in India for rheumatism. The leaves, crushed, are also used as a poultice.

Very common in the dry zone, especially near the shore, but rarely found growing to any great size of stem, the largest trunks seldom exceeding 3 feet in girth. Common near Hambantota and in the Magam Pattu in the Southern Province.

LXXXIV.—APOCYNACEAE.

A large order in Ceylon represented by the following genera: 1. *Willughbeia;* 2. *Carissa;* 3. *Rauvolfia;* 4. *Alyxia;* 5. *Hunteria;* 6. *Cerbera;* 7. *Ochrosia;* 8. *Vinca;* 9. *Holarrhena;* 10. *Tabernæmontana;* 11. *Alstonia;* 12. *Parsonsia;* 13. *Vallaris;* 14. *Wrightia;* 15. *Chonemorpha;* 16. *Aganosma;* 17. *Baissea;* 18. *Anodendron;* and 19. *Ichnocarpus.* These afford comparatively few species, that only number 25, of which 8 are endemic. The whole order is practically confined to the low country, only one of the endemic forms—*Baissea acuminata* —being found at 6,000 feet altitude.

No. 356. **WILLUGHBEIA ZEYLANICA** Vol. III. p. 123.

Kiriwel, S.

A very large woody creeper, with dark purplish-brown mottled bark, climbing by thin, (often reflexed), hooked branches. Leaves rather large, opposite. about 3 ins. across, ovate, tapering at base, acuminate, entire, smooth, rather stiff, pinkish when immature, becoming dark with age. Petiole short, milky. Midrib stout. Lat.-veins numerous, close, parallel, distinct, horizontal.

Flowers yellow, conspicuous, on short stalks, in "axillary paniculate cymes." Calyx 5-lobed, rounded. Corolla 5-lobed, spreading, lobes narrow, scarcely overlapping. Stamens 5. Filaments short. Ovary 1-celled. Ovules many. Fruit conspicuously large, about 5 inches in diam., smooth pinkish or rose-coloured enclosing a mass of pulp within which the crimson seeds are embedded. Seeds nearly 1 inch, oval, compressed.

The stem yields a free-flowing copious mass of pure white latex, on being cut. The latex, in many parts of Sabaragamuwa, is used by the village people in the preparation of a gummy fluid that is spread over the surface of a winnow-shaped tray, and is attached to the end of a long pole. The latex is thickened to a suitable consistency by the addition of wood-oil from *Dipterocarpus glandulosus*, when it assumes a highly viscous substance, but sufficiently solid not to percolate through the meshes of the winnow-like tray. A man then takes

a pole, to the end of which this tray is attached, after smearing it freely with the compound just described, and proceeds to sweep it horizontally over the heads of the growing rice, in which "rice-bugs" are found sucking the juice from the grain. These insects get caught in the sticky matter, and are destroyed in large numbers. The process is locally known as "Boku-gewima" in the wetter parts of the Ratnapura District.

From a stem, 12 inches in circumference, of this plant I have drawn as much as ¾ of a pint of latex, with only two or three transverse incisions; but after the first two or three wounds are made, the flow appreciably diminishes.

The plant is endemic and plentiful in the lower wet parts of the Peak Wilderness, and Singha Raja Forest.

Monkeys are particularly fond of the fruits.

No 357. **CARISSA SPINARUM** Vol. III. p. 125.

Hin-karamba, Karamba, S. Chirukila, Killatti, T.

A dense-growing bush, usually found in close masses. Stems short, quickly branching into many (often zig-zag) twigs and branchlets, frequently climbing over smaller trees, abundantly armed with sharp, rigid spines of variable size. Bark pale, becoming pubescent in very young shoots.

Leaves about 1 inch, oval, rather stiff, 'sharply apiculate,' smooth, glossy green above, glabrous or pubescent below. Buds pubescent. Petiole very short, stout. Flowers white, sometimes pinkish, scented, in stalkless clusters of 3 "at the end of stiff axillary and apparently terminal panicles" (*Trim.*) Calyx 5-lobed, narrow, acute, finely ciliate. Corolla-tube cylindrical, 5-lobed, lobes over-lapping. Stamens 5, inserted within tube. Ovary 2-celled; ovules 1-4, in each cell. Fruits ovoid, glossy-black, about ½ of an inch long.

The dried stems of this species are used for fencing round fields and plantations in the Eastern Province, where it is alleged that it will keep out elephants. Fruits are said to be eaten.

An exceedingly common plant in the dry zone, often to be found completely covering large areas of ground that have been used for Chena.

An allied species, known as Ceylon Damson, (*C. Carandas*), much used for making preserves, is commonly found in low-country gardens.

No. 358. **HUNTERIA CORYMBOSA** Vol. III. p. 128.

Mediya, S.

A smallish slender-stemmed tree with thin, faintly furrowed bark. Young parts and branches smooth.

Leaves opposite, up to 5 inches in length, rather variable, usually narrowly lanceolate, tapering to the base, acuminate, entire, rich glossy-green above, rather dead-green below. Petiole short, about ½ inch, midrib distinct. Lat.-veins many, rather close, parallel. Flowers yellow, in 2-3 stalked axillary cymes. Calyx 5-lobed, acute. Corolla-tube short; lobes 5, broad, rounded, overlapping to the left. Stamens 5, starting from the upper portion of the corolla-tube. Anthers oblong. Style thin. Carpels distinct, with 2—4 ovules in each. When ripe, the carpels are of a brilliant orange-yellow colour, smooth and glossy. Seeds nearly oval.

The wood of this species though never attaining a large size is very hard, springy, yellowish in colour, close grained, and very durable. It affords most excellent material for tool handles and is sought after for 'Catty' handles.

Trimen says that the leaves are used externally for wounds, I am inclined to think his observations apply to *Holarrhena mitis* (No 361) which see.

Occurs in the wet forests of the South and West of Ceylon, up to about 2,000 feet altitude, but not in great abundance. It is also found in Burma, South India and Penang.

No. 359. **CERBERA ODOLLAM** Vol. III. p. 128.

Gon-kaduru, Kaduru, S.

A small tree with large crown. Bark pale, or ashy, moderately thick. Branchlets stout, conspicuously leaf-scarred, twigs stout, smooth.

Leaves large, alternate, rather crowded, variable in size, up to 10 inches in length, narrowly lanceolate, very much tapered at base, broad towards apex, abruptly terminating in an acuminate apex; entire, sometimes wavy; glossy-green in well grown examples. Petiole rather short, 1 to 1½ inches long. Midrib stout. Lat.-veins many, horizontal, uniting in an intermarginal vein.

Flowers pure white, tinged within the corolla-tube with yellow, very sweet smelling, arranged in terminal panicles. Flower-stalks stout, erect. Calyx 5-lobed, acute, narrow. Corolla "funnel-shaped," with 5 over-lapping (to the left) lobes; "throat nearly closed by 5 pubescent projecting wings." Stamens 5, inserted half way down the corolla-tube. Anthers

pointed, style slender, stigma much pronounced. Bracts large, deciduous, pointed.

The fruit is large, about 3 in. in diam., nearly spherical, green, and smooth. Pericarp consisting of a hard fibrous netted mass enclosing one or two compressed ovoid endospermless seeds. This tough envelope enables the seed to be carried by water for very considerable distances without risk of early decomposition, and as the surrounding material is very light, the advantages for diffusion of seed are considerable. The fruit is used in villages in lieu of a cricket ball.

Wood spongy, soft, and valuless for timber or fuel. *Gamble* gives the weight per cubic foot as 21 lbs., so that possibly the wood might be used for floats. The seeds afford a most virulent poison, and have been used by suicides. It is alleged that so powerful is the acid, that dogs eating the decomposing fruits, have had their teeth loosened thereby!

It is a common water-loving plant in Ceylon, frequently found by the sides of lagoons, or on the banks of paddy fields. It is sometimes used as a fence plant, or for boundary-trees. More abundant in the Western half of Ceylon than the East.

Also in tropical Australia and the Pacific Island.

OCHROSIA BORBONICA

No. 360. Vol. III. p. 129, Pl. LX.

Mudu-Kaduru, S.

A slender erect tree of no great size. Bark pale, rather creamy, smooth. Branches few, stout, conspicuously marked with large leaf-scars. Young shoots and branchlets green, and faintly waxy.

Leaves crowded, or in clusters, large, up to ten inches in length, lanceolate ("obovate lanceolate"), much tapered to base, rounded or acuminate at apex, entire, smooth, glossy-green above, paler below, rather thick. Petiole stout, variable, sometimes two inches long, usually less. Midrib strong and distant. The lat.-veins and nerves pellucid, former nearly square with midrib.

Flowers dull greenish white, small, on short stalks (usually in pairs) in panicles. Calyx small, fleshy, 5-lobed. Corolla-tube short, cylindrical, with 5 lobes as long or longer than the tube, overlapping to the right. Stamens 5, very small, placed near the mouth of the tube. Style thin; stigma small, carpel ovoid, blunt at apex, rich yellow when ripe. Pericarp almost woody, shaggy, enclosing a large solitary flat seed.

The plant yields an extremely sticky latex that is said to be useful for temporary caulking purposes.

The wood is soft, pale in colour, and suitable for light packages, and small boxes.

The plant is confined to the sea coast, and is fairly abundant between Ambalangoda and Matara. It also occurs in Java, the Andamans and further East.

No. 361. **HOLARRHENA MITIS** Vol. III. p. 131.

Kiri-walla, Kiri-mawara, S. Parl-mudangai, Vellu-palai, T. (in Eastern Province.)

A slender tree, rarely large. Bark pale, smooth. Twigs studded with minute lenticels.

Leaves opposite, 2½ to 3½ inches long, by about ¾ inch wide; narrowly, oblong-lanceolate, tapering finely to base, acute at apex; entire; glabrous. Margins faintly sinuate. Petiole very short, about one-sixteenth of an inch. Midrib prominent below. Lat.-veins about 8 pairs, irregular, sometimes opposite, uniting below margin in a more or less distinct intramarginal line; pellucid; much curved.

Flowers, white, very sweet-scented, arranged on slender pubescent stalks, in drooping paniculate cymes. Calyx-tube short with 5 narrow, acute lobes. Corolla-tube very narrow, 5-lobed; lobes narrow and larger than tube, overlapping to the left. Stamens 5, inserted at the base of the tube. Anthers acute. Bracts minute. Pods (follicles) long, thin, straw-like, smooth, containing thin compressed seeds, to which latter is attached a long hair-like appendage, longer than the seed. Seeds red-brown.

Wood pale, nearly white, very close-grained, fairly hard; about 36 lbs. weight per cubic foot. The timber is unfortunately not procurable in large pieces, or it would probably be a popular cabinet wood. Cuts clean, and is easily worked.

The natives of the Eastern Province assert that the freshly bruised bark of this tree is a certain cure for milk fever, but that the patient must apply the breast to the living tree to effect a cure, it being alleged that the latex of the plant loses its virtue if allowed to dry in the slightest degree!

The plant occurs in both the wet and dry zones, up to about 2,000 feet altitude. It is however much more common in the dry districts, and there attains its largest size. It is endemic.

Allied to this species is the "Conessi" or Tillicherry Bark tree, *H. antidysenterica*, of high repute as a remedy in acute and chronic diarrhœa, and dysentery. The timber of this particular species is used in India for carving, and furniture.

TABERNÆMONTANA DICHOTOMA

No. 362. Vol. III. p. 132.

Divi-kaduru, S. Eve's Apple or *Forbidden Fruit, E.*

A rather small tree with pale smooth bark, Branchlets dark green at ends, smooth.

Leaves opposite, variable in size, those from plants growing in rich damp soils being distinctly larger than the average; about 8 in. by 3, lanceolate-oblong, acute at base, rounded, or obscurely acuminate at apex, rarely emarginate, stiff, entire, margins slightly recurved. Petiole stout, about one inch, dilated into a clasping and spreading base. Midrib strong, very prominent below, pronounced above. Lat.-veins about 18 pairs, opposite, or sub-opposite, nearly horizontal, parallel, prominent, forking suddenly within margin. Nerves indistinct. Flowers large, conspicuous, white with yellow throat, sweet scented, arranged in long axillary few-flowered cymes. Calyx-tube short, five-lobed, thick; corolla tube about one inch, widening to base of the 5 lobes which over-lap to the left. Stamens 5, inserted rather low in the tube. Bracts small, thick.

The fruits are usually in the shape of a double crescent attached in opposite directions, or end to end at the extremity of a longish stalk.

When ripe, the carpels are bright orange-yellow, and very conspicuous. The seeds are evenly grooved and completely surrounded with a bright red pulp.

The whole plant is milky. The wood is pale white, fairly even in grain, close and easily cut.

The timber is used for making devil-dance masks, but is unsuitable for structural work. Pores fine, close. Rays very fine, numerous.

This species is moderately common in the wet zone, up to about 2,000 feet altitude. I have met with it as a fairly large tree in the very wet forests round the base of the Adam's Peak range, but usually it rarely exceeds 3 feet in girth of stem.

Also occurs in the Western Ghats of India.

No. 363. **ALSTONIA SCHOLARIS** Vol. III. p. 133.

Ruk-attana, S. Elilaippala, T. Dita Bark, E. (in India.)

A large erect tree, often assuming very considerable proportions. Stem frequently much buttressed, usually cylindrical; branching in whorles of 3 or 4, at distinct intervals. Bark pale grey or creamy, rather spongy, rough, but not fissured. Branchlets smooth, leaf-scarred, abundantly dotted with lenticels.

Leaves in whorls of 3 to 7 clustering at ends of branches, rather large, from 3 to 12 inches long, narrowly oblong or elliptically lanceolate, tapering narrowly to base, finely acuminate at apex; entire; distantly and sparcely spinous-hairy above, crisply spinous-hairy below, becoming completely glabrous with maturity. Margins "faintly crenate." Petiole stout, about one inch, often quite short with a hook-like process at the base. Midrib prominent below, distinct above. Lat.-veins about 20, nearly horizontal, abruptly curving within the margin and scarcely uniting, rather thin, prominent below, distinct above. Nerves distant. Flowers small, greenish-white, offensive in smell, arranged in "many-flowered pedunculate pubescent cymes" (*Brandis*), 3 to 4 inches long. Calyx-tube short, 5-lobed. Corolla-tube wide, cylindrical, hairy round throat, five-lobed, lobes short, rounded, overlapping to the left. Stamens 5, inserted high up. Anthers acute. Follicles long, about 15 inches, thin, 'pendulous.' Seeds flat, many "with a fringe of hair at both ends."

Wood pale yellowish-white, or dull, greyish-yellow, very soft, foetid when freshly cut, light, about 25 lbs. per cubic foot. Timber suitable for frail temporary packages, often used for coffins, and at one time popular for tea boxes.

The pores oval in section, subdivided. Rays very irregular, wavy, with an intermediate series.

The bark is astringent, and is useful in fever and bowel complaints. Its active principle is *Ditain* and has febrifugal properties. The milky juice, abundant in the plant, is bitter, and precipitates, when collected in flasks or tubes, into a semi-solid mass.

Fairly common up to 3,000 feet altitude, but mostly so in the wet zone. Also in India, Burma and Malaya.

No. 364. **WRIGHTIA TOMENTOSA** Vol. III. p. 137.

Palmadankai, T.

A low deciduous tree, with moderately stout stem. Bark pale greenish, thin, rather smooth, fibrous. Twigs cylindrical, leaf-scarred. Leaves opposite about 6 inches by 2½, oblong-ovate, acute at base, tapering at apex, acuminate, entire, margins recurved; upper surface finely spinous-hairy; under surface tomentose. Petiole short, about ¼ inch rather swelled at base, greenish, crisply hairy. Midrib prominent below, depressed above. Lat.-veins about 15 pairs, depressed above, distinct below, opposite or sub-opposite, nearly parallel. Nerves much reticulated, conspicuous.

Flowers foetid, yellowish on opening, becoming purple later, arranged in short erect corymbose tomentose cymes. Calyx scaly within, 5-lobed. Corolla-tube short, 5-lobed, lobes fleshy, overlappings, 'with a distinct corona of erect scales.' Stamens 5. Anthers hairy. Carpels large, pod-like, at first uniting at apex, ultimately expanding separately, above 6 inches long, blunt, studded. Seeds narrow with long hair (coma) at base.

The wood is yellowish, fine and evenly grained, hard, weighing—according to *Gamble* for Indian examples—about 44½ lbs. per cubic foot. The pores are minute, radially arranged. Rays very fine, close and numerous.

The bark of the stem and root is alleged to be useful in snake bite.

Appears to be rare in Ceylon, though it occurs both in the East and West of the Island, and apparently is unknown to Sinhalese carpenters. The largest examples I have obtained were grown at Pillumalai in the Eastern Province.

Also in India and Burma.

Of the other introduced members of this large order in Ceylon, perhaps the most familiar is our so-called Temple Tree (*Plumeria acutifolia*), a plant that is generally associated with Buddhist Temples or shrines all over the Island. The date of its introduction is probably unknown, but without doubt it is very early, as there is evidence of its existence round shrines that have been long abandoned and forgotten. It is a native of Tropical America, where the genus is well represented. It very rarely fruits in Ceylon. For many years I sought to obtain the seed, and at last discovered a single pod growing on a tree in the town of Rakwana. Later, thanks to her powers of observation, the late Mrs. Sinclair of Colombo obtained a pod, which she kindly sent to me, but unfortunately this had been gathered while too young, and the seeds did not germinate. It would appear that *P. acutifolia* and *P. rubra* will cross, but till further experiment has been tried, it would be premature to say that a Hybrid has been developed. [This has apparently occurred to judge from the variegated flowers. There is also a yellowish variety. C.D.]

Later, in the year (1926), the same lady forwarded to me a ripe pod, the plants of which are now grown at the Botanic Gardens at Peradeniya. This, I believe, is the first instance of the plant being known to be raised from seed in this country, the credit for which is due to Mrs. Sinclair's care in preserving the fruit from being lost.

Plumeria rubra, or Red Temple tree, is now a familiar plant in Colombo gardens. It fruits fairly freely, and like its ally, the fragrant yellow flowed *Plumeria*, it is a native of Central America, and was introduced into Ceylon in 1900.

The familiar little "Madagascar periwinkle" (*Vinca rosea*) once common in all low-country gardens, and now often found semi-wild, is a very old introduction to Ceylon. The best known form of this species has the corolla pink. A variety with white flowers (*V. alba*) is also fairly common near the coast.

The Oleander (*Nerium oleander*), so well-known throughout tropical Europe, is another member of this large order. It was probably introduced before the Dutch occupation of Ceylon, and is now a common garden plant, though a poisonous one.

Landolphia Kirkii—a native of Tropical East Africa—is another member of this order, and was introduced here in 1880.

LXXXV.—ASCLEPIADEAE.

A large family in Ceylon, though mostly consisting of herbs and twining plants. It is represented here by the following genera, viz:—

1, *Hemidesmus;* 2, *Cryptolepis;* 3, *Secamone;* 4, *Toxocarpus;* 5, *Oxystelma;* 6, *Calotropis;* 7, *Pentatropis;* 8, *Daemia;* 9, *Holostemma;* 10, *Cynanchum;* 11, *Sarcostemma;* 12, *Gymnema;* 13, *Marsdenia;* 14, *Tylophora;* 15, *Cosmostigma;* 16, *Dregea;* 17, *Dischidia;* 18, *Hoya;* 19, *Heterostemma;* 20, *Leptadenia;* 21, *Ceropegia;* 22, *Caralluma.*

Of these many genera, only a total of 39 species occur in this Colony, making the average number of species under two per genus, but on the other hand, there are seven endemics, or 18 per cent. of the total species.

Large though the order is, but few come into special use so far as Ceylon is concerned, and most of these may be classed as belonging to Bazaar drugs.

No. 365. **HEMIDESMUS INDICUS** Vol. III, p. 144.

Iramusu, S. Nannari, T. Indian Sarsaparilla, E.

A small creeping twiner, with thin cylindrical climbing, or prostrate stems. Bark dull brown, slightly pubescent towards ends of stems. Root long, rather stout. Leaves opposite, very variable in size, usually about two inches long, narrowly oblong, acute or rounded at base, subacute at apex, entire, faintly pubescent on margins, dark green, with a more or less

variegated silvery pattern or stripe on the upper side. Petiole very short. Midrib narrow, rather prominent, more or less pubescent. Lat-veins short; veins and nerves pellucid; under surface of leaf pale.

Flowers small, less than 2½ inches diameter, purplish, green on the outside, arranged in short stalks in axillary clusters. Calyx, segments 5, ovate, faintly hairy; Corolla-tube short; ridged, 5-lobed. Stamens attached to base of corolla-tube, slender. Stigma, flat, angled. Follicles, long, narrow, about 5 inches, smooth. Seeds, with coma attached, flat.

A common plant in open or grassy ground, locally abundant, but becoming rare above 3,000 feet altitude.

The root is much valued in native medicine as a cure for fevers, dyspepsia, syphilis, skin diseases, coughs, rheumatism, and diarrhoea, its action being demulcent, alterative and tonic.

Combined with other ingredients, it enters into many varied local remedies. It is also recognised in the British Pharmacopoeia, and is prescribed in syrup form.

Common in India.

No. 366. **OXYSTELMA ESCULENTUM** Vol. III, p. 147.
Hin-mudahangu, S. Kulappalai, T.

A slender, much-branched, twining herb, with smooth stems. Leaves about 3 inches long, very narrow, or lanceolate-linear, rounded at base, finely tapering to an acute apex, entire, smooth, pale. Petiole, ¼ inch, fine; midrib thin; venation pellucid.

Flowers rather large, about 1 inch in diameter, creamy with veining and staining of purplish-pink colour, very handsome. Flowers in racemose cymes, drooping, lax, long-stalked. Calyx 5-lobed, lobes rather deep. Corolla, 5-lobed, "ovate-triangular." Stamens 5, "filaments, connate, short. Anthers with connective produced into an inflexed membranous tip" (Trimen). Stigma large, flat. Follicles about 2 inches, compressed, smooth. Seeds with conspicuous coma. The whole plant is milky.

The plant is used in India for gargles, and ulcerated throat. The fresh root is alleged to be a specific in jaundice, and a remedy in hydrophobia. Fairly abundant along the sides of tanks in the south of Ceylon. I have found it plentiful at Tissamaharama.

Also occurs in India, Java and Burma.

No. 367. **CALOTROPIS GIGANTEA** Vol. III, p. 148.

Ware. S. Errukalai, Urkkovi, T. Mudar or *Swallow-wort, E.*

A shrub or small bush, with more or less erect stem and many upturning branches. Bark, creamy, or yellowish-white, fissured or furrowed, or smooth, thin. Branches, yellowish or dull green, according to maturity. Twigs, leaf-scarred.

Leaves, opposite, large, about 6 inches by 3½, broadly oval-oblong, cordate at base, obtuse or abruptly rounded and shortly acuminate at apex; entire, thick, dull, and glaucous, cabbage-green above; densely cottony below, almost to give the under surface a frosted appearance. Margins sharp, faintly pellucid. Leaf-buds covered with cottony hair. Petiole hardly distinguishable, stout, very milky. Midrib prominent below, flat above, with a conspicuous patch of stiff, crisp, spinous nodules immediately at the base of the leaf-blade.

Flowers large, pale pinkish-violet, or white within. Outside greenish; column tinged with blue.

Inflorescence on large stalks from between the leaves, sometimes terminal. The follicles are conspicuous, being curiously broad, thick, inflated and somewhat corrugated, 3—4 inches broad, and containing many compressed seeds to which are attached a profuse coma. On opening, the follicles discharge their contents in a silky mass that is readily wind-carried, so much so as to be a danger to the eyes, as the fine hairs are easily caught and difficult to remove.

The powdered root-bark is used as an emetic, alterative, and purgative. A fluid extract of the leaves, according to *Kanny Lall Dey*, has been found by him to cut off the paroxysms in intermittent fever more effectually than quinine, if given in small doses during intermission. In large doses it is poisonous. The dried root-bark is useful as a substitute for Ipecacuanha, and may be used in small doses in dysentery.

Dr. G. Gunawardana gives a long list of diseases for which this plant is a reputed cure. He adds that it is employed to cure all kinds of fits, and poisonous bites.

The inner bark affords a very fine silky fibre, suitable for fishing nets and lines, as it withstands moisture. The seed-floss is capable of being made into a silky material, but it is difficult to spin, unless mixed with cotton. The wood is close, and produces a fine charcoal, which in parts of India has been used for gunpowder manufacture. Trimen records that in Jaffna, gunpowder is made from this plant.

A very common plant in waste or partially cultivated ground, especially in the dry country, where it is often found growing gregariously. Sometimes grown on estates by coolies.

Also abundant in India, Malaya and Southern China.

A white flowered form is occasionally seen in Ceylon. This is said to be effectual in cases of leprosy.

No. 368. **GYMNEMA SYLVESTRE** Vol. III, p. 153.

Masbedde, S. Siru-kurunya, T.

A slender many cylindrical-stemmed climber, often ascending up tall trees; stems faintly hairy. Leaves, small, about 2 inches long, rounded at base, acute or acuminate at apex, entire, finely hairy on veining, particularly so below. Petiole short, ¼ inch pubescent or hairy. Midrib and lat-veins distinct, hairy. Flowers, light yellow, on slender hairy stalks, and in short cymes; Calyx-segments 5, ovoid. Corolla about 1/6 of an inch across, 5-lobed, acute, recurved. Stamens 5; Stigma, much pronounced. Bracts many. Follicles, as long or longer than leaves, narrow, cylindrical, tapering, smooth, often solitary. Seeds with long coma.

The root (especially by Hindus) is regarded as a remedy for snake-bite, when it is applied in a powdered form. The leaves, crushed and masticated, weaken the sense of taste for a short time.

Fairly common on the edge of the dry zone, but nowhere abundant. Also occurs in India and Tropical Africa.

No. 369. **TYLOPHORA ASTHMATICA** Vol. III, p. 158.

Bin-nuga, S. Peypalai, T. Wild Ipecacuanha, E.

A slender climber with few branches, more or less pubescent. Roots numerous, fleshy, rather long. Leaves rather variable in size, about 2½ inches, oblong, cordate at base, or rounded, abruptly acuminate, entire, smooth above, pubescent below, pubescense less with maturity of leaf. Young or immature leaves densely pubescent. Petiole hairy, about ½ inch long. Lat-veins and midrib conspicuous.

Flowers about ½ inch in diameter, greenish, with a distinct purple tinge "on very long, hairy, numerous stalks, in 2 or 3 nearly sessile umbels." Calyx, 5-lobed, acute. Corolla 5, stamens 5, with short filaments. Stigma angled. Follicles long, about 3 inches, slender, smooth, finely tapered. Seeds oval, about 1/3 the length of the coma.

According to Trimen, "is a valuable medicine, possessing all the properties of Ipecacuanha," but I have been unable to trace any record of its local use. It affords a fine, silky, strong fibre.

Fairly common in the west of the Island up to 4,000 feet. Common near Colombo. Occurs in India, the Moluccas, and Mauritius.

[Certain members of this order deserve attention for the sake of the fibre they possess, and possibly mechanical appliances may yet be invented to spin the many delicate flosses that several afford, the material so obtained being applicable in the manufacture of extra fine fabrics.]

LXXXVI.—LOGANIACEAE.

A small order in Ceylon containing the following genera, viz :—

1. Mitrasacme;
2. Fagraea;
3. Strychnos;
4. Gaertnera.

These four genera afford 14 species, of which no less than 6 are endemic, but possibly the more recent scientific investigations into the family may result in a different subdivision, with correspondingly changed numbers.

No. 369A. **STRYCHNOS NUX-VOMICA** Vol. III, p. 175.
Goda-Kaduru, S. Kanchurai, Eddi, T. Strychnine and *Snake-wood Tree, E.*

A tree growing to about 30 feet, erect, handsome, deciduous. Bark, yellowish-grey, corky, flaking off in numerous small scales or flakes. Branches, many, twisted and "elbowed," cylindrical. Twigs quite smooth, rich, shining green at ends.

Leaves opposite, about 4 inches long by $2\frac{3}{4}$; ovate or broadly oval, rounded, or subcordate at base, gracefully rounded, and tapering to a shortly acuminate apex, entire, thin, rich glossy-green above, paler or dull below. Petiole short, about $\frac{1}{3}$ of an inch. Midrib, and two pairs of large nerves on either side of it, very distinct, the pair nearest the margin becoming attenuated towards the upper half of the leaf. Veins inconspicuous. Stipules none.

Flowers, small, dull greenish-white, in "terminal pubescent, pedunculate compound cymes." (*Brandis*).

Calyx, 4—5-lobed, narrow, acute, pubescent. Corolla-tube much longer than lobes, smooth outside, hairy within. Stamens 5, within the corolla tube, very short filaments. Ovary 2-celled. Fruit, a berry, about 2 inches in diameter, rather glossy, red, or orange-red, containing about 6 seeds surrounded by a dull-grey pulp. Seeds nearly an inch in diameter, very button-like, silvery-grey, and coated with extremely fine hair.

The timber is very handsome when cut in obliqued section, and carefully polished. It is, when fresh, yellowish-grey, with darker freckling of well-defined dark graining, becoming brown with drying.

Pores of two kinds; large, which appear as white streaks, and very small, irregular patches, joined by concentric and oblique white lines. The wood is bitter and has no heart-wood. White ants do not attack it. It is durable, about 60 lbs. weight per cubic foot, suitable for ornamental panels, but requires careful seasoning, as it splits.

The seeds contain the intensely bitter poisonous principle known as Strychnine, which is extensively used in medicine as a nerve tonic, and stimulant. So much is this drug employed in medicine, that the total export from India alone of Nux-vomica seeds amounts to about 20,000 cwts. annually, of which the greater quantity goes to England. The bark and wood is used in India as a tonic, and an oil obtained from the seeds is used as a local external application in Rheumatism. The soft pulp that covers the seed contains minute quantities of Strychnine, but is, notwithstanding, eaten by birds and by monkeys, without bad effects. In Australia, experiments in hypodermic injections near the seat of the wound, in snake bite, have been successfully carried out with strychnine, but unsuccessfully in India.

According to Dr. Gunawardana, the root-bark, reduced into a fine paste with lime juice, and made into 5-grain pills, is given in Cholera, and is a well-known native remedy. The poisonous nature of Strychnine may be estimated by the fact that the alkaloid in a ½-grain dose has caused death, and probably 30 grains of the powdered seed would also prove fatal, death occurring usually in five or six hours.

The plant is common in the dry zone throughout Ceylon but not very abundant near the sea.

Also found in British India, Burma and Java.

No. 370. **S. POTATORUM** Vol. III, p. 176.

Ingini, S. Tetta or Tetran-kottai, T. The Clearing-Nut Tree, E.

A moderate sized tree or large bush, with dark, deep-fissured bark, corky. Twigs smooth, thickened at the nodes, rather glossy. Leaves opposite, large, up to four inches in length, ovate or elliptical, acute at base, tapering to a more or less sharp apex, entire, glossy, darker green above than below; glabrous. Petiole very short, or nearly absent. Mibrid prominent, and branching shortly above base into one or two pairs of large lateral veins, giving the whole leaf the appearance of being 3 or 5 nerved. Nerves fine. Flowers white, faintly scented, arranged in short lateral smooth axillary cymes.

Tube of the Corolla rather broad, lobes 5, white-haired tufts at the mouth between the stamens. Style smooth, stigma faintly 2-lobed. Fruit, a berry, about $\frac{3}{4}$ inch in diameter, becoming black when ripe. Seeds round, surrounded with pulp, single or in twos.

The plant is not poisonous, but the seeds, when sliced and rubbed round the insides of earthenware pots, has the curious action of precipitating the mud in dirty water. A preparation made from the seeds was at one time a popular remedy for sore-eyes.

The Indian forms of this plant are much larger than those grown in Ceylon, and afford a good, durable timber, used for cart-building. Weight, according to Gamble, about 57 lbs. per c. foot.

Occasional on the confines of the intermediate zone, up to about 1,000 feet, but not plentiful.

Also in Central and South India and Burma.

LXXXIX.—BORAGINEAE

A rather large order in Ceylon represented by eight genera, viz.: 1. Cordia;

2. Ehretia;
3. Coldenia;
4. Rhabdia;
5. Tournefortia;
6. Heliotropium;
7. Trichodesma;
8. Cynoglossum.

Of these, the number of species is small, being only 18, two of which are endemic.

No. 371. **CORDIA MYXA** Vol. III, p. 193.

Lolu, S. Naruvili, Vidi, T. Sebestens, E.

A large bush, or small tree, deciduous. Bark furrowed, dull, greyish-brown, rather rough. Twigs thin, smooth, pubescent at ends.

Leaves alternate, rather large, but very variable, 2—5 inches, long, ovate or ovate-oblong, or nearly round, rounded at base or subcordate, bluntly apiculate, or rounded at end; Margins faintly lobed, slightly recurved, stiff, crisp, making a curious crackling sound when crushed close to the ear; glabrous above, stiffly distant-hairy on venation below. Petiole 1½ inches, curved, faintly grooved above, smooth. Midrib prominent below, partially hidden above. Lat-veins 4, oblique, with first pair opposite, strong, giving a 3-nerved appearance to the leaf. Nerves distant, prominent below. Leaf buds coated with thick coarse hair.

Flowers small, white, in lax terminal and axillary pedunculate cymes. Flower buds spherical. The flowers are polygamous, (male and bisexual). Calyx irregular 4—5-lobed. Corolla 4—5 or more lobed, lobes broad, recurved; Stamens 5—8 springing from mouth of Corolla tube, sometimes hairy at base. Ovary 4-celled with one ovule in each. Style long, cleft.

Fruit a drupe, about ½ inch wide, pale pinkish, deepening with ripeness, and containing a hard stone that is surrounded with a sweet gummy pulp. The base of the fruit is seated in a cup made by the persistent calyx.

The timber is rarely large, of a pale yellowish-grey colour, moderately hard, light, 28—32 lbs. per c. foot (Gamble), but liable to insect attack. Used in house-building for posts.

Pores rather large, scattered, often divided, open. Rays rather thick, distant.

The inner bark is tough, and used for rough cordage. The pulp surrounding the stone is valued as a demulcent in coughs, and an astringent gargle is prepared from the bark. It makes a strong gum.

Moderately common in the dry zone, and sometimes found cultivated.

Also in India, and Burma.

XC.—CONVOLVULACEAE.

This order of handsome flowered plants is represented in Ceylon by 11 Genera, embracing 46 species, of which three are endemic. The Genera consist of:

1. Erycibe,
2. Rivea,
3. Argyreia,
4. Lettsomia,
5. Ipomaea,
6. Hewittia,
7. Convolvulus,
8. Evolvulus,
9. Breweria,
10. Cressa,
11. Cuscuta.

For the most part all these are twining, or creeping plants, only a few becoming shrubby, their popularity being mainly due to their highly coloured ornamental flowers, so familiar both in this country and abroad. A few have medicinal properties, notably the Jalap (*Ipomaea purga*) and Scammony (*Convolvulus scammonia*). Another important member of the family is the well-known "Sweet Potato" (*Ipomaea Batatas*) or "Batala" of the Sinhalese, the natural home of which is unknown.

No. 372. **IPOMAEA DIGITATA** Vol. III, p. 212.

Kiribadu, S. Palmodika, T.

A powerful twiner, with long stems and large tuberous roots. Leaves large, about 6 inches long, (wider than long) deeply cleft into 5, 6, or 7 narrow acuminate lobes; glabrous, much darker above than below, prominently veined on the under side. Petiole about 6 inches long, grooved above, smooth.

Flowers about 3 inches across, bright mauve-purple, becoming more intensely coloured in the tube, numerous, on stout long axillary stalks. A characteristic of the species is that the ovary is 4-celled, and the seeds are clothed with long brown fine hair.

The root is said to be of medicinal value, as a tonic and alterative. The powdered root is supposed to stimulate the secretion of milk, and is effective in spleen affections. It acts as a purgative, and is believed to increase the formation of fat.

Dr. Gunawardana states that it is given to children in cases of emaciation, and that it is highly aphrodisiac.

The plant is usually found in or near old gardens, in the low-country, and is probably a very early introduction to Ceylon, having become natural here.

Also found in India and the tropics generally.

No. 373. **I HEDERACEA** Vol. III, p. 212.

Kodi-kakkutan virai, Tali, T.

The "Kaladana" of Europeans and others in India.

Stems slender, twining, hairy.

Leaves 3-lobed, about 3 inches long, broader than long, more or less hairy above and below; Central lobe of leaf exceeding the other two in length. Petiole about 2½ inches long. Midrib of central leaf-lobe prominent, veins hairy. Flowers generally solitary, about 2 inches in diameter, bright pale blue, often pink. The ovary in this species is 3-celled. Seed capsule large, "surrounded by enlarged sepals." Seeds about 6. "ovoid-triangular," smooth, sooty black.

The seeds are official in the Indian Pharmacopoea, and are known as an efficient purgative, and considerably used as such.

Occurs generally in a more or less cultivated form in low-country gardens, and is probably an introduction.

Also found in India and the tropics generally.

No. 374. **EVOLVULUS ALSINOIDES** Vol. III, p. 227.

Visnu-kranti, S. Vichnukiranti, T.

A small creeping herb, with many slender, spreading, thin, prostrate stems, usually growing flat on the ground.

Leaves alternate, small, numerous, about ¾ inch long, often much less, oblong, acute at base, broad at apex, and abruptly apiculate; entire, hairy on both sides, but density of hairiness depends much on the dryness of the situation where the plant grows. Petiole very minute, about 1/20 of an inch. Midrib hidden by pubescence. Buds silvery. Flowers about ½ inch in diameter, bright pale blue, more or less crossed or radiated with paler tinges, or with white; one or two on axillary hair-like stalks, extending beyond the leaves. Bracts minute, persisting. Calyx, 5-lobed, narrow, acute, hairy. Corolla hardly lobed, or almost forming a complete circle. Stamens

5, pale. Ovary 2-celled, with 2 ovules in each cell. Styles 2, each cleft. Capsule minute, seeds many, small.

The plant is bitter and is said to be a remedy in fever, and as a tonic for children.

This is our smallest flowered convolvulus, easily recognised by its minute bright blue flowers. Very common all round the coast in sandy ground. Common in the tropics.

XCI.—SOLANACEAE.

A very important order, but only represented in Ceylon by 4 Genera. There are 1. Solanum,
2. Physalis,
3. Withania,
4. Datura.

The species number 13 (exclusive of introduced ones) none of which are endemic. They are almost all shrubs or herbs, and most of our Ceylon forms occur outside the forest areas of the country.

Of the more familiar species belonging to this order, it is only necessary to mention the common Tomato (*Lycopersicum esculentum*), the "Tak-kali" of the Sinhalese; the Potato *Solanum tuberosum*), or "Aratapal" of the Sinhalese and *Uralakalenga* of the Tamils; the Chilly, (*Capsicum annuum*), —"*Miris*"—and its many varieties; Tobacco (*Nicotiana Tabacum—Dunkola*, Sin. and "Poyile" Tamil, in order to estimate the importance of this world-spread family. Our largest arboreal importation belonging to the *Solanaceae* is the "Potato tree" (*Solanum macranthum*), introduced from Brazil about the middle of the last century. At one time this was a very popular garden tree, in and around Kandy, but of recent years it has given place to smaller and more showy plants.

No. 375. **SOLANUM INDICUM** Vol. III. p. 234.

Tibbatu, S. Karimulli, T.

A shrub, rarely more than 2 or 3 feet high, more or less armed with sharp curved prickles.

Leaves large, up to 6 inches, oblong or ovate, rather unequal at base, acute, sparsely lobed along the margin, harsh, stellate hairy above, tormentose below.

Veins distantly armed with solitary thin, erect spines, both above and below. Petiole about 2 inches, spined.

Midrib stout. Lat.-veins few, prominent.

Flowers violet, rather large, in many-flowered axillary cymes on prickly stalks. Calyx small, 5-lobed, stellate. Corolla 5-lobed, lobes rather twisted along their edges, stellate outside. Stamens 5, filaments short. Anthers conspicuous, rather long, opening at apex with two distinct pores. Ovary 2-celled. Fruit small, about 2 inches, yellow, seated within the stout prickly calyx. Seeds small, numerous.

The root is valued in native medicine, and is used generally as an ingredient. It is regarded as useful in fever, dropsy, and catarrhal affections. The seeds are used for toothache.

A very common way-side plant, and especially common in abandoned gardens. Found up to high altitudes. Tropical.

Belonging to this genus is the familiar "Bringal" or Egg Plant, (*S. melongena*), *Wambatu*. Sin. *Kattiri-kai*. Tam., so well known as a vegetable to the native and European alike. It is much cultivated in Kandyan villages, many varieties in shape and colour of fruit being obtained. It is supposed to be useful in liver complaints.

The *Katu-wel-batu* (*S. Jacquini*) of the Sinhalese, and *Kandan-Kattiri* of the Tamils is another member of the genus, esteemed as a cure for fevers, asthma, dropsy, and "stone."

S. nigrum, the *Kalukanweriya*, of the Sinhalese, and *Manaltakkali*, of the Tamils, is yet another member of the genus. Its dark berries are medicinal, and the leaves and stems are a reputed cure for dropsy. Like the last, it is more or less a garden plant.

No. 376. **DATURA FASTUOSA** Vol. III, p. 238.

Attana, or *Kalu-attana*, *S.* *Venumattai*, *T.* *Thorn Apple*, or *Black Datura*, *E.*

A low spreading herb, with rather fleshy branchlets, rarely more than two feet high, and irregularly branched.

Leaves alternate, large, up to 6 or 7 inches long, unevenly ovate, usually unequal at base, acute at apex, distantly toothed on the marginal lobes, or entire, minutely pubescent on both sides; dull waxy green above, much paler below. Petiole stout, about 1½ inches long. Midrib thick. Lat.-veins variable in number, more or less pellucid; nerves distinct, pellucid.

Flowers large, solitary, white, or purple, on a stout stalk produced from the nodes, but *not* axillary. Calyx tubular,

long, finely pubescent, 5-lobed; Corolla funnel-shaped, widening upwards, about twice as long as the calyx-tube, 5-lobed, ridged, lobes recurved, slightly pubescent. Stamens long, 5, with large narrowly oblong anthers. Filaments more or less attached to the corolla-tube. Style long; stigma 2-lobed; Ovary 2-celled.

Fruit a capsule, 2 or 4 celled, and supported by thickened calyx, much studded with stiff erect prickles. Seeds light brown, many.

The plant is much valued in native medicine, and is a reputed remedy for asthma, fever, boils, rheumatism, lumbago, and even hydrophobia. It is narcotic, and in large doses is a violent poison, being often used for criminal purposes. The powdered seeds introduced into sweetmeats, and even soup, has been so used for "drugging" persons, and among the Thugs, or professional "datura poisoners," it was commonly employed when robbery or other crime was contemplated. The dried leaves, smoked like tobacco, are efficacious in asthma, and a poultice made from fresh leaves is said to be of use in glandular swellings. According to Dr. Gunawardana, the juice of the leaf is a common remedy for ear-ache, and relieves pain in ophthalmia, besides being a popular remedy in hydrophobia, and an ingredient in many native Ayurvedic preparations.

Capt. F. N. Windsor, in his work on Indian Toxicology, referring to Datura, instances many cases where fatal results followed from consuming the seeds.

He remarks that a decoction of 125 seeds caused death, and that the fatal period may be very short, but 12 to 15 hours is more common. The seeds are a gastric irritant, and cause vomiting. Dryness of the throat, with thirst, accompanied by difficulty in swallowing, and dizziness, and wide dilation of the pupil of the eye, are the signs and symptoms of Datura poisoning.

Some years ago, a resident of Colombo informed me that he had been "drugged" with, as he supposed from the foregoing symptoms, Datura, and he was rendered completely insensible, and carried away into a forest in the Galle district, where, on regaining his senses, he found himself alone, by the side of a stream. He asserted that he was unconscious for over 20 hours, and that his first symptoms were of an intolerable burning in his throat, and inability to stand.

The plant is not uncommon in waste lands, where once there have been gardens. It is not certain to what particular

country it is native, as it occurs generally throughout the Tropics.

A second species of Datura known as Stramonium, (*D. Stramonium*) is sometimes found as a garden plant. Its fruits are much more ovoid than in the last, and much armed with stout prickles. Both the seeds and leaves contain the alkaloid *Daturine*, nearly identical with Atropine, which is obtained from Belladonna.

Stramonium is used in asthma, and other diseases, but it is highly poisonous.

A third number of the genus is *D. suaveolens*, the well-known Trumpet-flower, so often found planted round cooly lines in the older districts of the Island. This is a Mexican species, but appears to have been introduced here many years ago, as both Sinhalese and Tamils are familiar with it, the former calling it *Rata-attana*, and the latter *Umattai*. It is poisonous.

XCVI.—BIGNONIACEAE.

This order is limited in Ceylon to three Genera viz.:

1. Oroxylum;
2. Dolichandrone;
3. Stereospermum;

affording only one species each.

Among our introduced forms belonging to this order, some of the more familiar are the "*Tanga-pu*" (Tamil) or *Bignonia venusta*, with large clusters of orange flowers; the "Indian Cork tree" (*Millingtonia hortensis*), once an ornamental tree about Colombo; *Tecoma stans*—a common, garden, shrubby tree, producing rich yellow flowers; the elegant *Jacaranda mimosaefolia*, admired for its bluish purple, bell-shaped flowers, and feathery foliage; the ornamental orange-flowered *Spathodea campanulata* or "Fountain tree," and lastly the curious "Calabash tree" (*Crescentia Cujete*) whose fruits serve as basins and jugs in its native land of Cuba.

No. 377. **OROXYLUM INDICUM**. Vol. III, p. 281.

Totila, S. Vanga, T.

A moderate-sized erect tree, with pale yellowish smooth bark, branching at the summit forming a small crown. Young parts dotted with lenticels.

Leaves very large, 3 to 4 feet long, opposite; much divided into many subdividing pinnae, and numerous leaflets.

Leaflets on short petioles, about 2 to 4 inches long, ovate or nearly round, rounded at base, more or less cordate-acuminate, smooth, darker above than below. Main rachis very large, cylindrical, much dilated at base. Flowers very large, campanulate, fleshy, unpleasant smelling, pale pinkish-yellow inside, dull purple outside, arranged on a long erect terminal raceme. Calyx large, persistant, campanulate, obscurely toothed. Corolla thick, coarse, hairy, 5-lobed crumpled; Stamens 5, hairy at base, of unequal length; anther cells large, pendulous; Style long, stigma "of two large leafy blades." Fruit a capsule often as much as three feet in length, narrow, flat, tapered at both ends, containing a large number of compressed pale white seeds, each seed being surrounded by a thin papery wing.

The plant is much prized in native medicine, as being astringent, tonic, and carminative; and is used to cure diarrhoea, dysentery, and several minor disorders.

The bark, well pulverised and mixed with lard or vaseline, is an excellent remedy for saddle-galls in horses. The wood is very light, about 30 lbs. per cubic foot, soft, pale yellowish-white in colour. Not used.

Occasional in the intermediate zone, but not abundant.

Also India to Cochin-China.

No. 378. **DOLICHANDRONE RHEEDII**. Vol. III, p. 282.

Diya-danga, S. Vilpadri, T.

A small tree, more or less erect, smooth, branchlets much leaf-scarred, and lenticellate. Leaves impari-pinnate, opposite. Rachis about a foot long, dilated at base, grooved above, smooth. Leaflets about 4 pairs, and end ones wide apart, about 5 inches long, unequally bladed, approximately ovate, acuminate, entire, shining above. Veins prominent below, often tinged with purple. When crushed, the leaves have a curious semi-aromatic smell, particularly in young leaves and buds.

Flowers white, in small terminal clusters of about 4 in number. Calyx large, and at first enclosing the rest of the flower, detaching early. Corolla-tube long, funnel-shaped, 5-lobed, with margins crisped. Stamens 4, didynamous; anthers large, ovary 2-celled, ovules many. Fruit a capsule, nearly a foot and a half long, smooth, purplish, blunt at apex. Seeds flat rectangular, papery, but not transparent. Wings nearly an inch long.

The wood is pale, white, hard, even in grain, and light, (23 lbs. *vide* Gamble), rarely used except in temporary shed construction.

Moderately common in mangrove swamps round our southern coasts. Also from India to New Guinea.

STEREOSPERMUM CHELONIOIDES.

No. 379. Vol. III, p. 283.

Lunu-madala, or *Dunu-madala*, *S. Padri*, *T.*

A large erect tree, with brownish-grey or brownish-yellow bark of about ½ inch in thickness; cylindrical, branching irregularly. Branches drooping, slender, ending in clusters of twigs.

Leaves opposite, imparipinnate. Rachis about 8 inches, swelled at base and joints, smooth, slightly grooved above. Leaflets 3—5 pairs opposite, and an end one, variable in size 4—5 inches long, acute at base, gradually tapered to attenuate apex; entire, glabrous. Petiole about ¾ inch, dilated below, channelled.

Midrib direct, prominent below, depressed above. Lat.-veins 10 or 12, horizontal, abruptly curving within margin and uniting into a faint wavy intramarginal line. Intermediate nerves netted, and pellucid.

Flowers yellowish, or pinkish-yellow, veined or blotched with purple, arranged in long drooping terminal stalked panicles. Calyx campanulate, with 5 short segments. Corolla campanulate, 5-lobed "upper part woolly within, and with tufts of woolly hair below insertion of stamens" (*Trimen*) Stamens 4, and one barren staminode, short. Stigma bladed. Capsule long, about 18 inches (often longer), very narrow, smooth, spotted, containing very numerous winged seeds Seeds splitting along a distinct transverse furrow.

The wood is a dark grey, without heart-wood, moderately hard, and fairly durable. It is suitable for house-building. Weight from 45 to 50 lbs. per cubic foot. Pores moderately large, joined by broken lines, or belts of soft tissue, and filled with a dark resinous matter, giving the wood a mottled appearance. Rays short, wavy, numerous. The bark is said to be used as a tonic.

Occurs sparingly in the western half of the Island up to about 2,000 feet altitude; also in the Eastern Province, and lower Uva.

Found in India, Burma and Siam.

XCVII.—PEDALIACEAE.

This is a small order in Ceylon, represented by—

1. Pedalium,
2. Sesamum,

with one species in each genus. Our local forms are only small plants, and not confined to this Island, and from their appearance and habit, appear to have been introduced from other tropical countries.

No. 380. **PEDALIUM MUREX** Vol. III. p. 285

Et-nerenchi, S. Peru-nerenchi, Anai-nerenchi, T.

A small, much-branched, low herb, with spreading habit. Young parts succulent, scaly, and hairy at ends.

Leaves opposite, ovate, acute at base, about 1 inch to 1½, obtuse, lobed along the margin, glandular-scaly above, minutely glandular below, thick, pale green above. Petiole ½ inch. Veins and nerves inconspicuous. Flowers rich yellow, solitary, on curved axillary stem. Calyx-tube short with 5 narrow lobes. Corolla about 1 inch in diameter, broadly lobed, "hairy within." Stamens 4, didynamous, hairy at base. Stigmas 2, Ovary 2-celled with 2 ovules in each cell. Fruit large, about ¾ inches in length, ovoid, angled, with spines protruding from their points, 4-celled and usually empty.

The young branches, if steeped for some little time in water and then slowly stirred, causes the water to develop a glutinous glycerine-like fluid, which is clear and flavourless.

This is used for urinary disorders, and is an efficient demulcent. The leaves are also applied in cases of ulcer.

Common in sandy soils round the coast, particularly in the Eastern Province.

Also Indian and African in distribution.

Allied to the foregoing is the beautiful large-leafed *Martynia diandra*, known to Europeans as "Tigers' claws," from its large sharp-pointed claw-like fruits.

This plant is to be found in waste land near places that have once been in occupation as gardens, and is well known to the Sinhalese by the name *Naga-darana*, and *Naka-tali* to the Tamils.

The woody seeds are carried about by the so-called Gypsies, who use them as charms or prophylactics in snake-charming.

According to Dr. Spittel, the cobra cowers before the stem of this plant. I have seen these fruits mounted in the form of necklaces, but whether for the purposes of charms or otherwise, I am unable to say. The plant is Mexican.

No. 381. **SESAMUM INDICUM** Vol. III. p. 285

Tel-tala, S. Ella, T. Gingelly, or Sesame, E.

An erect plant growing to about 2 feet in height, with many ascending branches and short stem.

Leaves opposite or alternate, very variable in size, from 1 inch to 2½ inches long, and variable in outline, being lanceolate and entire or deeply divided along the margin, generally smooth above, finely hairy below. Petiole short, midrib and lat-veins distinct.

Flowers pinkish or white, solitary, axillary, rather large, on short stout erect stalk. Calyx deeply 5-segmented, pubescent. Corolla-tube large, 5-lobed, with one lobe larger than the others. Tube smooth within, pubescent outside. Stamens 4; Stigma 2; Ovary 2-celled. Fruit a capsule, oblong, pubescent, shortly pointed at apex, seeds many, black or pale, smooth, compressed.

Usually found in a cultivated state, and abundantly grown in the dry districts of Ceylon.

In commerce, three outstanding varieties are recognised,—with black, white, or red seeds,—of which the first gives a very large percentage of clean oil, the other two affording considerably less. The oil has for ages been used in India as an item of diet, apart from its utility in medicine, or as an illuminent. Enormous quantities of Gingelli seeds are exported to Europe from India annually, as the demand both for the oil, and the refuse, or "Poonac" (for cattle food and manure) is very great, and increasing yearly. It may be mentioned that the soot from the burning oil, is an ingredient in the substance known as Indian Ink.

In native medicine, Dr. Gunawardana states that the roots, leaves, seeds, and oil are used. The leaves and root afford a hair-wash to blacken the hair. The leaves are, accordto this authority, useful in bowel affections, and poultices made from the seeds for ulcers.

Seeds used for sweet-meats, and oil for lubricating the body.

Common in tropical countries, and according to Captain Speke, is an article of food in parts of Africa.

XCVIII.—ACANTHACEAE

A very large order in Ceylon, and widely distributed from our lowest altitudes to the highest. Our Genera are:

1. Thunbergia,
2. Elytraria,
3. Ebermaiera,
4. Cardanthera,
5. Hygrophila,
6. Calophanes,
7. Ruellia,
8. Phaylopsis,
9. Daedalacanthus,
10. Stenosiphonium,
11. Strobilanthes,
12. Blepharis,
13. Acanthus,
14. Barleria,
15. Crossandra,
16. Asystasia,
17. Eranthemum,
18. Andrographis,
19. Gymnostachyum,
20. Lepidagathis,
21. Monothecium,
22. Justicia,
23. Adhatoda,
24. Rhinacanthus,
25. Ptyssiglottis.
26. Ecbolium,
27. Rungia,
28. Dicliptera,

affording 93 species, of which no less than 39 are endemic. Of these 18 are found growing from 3,000 feet altitude to our highest levels. Large as the number of species is, there are few of economic use, though many are justly celebrated for their beautiful flowers. The well-known "Nelu"—a name applied by the Sinhalese to the genus *Strobilanthes* generally, —is an abundant plant in our hill country, and one of the features of our mountain flora. Correspondingly, though not so extensively, the "Nelu" of the low-country,—*Stenosiphonium Russellianum*,—represents it in our dry forests; both genera are gregarious.

No. 382. **HYGROPHILA SPINOSA** Vol. III. p. 293.

Katu-ikiri, S. Nirmulli, T.

A many stemmed erect plant, rarely more than two feet high. Stems compressed, thickening at the nodes, where below each is a hair-like growth. Leaves in a whorl of about 6 in a large and small-leaved series, the two outer, very much larger than the inner, and supplemented with a strong thin yellowish hard spine of about one inch or more in length. Leaves variable in outline, narrowly oblong or lanceolate, or broadly ovate, pale green in exposed places. Petiole very short, or hidden by leaf-blade. Flowers purplish-blue, in four double-flowered axillary whorls with leaf-like bracts.

Calyx 4-lobed, one exceeding the others in width, hairy outside. Corolla-tube, deeply cleft, lobes oblong. Stamens 4, Fruit a narrow capsule. Seeds few.

The roots, leaves and seeds are medicinal, and said to be effective as a demulcent. Dr. Gunawardana says that these, —root etc.—cure rheumatism, jaundice, dropsy, and other disorders.

Common in the low-country in damp ground, edges of swamps and abandoned tanks and ponds. Also abundant in India.

ANDROGRAPHIS PANICULATA

No. 383. Vol. III. p. 326.

Hin-bin-kohomba, S. Nila-vempu, T.

"*Creat*" among Europeans in India.

A small erect herb, with stems four-angled, smooth. Leaves opposite, about 3 inches long, lanceolate, tapering at base and apex, smooth, entire, paler below than above. Petiole very short, veining obscure.

Flowers pink, small, solitary, rather sparce, in lax axillary and terminal racemes, or panicles. Calyx 5-lobed, lobes very narrow, pointed, pubescent or glandular. Corolla, glandular-pubescent outside, "lips spreading, as long as tube, upper one 2—lower one 3—toothed" (*Trimen*). Stamens 2, anthers tufted with hair at base. Fruit a capsule, about one inch long pointed at both ends, narrow, compressed, straw-coloured. Seeds "6 in each cell."

The whole plant is intensely bitter, and if crushed and placed for a short time in a vessel filled with water, it imparts its bitterness to the surrounding fluid very quickly. It is a valuable tonic, and is used in cases of diarrhoea and dysentery, and even—according to Dr. Dey—has been found highly efficacious in arresting the progress of influenza.

Occasional in the damp low-country, sometimes in gardens, where probably it has been cultivated. Also in India. The further cultivation of this important medicinal plant may be worthy of consideration.

No. 384. **ADHATODA VASICA** Vol. III. p. 338.

Agaladara, Wanepala, S. Adatodai, Pavettai, T.

A fairly large shrub, growing to about 8 feet in height. Stem dull yellowish, cylindrical, much branched. Leaves opposite, variable in length, often 10 inches long, lanceolate, acute at base, acuminate and subacute at apex, nearly entire, smooth, dark green above, paler below, fairly hairy in very young leaves. Petiole about $1\frac{1}{2}$ inches long. Midrib pronounced, lat.-veins rather irregular, curved. Nerves and veins

netted, abundant, pellucid. Flowers large, white and veined with pink, arranged in close "dense axillary spikes." Bracts conspicuously large, oval, subacute, bractlets small, acute. Sepals 5. "Corolla pubescent, 2-lipped, upper small, erect, lower broad, spreading, 3-lobed. Stamens 2, anthers *green*, with pointed lower cell, "not spurred," as in the closely allied genus *Justicia*. Capsule about one inch, 4-seeded.

The whole plant is slightly bitter in taste, and faintly aromatic. The roots are used in coughs as an expectorant. Dried, and rolled up like cigars, the leaves are smoked as a cure for asthma, this form of preparation being a common bazaar medicine. The juice of the leaves is said to be very useful in dysentery. It enters largely as an ingredient in native Ayurvedic preparations.

As a green manure, the leaves are largely used by the Tamils in Jaffna for their Tobacco gardens.

It is highly recommended as a plant to be grown among Tea, the leaves being rich in nitrogen. An infusion of the leaves has been found, when poured into white-ant holes to be very effective. It is also fatal to "Red Spider" in Tea.

This plant has the peculiarity of being one of the very few that the goat will not eat, hence the Tamil name *Adu* (goat) *thodadu* (will not touch), which has been (abominably) adapted as the generic name, while the specific title is borrowed from the Sanskrit.

Fairly common, but always cultivated as a hedge plant in native gardens. I have found it in abandoned villages, in some of the wildest parts of the country, in the dry zone. Also common in India, Upper Burma, Malaya, and China. An allied species, which also occurs in the Island of St. Helena, is known to the Sinhalese as *Sudu-puruk*.

XCIX.—VERBENACEAE.

This very important order is represented in Ceylon by 13 genera, as follows:—

1. Lantana,
2. Lippia,
3. Bouchea,
4. Stachytarpheta,
5. Priva,
6. Callicarpa,
7. Premna,
8. Gmelina,
9. Vitex,
10. Clerodendron,
11. Glossocarya,
12. Symphorema,
13. Avicennia.

embracing 26 species of which only three are peculiar to Ceylon.

Most of these plants might be classed as shrubs, and the order has been supplemented by some important additions, for example, Teak (*Tectona grandis*) which is probably of Dutch origin, as it is only found here as a cultivated tree.

The familiar Lantana (*Lantana aculeata*) properly belongs to Tropical America, and was introduced, it is said, by Sir Hudson Low in 1826. Since then it has become a weed, all over Ceylon, both in the wet and dry zones, and extending from sea-level to 4,000 feet, in such abundance as to become an all but impenetrable mass in many parts of the country. At one time it was alleged that land on which Lantana grew in abundance was worthless for Coffee cultivation, but there is no proof that this belief was well founded, and certainly the objection did not hold good in the case of Tea, as some of our finest Tea fields, to my certain knowledge, were at one time lands smothered with *Lantana*.

The Sinhalese name for Lantana is *Rata-hinguru*.

Teak in Ceylon ("*Tekka*" in Sinhalese), has been planted in both the wet and dry zones at low altitudes. It cannot be said to have been a signal success in Ceylon, though individual trees have certainly attained a fair size, but are not to be compared with Burma trees, or even Malabar Teak. Ceylon-grown Teak is paler in the colour of the wood than the imported timber, but is not wanting in durability or in hardness. It appears to be lighter in weight, being about 43 lbs. per cubic foot. In our Ceylon-grown Teak, I found the annular rings to be distinct, broad, fairly concentric, often close, averaging about 6 to the inch of radius. Rays close, direct, regular, even.

Pores moderately large, circular, open, mostly solitary. or evenly distributed. Grain nearly straight, smooth.

The largest trees that I have measured of Ceylon-grown Teak were from Kotadeniyawa on the south bank of the Mahaoya, a few miles distant from Giriulla. These trees were probably planted by the British about the beginning of the last century, when there was a small fort at this place.

The weight of Teak appears, however, to be variable as the following table will show:—

Travancore	...	42 lbs.
Malabar	...	46½ lbs. to 46 lbs.
Cochin	...	44 lbs.
Moulmein	...	42 lbs. to 50 lbs.
Burma	...	38 lbs. to 43 lbs.
Bombay	...	41 lbs.
Java	...	43 lbs.

I am indebted to Mr. J. D. Sargent, the Conservator of Forests, for the following important information respecting the growth of this valuable tree in this Island.

Mr. Sargent writes regarding Teak grown at Tonigala, near Vavuniya. Young Teak sown in 1913 or 1914. Average increment of 20 trees from 1916 to 1925 was 22.5 inches, or 2.5 inches per annum.

At Kantalai, in the Trincomalee District, 50 trees averaged in a "poor area" 2.8 inches.

In the Puttalam District in 34 to 35 year old trees, the average increment was 5.3 inches.

Mr. Sargent adds, as an argumet against pure Teak planting, the presence of the defoliating caterpillar which attacks Teak in parts of the country, one of which he specifies, six or seven times a year. He thinks it would be a great mistake to try to grow Teak—for timber—in any part of the country which does not get two monsoons.

No. 385. **PREMA SERRATIFOLIA** Vol. III. p. 352.

Midi, S. Erumaimullai, T.

A smallish tree, more often a shrub. Stem pale, or dull yellowish, young shoots and ends of branches faintly pubescent. Leaves opposite, about 3 inches long, ovate or broadly ovate, rounded, or sometimes acute at base, acute at apex, partially serrate towards apex, entire lower down, smooth, rather glossy above, scented a little like lemon-grass.

Petiole rather long, slender, narrow at base. Flowers yellowish, or yellowish-green "on short pubescent peduncle, cymes corymbosely paniculate, dense, pubescent, terminal" (*Trimen*). Calyx with one lip 2-lobed, and the other entire. Corolla 5-lobed, lobes rather broad, woolly inside or around the throat. Stamens 4, didynamous, rather extended. Fruit a minute drupe, with a hard 4-celled stone.

The wood is restricted to small sizes, but is hard, smooth, easily polished, of a pale greyish-white colour, quite suitable for small cabinets, and for fret-work.

The root affords an aromatic oil, employed in native medicine for colics.

Moderately common at low altitudes, more so in the dry zone. Also in India, Malaya, Nicobar group.

No. 386. **P. TOMENTOSA** Vol. III. p. 352.

Bu-seru, S. Kollukutti, T.

A small tree, or large bush, with single or many irregular stems. Bark thin, greyish, becoming deep cream colour on twigs and shoots. Young parts densely stellate-hairy.

Leaves opposite, large, about 7 inches by 5½, broadly ovate-triangular, flat at base, or cordate, tapering to a more or less attenuate apex; entire, or slightly sinuate; upper surface crusted on major venation with stellate hair; under surface densely stellate-hairy on veins and nerves. Petiole about 2 inches, swelled at base, spread at leaf base, pubescent. Midrib prominent below, distinct above. Lat-veins about 6 pairs, first pair basal, and branching to apex; prominent, obligue, uniting in broad arches within the margin. Nerves depressed above. Young buds densely stellate-hairy. When crushed, the young leaves have a pungent aromatic scent.

Flowers yellowish, small, numerous in rather dense cymes. Calyx 5 segments, hairy. Corolla with rounded lobes, hairy in throat; Stamens produced. Style minutely 2-fill. Ovary hairy. Fruits ovoid, dotted over with stellate hair, containing a 4-celled stone.

Wood light brown, smooth, even grained, close, about 50 lbs. per cubic foot, fairly large. Pores evenly distributed, small, sometimes subdivided. Rays short, rather broad, distinct. Rings indistinct. The timber is not much used, but suitable for rafters, or for temporary structures.

Very common in the dry zone, extending up to 2,000 feet. Abundant in Sabaragamuwa Province. Also in South India and Burma.

No. 387. **GMELINA ARBOREA** Vol. III. p. 355.

Et-demata, S. Gumudu-takku, T.

A moderately large deciduous tree, with rather uneven branching, and irregular outlined stem. Bark thick, dull yellowish, or greyish-yellow, rough. Young parts or ends of branches finely mealy-pubescent. Leaves opposite, large, up to 8 inches long, broadly ovate, cordate at base, tapering to acute apex; entire, sometimes recurved at base, woolly, pubescent beneath, with yellowish stellate-hairs; smooth above, except in immature leaves. Petiole slender, long, 3—4 inches, finely pubescent, cylindrical. Midrib prominent below. Lat.-veins few, opposite, with two large glands, or glandular pits at base of first pair. Nerves parallel, distinct. Flowers large, upper lobes pinkish-orange, and one lobe yellow, on hairy stalks "in

small stalked cymes of 3, arranged in a narrowly pyramidal hairy terminal panicle'' (*Trimen*). Calyx 5-lobed, tormentose. Corolla 4 or 5-lobed, large, lowest largest and prominent, very hairy without. Stamens 4, didynamous. Anthers pendulous. Stigma divided. Ovary 4-celled, with a single ovule in each. Fruit an ovate, yellowish, drupe, containing a hard 4-celled (or 2), 4-seeded (or 2) stone.

Wood greyish-white or yellowish, smooth, glossy, even, durable, rather light (30 to 32 lbs. per cubic foot) suitable for small panels, sash-bars, and fret-work. Pores large, simple or subdivided, regular. Rays short, distinct, rather broad. Rings distinct, pale. The root is valued as a bitter tonic, and laxative. The leaves are demulcent. According to Dr. Gunawardana, the fruits enter into Native Ayurvedic preparations, to allay thirst.

Moderately common up to 4,000 feet altitude, but not abundant. Sometimes grown in gardens. Also in India, Malaya and further East.

No. 388. **G. ASIATICA** Vol. III. p. 355.

Demeta, S. Kumil, T.

A bush, densely branched, branchlets spinescent. Bark white, greyish-white, or yellowish, smooth. Leaves small, variable, about one to two inches long, oval, rounded at base, entire, much dotted with fine glands on under surface. Petiole short, about $\frac{1}{4}$ inch. Flowers large, rich bright yellow, ''nodding, in terminal racemes or panicles.'' (*Trimen*). Calyx 4-toothed, strongly pubescent, ''with several flattened, oval glands on the upper part.'' Corolla-tube curved, 4-lobed, lowest largest. Fruit a yellow drupe, containing a 1- or 2-celled, and 1- or 2-seeded stone.

The root is demulcent, and in Indian native medicine is used in catarrh of the bladder. The bark is said to assist in the fermentation of toddy.

Common in the low-country, often found in gardens. Also in the Madras Presidency.

No. 389. **VITEX NEGUNDO** Vol. III. p. 357.

Nil-nika, Sudu-nika, Nika, S. Vennochchi, T.

The ''Five-leaved bhast tree,'' *E.*

A slender, supple small tree or bush, with finely pubescent compressed branchlets. Stem pale grey, becoming greenish-grey on twigs and young shoots, leaf scarred, compressed or quadrangular. Leaves opposite, 3 or 4 foliate, central leaflet

longest, about 5 inches, narrowly lanceolate, rounded or shortly acute at base, finely tapering to an attenuate apex; entire, glabrous or nearly so above, finely coated below with masses of dense pubescent hair. Rachis 2—2½ inches long, ridged above, finely pubescent. Petiole of leaflet, one inch or less long, minutely pubescent. Midrib prominent below, depressed above. Lat-veins in longest leaflet 13—15, opposite, fine. Leaves scented, aromatic.

Flowers small, lilac, numerous, shortly stalked, in opposite cymes on a long erect terminal panicle. Calyx pubescent, with 5 short triangular lobes. Corolla 5-lobed, pubescent outside, hairy within tube, lowest lobe large, lip-like. Stamens 4, didynamous. Ovary 4-celled. Fruit a small nearly spherical black drupe, containing a hard, bony, 4-celled stone.

The wood is pale-greyish-white, but never of any large size, but the coppice shoots and branches, owing to their flexibility, are used for basket work.

The leaves, root-bark, and flowers, are employed in local native medicine; the leaves as a tonic and vermifuge; the flowers as an astringent; the root-bark as a tonic. The Indian list of medical properties of this plant is however much larger than the Ceylonese, and includes headache cures, and cures for rheumatism, and bladder complications.

Common in both the wet and dry zones, near streams. Often cultivated. Also in India, and the East of Asia, to the Philippines. I found it growing in the Island of Male in the Maldives, where it is called *Dun-nika*.

No. 390. **V. ALTISSIMA** Vol. III. p. 357.

Milla, (often wrongly pronounced *Mililla*), *Miyan-Milla Kaha-milla, Sapu-milla*, S. *Kadumanakku*, T.

A large tree, with considerable variation in length of stem; often much contorted, irregularly cylindrical, with wide crown. Bark grey, or brownish-grey, or yellowish, varying very much according to rainfall, the paler-barked trees belonging to the dry zone. Bark about ½ inch thick, furrowed, fibrous. Branches large. wide-spreading. Twigs smooth, distantly freckled with narrow lenticels; ends and young shoots faintly pubescent, or completely glabrous, compressed.

Leaves opposite, 3- or 5-foliate, central leaflet the longest, about 6 inches long (often much less) by 1¾, narrowly ovate, or ovate lanceolate, tapering to extreme base of leaflet stalk, finely tapered to a narrow prolonged apex; entire, or in some cases distantly crenate-serrate towards apex; glabrous on both

sides. Petiole long, 3 or more inches, stiff, swelled at base, bladed in young plants, or on shoots growing from the stem of mature trees, the blading being replaced in mature leaves borne on old wood by more or less prominent ridges below the leaflets. Midrib, prominent below, depressed above. Lat.-veins 12 pairs, opposite, or sub-opposite, arching obliquely, joined by rather distant transverse veins, prominent below, depressed above. Intermediate reticulation very fine, close-netted.

Flowers violet, or white with a bluish stain on lower lip. Inflorescence terminal, or subterminal, axillary erect racemes or panicles; flowers numerous on short pubescent stalks, immediately above moderately large pubescent bracts. Calyx obscurely 5-lobed, pubescent outside, enlarged and clasping base of fruit. Corolla pubescent, campanulate, 2-lipped, the upper 2-lobed, and the lower 3-lobed, of which the central lobe is largest. Fruit a smooth drupe, nearly spherical, green when unripe, dotted over with white spots, becoming dark purple on ripening, enclosing a hard 4-celled, 4-seeded stone that is surrounded by a fleshy bitterish pulp, containing a purple-staining fluid.

The wood is pale creamy-yellow in colour, varying considerably on drying to a soft yellowish-brown, or greyish-brown. Smooth, wavy-grained, close; durable, hard. Resists white ants and suitable for all kinds of building work, such as beams, rafters, posts, door-frames, etc. The weight is variable, ranging from 60 lbs. per cubic foot to about 50. This again appears to vary with altitude and rainfall. Indian examples vary (according to Gamble's figures) from 49 to 56 lbs.

The annular rings in this wood are very distinct, but irregularly concentric, and of varying distances apart. Pores evenly distributed, few, usually solitary, closed, or finely fimbriated, seldom divided. Rays close, inconspicuous, hair-like.

This is one of our most useful timbers, and one of the most durable. It is a favourite with carpenters for all manner of house-building, wheel-naves, and sometimes for furniture. It has been used sucessfully for railway sleepers, and bridge planks.

Common in wet and dry zones, up to 3,000 feet altitude. The plant coppices well, and if carefully grown attains a good bole, though rarely cylindrical.

The names *Kaha-milla*, *Kos-milla*, and *Miyan-milla* applied by carpenters appears to be in accordance with the colour of the wood, and has nothing to do with the species. According to Trimen, however, he finds two varieties, viz. (*a*) *zeylanica*, and (*b*) *alata*, in which the former has the leaflets quite glabrous beneath, and the latter with the leaf-petiole always

winged, and densely pubescent below. As I have found bladed and non-bladed petioles to leaves appearing on the same tree, I think this distinction requires further examination.

The plant also occurs in Southern India.

No. 391. **V. LEUCOXYLON** Vol. III. p. 358.

Nebedda, *S.* *Kaddu-nochchi*, *Nir-nochchi*, *Minatchi-maram*, (local), *T.*

A short-stemmed, large-domed, water-loving tree. Bark creamy-grey or pale white, smooth, about ½ inch or less thick. Twigs and shoots glabrous at ends, compressed at nodes. Leaves deciduous, opposite, 5-foliate (usually) with central leaflet the longest, about 4 inches long, by 1 wide, narrowly ovate or ovate-lanceolate, acute at base, tapering to a shortly acuminate apex, rather thick; entire; glabrous above, sub-glaucous below.

Petiole long, about 3½ inches, sparcely hairy, or completely glabrous. Midrib prominent below. Lat-veins (in central leaflet) about 8 pairs, pellucid, opposite, pronounced above. Leaf buds pubescent.

Flowers white, tinged with purplish fine hair, arranged on long, lax, thin, axillary cymose pubescent panicles. Bracts narrow, pubescent. Calyx pubescent, 5-lobed, lobes shallow. Corolla pubescent, upper 4 lobes broad; lower, hairy within much "crisped." Fruit narrowly ovoid, about one inch long, smooth, becoming blackish-purple when fully ripe, staining. Stone hard, 4-celled.

The wood is of a dull purplish-brown colour, close, hard, even-grained, about 48 lbs. per cubic foot in weight, suitable for cart-frames and unexposed work.

Very common in the dry zone by the sides of tanks, but never quite absent from water. I have obtained it at Barrawa in the Western Province on the edge of back-waters from the Kelani river. The roots are astringent, according to Gamble, but I am not aware if they are used here. The staining matter from the fruits affords a dark dye.

Also occurs in India, the Andamans and Burma.

No. 392. **AVICENNIA OFFICINALIS** Vol. III. p. 363.

Kadol (local) *S.* *Kanna*, *T.* *White Mangrove*, *E.*

A small tree with broad crown. Bark pale, nearly white, or ashen, smooth. Twigs roughly quadrangular, channelled on two sides, pale brownish.

Leaves opposite, about 2½ inches long, ovate, tapering at base, sub-acute, entire, sometimes unevenly lobed, stiff, smooth or glabrous above, coated below with close felt-like pubescence. Petiole about ½ inch, stout, channelled above.

Midrib conspicuous above and below, Lat-veins about 8 pairs, sub-opposite, pellucid near tip, oblique, acutely arched within margin. Nerves indistinct.

Leaves sometimes dotted with large prominent galls. Flowers dull yellow, with a faint smell like Jak fruit, solitary or in twos, sessile, on a very short stalk; terminal. Bracts minute, oval. Calyx 4-lobed, persistent, deep-cleft. Corolla 4-lobed, spreading. Stamens 5, inserted below clefts in corolla, short. Stigma bi-fid. Fruit an ovoid capsule, smooth, yellowish, about one inch long, containing a solitary seed, large cotyledons, the radicle (root) often considerably developed before the seed falls. With maturity, the roots run horizontally in the mud in which the plant grows, sending up at intervals blunt shoots, for facilitating the passage of air to the plant.

The wood is greyish in colour, with darker heart-wood, the latter being moderately hard. Weight (*Gamble*) 58 lbs. per cubic foot. Timber brittle, but is a good fuel-wood.

Common round our southern and eastern coasts, in salt land and in tidal swamps. Also in India, Burma, the Andamans and Eastern Tropics.

Our southern forms appear to vary specifically from the above, and deserve closer comparison.

C.—LABIATE

This is a large order in Ceylon, though not including very many plants of economic value. Our Genera are:

1. Ocimum;
2. Geniosporum;
3. Moschosma;
4. Orthosiphon;
5. Plectranthus;
6. Coleus;
7. Anisochilus;
8. Pogostemon;
9. Dysophylla;
10. Mentha;
11. Calamintha;
12. Scutellaria;
13. Anisomeles;
14. Leucas;
15. Leonotis;
16. Teucrium.

We have 42 species, of which 10 are endemic, and a number of beautiful introduced forms, of which *Coleus* and *Salvia* are so familiar in our ornamental gardens, not to mentoin our common Mint (*Mentha viridis*) and Sweet Marjoram (*Origanum vulgare*) so well-known as culinary adjuncts.

No. 393. **OCIMUM SANCTUM** Vol. III. p. 366.

Madura-tala (lit. Mosquito plant) *S. Tulasi, T.*

The "Sacred Basil".

A small short-stemmed plant, with many hairy sub-quadrangular branches, more or less tinged with a dull purple colour. Leaves opposite, rather small, about 1 to 1½ inches long, ovate, broad at base and apex, blunt or apiculate, strongly aromatic in smell, more or less toothed along the margins, pubescent or hairy on both sides, gland-dotted. Petiole ½ inch, thin, hairy. Lat-veins pubescent. Flowers purplish-pink, small, in clusters or whorls on long, simple, hairy racemes. Bracts broad, rather conspicuous. Calyx 2-lipped, the upper "rotundate apiculate, flat," silky with white hair; lowest pair sharp, curved. Corolla-tube short, lower lip entire; upper toothed. Stamens (fertile) 4, bent. Achenes oblong, pale brown.

This plant is sacred to the Hindus, and is dedicated to Vishnu. It is regarded as of great value in native Indian medicines, the dried plant being stomachic and expectorant, and used in croup, coughs, and gastric troubles in children. The dried leaves, reduced to a fine powder, are used like snuff in nasal disorders. It is included in many preparations in the form of decoctions. Beads made from the wood of the stem are used by Hindus as rosaries in India.

The bruised leaves undoubtedly keep off mosquitoes, and possibly an oil distilled from the fresh leaves might be found very effective for this purpose. The Sinhalese name—*Maduru-tala*—is suggestive; while, it may be added, the African allied form, our common mint, is known as the fever plant in Sierra Leone.

Very common in waste garden lands, and most probably introduced into Ceylon where it has become naturalised. Also in India, and most Tropical Eastern countries.

CII.—NYCTAGINEAE

A small order in Ceylon, represented by two Genera, viz.: 1. Boerhaavia, and 2. Pisonia, and three species. The order, however, has, among others, the following familiar plants, viz.: The Marvel of Peru or "Four-o'clock-flower" of Europeans (*Mirabilis Jalapa*), or the *Sendrikka* of the Sinhalese. This appears to have been of very early introduction, since Knox considers it deserving of special mention, adding, "its Nature is to open at four o'clock in the evening, and so continueth open all night until the morning, when it closeth

up itself till four o'clock again." Apart from this distinctive peculiarity, its stout roots, crushed and boiled, afford a most excellent poultice for boils, etc.

A second introduction belonging to this order is the Lettuce Tree or "Lady Love," (*Pisonia alba*) or *Watabangakola* of the Sinhalese, and *Lechchai-Kedda* of the Tamils. This is familiar about the old coastal towns of Ceylon, and appears to have been long cultivated as an ornamental plant. The *Bougainvillea* is a third well-known example of the order, which has been introduced from Brazil.

No. 394. **BOERHAAVIA DIFFUSA** Vol. III. p. 390.

Pita-sudu-pala, S. Mukkaraichchi, T.

A prostrate much slender-branched plant, with cylindrical, thin, dull purple, pubescent, branch-like stems. Leaves opposite, one large, and one small at each node, these varying from 1 to 2 inches long in the larger one, and ½ to 2/3 of an inch long in the smaller. Leaves nearly round, or very broadly ovate, cordate at base, rounded or blunt at apex; more or less entire, smooth above, silvery below; hot to the taste. Petiole long, one inch or more. Midrib thin; Lat-veins indistinct. Flowers pink, minute, on short stalks in small umbels or "long-stalked, corymbose, axillary, and terminal panicles" (*Trimen*) Perianth-tube constricted, externally viscous, slender, 5-lobed. Stamens 2, Ovary one-celled, "Stigma peltate." Fruits very minute, one-seeded, viscous, and glandular.

The root is said to be laxative and anthelmintic. It is useful in asthma in small doses, and in large it is emetic.

A weed in the low-country, "especially near the coast," abundant about Colombo, Galle, Matara, Tangalla, and similar sea-side places. Occurs in most Tropical countries.

CIII.—AMARANTACEAE

This large order is represented in Ceylon by:—

1. Celosia;
2. Allmania;
3. Digera;
4. Amarantus;
5. Cyathula;
6. Pupalia;
7. Psilotrichum;
8. Nothosaerua;
9. Aerva;
10. Achyranthes;
11. Alternanthera

These represent 25 species, of which three are endemic. They are entirely composed of herbs, most of which might be

classed as "weeds," as they usually occupy waste ground and abandoned gardens.

The examples of the order which come chiefly into use, are mostly confined to the genus *Amarantus*. In this group, the leaves are alternate, without stipules, more or less spinous. The stems, stout, freely branching, often tinged with dull pink. The flowers are minute, unisexual, arranged in clusters. Perianth 3 (to 5), Stamens 3, (to 5), Stigmas 2 or 3, Ovule erect. Seeds usually compressed, glossy black.

No. 395. **AMARANTUS SPINOSUS.** Vol. III, p. 396.

Katu-tampala, S. Kirai or *Mudkirai, T.*

This is an abundant weed and probably an introduction into Ceylon. It occurs in waste land near gardens, especially in the dry zone. It is one of the many "curry" plants of the poorer classes, and is also regarded as of medicinal value, as it has mucilaginous properties, and therefore "cooling."

It is common in the Tropics generally.

No. 396. **A GANGETICUS** Vol. III, p. 396.

Sudu-tampala, S. Arai-Kirai, T.

This is a much larger plant than the last, its purplish stems being about 3 feet in length, and leaves about 6 inches long.

It is usually cultivated, but is nevertheless more or less a weed, grown for the sake of the stem which affords a good vegetable, and enters into the curry list, particularly with coolies. Common throughout Tropical countries.

Many examples of this genus are familiar garden plants, grown for the sake of their fantastic beauty, and equally fantastic names, such as "Love-lies-bleeding" (*A. caudatus*), or "Prince of Wales' feather," (*A. hypochondriachus.*)

No. 397. **AERUA LANATA** Vol. III. p. 402

Pol-kudu-pala, S.

A small, generally erect-stem plant with many wire-like branches covered with cottony-hair. Leaves alternate, small, about 1½ inches long in those on the central stem, and less than half that size on the branches.

Flowers very minute, in "dense, sessile, axillary heads or spikes" resembling in appearance coconut-scrapings, a fact which has given origin to the appropriate Sinhalese name.

It occurs in considerable abundance in the wet zone, often growing in chena lands, and waste ground.

It is regarded as a valuable native medicine for cough and indigestion, and as a specific for diabetes.

Occurs in tropical parts of Africa and Asia. The flowers of the Egyptian form (*A.E. tomentosa*) are used for stuffing mattresses.

CIV.—CHENOPODIACEAE

This order is represented in Ceylon by 5 Genera, viz.:

1. Atriplex;
2. Arthrocnemum;
3. Salicornia;
4. Suaeda; and 5. Basella.

They are mostly herbs, and erect, protrate, or climbing (*Basella*), with alternate or opposite fleshy or juicy leaves. Flowers small, with or without bracts, sessile or very short-stalked, bisexual, or unisexual, axillary. Perianth 3—5 segmented. Stamens solitary or 5; anthers 2-celled; style 2 or 3; Ovary single-celled, superior. Ovules solitary. Our largest form is *Suaeda monoica*, which forms a small bush of about two feet in height, and is found growing gregariously in salt lands near the coast.

No. 398. **BASELLA RUBRA** Vol. III. p. 410.

Niviti, S. Pasalai, T. Spinach, E.

Stems twining, slender, smooth, succulent. Leaves alternate, about 3—4½ inches long, ovate, subcordate at base, slightly apiculate, entire, completely glabrous, thick, fleshy; Petiole very stout, short. Midrib prominent below. Lat-veins hidden. Flowers pinkish, small, in hanging spikes.

Not very generally distributed, but possibly more abundant near the coast than inland. I have found it near Hambantota, and at Tissa.

It is a favourite vegetable, and is said to be used as a cooling medicine in digestive disorders.

Occurs in most of the tropics of the old world. The well-known domestic "Spinach" (*Spinacea oleracea*) is an imported member of this order, which also includes *Chenopodium anthelmenticum* (worm-seed), which in recent years, has sprung into prominence in the treatment for Hook-worm. The cultivation of this last-named important plant, might be more generally considered in Ceylon, owing to the prevalence of this terrible disease.

[*Beta vulgaris* (Beet Root) belongs to this order.—C.D.]

CVII.—NEPENTHACEAE

This small, but curious order is, in Ceylon represented by a solitary genus. The species are distributed in the tropics of the old world, and many, owing to their curious forms, have been introduced into Europe as hot-house plants.

Our only example is *Nephenthes distillatoria*, the *Bandurawel* of the Sinhalese, familiar to the Europeans as the "Pitcher Plant." It can be readily distinguished by the curious "pitcher", usually containing fluid, which affords a sufficient characteristic for identification.

The stems are long, slender, and smooth. These are used for the manufacture of small fancy-baskets, tea-pot holders, tiffin-baskets, and the like. The material is durable, and sufficiently pliable to render it useful for the manufacture of chair bottoms, etc.

Our species is endemic, and occurs in wet sandy ground on the west of Ceylon, extending up to about 2,000 feet altitude. I suspect the presence of a variety in the Kukulu-Korale, where the examples I have obtained have extraordinarily long "pitchers," and are of robust growth.

CVIII.—ARISTOLOCHIACEAE

This is a small order in Ceylon, represented by two genera only, viz.: 1. BRAGANTIA and 2. ARISTOLOCHIA, with one species in the former genus, and two in the latter.

No. 399. **ARISTOLCHIA INDICA**... Vol. III. p. 423.
Sap-sanda or *Sassanda*, *S. Perumaruntu*, *T. Indian Birthwort*, *E.*

Stems stout at base, long, slender, creeping over bushes, smooth. Leaves rather large, alternate, about 4 to 4½ inches long, narrowly lanceolate, rounded or slightly cordate at base, acute at apex, entire, smooth, with undulating margin. Stipules absent. Petiole thin, about one inch long. Midrib distinct, with two, sometimes more, strong nerves spreading from the base. Leaves have a faint scent, and are bitter. Flowers in twos or more, in a short corymb on a long, smooth, stalk; greenish with a dark purple lip.

The perianth is swollen at the base, round in outline, abruptly constricted, ending in a tubular mouth with a strongly produced oval lip. Within the tube, and around the constricted entrance to the base, there are minute hairs. These

almost close the entrance, preventing minute insects that are attracted by the odour of the flower from escaping; while in turn, the imprisoned insects assist in pollination. The fruit capsules are pendulous, oblong, rather horny, containing numerous flat seeds.

The root is bitter, nauseous, and is regarded as an antidote for insect-or even snake-bite. The seeds, crushed and macerated, mixed with black pepper are, according to Dr. Dey, given with beneficial results in cases of cholera, and mixed with honey, for leprosy. The leaves are alleged to be stimulant.

Moderately common on the western side of the Island up to 3,000 feet altitude; also occurs throughout India.

The familiar "Dutchman's Pipe" (*A. ridicula*) the large *A. gigas*, and the graceful *A. elegans*, are popular introduced members of this fly-catching genus.

CIX.—PIPERACEAE

The order, though containing many introduced species, is a small one in Ceylon, and is represented by—

1. PIPER and 2. PEPEROMIA, as its only two genera, but is fairly rich in species, the former genus, having nine species, and the latter five, making a total of fourteen, of which five are endemic. The order is mostly made up of climbing forms in *Piper*, while *Peperomia* is represented by small plants growing on rocks, tree-trunks, or in shallow soil.

No. 400. **PIPER BETLE** Vol. III. p. 425.

Bulatwel, S. Vettilai, T. Betel or *Betel-pepper, E.*

It is almost superfluous to describe this well-known plant and popular masticatory, so abundantly used by Sinhalese and Tamils in this country. It is a cultivated plant, and its cultivation, though attended with considerable risk from blights, is very profitable, owing to the very large demand there is for the aromatic leaves, chewed by men, women and children. Its origin is doubtful, but apparently is of great antiquity. Knox refers to it, and aptly describes it as "like Ivy, twining about trees, or poles, which they (the Sinhalese) stick in the ground for it to run up by."

The leaves are alternate, moderately large, about 6 to 8 inches long, ovate or cordate, and unequally lobed at the base, acute at apex, entire, completely glabrous, bright green and glossy.

Petiole about one inch, rather slender. Midrib, and three stout nerves on each side of it, prominent, the nerves nearly all starting from the base. The whole leaf has a strong pungent, aromatic flavour, and, when chewed, produces a copious salivation.

The flowers are very minute, pale, yellowish-white, bisexual, in dense (female) pendulous fruiting spikes. Stigmas 5 to 6 spreading. Fruit sunken within the spike, and almost hidden.

The variety known as *Rata-bulat-wel* (Var. B. *Siriboa*) is distinguished from the above by its much longer fruit spike, which attains a length of about 7 inches. Like the foregoing, it is cultivated, but is rare. Both the species and the variety are propagated by cuttings, and require much attention to the preparation of the soil.

The Betel-leaf, according to Dr. Dey, contains an aromatic essential oil, which treated with caustic potash yields a substance called "Chavicol", a phenol of very powerful antiseptic properties, more powerful than carbolic acid. For medicinal purposes, the leaves have astringent and carminative action. The juice of the leaf dropped into the ear, according to Dr. Gunawardana, will relieve ear-ache, or introduced into the eye, assists in painful eye affections. Among the poorer classes and village people, the Betel leaf is frequently used as a dressing for sores and ulcers.

It is cultivated up to about 3,000 feet altitude in Ceylon, but as far as I am aware, it nowhere occurs in a wild state.

Extensively grown in India, Burma and Malaya, and I have seen it grown in British North Borneo. In India it is known as "Pân."

No. 401. **P. NIGRUM** Vol. III. p. 427.

Gam-miris, S. Milaku or *Molagu, T. Pepper, E.*

Stems cylindrical, climbing, thickened, and shortly rooting at the nodes, rough at base, glabrous towards the ends.

Leaves variable in size, 4 to 7 inches long, oval or ovate-oval, rounded at base, equally or unequally lobed, tapering to short acuminate apex, acute, entire, smooth glossy above, paler below. Petiole stout, about 1½ inches. Midrib pronounced, primary veins three on each side of the midrib strongly pronounced, especially those nearest the midrib. Nerves rather distant, depressed above, conspicuous below. Flowers minute, bisexual or usually so, on slender, leaf-opposed pendulous spikes of about 5 inches in length. Fruits small, about 3/16th of an inch in diameter, at first glossy green, changing to

red on ripening. Seeds globose, or slightly ovoid, surrounded with a thin pulp, hard, yellowish.

The two kinds known as "black" and "white" pepper are only the result of the preparation of the article. The fruits are collected when ripe, and dried in the sun, when they quickly assume the black wrinkled form known as 'black pepper;" but by first removing the outer skin by maceration, which is effected by soaking the fruits for some days and then rubbing off the outer coat, the enclosed seed is exposed, and finally dried, thus making the so-called "white" pepper.

The plant in Ceylon is probably an introduction. I am not aware of an authentic instance of its being found truly "wild." The date of its introduction is unknown. It appears to have been an article of commercial importance during the Dutch occupation of Ceylon, for Bertolacci says that "they (the Dutch) collected annually from 40,000 to 150,000 lbs. of Pepper, worth from 1 to 1½ fanams per pound." The same authority, in his Tables of Exports and Imports, shows that in 1806, Ceylon exported 49,000 lbs. of this commodity, while as recently as 1922, our exports amounted to 1,533 cwts. valued at upwards of Rs. 54,000.

In local medicine, pepper is a popular ingredient, as it is employed as a cure for dyspepsia, cough, intermediate fever, and other complaints. The active principle is a crystallised substance called "Piperin," which varies from about 2 to 8 per cent, and is of similar composition to morphine.

Pepper is common to the tropics, and is one of the earliest spices known to mankind. It is recorded that, in the fifteenth century, Attila demanded, among other things, 3,000 lbs. of pepper in ransom for the city of Rome. The well-known Peppercorn Rent, which exists to this day, in name, prevailed in Europe during the Middle Ages, and consisted of an obligation to supply one pound weight of this article, which at one time carried an import tax into England of 5 shillings a pound.

The remaining economic examples of this genus are "Long Pepper" (*P. longum*) distinguished by its short, *erect* fruit spike, and *P. Cubeba* ("Cubebs") which differs from the others mentioned in having a very short petiole and much narrower leaves. This last was introduced into Ceylon in 1885, but owing to limited demand has not been commercially exploited in this country.

Both *P. longum* and *Cubeba* are in medical use: the first is a stimulant and carminative, and the latter is useful in disorders connected with the mucous membranes of the throat, etc.

CXI.—MYRISTICACEAE

This order consists of one single genus, of which Ceylon has four species, and of these, two are endemic. The well-known Nutmeg (*Myristica fragrams*), *the Sadikka* of the Sinhalese, is a familiar example of the order, and is an introduction from the Moluccas. It is frequently to be found in low-country gardens. Some of our oldest and largest examples are found at Mutwal, and Ratnapura.

No. 402. **MYRISTICA LAURIFOLIA** Vol. III. p. 434.

Malaboda, (*Ririmawara* in Sab. Prov.) *S. Palmanikam*, *T.*

A tall erect tree with cylindrical trunk. Bark dark grey, sometimes mottled, rather thick, yielding a pinkish, claret-coloured fluid on incision. Branches spreading, terminating in slender, rusty twigs and tips.

Leaves alternate, spreading, rather large, about 5 to 10 inches long, oblong or lanceolate-oval, rounded at base, more or less abruptly acute at apex, entire, smooth, glossy, dark green above, paler below, stiff. Petiole short, stout, channelled above, about one inch long. Midrib prominent below, distinct above. Lat-veins parallel, numerous, nearly pellucid, faintly pubescent when young.

Flowers unisexual, dioecious, in clusters within the axils of fallen leaves, orange yellow. Perianth 2 or 3-lobed, lobes acute, curved. Stamens 10 to 14. Ovary superior, 1-celled with erect ovule, pubescent, style short. Fruit about 2 inches long, coated with a rusty, scurfy pubescence, thick, rather fleshy. Seed large, solitary, about 1 inch (or more) in length, with rich yellow aril that subdivides into "frills." Endosperm rather soft, "cheesy," covered by a brittle, brown, thin coat.

The fruits, when ripe, are a favourite food of the Hill Myna (*Eulabes ptilogenys*) which even swallows the seed whole.

The wood is of a pale brownish-straw colour, easily split, or sawn. The timber is not durable if exposed, but suitable for light boxes, such as cigar-boxes, small tea-chests, or packing cases for light materials. Weight about 24 lbs. per cubic foot. Pores rather large, few, irregularly scattered. Rays close, indistinct, pale. Rings distinct, irregular, fairly concentric.

This wood has frequently been passed off by unscrupulous sawyers for harder timber of the same colour, with unfortunate results, as the wood not only rots quickly, but is much subject to insect attacks. The exudations from the wounded stems are often consumed by weevils which apparently bore into the timber from these points of injury.

A decoction of the leaf, made by boiling, affords a gargle.

Fairly abundant in all the wet zone forests up to about 6,000 feet altitude, and occasionally found in the dry zone.

Also occurs in South India, in the Nilgiri and Anamalai hills.

No. 403. **M. HORSFIELDIA** Vol. III. p. 435.

Ruk, S.

A moderately tall, erect, slender tree, with branches rather crowded at the top. Bark about ½ inch thick, brownish-grey, flaking off in scales and flakes, exposing a reddish-brown surface below. Exudes, on wounding, a cherry-coloured gum. Twigs slender, leaf-scarred, densely rusty-tormentose when young.

Leaves alternate, large, about 8 inches by 3, oblong, or oblong-lanceolate, rounded at base, tapering to a more or less elongated apex, entire, glabrous above, or sparsely dotted with minute stellate hair, which is moderately dense on the midrib and lat-veins. Dark apple-green above, paler or ashy below.

Petiole ¾ to 1 inch, thick, flat or grooved above, coated with soft tomentum. Midrib large, prominent below, partially raised above. Lat-veins about 12—14, prominent below, tomentose, alternate, oblique, arching considerably below the margin and breaking up into a netted venation. Nerves distant, distinct.

Flowers orange-yellow, very strongly scented. Male flowers in close, small, dense heads on tomentose spreading panicles. Female flowers fewer and larger in short panicles. Perianth 3-lobed, thick. Stamens 6. Ovary densely covered with tomentum. Fruit almost round, rufous outside, thick, about 2 inches long. Seeds large, about 1½ inches, oblong, coated with a dull orange-yellow aril (mace), not "frilled."

The wood is very like pale cedar, with narrow graining, of a soft, pale, red-brown colour. Weight about 15 lbs. per cubic foot, rather closely resembling the last in structure.

The timber is not durable, but possibly very suitable for pencils or pen-holders, light packing cases, or backings for pictures.

Fairly abundant in the wet zone up to about 2,000 feet altitude; usually grows near streams. Endemic. Its strong, heavy-scented flowers are unmistakable.

No. 404. **M. IRYA** Vol. III. p.435

Iriya, S.

A moderately large, erect, slender tree, branching rather densely at the crown. Bark brownish or purplish-grey, rather thick, smooth. Branches leaf-scarred, drooping, young parts rusty. Leaves alternate, large, nearly a foot long, narrowly oblong, or oblong-lanceolate, tapering at base, acuminate, entire, smooth; glossy above, rather pale green. Petiole short, flattened above. Midrib and lat-veins strong and conspicuous. Nerves distinct. Flowers pale yellow, males minute, numerous, clustered in axillary panicles. Female flowers much larger and few, "in short close panicles." Perianth short, 2-lobed. Stamens 6 to 10. Anthers free on the edge of a flat-topped ovate column (*Brandis*). Fruits nearly spherical, 1 inch in diameter, reddish, tomentose outside, pink within, exposing, when open, a globose seed entirely enclosed by a bright conspicuous scarlet, almost hyaline, aril.

The wood is greyish or olive-grey in colour, moderately hard, close, and takes a good polish, but it is not durable.

Weight about 40 lbs. per cubic foot. The timber once was considerably used for tea-boxes. It is suitable for packing cases or temporary work. The pores are large, oval, subdivided, and evenly distributed. Rays close, fine, bending near the pores, distinct. Rings very distinct.

Moderately common in wet ground, or by stream sides in the wet zone, up to about 1,500 feet altitude. Rare in the dry zone. Also found in the Andamans and Burmah.

CXIII.—LAURACEAE

A large and well-distributed order in Ceylon represented by—

1. Cryptocarya
2. Beilschmiedia
3. Cinnamomum
4. Machilus
5. Alseodaphne
6. Actinodaphne
7. Litsea
8. Lindera
9. Hernandia
10. Cassytha

numbering 33 species, of which 23 are endemic, the latter extending to our highest altitudes. A peculiar feature of our *non*-endemic forms is that they mostly occur at our lower elevations.

No. 405. **CRYPTOCARYA WIGHTIANA** Vol. III. p.439

Gal-mora, or *Golu-mora, S.*

A large tree with broad crown. Branchlets rusty. pubescent. Bark rather thick, dark. Leaves alternate, variable in size, 2 to

6 inches, oblong-oval, or oval, rounded or slightly acute at base, tapering to an acute apex, shortly acuminate, entire, margins somewhat recurved at base, smooth above, pubescent below, with considerable reddish pubescence on the midrib and veins below; dark above, much paler below. Petiole about ½ inch Midrib conspicuous below, distinct above. Lat-veins subopposite, oblique, depressed above, prominent below, up to 10 in number. Flowers yellowish, small, numerous, in axillary spreading rusty panicles. Perianth-tube terminating in 6 segments. Stamens "9, in three rows." Anthers introrse, except in third row, where they are extrorse. Style large. Fruits nearly spherical, almost completely embedded within perianth-tube, smooth, purplish-black, about ½ inch.

Wood dull yellow, hard, rather heavy, used for constructional work, moderately durable, suitable for rafters. Occurs in the western parts of the country up to 3,000 feet in moist forests. Not very common. Also found in the Western Ghats of Southern India.

No. 405 A. **C. MEMBRANACEA** Vol. III. p. 439.

Gal-mora, and doubtfully named *Tawenna* by Trimen, but this latter name I have only found applied to *Palaquium petiolare*.

A fairly large tree with dull reddish-brown bark and thin, or slender stem. Twigs terminating in reddish pubescent buds. Leaves alternate, rather large, thin, about 6 inches long (or smaller), oblong, or oblong-lanceolate, tapered at base and apex, slightly waxy below, entire. Petiole short, ¼ inch. Midrib and venation generally prominent below; nerves "finely reticulate."

Flowers pinkish, offensive in smell, small, in axillary, short panicles. Fruits smooth, ovoid, purplish when ripe.

The wood is of a straw-yellow colour, close, dense, easily worked. moderately durable; suitable for sash-bars, picture frames, and light work.

This is an endemic species, rather common in places, but not generally so, and found up to about 2,000 feet.

I have obtained the best examples of this tree in the Bambarabotuwa and Gilimale forests.

No. 406. **CINNAMOMUM ZEYLANICUM** Vol. III. p. 440.

Kurundu, S. Karuva, T. Cinnamon, E:

A moderately large tree in its wild state, generally found as a bush when cultivated, as it is more convenient to "quill"

when a bush than if allowed to mature. Bark (in wild trees) dull reddish, rather hard, about ¼ inch thick. Twigs smooth, compressed, "buds finely silky." Leaves variable in size, opposite or nearly so, usually about 5 inches long, but sometimes considerably exceeding this length, ovate-lanceolate, or ovate-oblong, acute or subacute at base, acute or acuminate at apex, smooth, rather stiff, glossy, entire, very variable in colour when young, changing from a pale yellow to a rich brilliant pink before maturity.

Petiole ½ to an inch long, stout, curved, strongly aromatic. The leaf is 3 or 5 nerved, the nerves being nearly as conspicuous as the midrib, prominent below. Minor nerves fine. Flowers dull pale yellow, numerous, on finely pubescent stalks in axillary or sub-terminal panicles; small. Perianth persistent, short, silky (segments 6) enlarging round base of fruit. Stamens 9 in three series. Fruit ovoid, dark purple, rather fleshy.

The wood is rarely used, except after it has been "quilled;" it may be used for fuel or fence sticks. It is pale in colour, rather soft, not durable. The pores are irregularly scattered, simple or divided, fimbriated or plain. Rays close, fine, distinct. Rings distinct.

This plant affords the well-known spice that has been popular since the earliest ages. Its history in Ceylon is also associated with very early enterprize and treaties with Kandyan monarchs, as formerly the bark was collected in the forests, of which the greater part was obtained in the interior of the country. The Dutch, finding increasing difficulty in obtaining sufficient quantities of Cinnamon for their trade, were the first to cultivate it, their Collector in the Colombo district (De Koke) suggesting to Governor Falk (in 1765) that it might be grown on the Dutch Company's lands. De Koke's suggestion was at first discouraged, but later Mr. Vandergraff continued the experiment made by De Koke, and Cinnamon plantations became established in the western part of the Island. The yearly consumption by the Dutch is estimated to have been as much as 5,000 bales of 80 lbs. weight each, and in early British times the Ceylon Government contracted with the English East India Company to deliver 400,000 lbs. of Cinnamon annually for £60,000, an important asset in the early stages of our colonial revenue. The trade, however, appears to have fluctuated a good deal, as the exports fell considerably in 1842, but thereafter it again revived, reaching as high as 7,700,560 lbs. in 1919, when the total value for quills and chips exceeded 3½ millions of rupees.

Apart from the commercial uses of the bark, *Camphor* is obtained from the root, and Cinnamon oil is obtained by distillation from the leaves as well as the bark, and a substance known as "Cinnamon Suet," used in the manufacture of scented candles, is extracted from the fruit.

In its medicinal uses, Cinnamon is employed as a cordial. and a stimulant, besides being regarded as an antiseptic and astringent. The oil is used in toothache, neuralgia, and headaches.

In a wild state, it now occurs sparingly in our central and western districts, and rarely in the dry country. Also found in the Western Ghats of Southern India.

No. 407. **C. CITRIODORUM** Vol. III. p. 443.

Pengiri-kurundu, S.

A small tree with thick, smooth pale bark and wide branches. Ends of twigs and shoots faintly hairy. Leaves *not* tri-nerved, small, opposite or sub-opposite, about 2 to 3 inches long, lanceolate or narrowly oval, tapering at base and apex, glabrous, stiff, shining above, entire, paler below than above. Petiole short, bitterish, and faintly lemon-flavoured and scented, about ½ inch long.

Midrib conspicuous below, distinct above. Lat-veins inconspicuous, rather indistinct. Flowers greenish, small, on short stalks in spreading panicles. Fruits oblong, seated within enlarged hardened cup or perianth-tube, about ½ inch long, deep purple, smooth.

Wood pale yellow, light, moderately hard, suitable for small panels, sash-bars, window frames, etc.; but unsuitable for exposed work.

Occurs in the Ratnapura district, in the Belihuloya valley, in moderate abundance. It is endemic.

I have seen this timber used for tea chests.

No. 408. **MACHILUS MACRANTHA** Vol. III. p. 443.

Ululu, S.

A large erect tree with cylindrical stem, rather markedly buttressed at base. Bark thick, rough, brownish, or ashen. Young parts and shoots smooth and glossy. Leaves alternate, rather clustered at ends of shoots or branches, about 5 inches long, oblong-lanceolate, sometimes unequal at base, otherwise tapered, rounded or obtuse at end, entire, very smooth above, more or less waxy below. Petiole about 1 inch, rather oblique with axis of branch. Lat-veins inconspicuous, nerves

finely netted. The leaves if crushed are faintly aromatic. Flowers light yellow, compartively large, arranged in numerous panicles at the ends of the branches. Flower-stalk short, pubescent. Perianth short, tomentose, 6-segmented, reflexed; persistent. Stamens 9, in three series. Anthers extrorse, 4-celled, filaments of third row with two glands. Fruits smooth, about ½ inch long, green, spotted with white.

Wood pale-yellow, close-grained, easily worked, smooth, about 35 lbs. per cubic foot. Suitable for ceilings, dadoes, and cabinet panels, but will not stand exposure.

At one time this was a very favourite wood for tea chests, but owing to its scarcity it is now less used. Fairly common in the wet-zone forests in the west of the Island, particularly in the lower hills of the "Peak" range. Also occurs in the western portion of Southern India.

No. 409. **ALSEODAPHNE SEMECARPIFOLIA** Vol. III. p. 444.

Wewarana, S. Ranai, Yarvaranai, T.

A very large tree with dense crown. Bark thick, longitudinally furrowed, dark yellowish-brown; young shoots smooth, much lenticelled.

Leaves crowded at ends of branches, rather variable in size, from 5 to 6 inches long, oblong-lanceolate, or oblong, tapering at base, obtuse or rounded at apex, entire, glossy dark-green above, usually waxy below, rather disagreeable in smell when crushed. Petiole variable in length from ¼ to 1 inch. Midrib distinct below. Lat-veins variable, reticulation close, complex. Flowers yellowish-green, on long stalks, in thin axillary panicles, considerably longer than the leaf. Perianth deciduous, deeply cleft, 6-segmented. Stamens 9, in three series. Anthers 4-celled. Fruits large, about 1 inch, ellipsoid, smooth, on a dilated stem, dark purple, much eaten by pigeons.

The wood straw-yellow when quite dry, slightly clouded, close, even, durable, taking a fine polish. Weight from 50 to 63 lbs. per cubic foot. The timber is much employed in house-building and is considerably exported to India for that purpose. It is said to resist Teredo, and for that reason is used in boat-building.

In structure, the pores are round, irregular, rarely confluent. Rays fine, narrow, pale, close, frequently in pairs. Rings pale, rather indistinct.

This fine tree is common in the dry zone, some of our largest trees being found in the Habarana country, and in the

Trincomalee district, and in the forests round "Westminster Abbey."

Occurs in Western South India.

No. 410. **ACTINODAPHNE SPECIOSA** Vol. III. p. 448.

"Elephants' Ears" of Europeans.

A moderately tall, slender tree. Bark greyish, thick, rather smooth. Stem cylindrical. Young parts and branchlets densely "covered with rufous tomentum;" buds silky. Leaves opposite (the only opposite-leafed member of the genus) or in 3s; large, from 5 to 10 inches long, broadly ovate, acuminate, entire, often with recurved margins.

Petiole stout, more or less pubescent. Midrib and lat-veins strongly prominent below, depressed above, the whole of the venation below being covered with a reddish-orange velvety tomentum, especially bright in fresh leaf. The curious "hanging" of the leaves appears, in addition to their shape, to have originated the name "Elephants' Ears."

The flowers are yellowish-brown, arranged in short-stalked, woolly, axillary clusters, dioecious. The perianth is tomentose and its segments deciduous. In the male there are 9 stamens, and in the female, 9 staminodes. Anther-cells introrse. Fruits small, $\frac{1}{4}$ inch, ovoid.

The wood is pale straw-colour, close, smooth, easily worked up, suitable for small fittings, sash-bars, brackets or panels, but rarely found in wide pieces.

This endemic is abundant in our high-level forests, and is apparently gregarious.

No. 411. **LITSEA TOMETOSA** Vol. III. p. 449.

Kosbedda, Landittan, Wal-kos, S. Pandali, T.

A tall, straight, erect tree with rather slender stem. Bark thin, pale, smooth. Crown rather small, branchlets short, thick, yellowish, tomentose, ending in a conspicuous bud with pubescent bud-scales.

Leaves rather crowded but alternate in arrangement, large, from 4 to 12 inches long, ovate or elliptic-lanceolate, acute or tapered at base, shortly acuminate, entire, glabrous above, very velvety-tomentose below, pale yellowish white below. Petiole stout, nearly 1 inch long. Midrib very prominent below; lat-veins 10 to 15 pairs, distinct, rather depressed above. Flowers light yellow, dioecious, moderately small, on hairy stalks. Flower-heads solitary. Perianth-tube short, hairy, not

segmented. Stamens in the male 18 to 20, with long hairy filaments. In the female the staminodes are strap-shaped, numerous. Fruit nearly ½ inch in dameter, spherical ("depressed globose"), smooth.

The wood when newly cut is yellow, becoming straw-yellow when well dried, very wavy in grain, stringy, difficult to work, rather heavy. Timber suitable for rafters, reepers and wall-plates. At one time was in demand for tea-box materials.

I have no notes of the weight per cubic foot. In structure the pores are round, rarely divided, open and evenly distributed. Rays distinct, broad, close, parallel.

Locally abundant in the wet zone, up to about 4,000 feet. The largest examples I have seen were from the Bambarabotuwa and Gilimale forests. Also occurs in South India.

No. 412. **L. CHINENSIS** Vol. III. p. 449.

Bomi, Bombi, S. Elumpurukki, T.

A fairly large tree, with pale brown bark, silky twigs, and slender branches. Leaves crowded at ends, variable 2 to 6 inches, long, elliptic-lanceolate, or oblong-oval, tapered at base, more or less obtuse, entire, glabrous, sometimes slightly pubescent below, rather thin. Petiole ½ to 1 inch. Midrib prominent. Lat-veins 8 to 12 pairs, conspicuous, joined by finely netted reticulation.

Flowers pale greenish-yellow, crowded, "arranged in axillary stalked corymbs or umbels." Perianth-tube softly hairy, long, not segmented. Stamens in male flowers 20, hairy, with long-stalked glands. Fruits spherical, smooth, purple.

Wood reddish-brown in colour, even in grain, moderately hard, close, takes a good polish, but has to be carefully seasoned to avoid warping. Very suitable for roofing, flooring-boards and ceiling, but will not stand extremes of wet and dry exposure.

Fairly common in both zones up to 4,000 feet altitude. The inner bark is soft and glutinous, and is used for bruises and sprains. A belief exists in the East of Ceylon among the Tamils that if a bandage is made of the leaves and bark of this plant, and tied over a fractured bone, in less than an hour the broken bones will unite. The Tamil name is derived from this belief.

Dr. Dey records its bark as a popular Indian native medicine, as a demulcent, and emollient.

It occurs also in India, Malaya and China.

No. 413. **L. ZEYLANICA** Vol. III. p. 454.

Kudu-dawula, Dawul-kurundu, S. Wild Cinnamon of Europeans.

A tree. Bark grey, smooth, rather thick. Branches slender, terminating in many finely pubescent twigs. Leaves rather crowded, about 5 inches long, lanceolate, tapering to base and apex, entire, smooth; waxy below in immature leaves, slightly aromatic. Petiole nearly 1 inch, slender, very finely pubescent in its early stage, becoming smooth with age. Leaf strongly 3-nerved at base; nerves oblique. Minor nerves closely netted. Flowers small, pale yellowish-white, often with a faint greenish tinge, arranged in axillary fascicles. Heads 4 or 5 flowered. Perianth-tube silky, 4 (or 5) lobed, the segments acute. In the female flowers the pedicels lengthen, terminating with the ovoid, small, purple fruit.

The wood is of a pale orange-yellow colour, sometimes tinged with green, close, moderately hard, and takes a fine polish. The timber is excellent for panels, dadoes, ceilings, sash-bars, and cabinet work, as it is easily worked. Very handsome if French-polished, especially if sawn obliquely with the axis. Weight 36 to 45 lbs. per cubic foot. Pores small, evenly distributed. Rays fine, close, many. Rings distinct.

Rather widely distributed in Ceylon in the western half of the Island. Also occurs in South India, Malaya and Burma.

A closely-allied form to the above occurs near Bibile and Monaragala, but I have insufficient material to identify it. In this the stems are stout, rather crooked, and shorter than in *Litsea Zeylanica*. It, like the above, is locally called *Kudu-dawula* by the Sinhalese.

No. 414. **HERNANDIA PELTATA** Vol. III. p.456.

Palatu, S. "Jack-in-a-box," E.

A slender, erect tree. Bark pale brown, thick, rather smooth. Branchlets stout, finely sparse-hairy.

Leaves alternate, large, 4 to 8 inches, "broadly ovate," acute at apex, peltate at base, entire, rather stiff, glossy green above, paler below. Petiole long, about 6 inches, smooth, swelled at base. Veining palmate, strong, prominent.

Flowers white, of complex structure; they are in threes, of which the central is a female, which last is supported round its base by a cup-shaped involucel that enlarges and thickens when in fruit. The perianth-segments are 8 in the female, 3 to 6 in the male. Stamens 3 in the male, and 4 staminodes in the female. Filaments in male with 2 glands. Anthers 2-celled.

Fruit about 1 inch, ovoid, and corrugated with ribs. Cotyledons fleshy.

Wood is pale greyish, soft, light, but not durable, only used for very temporary work. Pores rather large, in scattered patches. Rays very fine, numerous. The bark, seed and young leaves are purgative. The juice of the leaf acts as a depilatory, destroying hair painlessly.

Occurs in the south of Ceylon, near the sea-shore, from Matara westwards. Also in the Maldives, Malaya, Philippines, Madagascar and North Australia.

Of the cultivated members of the order, the most familiar is the "*Avocado pear*" (*Persea gratissima*), or as it is sometimes called "Alligator-pear." This is a Tropical American plant, and has become naturalised in Ceylon, where it is known to the Sinhalese as *Et.pera or Rata-pera.*

The *Camphor tree* (*Cinnamomum Camphora,*) "Kapuru" in Sinhalese, is another introduction and is a native of South China. It was introduced to Ceylon in 1852, and its cultivation at high altitudes was at one time seriously attended to, but the interest in this product does not, in later years, seem to have been great, though the plant undoubtedly thrives well at high elevations. The yield of Camphor in Ceylon is about one per cent. of the weight of young leaf.

CXV.—THYMELAEACEAE

The order is represented in Ceylon by 4 genera, viz.

1. Wikstroemia
2. Lasiosiphon
3. Phaleria
4. Gyrinops

with one species in each.

No. 415. **GYRINOPS WALLA** Vol. III. p.460.

Walla, S.

A slender tree, rarely growing to any large size. Crown dense. Bark thin, brownish-grey, smooth, easily detached, and naturally renews itself after stripping.

Leaves alternate, about 4 inches long, narrowly oblong, or oblong-lanceolate, tapering at base, shortly acuminate, entire, rich apple-green above, pale below, drying to a light brown. Petiole short. Midrib not very conspicuous above. Lat-veins many. Stipules absent.

Flowers pale yellowish, or yellowish-white, few, in "shortly stalked umbels," axillary, bisexual. Perianth pubescent, short, 5-segmented. Stamens 5, bracts hairy, quickly

falling. Ovary 2-celled, stalked, containing one pendulous ovule in each cell. Fruit a capsule, brown, pointed. Seeds pointed, hairy.

The wood is nearly white, soft, light, and suitable for inlaying in fancy cabinet work. The bark is thin, flexible, and very tough; much used by the poorer classes in lieu of string.

This endemic is common in the wet zone up to about 4,000 feet; often found in old chenas and stream belts.

The plant deserves consideration as a possible source of a material for hat manufacture, fine mats, or cigar pouches.

CXX.—EUPHORBIACEAE

This enormous order counts as the sixth largest in Ceylon, containing as it does 43 genera, and 130 species, of which, so far as have yet been catalogued, 45 are endemic. Forms varying from minute herbs up to very large trees come within the order, while altitudinally, the members extend from the sea coast to our highest mountain tops. Many important introductions belonging to the order occur here, of which it is only necessary to refer to "*Para Rubber*" (*Hevea brasiliensis*) brought here in 1876, and now planted over upwards of 400,000 acres of the country; not to mention the "Ceara" (*Manihot Glaziovii*), and the well-known food product "*Cassava*" (*Manihot utilissima*), so abundant in village gardens.

Our Genera consists of:—

1. Euphorbia
2. Sarcococca
3. Bridelia
4. Cleistanthus
5. Actephila
6. Agyneia
7. Sauropus
8. Phyllanthus
9. Glochidion
10. Flueggea
11. Breynia
12. Putranjiva
13. Hemicyclia
14. Cyclostemon
15. Mischodon
16. Aporosa
17. Daphniphyllum
18. Antidesma
19. Jatropha
20. Croton
21. Givotia
22. Trigonostemon
23. Ostodes
24. Blachia
25. Dimorphocalyx
26. Agrostistachys
27. Chrozophora
28. Acalypha
29. Adenochlaena
30. Trewia
31. Tragia
32. Podadenia
33. Claoxylon
34. Mallotus
35. Cleidon
36. Macaranga
37. Homonoia
38. Dalechampia
39. Gelonium
40. Chætocarpus
41. Sapium
42. Excæcaria
43. Sebastiania

No. 416. **BRIDELIA RETUSA** Vol. IV. p. 10.

Keta-kela, *S.* *Mul-venkai*, or locally *Arna-mulli*, *T.*

A moderate-sized deciduous tree, rather short in the stem, erect. Bark pale brownish, smooth, sometimes armed with a few spines in young trees. Twigs pubescent.

Leaves alternate, rather variable in size, about 5½ inches long, ovate-oblong, rounded or subcordate at base, abruptly and bluntly rounded at apex, or emarginate, entire, rather thin, very *Dipterocarp-like*. Petiole ½ to ¾ inch long, swelled, curved. Midrib strong, pronounced. Lat-veins about 16 pairs, opposite, or sub-opposite, prominent below, parallel, uniting within thickened margin. Minor nerves parallel. Under surface of leaf sparsely hairy with short hairs on the nerving.

Stipules opposite leaf-stalk, about ½ inch, lanceolate, slightly reflexed, persistent for about the first ten leaves from the end, finely hairy.

Flowers greenish-white, tinged with red within, in small axillary dense clusters, dioecious. Disk of the female flower double, the inner 5-lobed, the outer lining the calyx-tube. Bracts acute, deciduous. Calyx segments 5; Petals 5, inserted on calyx. Stamens 5. Filaments joined below. Ovary 2-celled, with 2 ovules in each; Styles short, forked. Fruits round, about ¼ inch, purplish when ripe, much eaten by pigeons.

Wood pale grey, brownish, or olive, very close, hard, durable, and resists white ants. It is capable of taking a high polish, but rather difficult to work. The timber is much used in house building, carts and agricultural implements. Weight from 45 to 50 lbs. per cubic foot. Pores small, regular, sometimes in radial lines; Rays rather broad, numerous. Rings distinct.

Fairly common in the wet zone up to 2,500 feet altitude, but occasionally found in the intermediate zone.

No. 417. **B. MOONII** Vol. IV. p. 11.

Pat-kela, S.

A small tree hardly to be distinguished from the last, except that the leaves are distinctly longer, and the fruits more ovoid. The timber is in all respects as good, but lacking in gloss. I suspect it to be a variety of *B. retusa*, and the Sinhalese name to be a local one.

No. 418. **PHYLLANTHUS EMBLICA** Vol. IV. p. 19.

Nelli, S. Toppu-nelli, T. Emblic Myrobalan, E.

A small tree, with generally a much bent, or contorted stem and tangled branches. Bark dull grey, or reddish-grey, scaled and irregular, with occasional large nodular projections that produce whippy branchlets.

Leaves numerous, nearly or quite overlapping, small, about ½ inch long, very narrow or linear, glabrous, entire, darker above than below, rounded at base, nearly acute at apex. Stipules very small, sharp. Petiole very short. Midrib fine. Veins inconspicuous.

Flowers greenish-yellow, the males small and very numerous, in axillary clusters and with slender stalks; the females few, almost stalkless. Calyx-segments, in male 6, oblong, Stamens 3. In the female the ovary is surrounded by a cup-shaped, toothed disk. Ovary 3-celled. Styles doubly bifid. Fruit large, about ¾ inch in diameter, pale olive colour, fleshy, obscurely furrowed, astringent in flavour. Seeds 6.

Wood red, or reddish-brown, close-grained, hard, durable, but splits. Weight about 49 lbs. Pores small, evenly distributed, open, or divided. Rays rather broad, moderately close. Rings indistinct. The timber is rarely used, as it cannot be got in large pieces or even sizes. Weight about 42 lbs. per cubic foot.

The acid fruits afford a powerful astringent, which, when unripe, contain about 35 per cent of tannin, and are employed in medicine. Dr. Gunawardana states that the fruit, bark and leaves are used in a large number of diseases that include dysentery, anaemia, jaundice, etc. The fruits make an excellent preserve.

The plant is generally found in Patana lands, below 4,000 feet altitude, and is fairly common. Also in India, Burma, Malaya, and China.

No. 419. **PUTRANJIVA ZEYLANICA** Vol. IV. p. 35.

Pelan, S.

A large, lofty tree, with smooth, pale greyish bark. Branchlets and young parts quite smooth, terminal buds gummy. Leaves 4 to 5 inches long, oval or oval-lanceolate, slightly unequally bladed, tapered at base, shortly acuminate or cordate-acuminate at apex, entire; margins wavy, glossy above, smooth. Petiole short, ¼ to ½ inch, smooth. Under surface of leaves dotted with waxy glands.

Flowers yellow, small, the males numerous in axillary clusters. females up to three together. Sepals in males 2, in females 4. Stamens 2 or 3. Ovary densely pubescent, 2 celled. Fruit ovoid, tomentose. The stones are polished and used as beads (*Hooker*).

The wood is hard and close-grained, but little used, probably owing to the rarity of the plant, which occurs very sparingly in the Kitulgala country.

No. 420. **HEMICYCLIA SEPIARIA** Vol. IV. p. 36.

Weera *Wira, S. Virai, T.*

A moderately large tree, with very much grooved stem, more or less buttressed at the base. Bark pale grey, and dull white, smooth, rather thin. Branches very irregular, often clustering and sending up erect shoots. Twigs numerous.

Leaves alternate, very variable in size, about 2 inches long by 1¼ wide, ovate, or broadly oval, sub-cordate at base, rounded at apex, entire, stiff, dark glossy-green above, dead green below. Petiole very short, wrinkled. Midrib prominent below, distinct above. Lat-veins very indistinct, slightly raised above. Stipules absent. Young buds faintly hairy. Flowers small, pale yellowish-white, apetalous. Males in axillary clusters, females nearly stalkless. Stamens in males 6, or more, inserted on the disk, slender. Fruits small, bright red, very sweet, much eaten by bears.

The wood is very pale, yellowish-white, or white, very close, even-grained, moderately light. Owing to the very deeply grooved nature of the stem, large regular pieces of the wood cannot be obtained, hence the timber is rarely used for any other purpose than fuel.

Exceedingly abundant, and almost the characteristic tree of the dry zone, where it grows gregariously.

Both Hooker and Brandis (who probably quotes the former) speak of this common tree as a "shrub"—an entirely mistaken idea, so far as Ceylon examples are concerned.

Occurs in the Carnatic and the Deccan.

No. 421. **MISCHODON ZEYLANICUS** Vol. IV. p. 38.

Tammana, S. Tampanai, T.

A rather slender, much-branched tree. Bark rough, brown, or red-brown, hard. Branchlets quadrangular, finely pubescent when young. Leaves in clusters, drooping, exceedingly variable in length, ranging from 3 inches to 12 inches, generally narrowly lanceolate, acute or rounded at base, rounded or obtuse at apex, entire, glabrous, shining above, dark green when mature, a beautiful lake-pink in new leaf. Petiole from ¼ to 1½ inches long, smooth. Midrib prominent below, strong. Lat-veins about 14, much branched near margin, rather prominent below. Nerves very distinct.

Flowers small, yellowish-green, apetalous, dioecious, crowding in axillary panicles at ends of twigs. Sepals 5, 6, or 8. Stamens usually 6. Ovary 3-celled. Fruits 3-lobed, the lobes conical, dry. Seeds glossy brown.

Wood hard, durable, withstands moisture, of a pinkish colour, and close-grained. The timber is excellent for house-building.

Confined to the dry country, and usually found near rivers and on stream banks. Also found in South India. Tamankaduwa is said to derive its name from this plant.

No. 422. **APOROSA LATIFOLIA** Vol. IV. p. 39.

Kampotta, Pepeliya, Mapat-kebella, S.

A moderately large erect tree. Bark pale brown, rather papery. Twigs stout, leaf-scarred. Leaves crowding, erect, large, about 4 to 7 inches long, broadly ovate, rounded or cordate at base, obtuse or round at apex, entire, stiff, dark shining green above. Petiole up to 1 inch, stout. Midrib stout, prominent. Lat-veins rather distant, prominent.

Flowers minute, males crowded in catkins, females in short stalkless clusters. Sepals in males, narrow, hairy. Stamens 2 (?). Stigma divided. Fruit about 1 inch, ovate, 3-valved, tapered to apex, and usually surmounted with dry remains of the styles. Seeds 3.

The wood is a dull greyish-white, close grained, but very quickly decaying. At one time the timber was considerably used for mine-props, but it is best suited for fuel.

A common tree in the Kalutara district, Kukulu Korale, and valley of the Ginganga. It is endemic.

CROTON AROMATICUS, Variety **B. LACCIFERUS.**

No. 423. Vol. IV. p. 48.

Keppitiya, S.

A much branched bush. Stems pale, cylindrical, brownish-grey. Branches dividing into simple forks, or clusters of 4, tawny, stellate-hairy on young parts.

Leaves alternate, rather distant, variable in size, from 4 inches by 3, to 6 inches by 5½, broadly ovate, rounded or shortly cordate at base, broadly acute at apex, finely or bluntly acuminate, more or less coarsely crenate-serrate, indentations irregular, stellate-hairy above, more closely so below on nerves.

Petiole long, 1½ to 2 inches, densely stellate-hairy. Midrib very prominent below, less so above, almost woolly with stellate masses. First pair of lat-veins basal, these branching towards margin; remaining lat-veins about 5 pairs, opposite and sub-opposite, stout, prominent below. Nerves parallel,

conspicuous below, distinct above, terminating in a wide netting within the margin. Two conspicuous yellow cup-shaped glands always occur immediately below the base of the first pair of lat-veins, smaller similar glands are occasional along the marginal indentations. When crushed or bruised the whole plant is faintly aromatic in odour.

Flowers greenish-white, in long terminal stellate-hairy spikes or racemes. Males with long or short stalks in clusters. Calyx veined, densely stellate-hairy outside. Petals 5, tipped with silky hair. Stamens 20, thus differing from the species, in which these number 30. Anthers large. Filaments short, finely hairy.

In the females, the styles split down to their base and persist on the fruit. Fruit depressed, globular, $\frac{1}{3}$ inch in diameter, closely coated with large and small masses of stellate-hair; calyx lobes persisting. Stones 3, hard, brown, smooth.

The leaves of this plant are often used for wrapping up balls of jaggery, and are also employed as a valuable mulch in Betel-vine cultivation.

The cut surfaces of the leaf-stalk, or young shoot-ends, I am informed, produce a rich yellow resinous wax (lac) that is used in painting upon wood.

Very common up to about 3,000 feet, and in the intermediate zone. Almost a gregarious plant, in places. Also occurs in South India.

The highly poisonous Croton of medicine (*Croton Tiglium*) is an imported member of this genus, and is found in native gardens in many parts of Ceylon. It is known to the Sinhalese as *Jayapala*, and *Nervalam* in Tamil. It is a drastic and dangerous purgative, the leaves as well as the seeds being alike poisonous. A small export of Croton seeds is still carried on in Ceylon.

No. 424. **GIVOTIA ROTTLERIFORMIS** Vol. IV. p. 50.

Puttalai, Vendule, T.

A medium-sized tree with rather uneven trunk. Bark thick, pale, furrowed. Branchlets and twigs stout, leaf-scarred, tomentose or scurfy or stellate when immature.

Leaves alternate, rather large, variable up to 8 inches long, ovate or broadly ovate, cordate at base, acute at apex, widely sinuate-toothed along margin, glabrous above, almost felt-like below with yellowish or tawny stellate tomentum. Petiole long, 4 inches, swelled at base, stellate-hairy, with

one conspicuous gland at the end. Veining palmate, very distinct, first pair of lat-veins basal, succeeded by 4 or 5 pairs of opposite veins, these forking once or twice. Nerves irregularly parallel, distinct above.

Male flowers small, in subterminal, long, erect panicles, yellow. Female flowers in short panicles. Bracts conspicuous, long, narrowly lanceolate and acute. Sepals 5. Petals longer than sepals, 5. Stamens 15 or more. Filaments hairy at base. Ovary stellate-hairy, 2; 3-celled with a single ovule in each. Fruit a drupe, about 1 inch long, ovoid, smooth, dull green; seed solitary, purplish brown with fleshy albumen.

The wood is white, extraordinarily light, only about 14 lbs. per cubic foot, soft, even in grain. The timber carves well, and is suitable for wooden toys or light packages.

Occurs in the dry zone only. I have found it near Kantalai, and again in the Hambantota District, but I suspect that it is an introduction. Also found in Mysore and Southern India. The seeds afford a fine soft oil.

No. 425. **DIMORPHOCALYX GLABELLUS** Vol. IV. p. 54.

Weliwenna, S. Tentukkai, T.

A small tree or large bush with wide-spreading crown. Stem rarely large, often irregular in outline. Bark reddish-brown, or greyish-brown, rather thin, young parts smooth. Leaves alternate, 3 to 5 inches long, oblong-lanceolate, tapering to base, sub-acute, entire or obscurely dentate, glabrous, dead green above, paler below. Petiole short, ½ inch. Midrib rather prominent, veining inconspicuous. Stipules short, triangular. Flowers, male and female, very unlike each other, white; males in "clusters on old wood," females 1 or 2 or 3 opposite to the leaf. Calyx in male cup-shaped, thin, narrowly 5-toothed; in female large, deeply cleft, oblong-lanceolate 5. Petals 5, larger in females. Stamens in two rows of 5, outer shorter than inner. Ovary 3-celled, one ovule in each. Fruit small, ½ inch or less, pubescent.

Wood dull-brownish, close, moderately hard, but rarely large. The timber is used for props and posts, and sometimes for rafters. It makes excellent fuel.

A remarkable superstition prevails in parts of the Eastern Province among village "Doctors," who allege that if the bark is removed by scraping it *upwards* it acts as an emetic, but if scraped *downwards*, it becomes a purgative!

No. 426. **AGROSTISTACHYS LONGIFOLIA** Vol. IV. p. 56.

Beru, S. Thirranai, T.

A small shrubby tree rarely more than 12 feet high. Stems cylindrical, straight. Branches stout, much leaf-scarred; young twigs and shoots resinous. Leaves crowding at ends of branches or shoots, erect, variable in size, 3 to 10 inches, narrowly oblong, much tapered at base, rounded or obtuse at apex, shortly acuminate, entire, stiff, hard, dark green above. Petiole very short or confluent to leaf-blade. Midrib strong, prominent, stiff. Lat-veins distinct, rather variable. Stipules broad, early-falling. Flowers small, white, or yellowish-white, in short racemes; males in few-flowered clusters, females solitary, or in twos on longer stalks than males. In males, calyx 3 (or 2) sepals: petals 5; stamens 10. In females sepals and petals 5; disk, lobed and large. Fruits small, under ½ inch.

Wood very pale, nearly white, inflammable dry or green. The timber is sometimes used for rafters in temporary buildings. Leaves are used in parts of Sabaragamuwa for thatching roofs, and are excellent for this purpose and very lasting. Also used for shading nurseries. Common at high altitudes, gregarious. Also occurs in Malaya and South India.

A second species of the above (*A. Hookeri*) known to the Sinhalese as *Maha-beru* or *Kunu-beru*, occurs in the very wet forests of S.W. Ceylon, and is an endemic form. It is easily distinguished from the last by its very long leaves, which often exceed 24 inches. It is usually found growing gregariously in wet ground. The leaves are sometimes used as in the last, but are not so durable.

CHAETOCARPUS CASTANOCARPUS

No. 427. Vol. IV. p. 74.

Hedawaka, Hedoka, S.

An erect tree with rather slender stem and large crown. Bark brownish, or greyish-brown, rather furrowed; young twigs smooth, thin. Leaves moderately large, alternate, about 2 to 5 inches long, ovate-oval tapering at base, shortly acuminate, entire, glossy dark green above, stiff, hard. Petiole short, ⅓ inch. Veining inconspicuous, close. Flowers minute, apetalous, in small axillary clusters. Males 4 to 5 sepals, usually 4. Stamens 8, united at base. Disc "a rim of small glands", red. Females with sepals as in the male; ovary 3-celled, with one ovule in each; style tri-fid. Fruit small, thickly coated with rigid sharp chestnut-red spinous prickles. Seeds black.

Wood reddish-brown (sometimes greyish) close grained, hard, dense, and very durable. Much improved by water-seasoning. Timber excellent for buildings, posts, beams or joists. Rather heavy, 56 to 58 lbs. per cubic foot.

Moderately common in the wet zone up to 2,500 feet elevation; abundant in the Ratnapura district. Also in Bengal, Andamans, Burma and Malaya. A second species—*C. coriaceus*—known to the Sinhalese by the same names as the above —is fairly abundant in the Kalutara district. It can readily be distinguished from the last by having tuberculed fruits instead of spines. Its timber is said to be equally durable and useful. It is endemic.

No. 428. **SAPIUM INSIGNE** Vol. IV. p. 76.

Tel-kaduru, S. Tillai, T.

A smallish deciduous tree, with cylindrical stem, not unlike the satin-wood tree in appearance. Bark rather thick, and yields a milky juice. Branches thick, leaf-scarred, rather glossy. Leaves crowding at branch ends, otherwise alternate, large, 7 to 8 inches long, usually narrowly oval, or oblong-lanceolate, tapering finely at base, acuminate, serrate, or crenate-serrate, glabrous, rich green above, paler below. Petiole 1 inch, stout, conspicuously marked with two large glands near the leaf base. Leaf-margins with occasional glands. Flowers green, males almost stalkless in clusters; females solitary, with 2 red glands at base, on stout terminal spikes, with males and females separate. Fruits 3-celled, numerous, ovoid, 1 to 3-lobed, at first fleshy, becoming dry before dehiscing. Wood greyish, spongy, very soft, light, about 28 lbs., suitable for floats. The juice is acrid and poisonous.

Moderately common in the dry zone only, abundant near Tissa. Also found in Bengal and Burma.

Of the more important introductions under this order, not separately described, the following deserve mention as being familiar as well as economic.

No. 428 A. **ALEURITES TRILOBA**

Tel-kekuna, S. Candle-nut, E.

A large tree, a native of the Pacific Islands. Common in native gardens up to about 3,000 feet. Affords a clear oil Timber used to be largely used for tea-boxes, but is very undesirable for such.

No. 428. B. **CODIAEUM VARIEGATUM**

The "Croton" of gardens all over Ceylon. Native of Java and Fiji. Popular in consequence of its beautifully coloured foliage.

No. 428. C. **RICINUS COMMUNIS**

Endaru, S. Amanakkam, T. Castor Oil, E.

Exceedingly common in both villages and estate gardens Wild in parts of Ceylon. Native of N. Africa.

No. 428. D. **SAPIUM (STILLINGIA) SEBIFERUM**

The Tallow Tree of Europeans.

A Chinese plant, the seeds of which are thickly coated with a fatty substance like tallow. Fruits eaten by birds.

CXXI.—URTICACEAE.

This is a large order in Ceylon, and includes some of our largest trees, as well as herbs and shrubs. The 27 Genera include no less than 62 species, of which only 8 are endemic. These endemics are mostly confined to low altitudes, one only ascending to about 4,000 feet, while a very rare form (*Elatostema Walkerae*) so far appears only to have been collected in Upper Ramboda.

OUR GENERA ARE:

1. Holoptelea	10. Phyllochlamys	19. Lecanthus
2. Celtis	11. Streblus	20. Pellionia
3. Trema	12. Dorstenia	21. Elatostema
4. Gironniera	13. Allæanthus	22. Procris
5. Ficus	14. Plecospermum	23. Bœhmeria
6. Antiaris	15. Fleurya	24. Chamabainia
7. Cudrania	16. Laportea	25. Pouzolzia
8. Artocarpus	17. Girardinia	26. Villebrunia
9. Taxotrophis	18. Pilea	27. Debregeasia

No. 429. **HOLOPTELEA INTEGRIFOLIA** Vol. IV. p. 80.

Goda-kirilla, S. Velayil, Ayil, T. The Indian Elm, E.

A large deciduous tree, elm-like with graceful drooping branches. Bark pale, almost ashen, conspicuously furrowed, exfoliating shoots, young parts and inflorescence pubescent, but otherwise smooth, and dotted with large pale lenticels.

Leaves alternate, horizontally spreading, large (except on small twigs) about 5½ by 3 inches, broadly ovate-oblong,

rounded or obscurely cordate at base, rounded and abruptly shortly-accuminate at apex, entire in mature leaves, serrate in young, glabrous above, dark green, paler, below, under surfaces slightly crisp with masses of minute glandular clusters. Pětiole about ½ inch, stiff, ashen grey. Midrib prominent below, distinct, pale above. Lat-veins about 6 pairs, arched or straight, ultimately arching within the margin; distinct above. Nerves distant; intermediate nerving close-netted. Stipules very thin, parchmenty. Flowers small, greenish, polygamous, in short racemes within the fallen leaf-scars. Perianth deeply-cleft, hairy, segments 4-8, usually 4. Stamens 8. Anthers pubescent. Stigmas 2. Fruit a winged "samara," nearly circular, about 1 inch in diameter, "notched at the top with two incurved teeth," veined. Seed flat.

Wood pale yellowish-grey, or (when freshly cut) creamy, smooth, easily worked, rather lustreless, fairly durable, light, 39 to 40 lbs. per cubic foot, suitable for indoor fittings, cabinet work, carving and carriage building. Pores large, completely filling the space between each pair of rays, evenly distributed, usually solitary, sometimes divided. Rays pale. Annular rings distinct.

A dry-zone tree, rather common, extending up to about 1,000 feet altitude. Fairly plentiful from Nalanda to Kantalai, and round Polonnaruwa. Also in India, Upper and Lower Burma and Cochin China.

No. 430. **CELTIS CINNAMOMEA** Vol. IV. p. 81.

Gurenda, S. Pi-nari, T.

A moderately large tree with pale or dull brown bark. Young parts or twig-ends tomentose. Leaves alternate, rather large, narrowly-ovate, tapering at base, finely tapered to apex, crenate or serrate on margins, smooth, dark green, strongly 3-nerved, with very distinct, wavy parallel veins. Petiole about ⅓ of an inch, rather slender. Stipules rather large, free. Young leaves, tinged with dull pink, thus adding to the resemblance of this species to Cinnamon.

Flowers small, greenish, polygamous, males in slender-branched cymes; females in thin axillary or terminal cymes. Sepals 4-5. Stamens 4-5 with erect filaments and minute anthers. Ovary on a hairy disc. Stigmas 2, deciduous, almost sessile. Fruit with a distinct "beaked tip," ovoid, seed nearly oval.

Wood pale or greyish, streaked with darker shades in irregular stripes of colour, rather hard, fairly durable. When freshly cut, or damp, the wood emits a most disgusting odour,

which makes the suggestive Sinhalese and Tamil names very fitting, though scarcely delicate. But for the offensive odour of the wood, the timber is suitable for boarding, rafters, etc. Pores small, more or less in masses near the annular rings, where they become distinctly smaller. Rays, fine, many, equidistant.

The wood is said to be medicinal in India, and also used "as a fumigatory against evil spirits."

Not very common, occurs in the damp forests and intermediate zones, from about 2,000 to 4,000 feet altitude, but I have nowhere found it plentiful. Rather partial to rocky forests.

A second species (*C. Wightii*) distinguishable from the above by its much longer and almost lanceolate leaves, occurs in Uva; but I have no notes as to its uses, or if it shares the same reputation as the last.

Both species occur in India and Malaya. The genus is well represented in temperate climates as well as in the tropics.

No. 431. **TREMA ORIENTALIS** Vol. IV. p. 82,
Gedumba, S. Mini, T. Indian Charcoal Tree, E.

A moderately tall, slender, smooth-stemmed tree, with thin, pale ashen-grey bark, and rather few branches. Branchlets and young parts slightly pubescent; olive-green. Leaves alternate, overlapping, variable in size, about 5 inches by 2, ovate-oblong, rounded or unequally cordate at base, finely tapering to acuminate apex, serrate, spinose-hairy above, sparsely silky-hairy below.

Petiole about $\frac{3}{4}$ of an inch, channelled above, finely silvery hairy. Midrib thin, prominent below, silky; depressed above. Lat-veins first pair basal, rebranching with much obliquely arched veins towards margin, where they form an almost continuous intramarginal vein that is joned with the second pair. Nerves parallel, and nearly horizontal. Midrib and veins tinged with rose-pink. Stipules nearly linear, or narrowly-lanceolate, ciliate on margins, deciduous.

Flowers minute, pale greenish-white, unisexual and bisexual "in small axillary cymose clusters." Sepals 4-5, finely pubescent, smaller in female flowers. Stamens 4-5, erect, styles short, incurved. Fruit a drupe, about $\frac{1}{4}$ of an inch in diameter, or less, at first pinkish, becoming black.

Wood pale, light reddish-grey, very soft, light (30 lbs per cubic foot) soon perishing, and much subject to wood borers. Affords a fine charcoal, burning with a minimum of ash, suitable for gun-powder. Bark moderately tough.

The plant is very rapid in growth, and is short-lived, suitable for shading nurseries and the like. Very common, and apparently growing spontaneously in newly-cleared lands in the vicinity of gardens up to about 4,000 feet.

No. 432. **GIRONNIERA RETICULATA** Vol. IV. p. 83.

Wal-munamal, S.

Having no material or notes, I quote from Trimen, who describes it as a tree 30 to 40 feet. Branchlets glabrous, verticillate, lenticillate. Young parts glabrous or sparsely hairy. Leaves 3 to 5 inches, oblong to ovate-lanceolate, acuminate base rounded or acute, smooth, glabrous, shining, and finely reticulate above, veins 10 to 12 pairs, spreading. Petiole ¼ to ½ inch, stipules connate, lanceolate, hairy, caducous. Male cymes shortly pedunculed. Female flowers solitary, axillary. Ovary glabrous. Fruit a drupe ½ to ⅓ inch, ovoid hardly compressed, stoutly beaked, glabrous.

Leaves dark, red-brown when dry. The wood is said to be hard, heavy, and useful for construction work. Apparently an intermediate zone plant, found from 1,000 to 3,000 feet above the sea. Occurs between Matale and Kurunegala. I have not met with it.

Also occurs in South India, Burma and Java.

No. 433. **FICUS BEGHALENSIS** Vol. IV. p. 36.

Maha-nuga, Nuga, S. Al-maram, T. Banyan of the Europeans.

An immense tree, with long, widespreading branches that produce aerial or adventitious roots. Bark smooth, pale ashen. Young parts greenish-grey, smooth, twigs leaf-scarred. Leaves alternate, large, 5—9 inches long, ovate-oblong, or broadly ovate, rounded or sub-cordate at base, often unequally lobed, more or less abruptly rounded to a broad acuminate apex; entire, glabrous, dark glossy green above, dead green below. Petiole about 1½ inches stout, flattened or grooved above, dull green smooth. Midrib stout, nearly equally prominent on both sides. Lat-veins 8 or 10 pairs, first pair basal, stiff, prominent below, raised above, looping and forming a continuous intramarginal vein. Nerves rather widely netted. Stipules large, conical, tapering to an acute apex, crisply hairy, stiff. Fruits dull coral-red (much eaten by barbets and flying-foxes), globose, pubescent, nearly sessile and supported by 2-4 bracts.

This tree is sacred to the Hindus, and frequently planted near Tamil "Kovils" on estates. The root-fibres are used in

decoctions, as blood purifying, and the milky juice, with which the whole tree abounds, is used in bruises, and applied externally. The bark is slightly astringent, said to be tonic, while a lotion made therefrom is employed in leucorrhoea. A paste made from the young or partially formed adventitious roots, is according to Dr. Gunawardana, given for obstinate vomiting.

Fairly abundant in the low-country, but not naturally a forest tree here. Very large examples are found near the coast, especially in the dry zone.

The development of the aerial roots deserves close scientific study, as these are by no means uniform. At Tangalla, for example, on one side of the bay, trees will be found with comparatively few aerial roots, while, on this opposite shore, they are abundant.

The timber of this plant is useless, and decomposes with great rapidity.

Common all over India.

No. 434. **FICUS RELIGIOSA** Vol. IV. p. 90.

Bo, S. Arachu, T. The Sacred Bo-tree, E.

A minute description of this well-known deciduous tree, sacred to and revered by devout Buddhists would be superfluous. It is the "Pepul" of India.

The introduction of the Bo to Ceylon is fully recorded in the XIXth Chapter of the Mahavansa, and thereby establishes that the great tree at Anuradhapura was brought to Ceylon with much religious ceremonial in B.C. 288. It is moreover, more than probable that this venerable and historic plant was, and possibly is, the parent of all the Bo trees found throughout Ceylon, where it is invariably associated with Buddhistic temples or shrines, the tree generally surviving after the shrine has fallen into decay. It occurs in many parts of the dry zone, but obviously as the result of introduction, and, as far as I am aware, it nowhere occurs as a forest tree.

Its bark and fruits have medical uses in certain preparations, such as mouth washes—a bark preparation—mild laxatives (fruit preparation) or astringents.

It also bears an indifferent *lac* of no importance.

The famous "Davie's Tree," which marked the tragedy of 1803 at Watapuluwa, was an immense example of this sacred plant. Curiously enough, this historical tree died one hundred years after the tragedy, leaving almost exactly on the same

spot a successor of the same species to shade a place of hallowed memory.

The wood is worthless.

No. 435. **FICUS CALLOSA** Vol. IV. p. 93.

Gonna, Wal-gonna, S.

A moderately large erect tree, without aerial roots. Bark pale white, or ashen, free from furrows. Branches few. Branchlets and twigs, pale greenish, slightly hispid and occasionally granulated, much scarred with fallen stipules and leaf scars.

Leaves large, alternate, up to 10 inches by 3, somewhat clustered at ends of twigs, ovate-lanceolate, tapered at base, abruptly rounded and shortly acuminate, the "tip" being rather sharply curved downwards, entire, smooth, glossy-green above, hispid below, in old leaves. Petiole stout, 1½ inches, thickened and faintly wrinkled and channelled above. Midrib prominent below, distinct but depressed above. Lat-veins up to 18 pairs, usually fewer, nearly opposite, straight at first, then arching with a distinct netting outside the arches, and within the recurved margin. An intermediate series of short lat-veins is distinct. Stipules large, about 1¼ inches long, narrow, faintly and sparsely hairy, early falling.

Fruits rather large, nearly globose, yellow.

The wood is pale, or slightly yellowish-white, soft, smooth, easily cut, moderately heavy, but not durable. It was at one time rather freely used for tea-boxes, but, except for very temporary packing materials, it is unsuitable as a timber.

Not very common, occurs in the wet zone up to about 2,000 feet, chiefly on the western sides of the Island.

Also in South India, Burma and Java.

No. 436. **FICUS HISPIDA** Vol. IV. p. 94.

Kota-dimbula, S. Pe-atiss, T. Sand-paper Tree, E.

A small tree or shrub, stem rarely attaining a girth of more than a few inches. Stems numerous, young parts usually hispid, dull brownish-grey. Branches few, rather crowded, slender hollow. Leaves opposite—a distinguishing characteristic of this species—very variable in size, 4 to 14 inches long, ovate-oblong, narrow and sub-cordate at base, gradually tapered to an abruptly acuminate apex, serrate-sinuate towards the apex, and generally unevenly so; spinous-hairy above, crisply hispid on veining below. Petiole

large, 1½ inches, stout, coarsely hairy, dilated below. Midrib stout, prominent below, hispid, distinct above. Lat-veins 5 or 6 pairs, the first basal and strongly branching outwards, prominent, depressed above. Nerves distinct, also depressed above, producing a bullate effect. Stipules large, 2 inches, stiff, semi-transparent, stiffly hispid, wide at base, somewhat ridged.

The "fruits" are scattered singly or in clusters on the stems, or often on the aerial roots close to the base of the plant. These are usually top-shaped, variable in size, from ½ to 1½ inches in diameter, roughly hispid, dull yellowish-green.

The leaves, well dried, afford a useful substitute for sand-paper for rough polishing.

The wood is small and useless. The seeds are said to be emetic, one drachm of the same reduced to a powder being effective.

The bark is likewise an emetic with a purging tendency.

Moderately common in wet forests up to 3,500 feet, and frequently found close to streams or in swampy ground.

Also occurs in India, Malay, Andamans and North Australia.

No. 437. **FICUS GLOMERATA** Vol. IV. p. 96.

Attikka, S. Atti, T. The Gular Fig, E.

A moderately large tree with pale smooth bark. Twigs cylindrical, faintly scarred with scars of fallen stipules and leaves. Leaves alternate, about 4 to 6 inches long, elliptical-oblong, acute at base, tapering to a finely or bluntly pointed apex, entire, rather thin, glabrous above, very slightly hispid (usually smooth) below. Petiole ¾ inch, channelled above, rather hispid. Midrib strong. Lat-veins about 6 pairs, first pair opposite, oblique. Nerves nearly pellucid, distinct.

Stipules about 1 inch, fine, acute, membranous, slightly hairy, early falling. "Fruits" shortly stalked on warts or "bosses" on old wood, often in copious masses irregularly scattered over the stem or larger branches, top-shaped, reddish, sometimes rose-pink, smooth or faintly pubescent.

The wood is greyish, soft, slightly mottled, light and not durable except under water. It is not used as a timber in Ceylon. The bark, root-juice, fruit, and leaf-galls are medicinal as astringents. The fruit is said to be used in diabetes, and a decoction of the stem juices is popular with the Tamils for this disease.

This is one of the "sacred trees," and was used in South India as a shade tree for coffee. Moderately common up to about 2,000 feet altitude and possibly introduced in some places. Also occurs in India and Burma. Plentiful in Assam.

The genus includes several important plants of which the *Assam Rubber* or Rambong (*F. elastica*) has been introduced into Ceylon. The latter is one of the sources of *India-rubber*, and was commercially well-known long before Hevea rubber was even heard of. It was introduced into Ceylon in 1835, but according to MacMillan, its seeds in this country are infertile, thus accounting for its not having been more freely grown here. The large specimens in the Royal Botanic Garden at Peradeniya, conspicuous for their enormous buttressed roots, are familiar to all visitors to this famous garden. The Fig (*Ficus Carica*) so well known in the Mediterranean countries, has been introduced into many of our up-country gardens, but, though it has been successfully grown, its fruits are not much relished in Ceylon. The wood, treated with a mixture of fine emery powder and oil, affords a useful razor strop.

No. 438. **ANTIARIS TOXICARIA** Vol. IV. p. 97.

Ritti, S. Netavil, T. The Upas Tree, E.

A tall, erect tree, with nearly cylindrical stem. Bark thick, somewhat nodular, pale greyish-brown. Twigs leaf-scarred, scabious at ends. Leaves alternate, rather variable in size, up to 8 inches, overlapping, ovate-oblong, or oblong, rounded at base, rounded or tapering to narrowly acuminate apex, entire, coated above with solitary rigid spinous hairs, more densely spinous-hairy below, the density varying with the size of the veins. Petiole short, densely spinous hairy. Midrib prominent below, raised above. Lat-veins 8 to 10 pairs, strong, prominent, nearly alternate, uniting within margin in wide arches. Nerves rather distant, parallel, prominent. Stipules short, conical, stiff, rigidly spinous-hairy, early falling.

Flowers—I quote from Trimen—males, 3 to 4 sepals, narrowly spathulate, stamens 3 to 8, filaments erect; females, perianth absent, ovary adnate to the involucre, style arms 2, ovule pendulous. Fruit globose or pyriform, $\frac{1}{4}$ to $\frac{3}{4}$ inch diameter, red-brown, one seeded.

The inner bark is tough and stringy; beaten into shape, it affords a sacking. It is also recorded that this material was used by the Veddhas as "a short skirt," and also as a temporary roofing during rainstorms. Wood pale in colour, nearly white, soft, even-grained, light, about 28 lbs. per cubic foot, suitable for package material.

Unlike the Javan form, the milk of our *Ritti* tree appears to be hardly poisonous, and its use for poisoning arrows, as far as I am aware, is unknown here.

In Java and Burma, on the other hand, the juice of the Upas is well-known as a deadly arrow-poison, its effects resembling that of strychnine. Some most extravagantly fantastic stories were at one time current with regard to the Javan Upas, such as that it was supposed to kill birds that perched on its branches, or beasts that rested beneath its shade. This myth has been disproved by the cultivation of the tree in gardens. The tree was shown to me in Borneo, and there called *Kaiu-Marti* or "the tree of death."

Its local distribution is wide, up to about 1,800 feet in the moist region, and extending to the confines of the dry zone. Not very common, but probably has been much exploited.

No. 439. **ARTOCARPUS NOBILIS** Vol. IV. p. 98.
Del, Bedi-del, S. Arsini-pelar, T. The Wild Bread-fruit Tree, E.

A very large tree with immense crown. Stem, stout, cylindrical, with large wide-spreading roots and boughs. Bark thick, dull-brown, often much coated with lichenous growths, irregularly furrowed, exfoliating in unequal scales or flakes. Twigs brown, or dull ashen-brown, leaf-scarred. Twigs studded with transverse rows of open lenticels. Leaves alternate, large, 10 to 18 inches by 7 to 12 inches wide, broadly ovate, oblique or abruptly tapered at base, rounded at apex to an abrupt deflexed tip; stiff; harsh, corrugated or channelled between the lateral veins; margins slightly sinuate, recurved, glabrous, dark green above, much paler below. Leaves of young plants deeply cleft, almost pinnatifid. Petiole large, stout, 1 to 1½ inches, often sparsely spinous. Midrib very stout obscurely furrowed, sparsely spinous, very prominent below, conspicuous above, yellowish. Lat-veins about 8 pairs, opposite or sub-opposite, broadly arching and uniting with the margins, occasionally spinous. Nerves strong, regular, conspicuous on both sides. Stipules large, thick, about 2½ inches, greenish outside, yellowish-white within, pointed, spinous-hairy, curiously soft within. Flowers monoecious, males in spikes, females dense, on a terminal or axillary club-like receptacle, 6 to 8 inches long. Seeds many, globose, about ½ inch in diameter, pale chest-nut brown.

The heart wood is dark yellow, quickly changing to a brownish shade. Sap-wood pale, nearly ashen, evenly grained; moderately hard, easily worked, durable, about 41 lbs. per

cubic foot, though in very old trees considerably heavier. Pores large, whitish within. Rays broad, short. Rings indistinct. The timber is much appreciated for fishing boats and canoes. Also occasionally used in house-building for rafters and beams, and for cabinet panels.

It is found in considerable abundance in the low-country up to 2,500 feet altitude, but much less common in the dry zone. The seeds, roasted, are much like chestnuts in flavour. The "milk" affords a crude gum. The species is endemic.

No. 440. **ARTOCARPUS LAKOOCHA** Vol. IV. p. 99.

Kana-gona, Kowudu-gona, S.

A moderately large deciduous tree. Bark about ½ inch thick, pale, ashen, moderately smooth, roughened by irregular small nodular masses. Branches slender; twigs few, much leaf-scarred.

Leaves alternate, 7 to 8 inches long, ovate-oblong, rounded at base, abruptly narrowing to a distinctly acuminate apex, margins recurved, strongly so at base; glabrous above, softly hairy below on nerves and veins. Young plants have the leaves serrate. Petiole 1 inch, stout, spinous hairy. Midrib stout, prominent below, distinct above. Lat-veins variable in number, sub-opposite up to about 12 pairs, at first straight, then arching and uniting intramarginally, conspicuous below. Nerves large, widely netted. Stipules large, conical, tomentose. Fruits solitary, yellowish-golden axillary, globose, about 1¼ inches in diameter, rough with crisp nodular masses, becoming soft on ripening, spongy within. Seeds few, flat, about ½ inch wide.

Wood, pale yellow heartwood, fading into white sapwood, soft, easily worked, light, about 35 lbs. per cubic foot. Pores large, surrounded with soft tissue; rays broad, distinct.

Occurs chiefly in the intermediate zone up to about 3,000 feet, and occasionally in the wet forests.

Also India, Andamans and Malaya.

No. 441. **ARTOCARPUS INTEGRIFOLIA** Vol. IV. p. 99.

Kos, S. Pila, T. Jak Tree, E.

A description of this most familiar cultivated plant is superfluous, as it is as common as the Coconut, and is almost as useful. The fruits attain an immense size, and frequently are to be found up to 75 lbs. in weight, and fifty in number, on a single tree!

No part of the Jak tree is useless. The timber is excellent for buildings, and is universally employed in Ceylon for furniture, as it is durable, easily worked, polishes and turns well, light (42 to 45 lbs. per cubic foot), and not subject to insect attack or dry rot.

At first, in colour, the wood is yellow, or lemon-yellow, gradually turning to a rich mahogany-brown, this colour intensifying in very old wood to a warm vandyke brown, with a rich lustre. The grain is even, clouded, and transversely etched with gold lines, giving the whole a most handsome appearance.

Pores rather large, uniform, rather oval, often sub-divided and surrounded with fine tissue. Rays narrow, distinct, rather close. Rings obscure.

The fruits afford ample food material to man and animals, while the seeds are much relished. The "milk" is applied, in swellings and abscesses, to assist in suppuration; the leaves afford fodder for cattle and goats, and are also used in skin diseases, while the root-bark is given in diarrhoea.

The wood affords a yellow dye, used for staining Buddhist priests' robes, obtained by boiling wood chips. Finally the latex is sometimes employed as a "bird-lime-gum."

Knox gives a very full and accurate description of the Jak tree and its fruit, adding that "these (the fruits) are a great help to the people, and a great part of their food"—a statement that applies in the present day.

The Jak is an introduction of great antiquity into Ceylon, and is not wild. "Escapes" are occasionally met with in rocky forests. In ordinary circumstances, if the tree is abandoned it will gradually die. I am well acquainted with instances of Coffee estates where Jak trees, carefully planted and preserved at one time, have died out after the properties came to be abandoned. In some cases, where the experiment has been tried of leaving a young Jak plantation to grow up without attending to the invading jungle, the whole plantation has died in a few years. High altitudes are unsuitable to this plant. The Sinhalese recognise different varieties by the fruit.

It is cultivated in India, Burma and Malaya.

The well-known *Breadfruit tree* (*A. incisa*) *Rata-del*, *S.*, *Era-pilakai*, *T.*, is another valuable member of this genus, and a native of the Pacific Islands. Its introduction here is of remote date, probably by the Dutch. Like the last, it is cultivated, and affords a very useful addition to the food of the people, and consequently is frequently met with in village gardens. Its timber is of no value.

No. 442. **STREBLUS ASPER** Vol. IV. p. 101.

Geta-netul, S. Pirasu, or *Perrai, T.*

A moderate sized tree, variable in outline of trunk, from much twisted to smooth and erect. Branches short, close, with tomentose or scabrid branchlets. Bark dull-grey or yellowish, smooth, said by the Tamils to be poisonous, a single drop of the latex being sufficient to "turn" milk.

Leaves alternate, extremely varied in size, from ½ to 3½ inches long by ⅓ to 1¼ inches wide, generally ovate, or ovate-lanceolate, or rhomboid, more or less acute at base, abruptly rounded to a shortly acuminate apex; margins unevenly crenate, sometimes distantly notched, stiff, nearly glabrous above, harshly hispid below. Petiole short, ⅛ of an inch, hispid. Midrib prominent below, inconspicuous above. Lat-veins 5 or 6 pairs, pronounced below, arching continuously within margin.

Fruits yellow, soft, ovate, seated within a large 4-lobed calyx, and tipped with filamentous bifid, persistent stigma. Seeds small, rounded, and with unequal cotyledons.

Wood, dull white or ashen, smooth, close, rather elastic and tough, suitable for curtain poles, rods and tool-handles; weight about 40 lbs. per cubic foot. Pores very small, enclosed in belts of soft tissue. Rays fine, even, numerous. Rings absent.

Common in the dry zone, and occasionally attaining a fair size. Often used as a hedge plant, or "boundary tree." Sometimes found near abandoned shrines, and is probably classed as "sacred."

Also occurs in Bengal, Central and South India, Malaya and China.

No. 443 **PLECOSPERMUM SPINOSUM** Vol. IV. p. 103.

Katu-timbol, S.

A small tree with thin, orange-brown bark, flaking off in irregular flakes or plates. Stems armed with stiff straight axillary spines. Branchlets pubescent. Leaves alternate, rather distant, about 3 inches long, oval, or oval-oblong, rounded or obtuse at base, rounded or acute at apex, stiff, glossy above; margins recurved, entire. Petiole short, ⅓ of an inch. Midrib distinct, smooth. Lat-veins slender, about 6 pairs, inconspicuous. Stipules very small. Flowers greenish, dioecious, Males close, 4-lobed perianth, stamens 4, females in larger dense heads, 4-toothed. Fruits fleshy, unevenly

shaped, containing few seeds. Cotyledons unequal, the larger enfolding the smaller.

Heart-wood orange-yellow, with pores containing a yellowish resin, very hard. Sap-wood pale greyish-white. The wood is used in India as a dye. The timber is unfortunately small, but suitable for tool-handles and ornamental cabinet work.

Occurs in both moist and dry-zone forests, fairly common.

Found in Nepal, Sikkim and South India.

No. 444. **LAPORTEA CRENULATA** Vol. IV. p. 105.

Ma-ussa, S. Devil-nettle, or *Fever-nettle E.*

A small shrubby tree rarely more than 10 feet high, with pale stems covered towards the ends with fine violently stinging hairs.

Leaves alternate, large, 8 to 14 inches long, oblong, or oblong-lanceolate, more or less rounded at base, and abruptly acuminate at apex; almost entire; dull greenish, finely hairy, especially on veins and nerves. Lat-veins numerous, up to 16 pairs, distinct, broadly arched. Petiole stout, long, up to 4 inches, hairy. Stipules very small.

Flowers pale greenish-white, unisexual, arranged in branched cymes. Male flowers with 4 or 5 sepals, and 4 or 5 stamens. Females with 3 to 4 sepals, acutely lobed. Style clothed at base with fine silky hair, stout.

This plant is perhaps the most powerfully stinging nettle in Ceylon, causing an intense burning sensation, if the sting is effected on any soft part of the body, its effects lasting for two or three days, and sometimes producing a high temperature.

A decoction, made from the leaves of this plant, by boiling, is said to be useful as a blister and counter-irritant in cholera.

Occurs in damp forests up to about 4,000 feet altitude, and generally in gregarious masses.

Also in South India, Burma and Malaya.

No. 445. **BOEHMERIA MALABARICA** Vol. IV. p. 113

Maha-diya-dul, S.

A small tree, or usually a shrub, with pale stem, (in old plants) and thin bark, smooth, pubescent at ends. Leaves "alternately large and small," opposite or alternate. The

larger up to 8 inches in length, oblong, or ovate-oblong, more or less cordate at base, tapering to an acute and marginally serrate apex; the rest of the margin for about $\frac{2}{3}$ being crenulate or unevenly serrate; under parts pubescent in variable density. Petiole very variable from 1 to 3 inches, rather slender. Midrib depressed above, prominent below. Lat-veins 3 pairs, first basal, long and oblique. Stipules small, quickly falling.

Flowers minute, "monoecious in small axillary clusters." Sepals in males 3 to 5; stamens 3. In the female the perianth is tubular, 3 to 4-toothed. Stigma fine and persisting. Fruit an achene, enclosed within the developed perianth.

This plant affords an excellent tough silky fibre, deserving of consideration as a material for fine fabrics. It is closely allied to the famous "china-grass," *Rhea* or *Ramie-fibre* plant (*B. nivea*), cultivated in China and Formosa for the sake of its fibre of high commercial value. With careful and mechanical methods of treatment, our plant might be of considerable importance.

It is fairly common in places. It affects deep rocky ravines and steep shady ground in the wet zone up to 4,000 feet.

Also in South India and Burma.

No. 446. **DEBREGEASIA ZEYLANICA** Vol. IV. p. 119.

Muda-kenda, S.

A large wide-branching epiphyte, growing on rocks or large trees. Stem short, early and copiously branching, pale, smooth, or obscurely furrowed. Young branches olive-brown, becoming pinkish at ends, finely hairy.

Leaves alternate, large, up to 11 inches by 9, broadly ovate, or nearly orbicular, cordate or ob-cordate at base, suddenly acuminate, entire, distantly spinous-hairy above, densely coated with a matted mass of greyish-silvery white pubescence below, giving a completely silvery appearance beneath. Petiole long, often up to 15 inches, pinkish, finely pubescent, faintly channelled. Midrib prominent. Lat-veins 4 or 5 pairs, first basal with strong outward branchings; remaining veins much curved. Nerves distinct below, hidden above, parallel. Young leaves slightly bullate, golden, or orange-pink. Stipules small, narrow, acute.

Flowers not seen. Fruits on stout branched cymes. The plant yields a very powerful, silky, tough fibre that is easily detached in long strips.

This endemic is fairly common in the wet forests of the Pasdun and Kukulu Korales, and in many parts of the Adam's Peak range up to about 2,000 feet altitude. Plentiful in the Kuruganga valley.

I have not found it as "a small tree", as recorded in Trimen, but always as an epiphyte.

CXXI. (A)—CASUARINACEAE.

No. 446A. **CASUARINA EQUISETIFOLIA** Vol. IV. p. 120. *Kasa, S. Chavukku, T. She-oak, Beef-wood, Whip Tree, E.*

A tall quick-growing erect tree, without leaves, but replaced with thin needle-like branchlets. "The male flowers are arranged in distinct whorls forming a spike, each stamen surrounded by 4 scales or leaflets. The female flowers are in dense axillary heads. Ovaries sessile. Styles 2, united at base. The winged nuts are collected in a cone hidden under the bracts." (Treasury of Botany.) Formerly this remarkable plant was classed as belonging to the *Coniferae*, but is now separated as a distinct order—*Casuarinaceae*.

The timber is excellent for fuel, hard, difficult to saw, heavy, liable to crack, rather handsomely marked.

It is used in Australia for shingles and for fencing. In Ceylon it is not much grown, though abundantly planted in the Madras Presidency for fuel. It grows well near the sea; occasionally found up-country, and sometimes employed as a windbelt. Coppices well.

Occurs from the Indian Archipelago to New Caledonia and in tropical Australia, where it is abundant.

CXXVII.—SCITAMINEAE.

This large order of important *Monocotyledonous* plants is represented by 14 genera in Ceylon, viz.:—

1. Globba
2. Curcuma
3. Kaempferia
4. Hedychium
5. Costus
6. Alpinia
7. Amomum
8. Zingiber
9. Cyphostigma
10. Elettaria
11. Clinogyne
12. Phrynium
13. Canna
14. Musa

affording a total of 37 species, of which 17 are endemic. Rich as the order is, as regards Ceylon, not many are native which

are of economic value. Introductions, on the other hand, increase its value by such familiar examples, as *Turmeric*, *Ginger*, *Arrowroot*, *Indian Shot* (*Canna indica*), or *But-sarana*, (with its many handsome-flowered varieties), *Plantain*, (Banana), *Manilla Hemp* and the curious *Travellers' Palm* (*Ravenala madagascariensis*), all of which have from time to time been brought from other countries to Ceylon.

As all of the foregoing are more or less familiar plants, a more detailed description of each is superfluous; but, for the guidance of the reader, a short note is here given to assist in identification.

No. 447. **CURCUMA LONGA** Vol. IV. p. 242.

Kaha, S. Manjal, T. Turmeric, E.

Tuberous rhizomes, bright yellow, closely clustered, transversely scarred, or grooved, waxy; plant about 3 feet high; leaves on rather slender stalks, obliquely parallel-veined.

Affords a much used addition to curries, giving it its characteristic yellow colour. It is stimulant and carminative, and is employed to relieve sprains, and, inhaled, is reputed to be of value in catarrhs.

It is also used for dyeing purposes.

No. 448. **ZINGIBER OFFICINALE** Vol. IV. p. 258.

Inguru, S. Inji, T. Ginger E.

Rhizomes generally slender, more or less dividing into finger-like shoots. These are highly pungent, and afford a characteristic odour.

Plants about 2 feet high, with thin, narrow alternate leaves. The rhizome is much used in domestic medicine, as it is aromatic, carminative, and stimulant. The tincture is an important officinal preparation. The popular preserve is best known as a Chinese product, and it is to be deplored that more attention has not been shown to the cultivation of this common garden plant in Ceylon for extended commercial use.

No. 449. **MARANTA ARUNDINACEA**

Hulan-Kiriya or *Araluk, S. Kua-mau, T. Arrowroot, E.*

Tuberous roots given out irregularly, pale in colour, about 8 inches long, and abruptly tapered at ends. Stems in small clusters, rather compressed at base. Leaves ovate, pointed at apex.

The tubers afford the well-known farina (arrowroot) of commerce, so largely used as an invalid diet.

The plant is a native of the West Indies, taking its name of arrowroot from the fact that it was used as an antidote to arrow poison.

It should not be confused with "Queensland Arrowroot" which is derived from a species of *Canna* (*C. edulis*).

No. 450. **MUSA SAPIENTUM** Vol. IV. p. 266.

Kehel, S. Valai, or Valapalam, T. Plantain, Banana, E.

This popular food-plant is cultivated throughout Ceylon, except in those places where the altitude is too high, or the soil too dry. Its place of origin is probably unknown, but its use as a food is appreciated throughout the greater part of the world.

Many varieties are known in Ceylon as cultivated forms, of which probably the most popular are the *Koli-kuttu*, *Suwandel* and (for cooking) *Alu-kehel*.

The *Manilla Hemp* (*M. textiles*) or "Abaca fibre" is obtained from a Philippine species of Plantain, but though the plant has been grown in Ceylon, more as a curiosity than anything else, it does not appear to have attracted serious commercial interest.

No. 451. **ELETTARIA CARDAMOMUM** Vol. IV. p. 261.

Ensal, S. Elam, or *Ellakai, T. Cardamom, E.*

A moderately tall, dense-growing plant with woody root-stock. Stems spongy, about 8 to 10 feet. Leaves long, narrowly lanceolate, finely tapered to an often unequally bladed base. Lat-veins oblique, parallel, prominent above, sparsely pubescent above. Softly pubescent below. The procumbent flowering shoots start from near the base, often growing to a length of 2 feet, in single or many spikes, these in turn bearing the capsules that are so familiar.

Some doubt still exists as to whether the Ceylon plant and the Mysore plant are identical; but, according to experienced Mysore planters, the Mysore form is distinct from the *Malabar* plant, which last was the parent of the Ceylon species.

The Cardamom has been known as a Ceylon spice from a very early period. The Dutch traded in it, and as early as 1806 it was of sufficient importance to figure in our list of exports. It is employed in medicine, and as a condiment and a masticatory, and is mentioned as early as Pliny's time.

CXXVIII.—HAEMODORACEAE.

The order is represented in Ceylon by two genera only, viz.: 1. OPHIOPOGON and 2. SANSEVIERIA, with one species in each, neither of which is endemic.

No. 452. **SANSEVIERIA ZEYLANICA** Vol. IV. p. 267.

Niyanda, S. Maral, T. "Bowstring Hemp", E.

A short-stemmed root-stock, with rigid erect tufts of leaves growing to about 3 feet in length. Leaves pale greenish, more or less banded or mottled with dull grey, margins much recurved, furrowed longitudinally, acute at apex, thick, strongly fibrous.

Flowers pale white, more or less shaded with violet, arranged on long axillary erect racemes in short-stalked clusters. Perianth 6-lobed, lobes narrow. Stamens 6; ovary 3-celled, with one erect ovule in each. Fruits lobed or globose, often with imperfect cells. Seeds solitary, pale, broadly oval.

The leaves afford a most excellent, tough and very pliable fibre, from which Kandyan mats are made. The plant is generally found growing on rocky ground, or in shallow gravelly soils in the dry country, often occurring in gregarious masses.

It is closely allied to the more ornamental *S. guineensis* frequently to be found in gardens as a pot plant, the leaves of of which are strap-shaped and mottled.

Occurs also in South India.

CXXXI.—DIOSCOREACEAE.

This order includes the true yams which are of great value as food crops in the Tropics.—C.D.

CXXXIX.—PALMEAE.

This vast order is represented in Ceylon by ten genera, viz.:

1. Areca
2. Loxococcus
3. Oncosperma
4. Caroyta
5. Nipa
6. Phoenix
7. Corypha
8. Calamus
9. Borassus
10. Cocos

representing 21 species, of which 11 are peculiar to the Island.

In addition to the foregoing, many examples of the Palm family have been introduced as purely ornamental, the more useful being the "Gomuti Palm" (*Arenga saccharifera*) from which the Malayan bristle fibre is obtained, as well as a rich sugar; the Date Palm (*Phoenix dactylifera*), the Sago Palm (*Metroxylon Sagu*) so important as the source of a farinaceous food, and the West African Oil Palm (*Elaeis guineensis*).

For quick reference to our Ceylon genera, the following very brief (and, in many respects, incomplete) key will be found useful for identifying the genus and reducing the descriptions.

A. Stems erect, straight, cylindrical	1. Areca. 2. Loxococcus.
B. Stems erect, straight, armed with spines	3. Oncosperma.
C. Stems gradually dilated	4. Caryota.
D. Stems absent	5. Nipa.
E. Stems short, closely leaf-scarred	6. Phoenix.
F. Stems cylindrical, creeping, or climbing	7. Corypha.
G. Stems erect, very large, immense inflorescence	8. Calamus.
H. Stems erect, usually coated with old leaf remains	9. Borassus.
I. Stems not always straight, enlarged at base.	10. Cocos

No. 452. A. **ARECA CATECHU** Vol. IV. p. 321.

Puwak, S. Pakku, T. Areca-nut or Betel-nut Palm, E.

A tall erect, slender, straight-stemmed palm. Stem cylindrical, smooth, almost equidistantly leaf-scarred. Leaves forming a comparatively small head, about 4 to 6 feet long, with large smooth sheath. Fruits up to 2 inches long, at first rich green, changing to orange when ripe, ovoid, containing a solitary, ovoid "nut" of about 1 inch (or less) in diameter, the endosperm of which is closely ruminate.

The wood of the stem, *i.e.* its outer cylinder, is moderately hard and used for cart-hoods, light roofing and temporary structures, also for spouts.

The "nut" is extensively used as an ingredient in the common masticatory with "betel." It contains tannin, and is used in medicine as an astringent, and a vemifuge. Burnt and reduced to a fine paste, the nuts are useful as a dentifrice, and in an early or unripe state, as a laxative. The nuts are a source of catechu.

The Areca Palm is always found in a cultivated state, or as an "escape" from an adjacent "areca grove." It has

Niyanda = bow-string hemp (Sansivieria)

long been an important article of commerce in Ceylon, our Customs returns showing, as far back as 1806 and 1807, that over 200,000 Rix Dollars worth of this product were exported. these figures increasing to over 3¼ millions of Rupees worth in recent years. The Arecanut played a very important part in the history of Ceylon in the beginning of the last century. by precipitating a conflict with Kandyan rulers.

Varieties are recognized by cultivators, mainly in respect of difference in size of fruit. The "*Rata-puwak*" yields the largest nut.

The small slender Wild Areca (*A. concinna*) or *Lentiri* is, unlike the last, a wild plant, and peculiar to Ceylon. Its fruits are also chewed, but owing to its rarity, it does not compete with the other species. The stems in this species are rarely more than 12 feet long and 2 inches in diameter. It occurs in swampy ground in parts of the Kalutara district. The fruit is scarlet.

No. 453. **CARYOTA URENS** Vol. IV. p. 324.

Kitul, S. Tippili, T. Toddy Palm, E.

A tall erect palm, with a large funereal head of graceful leaves. Trunk 40 or more feet long, smooth, gradually increasing in diameter from above the "waist," pale, hard. The inflorescences at first are axillary, within the crown, but with advancing age they are produced below the crown until the tree dies. The flowers are enclosed within a large, curved stiff spathe, which, on opening, allows an immense horse-tail-like mass of pendulous branches to emerge, carrying thereon the abundant flowers,—male and female.

It is from the young unexpanded inflorescences that the sap known as toddy is obtained, which (in its fermented condition) furnishes an intoxicating liquor. A crude sugar, called "Jaggery" (*Hakuru, S.*) is prepared from the sweet toddy. Bristle fibre of excellent quality is obtained from the leaf bases, and is of commercial importance.

The timber is very hard and close-grained, weight about 70 lbs. per cubic foot, very durable. It is used for rafters, reepers, spouting and ornamental work; also as spikes in wood-work, and for tool-handles.

Widely distributed throughout the moist forests of Ceylon. from sea-level to about 3,500 feet; often found in gardens. Less common in the dry country.

Occurs in India and Malaya.

No. 454. **PHOENIX ZEYLANICA** Vol. IV. p. 326.

Indi, S. Wild Date, E.

Stem rarely over 15 feet, much leaf-scarred. Leaves moderately long, with many long, narrow, acutely pointed leaflets, smooth, pliable and lasting. Flower spathe, about 1 foot long, curved, stoutly stalked. Fruits ovoid, about ½ inch long, at first red, deepening in colour with ripeness to a purplish blue. Seed solitary, narrowly oval, grooved, horny, enclosed in a thin, sweetish pulp.

The leaves are much used in the manufacture of mats, ornamental "Kalutara" baskets and pouches, and as they can be stained with different-coloured dyes, very attractive and useful articles are made therefrom.

A very common endemic plant in the damp low-country, especially in the south of Ceylon. Not found in the hills. This species is easily distinguished from *P. pusilla* (*Inchu, Tamil*) that abounds in the dry country, which last has a dumpy stem, and spine-like leaflets. A flour obtained from the stem is eaten in times of famine. *P. pusilla* is also found in South India.

No. 455. **CORYPHA UMBRACULIFERA** Vol. IV. p. 328.

Tala, S. Talapattu, T. Talipot, E.

This is sometimes *wrongly* called the "Century Plant" which is an "Aloe" (*Agave*).

Stem very large, tall, up to 50 or 60 feet, straight. Easily distinguished by the immense fan-like leaves which are often as much as 12 feet across.

The plant flowers only once, after which it dies. The inflorescence is one of the most striking of vegetable objects—forming a very large pyramidal terminal mass not inaptly described as "a fountain of flowers." The flowers themselves are bisexual, small, creamy-white. Calyx 3-lobed; petals 3, stamens 6; ovary 3-celled. Fruits 1-3 "globose drupes" about 1½ inches in diameter, very hard seeded.

The leaves, from the earliest times, have been used for thatching; also as a writing material in place of paper, known as "Olas." These are written on by a finely pointed stylus, after the leaf has been cut into suitable strips, dried and trimmed to the required size. Most, if not all, ancient Sinhalese books and documents were inscribed upon *olas*, and preserved in suitable wood-bound volumes. According to Tennent, this material was in use in the second century B.C. The Royal Grant or *Sannas* for lands was, from the earliest times,

mostly written on this material. Knox, who supplies an excellent illustration of the "Talipot leafe," says that the "smell of the blossoms so much annoyes them (the natives) that they regarding not the seed, forthwith cut them down." The leaves are in much use for roofing, ceiling and temporary room-partitions, mats, etc. The hard seeds are used for the manufacture of buttons. A spongy pith obtained from the interior of the stem affords a rude kind of "bread", which is sometimes eaten. The very young fruit, reduced to a pounded mass, is effective as a fish poison.

The Talipot is more or less a cultivated palm in Ceylon, extending through most of the wet country up to 2,000 feet altitude, but never found in forests. It is scarce in the dry country. Also common in South India, and probably introduced from there to Ceylon.

The Genus *Calamus* (or the *Rattans*) is represented in Ceylon by 10 species, of which 7 are endemic.

A brief key to the genus will be found of assistance in identification, and will save more detailed individual descriptions :—

A. Stems erect, stout, leaflets 3-veined.....*C. Thwaitesii.*

B. Stems climbing, leaflets 50 or more, fruits yellow, vertically scaled .....*C. Pseudo-tenuis.*

C. Stems slender, climbing; fruits pale, *not* vertically scaled ..... *C. Rotang.*

D. Stems slender; petiole armed with spines, fruits yellow, scales vertical, edged with brown.....*C. rivalis.*

E. Stems slender, with tufts of white hair-like spines; fruits olive-brown, edged on the scales with black.....
C. delicatulus.

F. Stems $\frac{1}{4}$ inch in diameter, densely spined on leaf-sheaths, fruits yellow, scales triangular .....*C. radiatus.*

G. Stems thin, leaf-sheath with small *flat* spines; leaflets few, irregular..... *C. pachystemonus.*

H. Stems very thin; leaf-sheath with long and short spines; fruits straw-yellow, 6-scaled, scales broad... *C. digitatus.*

I. Stems 1 inch in diameter, stout, up to 80 feet long, fruits large, round, brownish-yellow, scales white-edged.....
C. zeylanicus.

J. Stems stout, stiff, up to 20 feet long; fruits oval, grey, scales 12, edged with orange.....*C. ovoideus.*

A to H. Rachis of leaf without flagella.

I and J. Rachis of leaf *with* flagella.

No. 456. **CALAMUS ROTANG** Vol. IV. p. 331.

Wewel S. Perambu, T.

Stems pale yellowish-green, rarely very long, usually found in damp ground in the dry zone.

Split and deprived of their pithy matter, these canes are used for chair and bed-bottoms, baskets, and the like, the material so obtained being very tough, pliable and durable.

Also common in South India.

No. 457. **C. RADIATUS** Vol. IV. p. 333.

Kukul-wel, S.

Stems slender, very pale, nearly yellow. Leaves 6 to 8-foliolate on short petiole. Leaflets very narrow, about 12 inches long, smooth on the margin. Usually growing in tufts or clusters.

This "Cane" is in much demand for basket-work, and, when split into strips, is capable of producing very durable work-baskets and chair-bottoms.

Common in the wet-zone forests, and at one time very plentiful in the Kalutara district, and portions of the Kukul Korale. Endemic.

No. 458. **C. DIGITATUS** Vol. IV. p. 334.

Kukul-wel, S.

The petiole in this species is very much longer than in the last, the leaves 2 to 4-foliolate, with the leaflets much broader.

Uses as in the last.

An endemic species, found sparingly in the wet forests of the Kalutara and Galle districts, often confused with the last, owing to the Sinhalese name being common to both.

No. 459. **C. ZEYLANICUS** Vol. IV. p. 335.

Ma-wewel, S.

Stems very long, stout, green, climbing over the tallest forest trees. Leaves about 5 feet long, with petioles armed with strong recurved spines. Leaflets many, finely tapered.

This large cane is frequently employed for cables, cart-hoods, and for cane "bridges", owing to its extraordinary toughness and durability.

At one time very common in the wet forests of Sabaragamuwa up to 1,500 feet altitude, where I have measured examples of over 100 feet in length in the Balangoda country.

The growing head contains a most delicately flavoured heart or "cabbage," which is eaten raw, as well as cooked.

The species is endemic.

No. 460. **C. OVOIDEUS** Vol. IV. p. 335.

Tambutu-wel, S.

Stems much shorter than the last. Leaves long, leaflets about 26, rather broad, acute with bristly tip. Sheath armed with "black reflexed spines," in rings.

Purposes much the same as the last. Also used in making chairs and stools.

Fairly common, especially in steep, rocky forests in the wet parts of Sabaragamuwa and the Morowak Korale. Endemic.

No. 461. **BORASSUS FLABELLIFER** Vol. IV. p. 336.

Tal, S. Panai, T. Palmyra, E.

This important palm, with its manifold uses, is too well-known to require description. It practically takes the place in the North that the Coconut Palm does elsewhere, but, like the latter, is never wild.

Apart from the saccharine juice obained from the spadix, which supplies an intoxicating liquor and a very useful sugar, the timber of mature trees is very considerably used in house-building, being both hard, durable, straight, and handsome. Ornamental articles of furniture, picture frames, poles, etc., are also made from this wood. The weight appears to be variable, for according to Gamble, it ranges from 31 to 72 lbs. per cubic foot, the Ceylon average being about 65 lbs. The wood of the young trees is worthless. The leaves find abundant uses in thatching, mats, baskets, olas, etc., while the fibre from the leaf bases was at one time a considerable article of export.

The date of its introduction into Ceylon is not known, but it is probably of great antiquity.

Common in a cultivated state through the whole of tropical India, Burma and Malaya.

No. 462. **COCOS NUCIFERA** Vol. IV. p. 337.

Pol, S. Tennai or *Tengai, T. Coconut Palm, E.*

The most common of cultivated plants in the low-country of Ceylon, being found in practically every garden (except the North, where the Palmyra replaces it) up to about 2,500 feet altitude. It is nowhere wild. The extent under cultivation at

present probably exceeds a million acres, thus making this palm one of the most important of the commercial plants in the Island.

The uses and purposes of the Coconut and its products are too numerous to mention, and too well-known to require particularising here; but the reader is advised to consult the returns of the Customs to form some idea of the immense importance of the Coconut as a commercial crop.

The "King Coconut," or *Tembili* of the Sinhalese, is a popular variety, valued for its refreshing "milk." It is also cultivated, but not for copra. Other varieties are recognised by cultivators such as the "Dwarf Coconut", which bears fruit when the palm is only a few feet high, and yields much smaller nuts.

The Coconut is found throughout the Tropics, but its natural home is unknown.

The wood of this palm is used for rafters and reepers in house-building, spear-handles, rods, and small articles of furniture. It is known in Europe as "*Porcupine Wood*", and is hard, close-grained, durable, and rather heavy. .

CXL.—PANDANACEAE.

A small order in Ceylon, consists of two genera: 1. Pandanus and 2. Freycenetia, and embraces 5 species, of which one in the former, and two in the latter are endemic.

No. 463. **PANDANUS ODORATISSIMUS** Vol. IV. p. 339.

Mudu-keyiya, S. Talai, T. Screw Pine, E.

Stem more or less erect, cylindrical, resting above ground by many stout roots. Branches giving aerial roots. Leaves spirally arranged, long, up to 5 feet, narrow, with marginal spinous thorns directed upwards, the spines on the midrib being directed downwards, smooth, dark glossy-green, paler below.

The flowers are dioecious, the male inflorescence being a moderately long, hanging, "terminal rachis bearing the spadices of flowers in the axils of large white bracts." In the female, the spadix is solitary, large, surrounded by yellow bracts. The male flowers are strongly scented like chloroform. A perfumed oil and an otto are obtained from the bracts, the former being considered useful in earache.

The leaves are used in the manufacture of rough mats. The large, broadly-ovate, orange-coloured fruits are sometimes used in ornamenting "pandals."

Very common round the coast, often in gregarious masses; also occurs in most of the Eastern Tropics.

No. 464. **P. ZEYLANICUS** Vol. IV. p. 339.

O-keyiya, S.

Stem erect, slender, few-branched. Leaves usually crowded at ends of stems or branches, long, up to 4 feet, very narrow, distantly spined. Flowers not scented. Fruit nearly spherical, green, about 6 inches in diameter.

The leaves are used in making mats, and the whole plant is frequently planted on the margins of paddy fields as a boundary plant.

Common in the wet districts, in moist places. Endemic. A second doubtfully-endemic species—*P. foetidus*—known as *Dunu-keyiya* or *Weta-keyiya*, distinguished by its many branches, short or prostrate stem, and foul-smelling flowers, is found in wet places in the low-country, and planted near fields. Its fruits are in small clusters of 5 or 6, nearly round, and of an ashy grey colour. It is frequently seen as a boundary plant.

CXLII.—ARACEAE.

This large order is well represented in Ceylon by no less than 15 genera, and 33 species, of which 14 are endemic.

In addition a great many have been introduced for the sake of their ornamental flowers and leaves, and as such are commonly grown as pot-plants. Our genera consist of:

1. Pistia,
2. Cryptocoryne,
3. Lagenandra,
4. Arisaema,
5. Typhonium,
6. Theriophonum,
7. Amorphophallus
8. Synantherias,
9. Remusatia,
10. Colocasia,
11. Alocasia,
12. Raphidophora,
13. Pothos,
14. Lasia,
15. Acorus.

But few of the local species are in economic use in Ceylon, in proportion to their numbers.

No. 465. Vol. IV. p. 355.

AMORPHOPHALLUS CAMPANULATUS

Kidaran or Nai-kidaran, S. Sooran, T.

A tuberous herb growing to about 18 inches to 2 feet in height. Tuber large, depressed, dull brown. Stem (leaf-petiole) stout, pale green, freckled with white, rough. Leaf

large, deeply gashed into many simple or forked divisions, variable in size, conspicuously veined.

The flowers appear before the leaf. Spathes large, broad, about 6 inches long and wide, pointed, with recurved margins, "undulate and crisped", more or less dull claret-colour tinged with green and splashed with irregular blotchings of pale green. Nodular within. Spadix large, reddish, thick. Berries crowded, bright red or orange. The flowers on opening are of a most offensive odour.

The tubers are eaten, after the manner of yams. Also said to be very effective in haemorrhoids.

Very common from Matara to Beliatta in the Southern Province, where it grows gregariously. Also in India and Java.

No. 466. **COLOCASIA ANTIQUORUM** Vol. IV. p. 359.

Gahala, Habarala or *Kiri-ala, S. Taro, E.*

Root-stock penetrating underground, "giving off long, sheathed, bulbiferous runners." Leaves variable in size, up to about 18 inches, peltate, or deeply cleft at base, with rounded lobes, ovate in general outline, broad, tapering to an abrupt apex, unevenly margined, dark green above, smooth. Petiole stout, sheathing below. Midrib very broad. Veins radiating at first, conspicuous. Spadix much shorter than spathe, erect. Spathe solitary, greenish. Male and female flowers with a ring of neuter flowers between. Ovaries at the base of the spadix one-celled, with 6 erect ovules. Fruit, a berry, containing narrow striated seed.

The tubers or "yams" are much eaten in curries, and also boiled. The leaf juice is styptic, and said to be useful for cuts and wounds.

Very common in wet-country gardens, and is, in all probability, an introduction.

Abundant in India and tropical countries.

No. 467. **ALOCASIA MACRORRHIZA** Vol. IV. p. 360.

Habarala, S.

A large root-stock with ascending, stout, stem-like divisions, often 3 to 4 inches in diameter. Leaves generally very large, up to 4 feet, conspicuously sagittate, peltate, and broadly lobed, apex acute, margins undulate, smooth, glossy dark green above, paler below. Midrib and veins very conspicuous, strong. Petiole about as long as leaf, green, stout at base, sheathing. Spathes "2 or more together" on large stalks,

hooded. green, "spotted or streaked with red." Berries large, glossy.

Probably an introduced plant, very common in gardens in the wet zone, where it is cultivated for the sake of the farina contained in its roots. It comes into the category of "Yams," and as such enters into many items of vegetable diet, though insipid in flavour.

The tubers called *Rata-ala*, *Sudu-kandala*, and *Yakutala*, *S.* appear to be varieties that are equally popular as vegetables. They are referable to this genus, but so variable in form that a typical description can hardly be satisfactorily made, more especially as the names of the varieties are often confused.

Certain of the so-called "yams" afford material for curries in their leaf-stalks. These, after being chopped, are boiled, and form a soft palatable food, though not altogther unattended with danger; as, for example, the leaf stalk of the common aquatic *Lagenandra toxicaria*,—*Ketala* of the Sinhalese—which though often eaten by natives in curries, is poisonous, producing violent irritation in the throat.

It may not be out of place to remark that an antidote to this poison is milk, which should be copiously swallowed, and followed by emetics.

No. 468. **ACORUS CALAMUS** Vol. IV. p. 365.

Wadakaha, S. Vassambu, T. Sweet Flag, E.

A marsh plant. Root-stock about 1 inch in thickness, branching. Leaves long, up to 5 or 6 feet, very narrow, thickened down the middle, tapering to a fine apex, sheathing at the base. The spike is produced on a leaf-like stalk, from its edge, densely crowded with greenish flowers, each of which has the perianth divided into 6 lobes, enclosing 6 stamens with yellow anthers. Ovary 3-celled; stigma sessile.

The whole plant is aromatic, and the dried rhizomes are a common bazaar medicine, used in dyspepsia, diarrhoea, and colic. It is also supposed to be useful in epilepsy, and externally applied in chronic rheumatism. It is emetic in its action if taken in large doses, and carminative in small.

Occurs in marshy ground, generally in a more or less cultivated state, up to about 2,000 feet altitude.

Widely distributed in Europe, Asia and Northern America.

CXLIX.—GRAMINACEAE.

In the absence of a complete and up-to-date scientific work on the Grasses of Ceylon, the writer has not attempted to

introduce into this work anything approaching a full description of those economic members of this gigantic order, to do justice to which, a separate volume will have to be written.

It may, however, be of use to the reader to supply a brief catalogue of the better-known members of the order, carrying on the numerical system for quick reference from the Index. The catalogue, however, is far from complete, and it is possible that the nomenclature requires revision. I follow the names given by existing authorities without reservation, and the classification as adopted in Trimen's *Hortus Zeylanicus*.

No. 469. **PASPALUM SCROBICULATUM** Vol. V. p. 121.

Amu, S. Waragu, T. Millet, E.

A very variable grass in point of size. Often cultivated as a "Chena-crop," but requires careful treatment before it is eaten, as it is slightly poisonous.

Common in India. Several local varieties are recognised, chiefly by their size.

No. 470. **PASPALUM CONJUGATUM** Vol. V. p. 122.

Bitter or *Sour-grass, E.*

A common road-side grass, growing to about 1 foot in height. Commonly used as a cattle-fodder. West Indian in origin.

No. 471. **PASPALUM SANGUINALE** Vol. V. p. 123.

Guruwal, S.

Very common, much used as a cattle-fodder. Also abundant in India.

No. 472. **PASPALUM LONGIFLORUM** Vol. V. p. 124.

A creeping grass, very common up to 3,000 feet. Used as a cattle-fodder and for lawns. Widely distributed in the Tropics.

No. 473. **PASPALUM VIRGATUM**

An erect grass, growing to a height of about 4 feet. An excellent fodder, and said to be an excellent "milk-producer." Common in South Africa and the West Indies, but not generally grown here.

No. 474. **PANICUM CRUS-GALLI** Vol. V. p. 135.

Wel-marukku, S. Mondi, T. Cockspur-grass, E.

A fairly tall grass, growing to about 4 feet, common in the dry parts of the country. Affords a good bedding and excellent straw. Very quick-growing.

Occurs throughout the Tropics.

No. 475. **PANICUM MILIACEUM** Vol. V. p. 150.

Meneri or *Wal-meneri, S. Kannai, T. Indian Millet, E.*

An erect grass, growing to about 3 feet high. Leaves distinctly hairy. Usually found in a cultivated state. Affords an abundant fodder, but the straw has the reputation of being "heating." Common in India and Africa.

No. 476. **PANICUM MILIARE** Vol. V. p. 150.

Meneri, or *Heen-meneri, S. Chamai, T. Little Millet, E.*

A tufted grass, about 2 feet high, with narrow, acute, smooth leaves. Occasionally cultivated in chenas, but not very common in Ceylon. Affords an inferior grain.

Common to the Tropics.

No. 477. **PANICUM MAXIMUM** Vol. V. p. 153.

Rata-tana, S. Semai-pillu, T. Guinea Grass, E.

A well-known and very popular grass, generally cultivated, but occasionally found semi-wild. Usually tufted, with erect, long, narrow, smooth, bright green leaves of variable length.

Grown up to 4,000 feet altitude, and much used for fodder for cattle and horses. It is a native of Tropical Africa, and appears to have been introduced into Ceylon during the later Dutch period.

No. 478. **PANICUM REPENS** Vol. V. p. 154.

Etora, S. "Couch-grass," E.

A pestiferous grass, with deep spreading roots, difficult to eradicate, common up to about 6,000 feet.

Affords an inferior cattle-fodder, and once introduced, becomes a weed.

It occurs throughout sub-tropical Europe, Asia, Africa and America.

No. 479. **PANICUM MOLLE (P. BARBINODE) (P. MUTICUM)**

Diya-tana-kola, S. Thanni-pillu, T. Mauritius-grass, or Water-grass, or Buffalo-grass, E.

A creeping, spreading grass with stems about ⅓ of an inch thick. Leaves hairy, or soft. Generally grown in moist ground, spreading with great rapidity. Common up to about 5,000 feet, very useful as an excellent fodder grass. It is a native of Tropical America, but appears to have been widely grown in the West Indies and Mauritius.

No. 480. **SETARIA ITALICA** Vol. V. p. 164.

Tana-hal, S. Shamai, T. Italian Millet, E.

An erect grass, with long, narrow finely acute leaves. Generally cultivated in the dry parts of Ceylon for the sake of its grain. Not very common. Occurs in India, China and Japan.

No. 481. **PENNISETUM TYPHOIDEUM** Vol. V. p. 170.

Kumba, T. Pollu, S. Bull-rush Millet, E.

An erect-stemmed grass, growing to about 5 feet. Spikes terminal and erect. Leaves nearly 3 feet by 2 inches wide. Cultivated for the sake of its grain, chiefly by Tamils. It affords a good straw for cattle. The grain is much relished by poultry and pigeons.

Common in tropical countries, from Italy to China. This is the "Bajri" of India.

No. 482. **SPINIFEX SQUARROSUS** Vol. V. p. 174.

Maha-rawana-rewula, S. Water-pink, E.

A much-branched, dense, bushy grass, with long creeping stems. Leaves stiff, about 6 inches, acute, glaucous.

Common on the sea-shore, especially in the dry-zone. Useful for binding shifting sand. Occurs from India to China. Fruit, a globose rolling head.

No. 483. **ZEA MAYS**

Iringu, S. Muttu-sholum, T. Maize, or Indian Corn, E.

Much grown, especially in the dry country, for the sake of its nutritious grain. Largely cultivated in some parts of the Island as a "Chena crop." Also produces an abundant fodder.

Next to Rice, probably one of the best-known of tropical grains, and is now cultivated in all tropical and sub-tropical countries.

Many varieties with fancy names are recognised, but the main divisions are known as "flint" and "dent." The starch equivalent in Indian corn is high, (though lower than rice); hence its importance as a food product.

No. 484. **ORYZA SATIVA** Vol. V. p. 182.

Goyam, Wi (unhusked) *S. Arisi, T. Rice, E.* (probably from the Arabic, "*Arruz*").

Probably the best-known of all food products. Comprises a greater number of varieties than any other cultivated plant.

The date of its introduction into Ceylon is unknown, just as its earliest history is obscure. There is evidence to show that it existed in Egyptian remains, and that it was cultivated in China about 2800 B.C.

It was cultivated in the Euphrates valley 400 years before the Christian era, and the Arabs carried it to Spain.

In comparatively modern times it was introduced into Italy, and much later into America, till now it may be said to occur all over the world.

This country produces approximately 13 million bushels, exclusive of Hill Paddy, while our imports in 1926 amounted to nearly $8\frac{3}{4}$ million cwts. in clean rice alone.

No. 485. **IMPERATA ARUNDINACEA** Vol. V. p. 200.

Illuk, S. Lalang of Malaya.

A gregarious quick-growing pest. Stem rather stout, often creeping. Leaves up to 18 inches, very narrow, finely tapering to a long, sharp apex. Panicles fine, cottony, silvery-white in colour. The leaves make an excellent thatch.

Very common, and covering large areas of land in the dry-zone. Extremely difficult to kill out. Abundant in the Tropics.

No. 486. Vol. V. p. 202.

SACCHARUM ARUDINACEUM

Rambuk, S. Pey-karambu, T. Elephant Grass, E.

Stems erect, 10 to 20 feet high, straight, about $\frac{1}{2}$ inch wide, scarred by fallen leaves. Leaves varying in length from 1 to 5 feet, by from 1 to 2 inches wide, rather stiff,

glaucous below. Panicles large, tinged with brown or purplish brown.

Found in gregarious masses in damp ground up to about 2,000 feet altitude. The stems, dried, and arranged in lengths, make excellent rush-mats, and temporary fencings or partitions.

Occurs in India and Southern China.

No. 486A. **SACCHARUM OFFICINARUM** Vol. V. p. 202.

Uk-gas, S. Karambu, T. Sugar-cane, E.

A tall reed, 8 to 14 feet high, more or less erect, about 2 inches in diameter. Stems scarred at "joints", variable in colour, from greenish-yellow to dark purple. Leaves very long, at first erect, and then drooping, narrow, finely acute.

The chief constituent of the plant is Sugar, for which purpose it is cultivated in many parts of the tropical world. In Ceylon it is planted in many parts of the island, in village and estate gardens, but not on a commercial scale.

The Dutch introduced Sugar into this Island, and Sir Edward Barnes experimented in its cultivation near Veyangoda, and in 1840 it was seriously worked by the late Mr. George Winter, who may be considered the pioneer of Sugar in Ceylon.

According to Bertolacci, the cultivation of sugarcane was attempted twice upon an extensive scale, on the same spot near Kalutara, but on both occasions it proved unremunerative. Sir Edward Barnes' experiment came later and was followed by Mr. Winter and other planters.

No. 487. **CYMBOPOGON NARDUS** Vol. V. p. 242.

Pengiri-mana, S. Citronella, E.

A fall grass, with leaves up to 3 feet in length. Stems woody at base, growing in tufts. Much cultivated in the Southern Province for the sake of the oil, which is obtained by distillation of the leaves. The oil is used for perfuming soaps, and is useful in combating mosquitoes, eye-flies and leeches. It is said to be a good embrocation. Two distinct varieties are recognised in the Southern Province, these being locally known as *Maha-pengiri*, or Winter's Citronella, and *Lenabatu-pengiri*—the former of which is a stouter grass.

The grass occurs in the Punjab and North-west Provinces of India.

No. 488. **CYMBOPOGON CONFERTIFLORUS**

Mana, S. Mana-pillu, T. Mana-grass, E.

A tall, rank, erect grass with leaves up to 5 feet in length. Abundant in our Patina lands. Suitable for bedding for cattle, but not for fodder. Makes a useful thatch.

Also in South India.

No. 489. Vol. V. p. 233.

ANDROPOGON MURICATUS-VETIVERIA ZIZANOIDES-ANDROPOGON SQUARROSUS

Sevandara, S. Vetti-veru, T. Cus-cus or *Khus-khus, of Europeans.*

A close-tufted, erect grass, with many fibrous aromatic-scented roots. Leaves up to 2 feet long, very narrow, acute at apex, markedly "keeled" at base.

Occasionally found in Ceylon up to 2,000 feet, but probably as an escape from cultivation.

The roots afford the material for Khus-khus tats and fans and punkahs. The roots have a pleasing odour like that of Sandalwood, and keep off insects. The powdered root is esteemed as a medicine for irritation of the stomach. The oil distilled from the root, is used in perfumery.

Also found in India, Malaya, and parts of Africa.

No. 490. Vol. V. p. 234.

CHRYSOPOGON (ANDROPOGON) ACICULATUS

Tuttiri, S. and T. Love Grass, E.

A creeping grass, with erect shoots, growing to about a foot in height. Easily recognised by its barbed "seeds" which attach themselves to clothing. Very common up to about 4,000 feet. Said to be a good lawn-grass, but not easy to keep in order.

Also occurs in South India, Tropical Asia and Australia.

No. 491. **CYNODON DACTYLON** Vol. V. p. 274

Arugam-pillu, T. Doob-grass, Devil's-grass, Bermuda-grass, E.

A slender creeping grass "forming matted tufts." Leaves small, up to 3 inches (usually much less) long, by $\frac{1}{8}$th of an inch wide, very soft. Spikes radiating.

Very common in the dry country. Affords an excellent fodder for horses and cattle. It is used medicinally; the juice of

the fresh grass being a popular remedy for bleeding wounds, and a decoction of the rhizome serves as a diuretic.

Common in Tropical countries.

No. 492. **ELEUSINE CORACANA** Vol. V. p. 277.

Kurrakan, S. Kel-varagu, T. Ragi of India.

An erect grass growing (in suitable soils) to about 2 feet, slightly tufted. Roots fibrous. Leaves narrow, flat, spikelets incurved in terminal clusters. Seeds brownish, or rusty, in dense masses.

This plant is much grown in Chenas, and where available, in Owiti lands. It supplies a grain very considerably used as a food by the poorer classes. It is rich in starch, though less so than in Rice, and is believed to be less digestible. It is also much used in native confections.

Extensively cultivated in India.

No. 493. **BAMBUSA ARUNDINACEA** Vol. V, p. 313.

Katu-una, S. Mungi, T. Thorn-bamboo, E.

Stems in tufts, tall, up to 80 feet, green, branching from low down, thorny. Internodes (or spaces between the "joints" on the stem) about a foot. Culm-sheaths hairy outside, yellowish, strongly ribbed within. Leaves small.

An excellent bamboo for temporary buildings.

Occasionally found near rivers in the dry zone, but obviously cultivated. Leaves used for coughs in horses.

Common in India and Burma.

No. 494. **BAMBUSA VULGARIS** Vol. V. p. 314.

Una, S. Mungi, T. Yellow Bamboo, E.

Stems about 30 feet high by 3 to 4 inches in diameter, with "joints" from 10 to 15 inches apart, usually yellow with one or more straight, sharply defined, green, vertical stripes, often all green, with one or more yellow stripes, smooth, polished, branching towards the upper half.

Leaves about 6 inches, often twisted at tip.

Much used for scaffolding, spouts, cart-hoods, roofing, etc. More or less cultivated and fairly common up to 2,000 feet altitude, never wild. Also in India and Burma.

No. 495. **BAMBUSA NANA** Vol. V. p. 315.

Dwarf Bamboo, E.

Stems in tufts, short, 10 feet or less, by about 1 inch in diameter, internodes variable in length, about 12 inches, generally green, smooth. Joints prominent. Leaves small, up to 4 iches long, narrow.

Generally used as a fence or hedge plant, occasionally found in gardens up to about 2,000 feet.

Common in China, and sometimes called the "China Bamboo."

No. 496. **DENDROCALAMUS GIGANTEUS**

Giant Bamboo, E.

Stems in immense clumps or tufts, and attaining a length of nearly 100 feet. Internodes 15 to 20 inches with a diameter of 10. Stems generally dark green, with conspicuous nodes. Leaves large. Culm-sheath large, stiff, glossy within, coarsely spiny-hairy outside.

Much used for scaffolding, flower-pots, temporary buckets, etc. Only found cultivated; grows well near water, up to about 4,500 feet altitude. Introduced here, native of Burma.

No. 497. **DENDROCALAMUS STRICTUS**

Kal-mungi, T. Male Bamboo, E.

Clumps dense. Stems nearly solid, about 30 feet long by 2 inches in diameter. Internodes 10 inches. Leaves from 4 to 10 inches long, hairy above and below. The plant is deciduous.

Rare, only found planted. Very useful for poles, spear-handles, posts, etc.

Common in India and Burma.

No. 498. **OCHLANDRA STRIDULA** Vol. V. p. 318.

Bata, S. Mungi, T. Bamboo, E.

Gregarious. Stems about 12 to 18 feet long by ½ to ¾ inches in diameter, thin-walled, internodes sometimes 20 inches long, faintly scabrid. Leaves large, up to 12 inches, often 2 inches wide. Leaf-sheath at first much coated with conspicuous, finely-pointed spicules.

Very common in the wet country up to 3,000 feet. Endemic. Much used for Basket-making, "Tats," etc.

I have on more than one occasion found, within the stems of this Bamboo, a pale, solid, alum-like substance known to the Sinhalese as *Una-kapuru*, which is said to be used in phthisis. It is very rarely found, and highly prized accordingly. Dey refers to it as largely used in homeopathic medicine as a cooling tonic and aphrodisiac.

No. 499. Vol. V. p. 319.

OCHLANDRA STRIDULA, VAR-MACULATA

Ranabata, S. Mottled Bamboo, E.

A variety of No. 498. Stems shorter and more slender than the last, readily distinguished by its purple-brown mottling. It is used for fancy work, because of its curious pattern.

Occasional in the wet forests around Adam's Peak.

ORDERS, GENERA AND SPECIES.

(Roman figures refer to numbers of orders, which are printed in capitals. Small figures refer to those of Genera and Species).

SINHALESE NAMES.

TAMIL NAMES.

ENGLISH NAMES.