A REVISION OF THE OCHNACEAE OF THE INDO-PACIFIC AREA

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CONTENTS

SUMMARY

This taxonomic revision includes all *Ochnaceae* from South and Southeast Asia, Malesia, Australia, and the Pacific Islands. A much wider species concept is applied than in most previous works: 20 species in 10 genera are accepted for the area treated, whereas 199 specific synonyms are listed. A few taxa have been accepted at infra specific level among which *Brackenridgea palustris* ssp. *kjellbergii* Kanis is new.

It is shown that some old specific names have been overlooked in the past and that the traditional concepts of some species have not been in accordance with the original concepts. All names, currently used for Asiatic species of *Ochna* L. and *Gomphia* Schreb. are no longer accepted here, *O. jabotapita* L. and *G. serrata* (Gaertn.) Kanis being the correct names for the respective type species. *O. fascicularis* Blanco is made the type of a distinct section *Notochnella* (v. Tiegh.) Kanis in the genus *Brackenridgea* A. Gray.

A short history of the taxonomy is given and a partly new suprageneric subdivision of the *Ochnaceae* is subsequently proposed. Two subfamilies are recognised: the *Ochnoideae* comprising the tribes *Ochneae* and *Elvasieae* Rchb., and the *Sauvagesoideae* Lindl. including the tribes *Sauvagesieae*, *Euthemideae* Planch., and *Lophireae* Rchb. The *Ochneae* are newly subdivided in the subtribes *Ochninae* and *Ouratinae* (v. Tiegh.) Kanis, and the *Sauvagesieae* in the subtribes *Sauvagesinae* and *Luxemburginae* (Planch.) Kanis.

Some general remarks are made about morphological characters in the family, including some new characters of the pollen. An attempt is made towards a better understanding of the inflorescence types.

It is assumed that the genera *Ochna* and *Gomphia* migrated from Africa into Asia. Other genera in Southeast Asia, Malesia, Australia, and the Pacific Islands are regarded as long established, because of the more or less relict-like nature of their areas.

INTRODUCTION

The revision presented here was started as a preliminary study for a contribution to the Flora Malesiana. After completion of a first manuscript on the subfamily *Sauvagesoideae*, it soon proved necessary to extend the studies in the *Ochnoideae* over the boundaries of the Malesian area. Certain genera of the latter subfamily are only poorly represented in Malesia, which made comparitive studies in related species from adjacent areas highly desirable.

A second, but not less important motive for this revision was the situation that no critical monographic work including the *Ochnaceae* of the Indo-Pacific area was written after those by De Candolle (1811) and Planchon (1846—47). The work of Van Tieghem (1902—07) has merit in certain aspects, but his taxonomic treatment has not been accepted because of his unusually narrow species concept. Floras in Asia, Australia, and the Pacific area could only give names according to local traditions.

The area treated covers the tropical and subtropical parts of South and Southeast continental Asia, Malesia, Australia, and the Pacific Islands. This means that the natural boundaries of the *Ochnaceae* are reached in the North (Himalayan Mts., Kwangsi, and Hainan) and the South (NE. Queensland). Fiji marks the eastern boundary, as it is the most remote island group where an Old World genus is found, whereas neotropical genera of this family do not occur in the Pacific Islands.

The western limits of this revision are chosen for practical reasons. There is a wide gap between the species in India and Ceylon on the one hand and those of the SW. Arabian Peninsula, Africa, Madagascar, and the Mascarenes on the other. However, two of the genera treated here are mainly African and apparently there is a rather close relationship between certain species in continental Asia and others in Africa and Madagascar. I have refrained from analysing African material, since thorough comparitive studies could easily have doubled the time necessary for the preparation of this paper. Besides, the African *Ochnaceae* have been revised more often than their eastern relatives and presently they are the subject of more or less parallel studies by other botanists.

Some brief, general chapters on taxonomy, morphology, and geography have been added as an attempt towards a better understanding of the family as a whole, though with special reference to the taxa treated. For data on other taxa I had to rely almost completely on literature. I hope that this will facilitate comparisons with *Ochnaceae* from the African region and the Neotropics.

The completion of this paper was made possible by a grant from the Netherlands Foundation for the Advancement of Tropical Research (WOTRO) and by an allowance for a study tour to herbaria in London and Paris. This substantial support is gratefully acknowledged here.

I am very grateful to Professor Dr. H. J. Lam, formerly director of the Rijksherbarium, who encouraged my first steps on the path of plant taxonomy and advised me to extend my studies to this regional revision. I am very much indebted to his successor, Professor Dr. C. G. G. J. van Steenis, who made it possible for me to realize this plan, first as his assistant, later as a guest worker. He kindly provided me with all possible facilities from the Rijksherbarium and the Flora Malesiana Foundation and he spent much of his valuable time in reading and discussing the final draft of the manuscript. I should like to thank both scientists also for their major contributions to my general education as a botanist.

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Gratefully acknowledged assistance was received from Miss E. van Nieuwkoop, who typed most of the final manuscript and compiled the index, from my wife, who also typed part of it in different stages, and from Mr. C. L. Marks and Mr. E. Vijsma, who prepared the drawings for this paper.

The directors of the institutes mentioned below kindly permitted examination of their collections. Their cooperation is gratefully acknowledged here. I have personally visited the institutes marked with an asterisk*.

A	Arnold Arboretum, Cambridge, Mass., U.S.A.
BKF*	The Forest Herbarium, Bangkok, Thailand.
BM*	British Museum (Natural History), London, England, U.K.
BO	Herbarium Bogoriense, Bogor, Indonesia.
BRI	Botanic Museum and Herbarium, Brisbane, Qld., Australia.
C	Botanical Museum and Herbarium, Copenhagen, Denmark.
CAL	Central National Herbarium, Howrah, Calcutta, India.
DD	Forest Research Institute, Dehra Dun, India.
E	Herbarium of the Royal Botanic Garden, Edinburgh, Scotland, U.K.
FI	Herbarium Universitatis Florentinae, Florence, Italy.
G	Conservatoire et Jardin Botaniques, Geneva, Switzerland.
GH	Gray Herbarium of Harvard University, Cambridge, Mass., U.S.A.
GL	Department of Botany, University of Glasgow, Scotland, U.K.
K*	Herbarium of the Royal Botanic Gardens, Kew, England, U.K.
KEP*	Forest Research Institute, Kepong, Malaya, Malaysia.
KYO	Department of Botany, Kyoto University, Japan.
L*	Rijksherbarium, Leiden, Netherlands.
P*	Muséum National d'Histoire Naturelle, Paris, France.
S	Naturhistoriska Riksmuseum, Stockholm, Sweden.
SAN*	Forest Department, Sandakan, Sabah, Malaysia.
SAR*	Sarawak Museum and Forest Department, Kuching, Sarawak, Malaysia.
SING*	Herbarium of the Botanic Gardens, Singapore.
U*	Botanical Museum and Herbarium, Utrecht, Netherlands.

SUBDIVISION AND INTERRELATIONS

Historical survey

The *Ochnaceae* were first described as a family by A.P. de Candolle in 1811 [1], but it lasted until 1895 that a more unanimously accepted circumscription was given by Gilg. It is not surprising, however, that this family was not recognized as such in early natural systems. The androecium and especially the gynoecium in the respective tribes show at first sight remarkable differences rather than a general resemblance. Nonetheless, it could eventually be demonstrated that the flowers of the *Ochnaceae* have much in common fundamentally, whereas anatomical and palynological evidence also indicates true interrelationships.

In De Candolle's concept, the family *Ochnaceae* comprised about what is treated here as the subfamily *Ochnoideae*. Initially (1811) he added a tribe *Simaroubeae* which he distinguished later on as a separate family (1824). A close relationship between *Ochnaceae* and *Simaroubaceae* was accepted long after by several authors. Reichenbach (1841) even accepted the *Ochnoideae* as a subtribe of a tribe *Simaroubeae* in the family *Rutaceae*.

[1]) References to publications in this chapter are given more extensively in the taxonomic enumeration, mostly under the family, sometimes under relevant lower taxa.

According to later opinions, this was based on analogy rather than on homology of certain floral characters.

The genus *Sauvagesia* L. was regarded by De Candolle (1824) as belonging to a distinct tribe of the *Violaceae*, because of its 3-carpelled, 1-celled ovary, developing into a 3-valved capsule with many seeds. However, in *Sauvagesia* the capsules are opening along the margins of the carpels, whereas in the *Violaceae* the fruits are dehiscing along the medians. His view was supported by several authors like Meisner (1836), Bentham & Hooker (1862), Le Maout & Decaisne (1868), and Baillon (1873). They added other genera to the tribe *Sauvagesiae* sometimes also including *Luxemburgia* St. Hil. and its allies. Other authors like Bartling (1830), Martius (1835), and Endlicher (1840) rather followed Dumortier (1829), who described a separate family *Sauvagesiaceae*. Lindley, who published several versions of a natural system, at first treated the *Sauvagesieae* as a tribe (1830), later as a subfamily in the *Violaceae* (1836), and finally as a family in its own right (1846).

The genus *Euthemis* Jack has also a noteworthy history for its alleged affinities. It was considered to be related to the *Ochnaceae sensu* DC. by Endlicher (1840) and others. Planchon referred it primarily to the *Sauvagesiaceae* (1845), but transferred it later to the *Ochnaceae* (1846). Lindley referred it to the *Ochnaceae* first (1836), later to the *Sauvagesiaceae* (1853).

Planchon (1846—47) was the first to write a world revision of the *Ochnaceae*. He regarded *Ochna*, *Gomphia* (*Ouratea*), and *Elvasia* as belonging to one tribe, incorrectly named *Gomphieae*. He instituted two other tribes in the family, viz. the monogeneric tribe *Euthemideae* from SE. Asia and the *Luxemburgieae* including some neotropical genera. *Sauvagesia* and its closest relatives were not included in the latter tribe, although he pointed at a resemblance with *Luxemburgia*.

Bentham & Hooker largely accepted Planchon's concept in their Genera Plantarum (1862), incorporating *Tetramerista* Miq. in the *Ochneae*. They accepted the *Luxemburgieae* as a tribe in the *Ochnaceae*, whereas the *Sauvagesieae s.s.* were treated as part of the *Violaceae*. Their system has had a considerable influence on many Floras in the late 19th and early 20th century.

Engler published a general treatise on the *Ochnaceae* in 1874, in which the modern outline of the family was already more or less reflected. He united *Elvasia* and *Tetramerista* in a separate tribe and he recognized the *Sauvagesieae* as a tribe of the *Ochnaceae*, still keeping them apart from the *Luxemburgieae*. He divided the family into two groups, without giving these formal rank, and called them 'series'. They were based on the presence or absence of albumen in the seed and were accordingly named '*Albuminosae*' and '*Exalbuminosae*'. He did not associate this criterion with other characters.

Gilg, who treated the *Ochnaceae* in 'Die natürlichen Pflanzenfamilien' (1895), accepted most of Engler's system, including his 'series'. He transferred *Lophira* Banks *ex* Gaertner from the *Dipterocarpaceae* into the '*Exalbuminosae*' *sensu* Engler [1] and he excluded *Tetramerista* from the *Ochnaceae*, both primarily on anatomical grounds. He united the *Sauvagesieae* and the *Luxemburgieae* into a single tribe, incorrectly applying the latter name.

Several papers dealing with the *Ochnaceae* were published by Van Tieghem between 1901 and 1907. Together these comprise the most recent world revision of the family. Van Tieghem was a keen observer and he made important discoveries, especially in the field of embryology. He was also the first to publish an observation concerning the blastogeny in this group. Unfortunately he caused much confusion by his unorthodox

[1]) It is remarkable that two years earlier (Ber. Deutsch. Bot. Ges. 11, 1893, 25) he had pointed to the resemblance in the structure of the ovary of *Lophira* with the *Sauvagesieae* (named by him *Luxemburgieae*) of the "*Albuminosae*"; later he did not refer to this early opinion which is here revived.

treatment of nomenclatural problems and his unusually small concept of taxa of all ranks. Besides, his papers are rather scattered and he revised several of his ideas shortly after publication. He raised Gilg's *Lophireae* and Engler's *Euthemideae*, *Luxemburgieae*, and *Sauvagesieae* to family rank, whereas the *Ochneae* and *Elvasieae* were raised to subfamilies of the *Ochnaceae s.s.* Gilg had recognized three genera in the *Ochneae*, viz. *Ochna* L., *Ouratea* Aubl. (incl. *Gomphia* Schreb.), and *Brackenridgea* A. Gray. Van Tieghem treated *Ouratea* as a tribe, subdivided into two subtribes with 13 palaeotropical and 22 neotropical genera respectively. He united *Ochna* and *Brackenridgea* into another tribe, considering the latter as one subtribe with 5 genera and the former as two subtribes with 11 and 5 genera respectively. Most of Van Tieghem's genera are considered best at the level of section or species, whereas many of his species are mere forms or do not deserve a taxonomic status at all. Later authors followed Gilg rather than Van Tieghem. There is a tendency, however, to re-evaluate Van Tieghem's observations as a basis for a more moderate subdivision of the African *Ochneae s.l.*

Proposed subdivision

Though, in this revision, I have studied only ten genera belonging to three of the five tribes, I have been tempted to propose an improvement of the subdivision of the *Ochnaceae*.

In the first place a few nomenclatural changes appeared necessary to bring the names of subfamilies, tribes, and subtribes in accordance with the present Code of Nomenclature.

I have accepted Engler's main division (1874) into '*Exalbuminosae*' and '*Albuminosae*' as two distinct subfamilies, named *Ochnoideae* and *Sauvagesoideae* respectively, omitting *Tetramerista* which was soon after recognised as Theaceous.

The monogeneric, African tribe *Lophireae* which was not included by Engler in the *Ochnaceae*, was referred by Gilg (1895) to the '*Exalbuminosae*' because of its lack of albumen. However, a position in the *Sauvagesoideae* seems more logical, since it shares non-distichous leaves and a 2-carpelled, 1-celled, many-ovuled ovary with that subfamily.

The proposed system is not very distinct from that by Gilg (1925), mainly differing in the position of the tribe *Lophireae*. (Table 1).

The genus *Ochna* L. was recently subdivided into three sections by Robson (Bol. Soc. Brot. II, 36, 1962, 12). Since only the section *Ochna* is represented in the area treated here, it can be safely assumed that a possible other delimitation of this genus will not affect the names of the Asiatic species in the future.

The genus *Ouratea* Aubl. was subdivided by Gilg (1895) into two sections, *Neoouratea* (New World) and *Palaeoouratea* (Old World), treated later as subgenera (1925). These two taxa are identical with Van Tieghem's 'subtribes' '*Orthosperminae*' and '*Campylosperminae*' respectively. Farron (Bull. Soc. Bot. Suisse 73, 1963, 208—212) proposed for the same taxa a distinction at generic level, correctly reserving the name *Ouratea* for the species of the New World. I have accepted this opinion, but I have used the name *Gomphia* Schreb. for the species of the Old World treated here. This name as typified by me (1967), should have priority over *Campylospermum* v. Tiegh. as used by Farron (l.c., 1963; Bull. Jard. Bot. Brux. 35, 1965, 393) for the same concept.

The genus *Brackenridgea* A. Gray was regarded by many authors as related to *Gomphia* and even as congeneric by Bennett (1875) and Ridley (1922). Van Tieghem placed his 'subtribe' '*Plicoseminae*' (*Brackenridgea s.l.*) first in his tribe *Ourateae* but shortly after in his *Ochneae*. In my opinion *Brackenridgea* is indeed related to *Ochna* rather than to *Ouratea*

TABLE 1. Proposed subdivision of Ochnaceae, complete as far as and including the subtribes. Taxa treated in this revision have been provided with the numbers given to them.

Subfamily	Tribe	Subtribe	Genus
1. Ochnoideae	1. Ochneae	Ochninae	1. Ochna L.
			2. Brackenridgea A. Gray
		Ouratinae (Tiegh.)Kanis 1)	Ouratea Aubl.
			3. Gomphia Schreb.
	Elvasieae Rchb.		Elvasia DC.
	2. Euthemideae Planch.		4. Euthemis Jack
2. Sauvagesoideae Lindl.	3. Sauvagesieae	Sauvagesinae	Sauvagesia L.
			5. Sinia Diels
			6. Indosinia Vidal
			7. Neckia Korth.
			8. Indovethia Boerl.
			9. Schuurmansiella Hall.f.
			10. Schuurmansia Bl.
		Luxemburginae (Planch.)Kanis 2)	Luxemburgia St. Hil.
	Lophireae Rchb.		Lophira Banks ex Gaertn.

1) Subtribus Ouratinae (v.Tiegh.) Kanis stat.nov., based on tribus Ourateae (non Engl.) v. Tieghem, in Morot, J. de Bot. 16 (1902) 33.

2) Subtribus Luxemburgineae (Planch.) Kanis, stat.nov., based on tribus Luxemburgieae Planch. in Hook. Lond. J. Bot. 5 (1846) 592.

and *Gomphia*, the newly introduced *Brackenridgea* sect. *Notochnella* (v. Tiegh.) Kanis being more or less intermediate between *Brackenridgea* and *Ochna*. Van Tieghem's tribes have, therefore, been accepted here as subtribes, named *Ochninae* and *Ouratinae* respectively. Other evidence sustaining this view is derived from palynological data (see p. 13).

The African species of *Brackenridgea* are at first sight rather different from the Asiatic ones, which is probably caused by their adaptation to seasonal drought conditions. They are distinct by persistent stipules and a yellow pigment below the bark (cf. Robson, 1962). Possibly they are treated best as a distinct section.

The *Sauvagesieae* have been subdivided into two subtribes, *Sauvagesinae* and *Luxemburginae*. The latter subtribe includes *Luxemburgia* St. Hil. and the other neotropical genera with 5—∞ stamens and a 3—5-carpelled, usually 3—5-celled ovary. The *Sauvagesinae* comprise *Sauvagesia* L. and all genera with 5 stamens and a 2—3-carpelled, 1-celled ovary, viz. all Asiatic and African genera and the remaining American ones. Six genera of the *Sauvagesinae* have been treated here, four of which have always been regarded as monospecific. In my opinion, the genus *Neckia* Korth. is also represented by only one species, whereas the many species of *Schuurmansia* Blume have been reduced to three.

The *Luxemburginae* are identical with the *Luxemburgieae* in Planchon's original concept. It should be noted that the subtribal subdivision proposed here will result in an arrangement of genera different from that in the tribes *Sauvagesieae* and *Luxemburgieae sensu* Engler (1874).

Table 1 should not be interpreted as a phylogenetical tree, since the taxa are merely arranged according to similarities in their morphological characters, without regard to their respective evolutionary levels or supposed actual relationships. On the other hand, the system proposed is meant as a natural system, since it is assumed that natural relationships are more or less reflected by the subdivision presented. Most taxa seem to be advanced in certain characters and primitive in others. Some remarks on the evolutionary levels in certain organs are made in the chapter on morphology.

A hypothetical evolutionary tree of the *Ochnaceae*, more especially of the *Sauvagesieae* was designed by Jane Decker (1966). She based her assumptions mainly on the taxonomic opinions of Dwyer on American *Ochnaceae* (Thesis Fordham Univ. N.Y., 1941, *non vidi*) and the results of her own anatomical studies. It is an attempt towards a synthesis of all morphological and anatomical data presently known. However, as long as fossil records are lacking, each phylogenetical system will be highly speculative and, therefore, not of great value.

Finally, a remark should be made on the relations of the *Ochnaceae* with other families, although nothing new is added here. Engler (1909) placed the family in his order *Parietales*, suborder *Theineae*, and this position was not fundamentally changed by later authors. They usually raised Engler's suborder, with about the same combination of families, to the rank of order, naming it either *Guttales* (Hallier *f.*, 1912), *Guttiferales* (Wettstein, 1935; Pulle, Compendium, 1938; Melchior 1964), *Clusiales* (Pulle, Compendium, ed. 3, 1952), or *Theales* (Takhtajan, 1959). An exception was made by Hutchinson, who primarily referred the *Ochnaceae* to his *Theales* which he kept apart from his *Guttiferales* (1926). Later he referred the *Ochnaceae* to his *Ochnales*, again a finer segregate from his *Theales* (1959). Most authors agree that the family is among the more primitive in the *Guttiferales*. A discussion of the views on the hypothetical phylogenetical relationships of the *Ochnaceae* was given by Decker (1966).

MORPHOLOGICAL REMARKS

The vegetative parts

The *Ochnaceae* are a typically woody family. Some species grow to a considerable height in the tropical rain forest like the Malesian *Brackenridgea spp.*, some of which have been reported to attain over 30 metres height. Others are only known as bushy shrubs. Smaller treelets and more sparsely branched shrubs occur in the tribes *Sauvagesieae* and *Euthemideae*. Real herbs are only found in the amphi-Atlantic genus *Sauvagesia* L. It is assumed that taller trees represent a more primitive life form in the family, as they often show other characters in a less advanced state. Small shrubs in the subfamily *Ochnoideae* are usually adapted to rather extreme ecological conditions like long dry periods, sometimes they develop typically pyromorphic forms. Undershrubs and herbs in the *Sauvagesoideae* generally do not show such striking adaptations to drought, but are more advanced in floral characters (see below).

The phyllotaxis is distichous in the *Ochnoideae*, non-distichous in the *Sauvagesoideae*. All *Ochnaceae* have stipules which are either persistent or caducous, free or intra-petiolarly united, entire or laciniate, and usually small. The leaves belong to various types which, like the stipules, are often characteristic for certain groups. They may be small in certain *Ochna spp.* of dry habitats to large in some *Sauvagesoideae*: leaves of up to 85 cm long have been measured in *Schuurmansia henningsii*. The leaves of the *Ochnoideae* are usually (ovate-)oblong, whereas those of the *Sauvagesoideae* are obovate-lanceolate or linear-lanceolate. All leaves are stiff, glossy, and above distinctly darker; the texture is sub-coriaceous or chartaceous truly coriaceous in more exposed habitats. The margin is often serrulate or denticulate. Compound leaves occur only in the American *Rhytidanthera splendida* (Planch.) v. Tiegh.

Apart from shape and size, the venation of the leaves is characteristic for certain groups. A pattern of many parallel, only slightly curved nerves is found in the *Sauvagesoideae*; parallel secondary and sometimes more or less distinct tertiary nerves are intercalated between the primary ones. In the Asiatic *Ochna spp.* the nerves are more remote and curved upward. In *Brackenridgea* the nerves are strongly curved upward and some are parallel to the margin over a considerable length. Finally, the Asiatic species of *Gomphia* shows straight nerves, connected by one or two distinct intra-marginal nerves.

The inflorescence

Several kinds of inflorescences occur in the *Ochnaceae*; cymose, racemose, or thyrsoid, simple or compound, lateral or terminal, with or without a terminal flower. Flowers are always articulate. The mode of branching is often a useful taxonomic character, sometimes even at specific level.

Theoretically, all different forms of inflorescences could be derived from a leafy branch, bearing lateral flowers (fig. 1a). By branching from the axils of the bracteoles, the one-flowered inflorescences could develop into simple cymes, monochasia or dichasia (fig. 1b). If the cymose inflorescences are conferted towards the end of the branch and the bracts lose their leaf-like appearance, the inflorescence becomes thyrsoid (fig. 1c). Such a thyrse can become compound once more by incorporating branches at the base that are likewise thyrsoid (fig. 1d).

Thyrses of type c are found in *Brackenridgea*, in some species only as terminal inflorescences, in others as lateral ones as well. A terminal flower is not developed here and the terminal bud of the shoot is often capable to grow on vegetatively after flowering. The cymose branches with three or more flowers are more or less shortened. In sect. *Brackenridgea* the flowers seem to be arranged evenly in a group of conferted umbels,

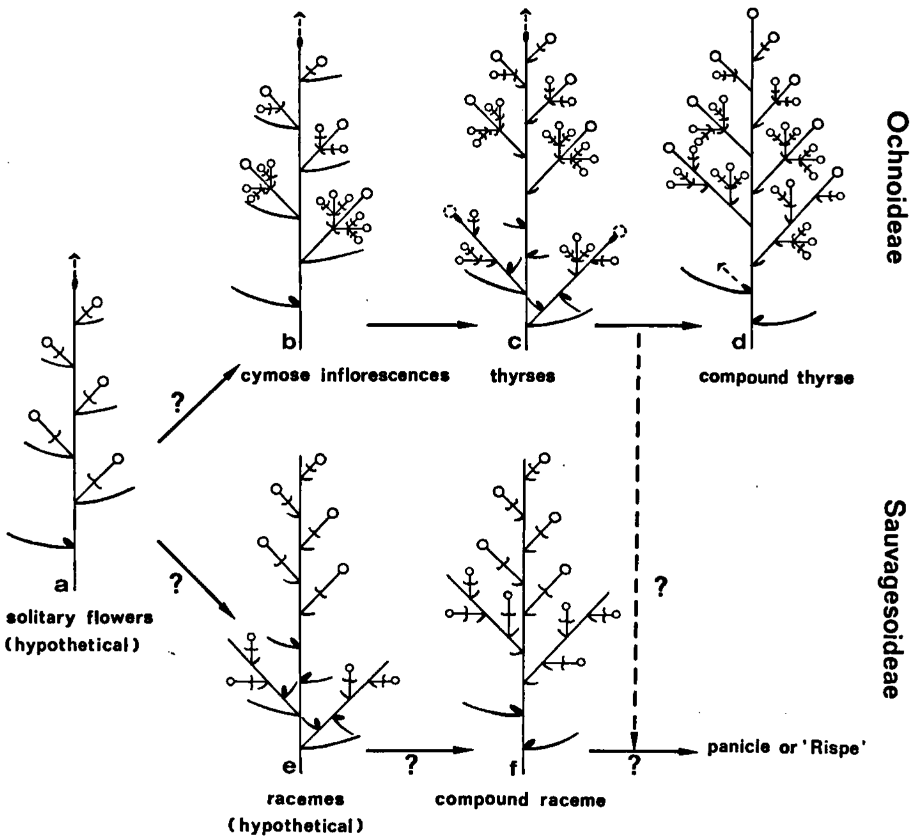

Fig. 1. Concept of inflorescence structures in the *Ochnaceae*. The arrows indicate a theoretical development, not to be interpreted in an evolutionary sense.

rather than in a thyrse. In sect. *Notochnella* the reductions have not gone so far and the sometimes show more clearly their leaf-like nature, indicating a somewhat intermediate stage between b and c.

Thyrses of type c are also found in the Asiatic species of *Ochna*. The cymose branches are not much shortened, but they may be reduced to one flower, especially the higher ones. The terminal bud is developed into a flower, making monopodial growth impossible. This situation is compensated by the fact that the inflorescences are terminal on short side-branches, below the vegetative main shoot of the same season (compare 1c, lower part). It is interesting to mention here the pyromorphic forms of *Ochna obtusata* var. *pumila*. As all stems are burned off yearly, it is impossible to develop a specialised inflorescence from the old wood. As a result, a leafy shoot is formed with axile flowers or simple cymes and without a terminal flower (compare 1b, upper part).

Compound thyrses of type d frequently occur in the Asiatic *Gomphia serrata*, although simple thyrses are found here too. The inflorescences are terminal or lateral. The cymose branches are more or less shortened and they usually have a reduced number of flowers, especially the higher ones. Terminal flowers are developed, making sympodial growth of the vegetative branches necessary.

A raceme (fig. 1e) could be interpreted as another specialisation of type a, viz. a more or less shortened axis with solitary, lateral flowers and reduced leaves. A compound raceme (fig. 1f) can be understood as composed of several simple racemes, but it could also be explained as a compound thyrse (fig. 1d) of which all cymose branches have been reduced to one flower.

The inflorescences in the tribes *Sauvagesieae* and *Euthemideae* have been described by me as compound racemes or panicles for practical reasons, although I doubt that these are completely of a racemose nature. There is a tendency among the flowers of the ultimate branches to grow in pairs or triplets, which is an indication of a thyrsoid nature. However, as this tendency is obscured by reductions or dislocations, it would require a specialised study to reveal their true nature. With the exception of *Neckia*, all genera treated have compound, many-flowered, terminal inflorescences, which make sympodial growth of the vegetative parts necessary. Possibly they are classified best by the German term '*Rispe*'; it should be noted that terminal flowers are probably lacking. The term panicle is a more neutral one than raceme in relation to the mode of branching, but it suggests a more pyramidal form than those found in most genera treated here.

The genus *Schuurmansia* has profusely flowering panicles. The flowers are of somewhat different age. The ultimate mode of branching is very much obscured by concaulescences and recaulescences.

The genera *Sinia*, *Indosinia*, *Indovethia*, and *Schuurmansiella* have raceme-like inflorescences which are fading out towards the apex and may have an occasional, similarly organised branch at base. Other branches are very much shortened and are primarily resembling bundles of two to many flowers of successive age. The ultimate mode of branching is concealed here by the strong reductions. This type is considered by me as more advanced than the previous one.

In the genus *Euthemis* both of the forms just mentioned are found. Small panicles occur in *E. leucocarpa*, whereas *E. minor* has slender, raceme-like inflorescences with shortened branches.

The genus *Neckia* has lateral inflorescences that are found above the leaves in smaller plants, but often on the old wood in larger ones. They are composed of a rachis with a few to several, spirally arranged, empty bracts and one articulate, terminal (?) flower.

Summarising, it can be stated that the inflorescences of the *Ochnoideae* are cymose or thyrsoid with cymose branches which, in accordance with the phyllotaxis, are distichously arranged. Those of the *Sauvagesoideae* are raceme-like or paniculate, but their ultimate mode of branching is not yet completely understood.

The flower

All *Ochnaceae* studied have regular flowers. In some American genera of the *Sauvagesieae* there is a tendency to zygomorphy of the androecium which is manifest in *Luxemburgia* St. Hil.

The calyx is pentamerous, quincuncial, except in the American genera *Blastemanthus* Planch. with ten, and *Elvasia* DC. with three to six lobes. The sepals are free, or only very shortly connate at the base. They are often persistent and accrescent, but they are caducous in several American genera. In the African genus *Lophira* Banks *ex* Gaertn., the outer two or three sepals are considerably, though unequally enlarged in fruit, forming a kind of wings. Ciliate margins occur in several genera of the subfamily *Sauvagesoideae* (*Euthemis*, *Sinia*, *Indosinia*, *Neckia*, *Indovethia*). The outer two and a half sepals that primarily cover the flower bud, are usually much thicker and more fleshy than the inner ones.

The corolla is caducous, contorted, and usually pentamerous. An extra inner whorl of one to five petals is often found in certain species of *Ochna* and *Brackenridgea*. Three to six petals occur in the American genus *Elvasia* DC. It is assumed that five sepals and petals represent the original organisation of the Ochnaceous flower.

The androecium shows various patterns, especially important taxonomically at generic or higher level. Ten stamens, apparently in one whorl, are found in *Gomphia*, *Ouratea*, and in *Brackenridgea* sect. *Brackenridgea*. Many stamens, in more than one whorl, occur in *Brackenridgea* sect. *Notochnella* and *Ochna*; I have counted as few as twelve stamens in *O. jabotapita*, but up to 120 per flower in *O. obtusata* var. *pumila*. Staminodes are never found in the subfamily *Ochnoideae*.

More variation occurs in the subfamily *Sauvagesoideae*, where staminodes are often found in flowers with a reduced number of stamens. In the tribe *Euthemideae*, five fertile, antesepalous stamens are found, sometimes with five alternating staminodes.

In the tribe *Sauvagesieae* there are important differences between the subtribes. The neotropical subtribe *Luxemburginae* usually has many stamens, rarely five or eight, and no staminodes, except *Blastemanthus* Planch. which has ten stamens and many small staminodes in an outer whorl.

The pantropical subtribe *Sauvagesinae* is much more homogeneous, as there are always five fertile, antesepalous stamens and an outer whorl of five, or a multiple of five linear or spatulate staminodes, which are more or less connate at the base. Here the five staminodes that alternate with the stamens usually have one distinct nerve. The other staminodes in the same whorl are smaller and about free (*Schuurmansia*, *Schuurmansiella*, *Neckia*), or fused into five larger, petaloid organs, opposite to the stamens, with two to five distinct nerves, forming a kind of corona (*Sinia*, *Indosinia*, *Indovethia*). Sometimes there are one or more supplementary outer whorls of many smaller, filamentous or gland-like staminodes (*Schuurmansia*, *Schuurmansiella*, *Sinia*, *Neckia*). The reduction of the number of fertile stamens and the fusion of staminodal structures should be considered advanced characters.

The gynoecium also yields important taxonomic characters. The *Ochnoideae* have carpels with one ovule each. The carpels are fused into a single ovary in the tribe *Elvasieae*, but free in the *Ochneae*, which represents a more primitive structure. Five carpels are found in *Ouratea*, *Gomphia*, and *Brackenridgea* sect. *Brackenridgea*; three to ten carpels in one whorl occur in *Brackenridgea* sect. *Notochnella* and in *Ochna*, although up to 15 have occasionally been counted in flowers of *O. integerrima*. It is assumed that a variable number of three to seven carpels is a more primitive character than a fixed number of five. A large number of carpels per flower in species of *Ochna* is usually found together with relatively many stamens and a partial or complete duplication of the corolla. Moreover, such flowers usually have larger flower parts than others. This combination of characters frequently occurs in *O. obtusata* and *O. integerrima*. It would be interesting to investigate whether polyploidy could be the cause of these deviations of the normal pattern.

The *Sauvagesoideae* have two to five carpels, always fused into one ovary. The tribe *Euthemideae* has five-celled ovaries with two ovules per cell. Carpels with many ovules are found in the tribes *Sauvagesieae* and *Lophireae*. Three- to five-celled ovaries are also found in the subtribe *Luxemburginae*, although the septs are sometimes incomplete towards the apex. Two- or three-carpelled, one-celled ovaries are found in the subtribe *Sauvagesinae*, but the parietal placentas are usually intruding towards the base. One-celled ovaries with a reduced number of carpels probably are more specialised than others. The placentation in the tribe *Sauvagesieae* is more or less restricted to the lower half of the ovary and it is completely basal in the African tribe *Lophireae*. A reduction of the number of ovules in the *Euthemideae* probably indicates another specialisation.

The torus has no disk-like appendages. Extensions of the floral axis, in the sense of spacing floral whorls, sometimes occur in the *Sauvagesieae*, like the anthophore of *Indosinia* and the gynophore in several American genera. A swollen torus, especially in fruit, is found in the *Ochneae*: about hemispherical in *Ochna* and *Brackenridgea*, subcylindrical or subglobular in *Ouratea* and *Gomphia*.

Fruit and seed

1. *Ochnoideae*. In the tribe *Elvasieae* each flower develops a single, stellate, coriaceous, one-celled, one-seeded, non-dehiscent fruit. In the tribe *Ochneae* each flower produces one or more, one-celled, one-seeded drupes, although usually less than the number of carpels, as some of these are aborted. The drupes are bluish or black when ripe. In the subtribe *Ochninae* they are contrasting with a swollen torus and an enlarged calyx, both purplish red. Evidently, this colour contrast is an adaptation to bird dispersal. *Brackenridgea* is remarkable for the two inward projections of the endocarp, forming two air-filled spaces and a transverse connection, around which the seed is curved. The seeds of all *Ochnoideae* are without albumen.

2. *Sauvagesoideae*. The *Euthemideae* have red or white berries, each with five one-seeded pyrenes. They are probably dispersed by birds. The *Lophireae* have one-seeded, woody nuts, unevenly winged by the persistent calyx. The *Sauvagesieae* have coriaceous, septicidal capsules with many seeds which are winged in *Schuurmansia* and some American genera. The seeds of the *Lophireae* contain oil, those of the other *Sauvagesoideae* are albuminous.

Embryological characters proved to be important in the tribe *Ochneae*. Van Tieghem (Bull. Mus. Hist. Nat. 8, 1902, 208—218) originally gave short descriptions of ten types of embryos and added some more later. Farron (Bull. Soc. Bot. Suisse 73, 1963, 197—203) interpreted and evaluated these types, adding schematic drawings. I have not used the specialised terminology of these authors in the descriptions, as it was not necessary for distinction between the taxa studied. However, Van Tieghem's terms should be mentioned here, as far as relating to these taxa. *Ochna* species of sect. *Ochna* have erect seeds and 'isocotyled, incumbent' embryos. *Brackenridgea* species of sect. *Brackenridgea* and sect. *Notochnella* have seeds which are strongly curved around the inward projections of the endocarp and also 'isocotyled, incumbent' embryos. *Gomphia serrata* has curved seeds and 'isocotyled, accumbent' embryos.

Anatomical characters

A short paragraph on anatomy should be added, as studies in this field have contributed much to the concept of the *Ochnaceae* as a natural family. I have not carried out any anatomical research myself.

Gilg (Ber. Deutsch. Bot. Ges. 11, 1893, 20—25) demonstrated the homogeneity of the family from an anatomical point of view. He found that cortical bundles without resin canals are characteristic for the *Ochnaceae*. (Cortical bundles with resin canals are found in the *Dipterocarpaceae*.) He accepted the circumscription of Engler (1874), with the exception of *Tetramerista* Miq. which was excluded, and *Lophira* Banks *ex* Gaertn. which was included in the family.

Van Tieghem paid much attention to anatomical characters in the *Ochnaceae s.l.*, especially in the taxa that are referrred here to the subfamily *Ochnoideae*. In one publication

(Bull. Mus. Hist. Nat. 8, 1902, 266—273) he described the 'cristarque' cells that are characteristic for this subfamily.

Metcalfe and Chalk (1950) pointed to the taxonomic importance of the cortical bundles in the *Ochnaceae* and the 'cristarque' cells in the genera united here in the subfamily *Ochnoideae*. They also mentioned mucilage cells as characteristic for certain genera referred by me to the subfamily *Sauvagesoideae*. They distinguished three main types of wood parenchyma, viz. apotracheal in the genera of the subfamily *Ochnoideae*, paratracheal in some genera of the tribe *Sauvagesieae*, metatracheal in the genus *Lophira*. The inclusion of *Lophira* in the *Ochnaceae* was considered by them to be correct, its position, however, being rather isolated.

Jane Decker (1966) studied the anatomy of the wood, especially in the tribe '*Luxemburgieae*' (*Sauvagesieae*). She excluded amongst others again *Tetramerista* from the family on anatomical grounds. Following Gilg (1925), she accepted *Lophira* in her subfamily '*Exalbuminosoideae*' as representing a distinct tribe. However, she found that the *Lophireae* have homogeneous vascular rays, metatracheal axial parenchyma, and vasicentric tracheids, whereas the '*Ourateae*' (*Ochneae*) and *Elvasieae* have heterogeneous vascular rays, diffuse and vasicentric axial parenchyma, and no vasicentric tracheids.

From an anatomical point of view, there are no objections to a subdivision of the *Ochnaceae* like the one proposed (see table 1). The removal of *Lophira* from the '*Exalbuminosae*' appears fully justified by its lack of 'cristarque' cells, the homogeneity of its vascular rays, the presence of vasicentric tracheids, and the type of the axial parenchyma. A relationship between the *Lophireae* on the one hand and the *Sauvagesieae* and *Euthemideae* on the other, is perhaps not clearly indicated on anatomical grounds. However, it should be kept in mind that the *Lophireae* are often tall trees, whereas the other *Sauvagesoideae* usually do not grow beyond shrub size. Smaller sizes of plants are possibly correlated with more simple wood structures (cf. Decker, 1966).

The pollen

Up till the present, only Erdtman (1952) has published a limited amount of information on the pollen of the *Ochnaceae*. Some further investigations in this field were recently made by J. Muller. His results will be published separately, but some of his tentative conclusions are briefly rendered below.

Investigations were made of 24 species in 12 genera, mainly from Southeast Asia, but including representatives of all tribes. It was demonstrated that the pollen of all taxa studied has a general resemblance, but taxonomically interesting differences were found at generic or higher levels. The following types were distinguished:

1. Lophira type: *Lophira, Neckia, Schuurmansiella.*
2. Indovethia type: *Indovethia.*
3. Euthemis type: *Euthemis, Indosinia.*
4. Schuurmansia type: *Schuurmansia.*
5. Ochna type: *Ochna, Brackenridgea.*
6. Elvasia type: *Elvasia.*
7. Ouratea type: *Ouratea, Gomphia.*

Types 4—6 have in common that colpi and pores are equally well developed. Types 1—3 have reduced pores and bridged colpi. Type 7 has reduced colpi. Other distinctions between the types are mainly based on the thickness of the wall, the development in the wall of more or less distinct ektexine and endexine, and the development of a more or less distinct layer of pillars under a tectum in the ektexine.

If compared with the proposed subdivision of the *Ochnaceae* (table 1), it will be seen

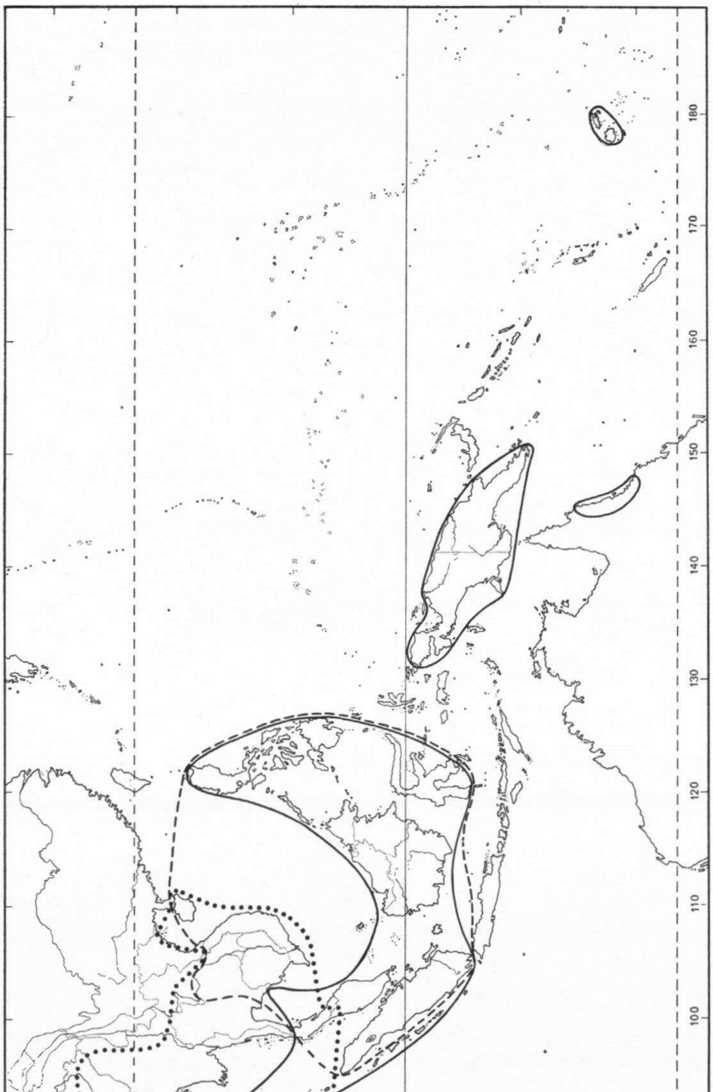

Fig. 2. Distributional map of the genera of the subfamily *Ochnoideae* in the Indo-Pacific area. Outlined areas are more or less generalised.

that types 1—4 are found in one subfamily, whereas types 5—7 occur in the other. Reduction of pores and bridging of colpi appears to be a tendency in the *Sauvagesoideae*, whereas reduction of colpi is only found in the *Ochnoideae*. Equally well developed colpi and pores occur in both subfamilies, but distinction between the rather primitive, thin-walled *Schuurmansia* (4) type and the types with more or less distinct pillars of *Ochna* and *Elvasia* (5, 6) is rather easy.

In the *Ochnoideae*, the tribe *Elvasieae* and the subtribes *Ochninae* and *Ouratinae* can be distinguished also by their respective pollen types. In the *Sauvagesoideae* the situation is different. The tribe *Sauvagesieae*, as far as studied, is represented by four different types, whereas the respective pollen types of the tribes *Lophireae* and *Euthemideae* are similar to two of these four. Although the presentation of pollen types does not support the proposed subdivision of the *Sauvagesoideae*, the coherence of the subfamily appears well demonstrated. This confirms the position of the genus *Lophira* in this subfamily as being a natural one.

The pollen type of *Tetramerista* Miq. is not referable to the *Ochnaceae*, but is certainly related to those in the *Theaceae*.

GEOGRAPHICAL REMARKS

Summary of data

The *Ochnaceae* form a pantropical family with only a few representatives in the subtropics. In Asia only the genus *Sinia* from Kwangsi at *c.* 24° N. is extra-tropical, whereas the species *Ochna obtusata* and *O. integerrima* partly cross the Tropic of Cancer in northern India, to *c.* 30° N.

In the subfamily *Ochnoideae* there are the neotropical, monogeneric tribe *Elvasieae* and the pantropical tribe *Ochneae*. The latter tribe is subdivided in a mainly amphi-Atlantic subtribe *Ouratinae* and a palaeotropical subtribe *Ochninae*. Amphi-Pacific relationships do not occur within the subfamily.

The subtribe *Ouratinae* comprises the neotropical genus *Ouratea*, the African genera *Rhabdophyllum* v. Tiegh. and *Idertia* Farron, and the mainly African *Gomphia* which is also represented, by one variable species, in parts of continental Asia and western Malesia.

The subtribe *Ochninae* comprises the palaeotropical genera *Ochna* and *Brackenridgea*. *Ochna* is represented by several species in three, mainly African sections, only sect. *Ochna* also occurring in continental Asia with four species. *Brackenridgea* comprises five species in two sections, ranging from the Andaman Islands to Fiji, and some other species, probably in a distinct section, in eastern Africa and Madagascar.

In the subfamily *Sauvagesoideae* there are the monogeneric tribes *Lophireae* and *Euthemideae* which are African and Malesian respectively and the pantropical tribe *Sauvagesieae*. The latter tribe is subdivided into the neotropical subtribe *Luxemburginae* and the pantropical subtribe *Sauvagesinae*.

The majority of the genera and species of the *Sauvagesinae* are found in tropical America, eight species in six genera occur in Southeast Asia and the western Pacific, and only the amphi-Atlantic genus *Sauvagesia* L. (incl. *Vausagesia* Baill.) is found in Africa with two species. The relationships of the *Sauvagesinae* in Malesia *s.l.* are, therefore, amphi-Pacific rather than via Africa. This is especially true for *Schuurmansia*, a genus with winged seeds, occurring from Borneo and Luzon to the Solomon Islands, since other genera with similar seeds are found in South America only. The other *Sauvagesinae* treated are restricted to continental Southeast Asia and western Malesia. *Sinia* and

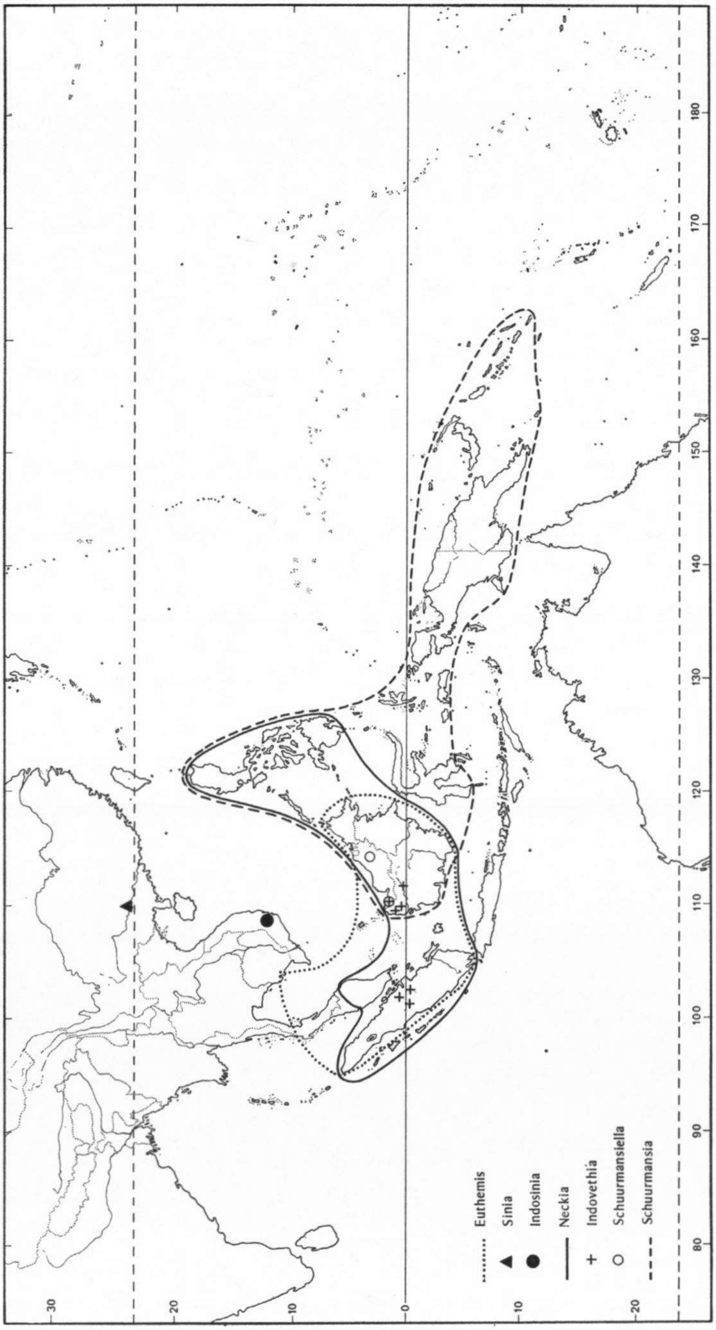

Fig. 3. Distributional map of the genera of the subfamily *Sauvagesoideae* in the Indo-Pacific area. Outlined areas are more or less generalised.

Indosinia seem to be limited to small areas in Kwangsi and South Vietnam respectively. *Neckia* is found in Sumatra, the Malay Peninsula, Borneo, and the Philippines. *Indovethia* apparently occurs in central eastern Sumatra and western Borneo only, whereas *Schuurmansiella* appears to be restricted to certain localities in Sarawak.

Distributional maps of the genera in the Indo-Pacific area are given for the respective subfamilies (figs. 2, 3). The areas of relatively rare, monospecific genera are indicated by their localities as presently known. Those of more widely distributed genera are delimited by more or less generalised outlines, since larger islands or island groups are included as a whole even if only one or a few collections are known from such island. Less generalised areas are given in the distributional maps of species under the genera *Ochna*, *Brackenridgea*, *Euthemis*, and *Schuurmansia* (figs. 4, 6, 7, 8).

Discussion

The present distribution of taxa should of course be explained by past and present geological and ecological circumstances. It should be kept in mind, however, that the distribution of most genera and species treated is still imperfectly known. The genus *Neckia*, for example, is only known from the Philippines by one collection from Samar. It is very probable that this genus will prove to occur in neighbouring islands as well, in particular in those of the easternmost arch, where a dry season is almost absent. Distributional gaps in North and South Sumatra and South Borneo are probably likewise due to insufficient botanical exploration of these areas.

The genus *Ochna* is doubtless of African origin, its Asiatic subcenter being in Ceylon, where three species are found of the four treated. It never spread into Malesia beyond the northern half of the Malay Peninsula.

Ochna jabotapita is confined to the everwet south-western part of Ceylon. Its probably closest relatives are in Madagascar and the Mascarenes, such as *O. mauritiana* DC. The species occurring in continental Asia are more or less adapted to seasonal drought. Species that are closely related to *O. lanceolata* from Malabar and Ceylon, are found in eastern Africa, of which *O. inermis* (Forsk.) Schweinf. is also found in the mountains of Yemen.

Ochna obtusata and *O. integerrima* are rather closely related: possibly they developed from a single species, of which the area became disjunct at a time. They are probably more related to *O. jabotapita* than to *O. lanceolata*. They meet each other in Assam and East Pakistan, *O. integerrima* spreading westward into the Chittagong Hill Tracts and the Khasia and Garo Hills, *O. obtusata* occurring eastward down along the coast of Chittagong and upward through the valley of the Brahmaputra.

The genus *Gomphia* also originated in Africa, from where it reached Ceylon and southern India at a time. It is adapted to a more or less everwet climate, although it can stand a not too severe dry period. Climatic conditions in the past have possibly permitted *Gomphia* to spread through India and Birma into Further India and western Malesia. It does not occur in Java, the islands north and west of Sumatra and east of Celebes, which might indicate its relatively recent arrival in the Malesian area. The present disjunction in Asia is certainly caused by more recent ecological changes. It has not given rise to differentiation at specific level, although some local races can be distinguished.

The genus *Brackenridgea* was probably in Malesia before the arrival of *Ochna* and *Gomphia*. Evidence for this assumption is found in its present wide, but disjunct distribution. Although occurring in eastern Africa and Madagascar on the one hand and in Malesia *s.l.* on the other, it appears to be completely absent from India and Ceylon.

In western Malesia it covers about the same area as *Gomphia*, but including the Andaman and Mentawai Islands. Eastward it is found in New Guinea, the wet, northeastern, coastal area of Queensland, and in Fiji. The apparent absence of the genus from continental Southeast Asia and the Moluccas is very probably due to recent ecological conditions, as it does not occur in areas with even a short dry season.

It is not surprising that *Brackenridgea hookeri* and *B. palustris* in western Malesia on the one side and *B. forbesii* and *B. nitida* in eastern Malesia, Queensland, and the Pacific on the other, form two slightly distinct groups within one section. It is remarkable, however, that *B. fascicularis* from the Philippines represents a distinct section.

As already concluded, the *Sauvagesinae* in Southeast Asia and the western Pacific have no close affinities with those in Africa. The fact that *Sinia*, *Indosinia*, *Indovethia*, and *Schuurmansiella* are monospecific genera with restricted distribution probably indicates a relict-like nature of the subtribe. The more common, monospecific genus *Neckia* is distributed from the Mentawai Islands to Samar, which is within the same general area. Only *Schuurmansia* is represented by three species, reaching from Borneo through the Moluccas to the Solomon Islands. Its occurrence in geologically more disturbed regions is understandable from the pioneer-like nature of its species. It is assumed that *S. elegans* is more common on both sides of Makassar Strait, than can be concluded from present collections.

The monogeneric tribe *Euthemideae* is only found in western Malesia and in a small area in Cambodia. Possibly it descended from an old stock in the tribe *Sauvagesieae* and it may well have originated in or near western Borneo which is still the Malesian centre of that tribe. Apparently it never reached the islands north and west of Sumatra, Java, Celebes, or the Philippines, which probably indicates a relatively young age of the genus *Euthemis*. *E. minor* covers a smaller area than *E. leucocarpa*, which is probably best explained by the fact that the former species is adapted to a drier and poorer type of kerangas, especially common in Borneo and the islands east of Sumatra.

It is remarkable that no *Ochnaceae* have ever been collected in Java and the Lesser Sunda Islands. However, it should be noted in this respect that the area is subjected to a dry monsoon from Central Java eastward, which makes occurrence of most Malesian genera improbable. The deciduous species of *Ochna* apparently never crossed the barrier of everwet lowland rainforest in western Malesia.

It is a different matter that no *Ochnaceae* have been found in the everwet province of West Java. The genus *Gomphia* probably arrived too late in the area to be able to cross Sunda Strait and the young Java Sea, since it is found as far south as the Lampong Districts and Karimundjawa. It is more difficult to understand, why widely distributed genera such as *Brackenridgea*, *Euthemis*, and *Neckia* should not occur in West Java. The most probable explanation is that the young volcanic soils of Java are not suitable for these genera, as they are usually found on poor sandstone soils or in peat swamp forests.

REMARKS ON THE PRESENTATION OF DATA

Literature concerning taxa treated is given as complete as possible. Enumerations and lists, however, are given only if being generally in use for reference in certain areas, or if being of historic importance in this respect. A selection of general works of reference is given under the family.

The cited literature is arranged according to the homotypical method, that is first to taxa, secondly to synonymous basionyms in chronological order, finally to homotypic synonyms, also chronologically.

The synonymy of the respective taxa includes all valid names and effectively published *nomina nuda*, as far as relevant to the area treated. Full references are given under family, subfamilies, tribes, genera, and species, whereas only relevant basionyms are repeated under sections, subspecies, and varieties.

In drafting the descriptions, all possible care has been taken to facilitate comparison between those of taxa of the same rank and to avoid duplication with those of higher and lower ranking taxa.

A key to the subfamilies, tribes, and genera is given under the family. Keys to species are given under the respective genera, those to subspecies or varieties under the respective species.

The distribution of each taxon is briefly indicated. Geographical enumerations of specimens are given under the lowest taxa distinguished, species, subspecies, or varieties. The collections are arranged by geographical units, political units, administrative units, and by localities, as far as known and in this order. The sequence is generally running from west to east and from north to south. Islands are treated after the corresponding areas on the mainland or larger island. Specimens of unknown localities within a certain area are cited first, those of untraced localities within that area are given at the end. The spelling of geographical names is similar to that of the Times Atlas, midcentury edition, as far as possible.

A geographical enumeration of specimens was chosen instead of an identification list, arranged by collectors' names and numbers. Advantages of the accepted method are detailed information on the distribution of taxa and the possibility to mention old specimens without a collector's number. Only few collections without collector's name, or with geographical annotations no more precise than '*India Orientalis*', have been left out.

Short ecological notes are given for each taxon, usually generalised from scant annotations on labels and in local floras. Notes on some species in western Malesia could be emended from observations in the field.

Vernacular names and local use of species or lower taxa are mentioned as far as known from literature and labels, since these might be of some use to foresters and ethnobotanists. I can not guarantee the correct spelling or application of the names. Only Malay names have been more or less adapted to the spellings, presently used in Malaysia and Indonesia respectively. Some Malay names mentioned by others have been discarded, as these are known to be currently used for non-Ochnaceous plants.

Genera and species excluded for taxonomical or geographical reasons, are discussed at the end.

An index to effectively published names of genera and lower taxa has been added. For practical reasons, no references are given to pages, but only to the numbers of the respective taxa as accepted here.

OCHNACEAE

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Sauvagesiaceae Dum., Anal. Fam. Pl. (1829) 49; Mart., Conspectus (1835) 50; Lindl., Veget. Kingd. (1846) 343; ibid. ed. 3 (1853) 343; v. Tiegh., Ann. Sc. Nat. Bot. VIII, 19 (1904) 93—96. — '*Ordo Sauvagesiae*' Bartl., Ord. Nat. Plant. (1830) 289. — '*Ordo Sauvagesieae* Endl., Gen. Pl. (1840) 912; Planch. in Hook., Ic. Pl. II, 4 (1845) t. 711; Walp., Rep. 5 (1846) 60; Ann. 2 (1852) 68. — Type genus: *Sauvagesia* L.

Euthemidaceae v. Tiegh., Ann. Sc. Nat. Bot. VIII, 19 (1904) 96. — Type genus: *Euthemis* Jack.

Woody plants, very small undershrubs to tall trees, with ± terete branches. *Leaves* stipulate, simple, glabrous; midrib prominent on either side. *Inflorescences* 1- to many-flowered, cymose, racemose, or thyrsoid, bracteate; lateral, terminal, or both; pedicels articulate. *Flowers* actinomorphic, bisexual (rarely functionally polygamous). *Sepals* 5, free or a little connate at base, quincuncial, persistent. *Petals* 5—10, free, contort, caducous. *Staminodes* 0—∞. *Stamens* 5—10—∞; anthers basifix, ± latrorse and dehiscing lengthwise, or with 1—2 apical pores. *Carpels* 2—5—10(—15), superior, free with 1 ovule, or fused with 2—∞ ovules per carpel; styles fused, basigyn or epigyn respectively; stigmas free or ± fused. *Fruits*: drupes, berries, or capsules. *Seeds* 1—∞, small or large, sometimes winged, with or without albumen.

Distribution: About 30 genera and possibly *c.* 250 species through the tropical, rarely subtropical countries (S. Africa).

Remarks: The description presented is compiled from my own observations on the Indo-Pacific taxa. The following deviations of the characters mentioned occur in the neotropics:

(a) Compound leaves in *Godoya splendida* Planch.

(b) Zygomorphic flowers in *Luxemburgia* St. Hil.

(c) 10 Sepals in *Blastemanthus* Planch., 3—6 sepals and petals in *Elvasia* DC.
(d) Caducous sepals in several American genera.
(e) Herbs in *Sauvagesia* L.

KEY TO THE GENERA

1. Stamens 10—∞. Carpels (3—)5—10(—15), free. Fruits 1—5, 1-seeded drupes on a swollen torus. Leaves distichous (*Ochnoideae-Ochneae*).
  2. Anthers opening with 2 apical pores. Stipules intrapetiolary united. Inflorescences with (1—)3—∞, ± remote flowers, usually thyrsoid, sometimes simple cymes.
    3. Stamens 12—∞; ovaries (3—)5—10(—15); embryo straight. Leaves without an intra-marginal nerve . . . . **1. Ochna**
    3. Stamens 10; ovaries 5; embryo curved. Leaves with a distinct intra-marginal nerve . **3. Gomphia**
  2. Anthers opening with 2 longitudinal slits. Stipules free. Inflorescences of umbelloid appearance with ∞ flowers in conferted, cymose clusters of 3 or more . . . . **2. Brackenridgea**
1. Stamens 5. Carpels 2—5, fused. Fruit a more-seeded berry or capsule; torus not distinctly enlarged in fruit. Leaves alternate, not distichous (*Sauvagesoideae*).
  5. Ovary 5-carpelled, 5-celled. Fruit a berry. Anthers opening by 1 apical pore (*Euthemideae*). **4. Euthemis**
  5. Ovary 2—3-carpelled, 1-celled. Fruit a capsule. Anthers opening by 2 longitudinal slits (*Sauvagesieae*).
    6. Ovary 2-carpelled. Flowers with a distinct anthophore . . . . **6. Indosinia**
    6. Ovary 3-carpelled. Flowers without anthophore.
      7. Seeds not winged. Fruit opening with 3 valves. Inflorescences simple, or compound and (nearly) all branches shortened.
        8. Inflorescences axillary; the rachis bearing a varying number of bracts, but only 1 flower. **7. Neckia**
        8. Inflorescences terminal (or pseudo-axillary by sympodial growth), many-flowered.
          9. Staminodes 10, in 1 whorl. Fruit subglobose . . . . **8. Indovethia**
          9. Staminodes ∞, in more than 1 whorl, those of the inner whorl larger. Fruit fusiform.
            10. Staminodes of inner whorl 10, spatulate, alternatingly with 1 and 3—5 nerves respectively. Petals as long as the sepals . . . . **5. Sinia**
            10. Staminodes of inner whorl 25—30, linear, equal. Petals 3—4 × as long as the sepals. **9. Schuurmansiella**
      7. Seeds winged. Fruit opening with 3 longitudinal slits under the persistent style. Inflorescences much-branched panicles . . . . **10. Schuurmansia**

SUBFAM. 1. OCHNOIDEAE

v. Tiegh., Bull. Mus. Hist. Nat. Paris 8 (1902) 548; Ann. Sc. Nat. Bot. VIII, 16 (1902) 188, 204, 405; ibid. 18 (1903) 60. — *Ochnaceae 'ser. Exalbuminosae'* Engl., Nova Acta Leop.-Carol. Akad. 37, 2 (1874) 20. — *'Exalbuminosae'* Gilg in E. & P., Nat. Pfl. Fam. 3, 6 (1895) 138; D.-T. & H., Gen. Syph. (1903) 315; Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 63. — *Exalbuminosoideae* Decker, Phytomorphology 16 (1966) 45, *nom. illeg.* — Type genus: *Ochna* L.

Trees or shrubs. *Leaves* distichous, shortly but distinctly petioled; nerves ± straight to strongly curved. *Inflorescences* cymose or thyrsoid. *Flowers* bisexual. Petals 5—10. Staminodes 0. Stamens 10—∞ in 1 or more whorls, free. Carpels (3—)5—10(—15) in 1 whorl, free, with 1 ovule; style gynobasic, persistent even beyond fruitfall. *Fruits*: drupes on a swollen torus or gynophore. *Seed* exalbuminous.

Distribution: The tribe *Ochneae* occupies approximately the same area as the family, the tribe *Elvasieae* is restricted to the neotropics.

Remarks: The African genus *Lophira* Banks *ex* Gaertn. and the American genus *Elvasia* DC. were treated by Gilg (1895, 1925) as representing separate tribes, related with the *Ochneae* because of their exalbuminous seeds. I would rather place *Lophira* in a distinct tribe in the *Sauvagesoideae*, because of its non-distichous leaves and carpels with more than 1 ovule.

The tribe *Elvasieae* differs from the tribe *Ochneae* in the following characters:

(a) Sepals and petals 3—6.
(b) Stamens 8—20.
(c) Carpels 4—5, fused into a 2—5-celled ovary with 1 ovule per cell and ± epiginous style, developing into a coriaceous, 1-celled, 1-seeded fruit.
(d) Torus in fruit not distinctly enlarged.

Tribe 1. OCHNEAE

Endl., Gen. Pl. (1840) 1142; Rchb., Nomenclator (1841) 197; Lindl., Veg. Kingd. (1846) 475; Walp., Ann. 7 (1868) 543; v. Tiegh. in Morot, J. Bot. 16 (1902) 113—119, 127, 128, 181—183; Bull. Mus. Hist. Nat. Paris 8 (1902) 547—549; Ann. Sc. Nat. Bot. VIII, 16 (1902) 189, 195, 343, 405; ibid. 18 (1903) 39, 60; ibid. IX, 5 (1907) 172. — '*Sect. Ochnaceae polyandrae*' DC., Ann. Mus. Paris 17 (1811) 406, 410. — '*Genera Ochnea*' Bartl., Ord. Nat. Plant. (1830) 384. — *Gomphieae* Planch. in Hook., Lond. J. Bot. 5 (1846) 593, 648, *nom. illeg.*; Walp., Ann. 1 (1849) 179. — *Ourateae* Engl., Nova Acta Leop.-Carol. Akad. 37, 2 (1874) 20, *nom. illeg.*; Gilg in E. & P., Nat. Pfl. Fam. 3, 6 (1895) 139; D.-T. & H., Gen. Syph. (1903) 315; Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 63; Decker, Phytomorphology 16 (1966) 45. — Type genus: *Ochna* L.

'*Sect. Ochnaceae oligandrae*' DC., Ann. Mus. Paris 17 (1811) 407, 414, excl. *Elvasia* DC. — *Ourateae* Engl., *nom. illeg., p.p.*; v. Tiegh. in Morot, J. Bot. 16 (1902) 33—36, 47, 181—183, 194, 204; Bull. Mus. Hist. Nat. Paris 8 (1902) 547—549; Ann. Sc. Nat. Bot. VIII, 16 (1902) 189, 204, 343; ibid. 18 (1903) 5, 39; ibid. IX, 5 (1907) 163. — Type genus: *Ouratea* Aubl.

Distribution: Two mainly African genera occur also in the Indo-Malesian area; a third genus is found in Malesia and the Pacific and perhaps also in East Africa; 2 other genera are found in Africa and 1 in South America.

1. OCHNA

Linné, Spec. Pl. 1 (1753) 513; Gen. Pl. ed. 5 (1754) 229; Boehm. in Ludw., Def. Gen. Pl. (1760) 315; Schreb., Linn. Gen. Pl. ed. 8, 1 (1789) 354; Vahl, Symb. Bot. 2 (1791) 50; Lamk., Enc. Méth. 4, 2 (1797) 509, *p.p.*; Willd., Linn. Spec. Pl. ed. 4, 2 (1799) 1158; DC., Ann. Mus. Paris 17 (1811) 410; Prod. 1 (1824) 735; Roxb., Fl. Ind. ed. Carey, 2 (1832) 643; W. & A., Prod. Fl. Pen. Ind. Or. 1 (1834) 152; Endl., Gen. Pl. (1840) 1142; B. & H., Gen. Pl. 1 (1862) 317; Baill., Hist. Pl. 4 (1873) 368; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 523; Kurz, For. Fl. Br. Burma 1 (1877) 204; Boerl., Handl. Fl. Ned. Ind. 1 (1890) 173; Trim., Handb. Fl. Ceyl. 1 (1893) 232; King, J. As. Soc. Beng. 52, II (1893) 231; Gilg in E. & P., Nat. Pfl. Fam. 3, 6 (1895) 139; Bartell., Malpighia 15 (1901) 153; *non* v. Tiegh. in Morot, J. Bot. 16 (1902) 119, *err. emend.*; Lecomte, Fl. Gén. Indo-Ch. 1 (1911) 705; Ridl., Fl. Mal. Pen. 1 (1922) 364; Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 67, 71; Robs., Bol. Soc. Broter. II, 36 (1962) 11; Taxon 11 (1962) 48—51. — *Jabotapita* Plum., Pl. Am. ed. Burm., 7 (1758) 147, *in syn.*; Adans., Fam. Pl. 2 (1763) 364, *p.p. quoad syn. Linn., nom. illeg.* — *Discladium* v. Tiegh., Bull. Mus. Hist. Nat. Paris 8 (1902) 214; in Morot, J. Bot. 16 (1902) 125; Ann. Sc. Nat. Bot. VIII, 16 (1902) 196, 350; ibid. 18 (1903) 42, *nom. illeg.* — Type species: *O. jabotapita* L.

Diporidium Wendl. *f.* in Bartl. & Wendl., Beitr. Bot. 2 (1825) 24; Kuntze, Rev.

Gen. Pl. 1 (1891) 104, *emend., incl. typ. Ochna*; v. Tiegh., Bull. Mus. Hist. Nat. Paris 8 (1902) 214; in Morot, J. Bot. 16 (1902) 126; Ann. Sc. Nat. Bot. VIII, 16 (1902) 196, 353; ibid. 18 (1903) 51. — Lectotype species: *D. atropurpureum* (DC.) Wendl. *f.* = *Ochna atropurpurea* DC.

Polythecium v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 196, 366; ibid. 18 (1903) 53; ibid. IX, 5 (1907) 174. — Lectotype species: *P. ciliatum* (Lamk.) v. Tiegh. = *Ochna ciliata* Lamk.

Pleopetalum v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 163; in Morot, J. Bot. 17 (1903) 97; Ann. Sc. Nat. Bot. VIII, 18 (1903) 45. — Lectotype species: *P. lucidum* (Lamk.) v. Tiegh. = *Ochna obtusata* DC.

Polythecanthum v. Tiegh., Ann. Sc. Nat. Bot. IX, 5 (1907) 160, 175. — Lectotype species: *P. thorelii* (v. Tiegh.) v. Tiegh. = *Ochna integerrima* (Lour.) Merr.

Shrubs or treelets with spreading branches, sometimes undershrubs. Stipules small, intrapetiolarly united, caducous. *Leaves* chartaceous or subcoriaceous, nerves curved upward, especially near the margin, not joining, veinlets ± at right angles to the nerves near the midrib and joining in irregular secondary nerves, ± transverse near the margin. *Inflorescences* sometimes lateral, simple cymes, mostly lateral or terminal thyrses with a terminal flower; peduncle ± persistent, bearing at base many small, distichously conferted, caducous bracts, leaving a distinct annulus of scars, with small axillary buds, sometimes branching once or twice after flowering and developing new inflorescences; pedicels filiform, articulate. *Flowers* with ± hemispherical torus, distinctly tumid and turning red in fruit. *Sepals* 5, greenish, enlarging and turning red in fruit. *Petals* 5(—10) in 1—2 whorls, yellow. *Stamens* ∞ in 2 or more whorls; filaments subterete; anthers opening with 2 apical pores. *Ovaries* 5—10(—15), obovoid; ovule atropous; stigmas as many as ovaries, on short branches or ± united. *Fruits* 1—3(—5), greenish, turning black when ripe.

Distribution: 4 species in continental S. and S.E. Asia, Ceylon, Hainan, and the northern Malay Peninsula; the majority of the species in Africa S. of the Sahara, the S.W. part of the Arabian Peninsula, Madagascar, and the Mascarene Is.

Ecology: Confined to the tropical areas below 1500 m altitude, as far northward as the foothills of the Himalayan Mts. More or less adapted to dry seasons and dry habitats on poor soils. Dispersal by birds because of conspicuous black fruits on red torus and calyx (Ridley, Disp. Pl., 1930, 419).

Remarks: Linnaeus' changing circumscription of *O. jabotapita* and the heterogeneity of this concept have caused controversial interpretations of the genus *Ochna* L. and its type species in later years. Robson (1962) made an analysis of the nomenclatural aspects of the problem, applying the modern rules, and his conclusions are accepted here.

The genus *Ochna* L. (1753) was defined as having numerous stamens per flower. *O. jabotapita* L. (1753) was the sole species described originally and only 'Burm. Zeyl. 123. t. 56.' is cited under the type variety. The specimen depicted, however, belongs to *Ouratea* Aubl. *s.l.*, a genus defined as having 10 stamens per flower. This discrepancy is elucidated in the protologue: (L., Fl. Zeyl., 1747, 93). The same phrase and plate are cited there, together with another phrase of Burman and a specimen in Hb. Hermann. The specimen of Hermann certainly belongs to *Ochna*, having many stamens per flower. Apparently it is the only collection from Ceylon seen by Linnaeus personally and therefore it should be designated as the type collection of *O. jabotapita* L.: the type species of the genus *Ochna* L.

The name *Ochna* was incorrectly used by Kuntze (1891) to designate the genus generally known as *Ouratea* Aubl. Consequently he renamed under *Diporidium* Wendl. *f.* (1891) the species previously described in *Ochna* L., including its type species.

Van Tieghem (1902) incorrectly reserved the name *Ochna* L. for a group of African species. The type species of *Ochna* L. was included in his genus *Discladium*, making the latter a superfluous name.

The genera *Pleopetalum* v. Tiegh. (1903) and *Polythecanthum* v. Tiegh. (1907) are taxonomic synonyms of *Ochna* L. The Asiatic species placed by van Tieghem in the genera *Diporidium* Wendl. *f.* (1825) and *Polythecium* v. Tiegh. (1902) are all taxonomic or nomenclatural synonyms of *Ochna* spp. I did not study the African species of the respective genera.

Section A. **Ochna**

Diporidium Wendl. *f.* — *Discladium* v. Tiegh. — *Pleopetalum* v. Tiegh. — *Polythecanthum* v. Tiegh. — *Polythecium* v. Tiegh. — Type species: *O. jabotapita* L.

Anthers dehiscing by 2 terminal pores. Fruits cylindric to globose, ± basally inserted on the receptacle. (Cf. Robson, 1962a).

KEY TO THE SPECIES

1. Petals 5—10 by 2—5 mm, about as long as the sepals.
   2. Inflorescences 1—3(—5)-flowered, hardly branched. Stamens 25—50 . . . . **1. O. lanceolata**
   2. Inflorescences many-flowered, much branched. Stamens 12—25 . . . . . . **2. O. jabotapita**
1. Petals 15—25 by 7½—15 mm, somewhat larger than the sepals.
   3. Inflorescences 2—3-flowered cymes on 3—7 cm long peduncles. Anthers at most 1½ × as long as the filaments. Sepals in fruit spreading or inflexed . . . . **3. O. obtusata var. pumila**
   3. Inflorescences many-flowered thyrses on up to 1½ cm long peduncles.
      4. Anthers during anthesis 2 × as long as filaments or more. Sepals in fruit spreading or inflexed. **3. O. obtusata**
      4. Anthers during anthesis 1½ × as long as filaments or less. Sepals in fruit usually distinctly reflexed. **4. O. integerrima**

1. Ochna lanceolata Spreng., Syst. Veg. 2 (1825) 596. — Type: *Heyne s.n.* in Herb. Rottler (B holo†?, K) Pen. Ind. Or., Cuttalam, fr. IX-1818.

O. wightiana Wall. *ex* W. & A., Prod. Fl. Pen. Ind. Or. 1 (1834) 152; Wight, Ill. Ind. Bot. 1 (1840) 172; Ic. Pl. Ind. Or. 1 (1840) t. 223; Walp., Repert. 1 (1842) 528; Thw., En. Ceyl. Pl. 1 (1858) 70; Drury, Handb. Ind. Fl. 1 (1864) 221; Bedd., Fl. Sylv. 3 (1869) 51; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 524; Trim., Handb. Fl. Ceyl. 1 (1893) 233; Brand., Ind. Trees (1906) 129; Gamb., Fl. Madr. 1 (1915) 166. — *Diporidium wightianum* Kuntze, Rev. Gen. Pl. 1 (1891) 105; v. Tiegh. in Morot, J. Bot. 16 (1902) 127; Ann. Sc. Nat. Bot. VIII, 16 (1902) 359. — Type: *Hb. Wight 470 = Wallich 2808* (GL holo, K) Pen. Ind. Or. (Travancore), old fl.

O. heyneana W. & A., Prod. Fl. Pen. Ind. Or. 1 (1834) 152; Walp., Repert. 1 (1842) 528; Gamb., Fl. Madr. 1 (1915) 166. — Type: *Wallich 2807A ex Hb. Heyne* (BM, E, K holo, P) Cuttalam, old fl. 23-VII-1818.

O. walkeri Planch. in Hook., Lond. J. Bot. 5 (1846) 653; Walp., Ann. 1 (1849) 180. — *Diporidium walkeri* v. Tiegh., Ann. Sc. Nat. Bot. VIII, 18 (1903) 52. — Type: *Walker 295* in Hb. Hook. (E, K holo) Ceylon, fr.

O. moonii Thw. var. *β* Thw., En. Ceyl. Pl. 1 (1858) 70. — *O. wightiana* Wall. *ex* W. & A. var. *moonii* Trim., Handb. Fl. Ceyl. 1 (1893) 234, *p.p. excl. typus.* — Type: *Thwaites C.P. 2554 (err. C.P. 1224) ex Hb. Gardner* (K, P, PDA holo?) Ceylon (Jaffna), fl.

Shrub or treelet, up to 2½ (?) m high, much branched. Branchlets covered with lenticels. Stipules 4—8 by 1—2 mm. *Leaves* with 1—3 mm long petiole; lamina ovate, (ovate-) oblong, or (ovate-) lanceolate, 1½—7 by ¾—2½ cm, rounded to acute, sometimes

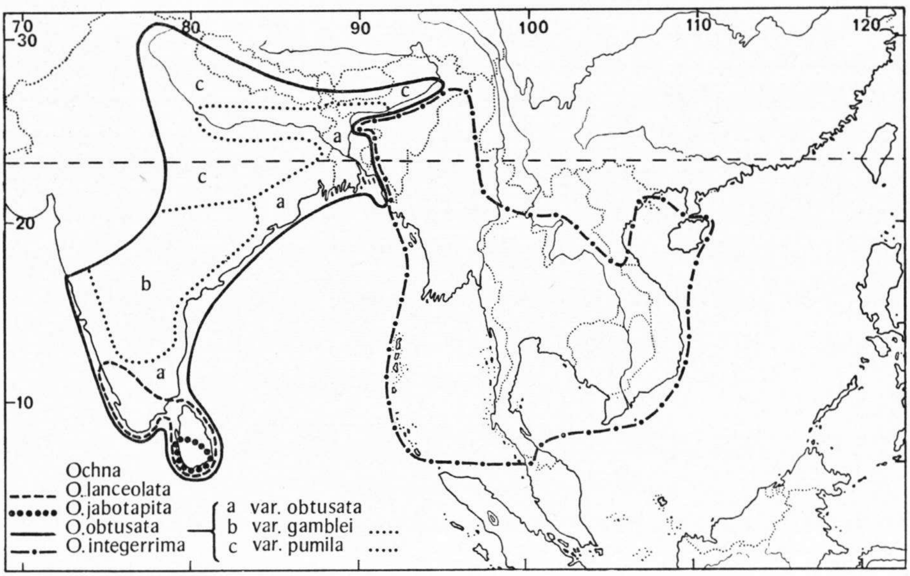

Fig. 4. Distributional map of the species of *Ochna* (sect. *Ochna*) in the Indo-Malesian area. The westward extension of *O. obtusata* is partly uncertain; the outlined areas of varieties *gamblei* and *pumila* are including var. *obtusata* only in their border districts. Other areas are slightly generalised from cited localities.

slightly acuminate at apex, rounded to acute, sometimes slightly emarginate at base, margin crenately denticulate, subentire towards base, chartaceous or subcoriaceous. *Inflorescences* simple, with 1—3(—5) separate flowers, standing close together; rachis $\frac{1}{2}$—4 mm long; pedicels filiform, $\frac{3}{4}$—2 cm long, in fruit up to $2\frac{1}{2}$ cm, the lower 2—8 mm persistent. Torus *c.* 1 mm high, $1\frac{1}{2}$ mm ∅, in fruit up to 2 mm high, 5 mm ∅. *Sepals* 5, ovate to ovate-oblong, $7\frac{1}{2}$—10 by 3—5 mm. *Petals* 5, obovate-oblong, $7\frac{1}{2}$—10 by 3—5(—7) mm. *Stamens* 25—50, with 2—4 mm long filaments; anthers straight, 2—5 by $\frac{1}{2}$—$\frac{2}{3}$ mm. *Ovaries* (3—)5—7, 0.7—1 by 0.5—0.7 mm; style 5—$7\frac{1}{2}$ mm long, in fruit up to 10 mm long; stigmas mostly on up to 1 mm long branches. *Fruits* mostly 1—2, up to 8 by 6 mm.

Distribution: South Peninsular India, Ceylon.

INDIA. *Wallich 2807A ex* Hb. Heyne (BM, E, K, P), *Wallich 2807B ex* Hb. Madras (K). — Kerala, Travancore: *Hb. Wight 470* = *Wallich 2808* (GL, K). — Madras, Nilgiris Distr.: *Wight s.n.* (K); Coimbatore Distr., Syamalay: *Wight K.D. 395* (K); Nelhimalai: *Fischer 2836* (DD); Dimbham Ghat: *Lushington s.n.* (K); Madurai Distr., Palni Hills, Tope: *Auglade 2162* (K); Tirunelvely Distr.: *Beddome 1087* (BM); Kattalaimalai: *Barber 519* (K); Mundanthoru: *Barber 3175* (CAL), *3222* (K); Kuttalam: *Heyne s.n.* in Hb. Rottler (K), *Hb. Wight 184* = *K.D. 394* (E, GL, K, L), *Wight K. D. 393* (K).

CEYLON. *Brodie s.n.* (E); *Walker 295* (E, K), *1347* (E). — North. Prov., Jaffna: *Thwaites C. P. 2554* (err. *C. P. 1224*) *ex* Hb. Gardner (K, P); Mannar: *fide* Trimen (1893). — N.W. Prov., Puttalam: *fide* Trimen (1893). — East. Prov., Trincomalee: *Twhaites C. P. 1221* (BM, CAL, K). — ?, Nangala: *Alston 488* (K).

Ecology: In the drier lowlands and in low jungle on ridges up to 1200 (?) m altitude. Flowers in May and June.

Vernacular names: Ceylon: *bo-kéra* (Singh.), *katharai* (Tamil), *fide* Trimen (1893).

Remarks: In *O. lanceolata* Spreng. I have merged some entities that have been described as different species at some time.

Possibly there are minor differences between regional populations. Unfortunately I had to base my conclusions on about the same old collections as my predecessors, since more recent material appears to be extremely rare. I did not see enough good flowering material to propose any infraspecific division. Generally speaking, the plants from the Coimbatore and Nilgiris Distrs. are rather sclerophytic: with small, thick, bluntish leaves and stout branches. Plants from Tirunelvely Distr. have rather narrowly lanceolate leaves and slender branches. A collection from Travancore is about intermediate. Plants from Ceylon have more or less oblong leaves and comparatively long anthers. Future studies should be made on ample material in order to check the constancy of the different characters in relation with differences in habitat and distribution.

The original description of *O. lanceolata* Spreng. (1825) is rather short and incomplete. It was described from Malabar as distinct from the Indian species *O. lucida* Lamk., *O. obtusata* DC., and *O. nitida* Thunb. *ex* DC., that I regard as conspecific. If *O. lanceolata* Spreng. is really different from *O. obtusata* DC., than it can only be conspecific with *O. wightiana* Wall. *ex* W. & A. (1834) and *O. heyneana* W. & A. (1834). The characters 'foliis lanceolatıs crenulatıs, pedunculis (= pedicellis!) subsolitariis' of Sprengel's description are pointing in this direction too. He mentioned Rottler as the collector or donor of his material. Sprengel's type material was burned in Berlin, but among the Indian collection of *Ochna* spp. from K, I found a sheet that originates from Rottler's herbarium. It bears material collected by Heyne near Cuttalam in 1818 that fits Sprengel's description very well. It is quite probable that this is a duplicate of the type material and there is no doubt about its identity. Therefore I accept *O. lanceolata* Spreng. as the correct name for the species treated here.

Originally Heyne's collections of *O. lanceolata* Spreng. have been named *O. parvifolia* Vahl. Wallich dispersed part of this material under no. *2807A* and added a question mark to the name. It is a later synonym for *Euonymus inermis* Forsk., described from Yemen, which is indeed a true *Ochna*: *O. inermis* (Forsk.) Schweinf. I agree with the conclusion of Wight &Arnott (1834), that it is hardly possible to decide on the original descriptions of Forskaol (Fl. Aeg. Arab., 1775, 204) and Vahl (Symb. Bot. 1, 1790, 33) whether that species is conspecific with the one treated here. The same is true for De Candolle's description and plate in Ann. Mus. Par. 17 (1811) 414, t. 30, f. 2. There is a certain resemblance and it is probable that both species have an affinity with some *Ochna* spp. in East Africa. Planchon (1846) also pointed at a resemblance between *O. walkeri* Planch. from Ceylon, *O. parvifolia* Vahl from Yemen, and *O. atropurpurea* DC. from South Africa.

There has been confusion in literature about the identity of *O. moonii* Thw. (1858), as 3 different elements are combined under this name (see also undeı *O. obtusata* DC.). Beddome (1869) pointed at a relationship with '*O. squarrosa*'. Contrarily, Bennett (1875) and Trimen (1893) cited this species under *O. wightiana* Wall. *ex* W. & A., although the latter seems to be aware of the considerable differences between the two varieties of *O. moonii* Thw. The collection *C.P. 1224* cited under the species (= var. typ.) is considered by me to represent a form of *O. obtusata* DC. On the other hand, the collection *C.P. 2554* cited under var. β is very probably a form of *O. lanceolata* Spreng. Possibly Bennett's error is caused by a specimen of Thwaites in K, labelled *O. moonii* and numbered *C.P. 1224*. This specimen is very different from the collections undeı the same number in BM, BO, and K, but similar to one in P.

It is very probable that the two specimens in K and P were wrongly numbered and in fact represent duplicates of *C.P. 2554*, the type collection of var. *β* being clearly in accordance with its original description.

I have seen some herbarium material from the Botanic Garden in Calcutta that was partly dispersed by *Wallich* under no. *2806* (BM, E, K) bearing the name O. *stipulacea* Colebr. (*nom. nud.*). One sheet from *Wallich* is numbered *802* (BM) and named 'O. *sp. nov. Colebrookii*' (*nom. nud.*). Some collections are from Hb. Griffith (E, K) and are named O. *stricta* (*nom. nud.*). This material is of unknown origin, but it is all very similar and closely resembles O. *lanceolata* Spreng. It does certainly not belong to O. *wallichii* Planch. as suggested by Bennett (1875). The separate fruits from Hb. Griffith, affixed to the same sheet in K are definitely from a different collection, being more suggestive of O. *obtusata* DC.

2. **Ochna jabotapita** Linné, Spec. Pl. 1 (1753) 513; Robs., Taxon 11 (1962) 48—51; *non* Linné, *ibid.* ed. 2, 1 (1762) 732, *& auct. div.* = *Ouratea* spec. — O. *squarrosa* Linné, Spec. Pl. ed. 2, 1 (1762) 731, *nom. illeg.*; Burm., Fl. Ind. (1768) 120; Willd., Linn. Spec. Pl. ed. 4, 2 (1799) 1158, *p.p.*; Moon, Cat. Pl. Ceyl. 1 (1824) 41; *non* Rottb., Dansk. Vidensk. Selsk. Skrift. N.S. 2 (1783) 545, *& auct. mult.* = O. *obtusata* DC.; *non* Kurz, For. Fl. Br. Burma 1 (1877) 205 = O. *integerrima* (Lour.) Merr. — O. *lucida* Lamk., Enc. Méth. 4 (1797) 510, *p.p. quoad syn. Linn.*, *nom. illeg.*; *non* Griff., Not. Pl. As. 4 (1854) 464, *nom. illeg.* = O. *integerrima* (Lour.) Merr. — *Diporidium squarrosum* Kuntze, Rev. Gen. Pl. 1 (1891) 105. — *Discladium squarrosum* v. Tiegh. in Morot, J. Bot. 16 (1902) 125. — Lectotype: *Hb. Hermann* (BM) Ceylon, fr.

O. *nitida* (*non* Thunb. *ex* DC.) Planch. in Hook., Lond. J. Bot. 5 (1846) 650, *err. emend.* — *Discladium planchonii* v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 351. — Lectotype: *Walker 67* in Hb. Hook. (K) Ceylon, fl. — Paratype: *Walker 1015* (E, K) Ceylon, old fl.

O. *rufescens* Thw., En. Ceyl. Pl. 1 (1858) 70; Walp., Ann. 7 (1868) 543; Bedd., Fl. Sylv. 3 (1869) 51; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 523, *err. in syn.* O. *squarrosa* L.; Trim., Handb. Fl. Ceyl. 1 (1893) 234. — *Diporidium rufescens* v. Tiegh. in Morot, J. Bot. 16 (1902) 127. — *Polythecium rufescens* v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 369. — Type: *Thwaites C.P. 3455* (BM, BO, K, P, PDA holo?) Ceylon (Hinidoon Corle) fl.

Discladium microphyllum v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 161; Ann. Sc. Nat. Bot. VIII, 18 (1903) 44. — Type: *Hb. Wight 471 p.p. quoad distr.* (E *p.p.*, P holo) fl.

Discladium koenigii v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 162; Ann. Sc. Nat. Bot. VIII, 18 (1903) 45. — Type: *Koenig s.n. ex* Hb. Vahl (C, P holo) India, 1768.

Shrub or treelet, much branched. Branchlets blackish, covered with lenticels. Stipules 4—5 by 1½—2 mm. *Leaves* with 2½—5 mm long petioles; lamina mostly obovate-oblong, 5—10 by 2—4 cm, acute to acuminate at apex, obtuse to acute at base, margin spinulose-denticulate, chartaceous. *Inflorescences* compound, many-flowered; main axis 6—25 mm long; branches mono- or dichasial, up to 3 times branched or reduced to 1 pedicel; pedicels 1½—2 cm long, in fruit up to 2½ cm long, the lower 1—6 mm persistent. Torus *c.* ½ mm high, 1½ mm ∅, in fruit up to 2 mm high, 3 mm ∅. *Sepals* 5, (obovate-)oblong, 7—10 by 3—4½ mm. *Petals* 5, obovate-oblong to -lanceolate, 7—10 by 3—6 mm, ± tapering at base. *Stamens* 12—25, with 1—2 mm long filaments; anthers 3—6 by ½—⅘ mm. *Ovaries* 6—10, 0.5—0.6 by 0.4—0.5 mm; style 5—7 mm long, in fruit up to 10 mm long. *Fruits* mostly 1—2 per flower, up to 8 by 6 mm.

Distribution: Ceylon.

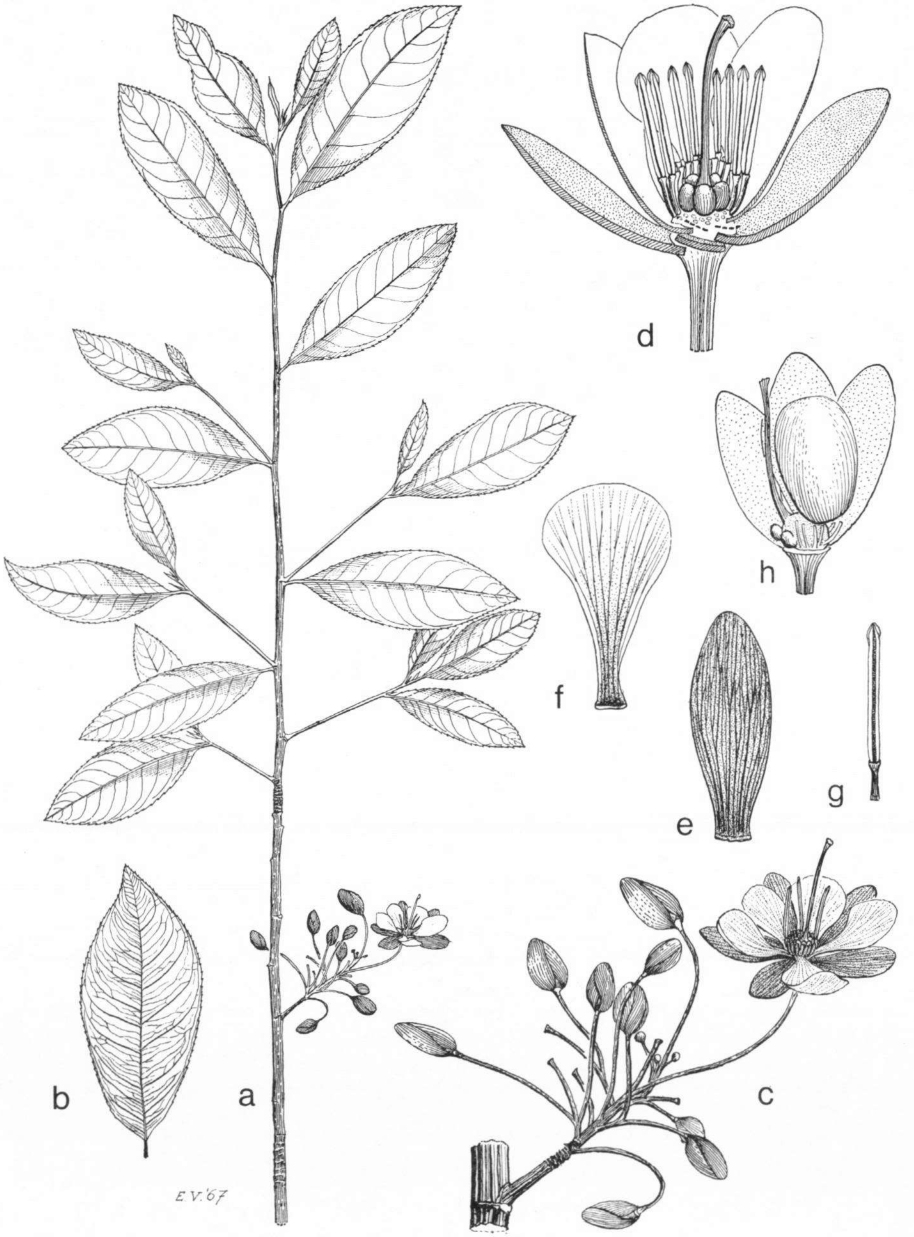

Fig. 5. *Ochna jabotapita* L. — a. Branchlet with inflorescence and young leaves, × ½; b. mature leaf, × ½; c. inflorescence, × 1½; d. flower: 1 sepal, 2 petals, and some stamens detached, × 3; e. sepal, × 3; f. petal, × 3; g. stamen, × 3; h. fruiting flower: 2 sepals detached, × 2½ (*Walker* 75, E).

CEYLON. *Fraser 74* (K); *Gardner 167, 168* (K); *Hermann 'zeyl. 9'* (BM); *Jonville*] *s.n.* (BM); *Koenig s.n.* in Hb. Vahl (C, P); *Walker 67* (K), *75* (E), *1015* (E, K), *1278* (E, U), *s.n.* (CAL, L, P); *Hb. Wight 471 p.p.* (E, P), *s.n.* (K). — West Prov., Kalutara: *Macrea 139* (K); Pelawatta: *Worthington 6604* (L). — South. Prov., Hiniduma: *Thwaites C.P. 3455* (BM, BO, K, P). — ? Hakkinda: *de Silva 100* (DD, E).

Ecology: In the everwet part of Ceylon at low altitudes. Flowers in April and May.

Remarks: *O. jabotapita* L. (1753) was based on very different entities. Robson (1962) correctly indicated a specimen in Hb. Hermann as lectotype: see remark under *Ochna*. As a result this East Indian species of *Ochna* is named with an epithet that is also a vernacular name for a West Indian species of *Ouratea*. The later name *O. squarrosa* L. (1762) for the Asiatic and African varieties of *O. jabotapita* L. (1753) is illegitimate. It has been commonly in use for the species that should be correctly named *O. obtusata* DC. The status of *O. nitida* Thunb. *ex* DC. is discussed under *O. obtusata* DC. Planchon (1846) erroneously emended De Candolle's description based on two of Walker's collections from Ceylon, that certainly belong to *O. jabotapita* L.

The original description of *Discladium microphyllum* v. Tiegh. was based on a specimen labelled *Herb. Wight propr. 471*, and suggests a close affinity with *O. jabotapita L.* However, the corresponding sheet in Wight's own herbarium in GL belongs to *O. obtusata* DC. and does not fit in with the description. A clue to this problem was found in another corresponding sheet in E (*ex* Herb. Greville) which bears a mixture of material belonging to *O. obtusata* DC. and *O. jabotapita* L. The material of the latter species must be of Ceylonese origin and it fits in much better with the description concerned. Van Tieghem's original material in P also belongs to *O. jabotapita* L.

3. **Ochna obtusata** DC., Ann. Mus. Paris 17 (1811) 411, pl. 11; Prod. 1 (1824) 735; Spreng., Syst. Veg. 2 (1825) 596; Robs., Taxon 11 (1962) 50, 51. — *Discladium obtusatum* v. Tiegh. in Morot, J. Bot. 16 (1902) 125; Ann. Sc. Nat. Bot. VIII, 16 (1902) 351. — *Pleopetalum obtusatum* v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 164; in Morot, J. Bot. 17 (1903) 99; Ann. Sc. Nat. Bot. VIII, 18 (1903) 45. — Type: *in Hb. DC.* (G holo) Ind. Or., fl.

O. squarrosa (*non* L.) Rottb., Dansk. Vidensk. Selsk. Skrift., N.S. 2 (1783) 545, t. 6; Roxb., Pl. Corom. 1 (1795) 62, t. 89; Willd., Linn. Spec. Pl. ed. 4, 2 (1799) 1158, *p.p.*; Roxb., Fl. Ind. ed. Carey, 2 (1832) 643, *p.p. excl. syn. Burm.*; W. & A., Prod. Fl. Pen. Ind. Or. 1 (1834) 152; Grah., Cat. Pl. Bomb. (1839) 37; Wight, Ill. Ind. Bot. 1 (1840) 172, t. 69; Walp., Repert. 1 (1842) 528; Thw., En. Ceyl. Pl. 1 (1858) 70; Dalz. & Gibs., Bomb. Fl. (1861) Suppl. 17; Drury, Handb. Ind. Fl. 1 (1864) 220; Bedd., Fl. Sylv. 3 (1869) 50, t. 8, f. 3; Brand., For. Fl. (1874) 60; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 523, *excl. syn. O. lucida* Griff. & *O. rufescens* Thw.; Watt, Dict. Econ. Prod. Ind. 5 (1891) 439; Trim., Handb. Fl. Ceyl. 1 (1893) 233; Cooke, Fl. Bomb. I, 1 (1902) 196; Prain, Beng. Pl. 1 (1903) 309; Brand., Ind. Trees (1906) 128; Talb., For. Fl. Bomb. & Sind 1 (1909) 212, f. 129; Haines, For. Fl. Ch. Nagp. (1910) 237; Gamb., Fl. Madr. 1 (1915) 165; Haines, Bot. Bih. & Or. 2 (1921) 169; Benthall, Trees Calc. (1933) 97, fig.; Kirt. & Basu, Ind. Med. Pl. ed. 2, 1 (1933) 518; Kanj. & Das, Fl. Assam 1 (1936) 220; Say.-Din, J. Bomb. Nat. Hist. Soc. 40 (1938) 196. — *O. grandiflora* Moon, Cat. Pl. Ceyl. 1 (1824) 41. — Type: Roxburgh, Pl. Corom. 1 (1795) t. 89.

O. lucida Lamk., Enc. Méth. 4 (1797) 510, *p.p. quoad descr.*, *nom. illeg.*; Illustr. t. 472, f. 1; DC., Ann. Mus. Paris 17 (1811) 411; Prod. 1 (1824) 735; Spreng., Syst. Veg. 2 (1825) 597; Planch. in Hook., Lond. J. Bot. 5 (1846) 649; Walp., Ann. 1 (1849) 179; *non* Griff., Not. Pl. As. 4 (1854) 464, *nom. illeg.* = *O. integerrima* (Lour.) Merr. — *Discladium lucidum* v. Tiegh. in Morot, J. Bot. 16 (1902) 125, Ann. Sc. Nat. Bot. VIII, 16

(1902) 351; ibid, 18 (1903) 43. — *Pleopetalum lucidum* v. Tiegh., Bull. Mus. Hist. Nat. 9 (1903) 164; in Morot, J. Bot. 17 (1903) 99; Ann. Sc. Nat. Bot. VIII, 18 (1903) 45. — Type: *Sonnerat in Hb. Lamarck* (P holo) Ind. Or.

O. *nitida* Thunb., Mus. Nat. Ac. Ups. 16 (1794) 132, *nom. nud.*; Thunb. *ex* DC., Ann. Mus. Paris 17 (1811) 412, pl. 12, *nom. illeg.*; Prod. 1 (1824) 735; Thunb., Fl. Ceyl. (1825) 7; Spreng., Syst. Veg. 2 (1825) 597, Juel, Pl. Thunb. (1918) 251; *non* Swartz, Prod. Veg. Ind. Occ. (1788) 67; *nec* Lamk., Enc. Méth. 4 (1797) 513 = *Ouratea sp.*; *non* Planch. in Hook., Lond. J. Bot. 5 (1846) 650; *nec* Walp., Ann. 1 (1849) 180 = O. *jabotapita* L. — *Discladium nitidum* v. Tiegh. in Morot, J. Bot. 16 (1902) 125. — *Polythecium nitidum* v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 368; ibid 18 (1903) 54. — Type: *in Hb. Delessert* (G holo) Ind. Or., prob. Ceylon, fl.

O. *pumila* Buch.-Ham. *ex* DC., Prod. 1 (1824) 736; Don, Prod. Fl. Nep. (1825) 224; Royle, Ill. Bot. Him. Mts. 1 (1839) 165; Walp., Repert. 1 (1842) 528; Planch. in Hook., Lond. J. Bot. 5 (1846) 652; Walp., Ann. 1 (1849) 175; Brand., For. Fl. (1874) 60; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 524; Nairne, Fl. Pl. W. Ind. (1894) 50; Cooke, Fl. Bomb. I, 1 (1902) 196; Duthie, Fl. Upp. Gang. Plain I, 1 (1903) 146; Prain, Beng. Pl. 1 (1903) 309; Brand., Ind. Trees (1906) 128; Haines, For. Fl. Ch. Nagp. (1910) 237; Gamb., Fl. Madr. 1 (1915) 166; Witt, Descr. List N. & Ber. For. Circ. (1916) 99; Haines, Bot. Bih. & Or. 2 (1921) 170; Osmast., For. Fl. Kum. (1927) 81; Cow. & Cow., Trees N. Beng. (1929) 30; Kirt. & Basu, Ind. Med. Pl. ed. 2, 1 (1933) 517; Kanj. & Das, Fl. Assam 1 (1936) 220. — *Diporidium pumilum* Kuntze, Rev. Gen. Pl. 1 (1891) 105. — *Polythecium pumilum* v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 373. — Type: *Buchanan Hamilton in Hb. Lambert* (BM holo), Nepal, Terriany Forest, fl. 30-III-1802.

O. *nana* Buch.-Ham. *ex* W. & A., Prod. Fl. Pen. Ind. Or. 1 (1834) 152; Dalz. & Gibs., Bomb. Fl. (1861) 46; Drury, Handb. Ind. Fl. 1 (1864) 221. — Lectotype: *Wallich 3761/1 ex* Hb. Buch.-Ham. (K), Sannyashikata, 7-IV-1809. — Paratype: *Wallich 3761/2 ex* Hb. Buch.-Ham. (K), Gorakhpur, 13-IV-1809.

O. *humilis* Buch.-Ham. *ex* Wall. Cat., *nom. nud.*; *non* Engl., Bot. Jahrb. 30 (1902) 354. — Specimen: *Wallich 3762 ex* Hb. Moorcroft (K), Bhyrubpur.

O. *collina* Edgew., Trans. Linn. Soc. 20, 1 (1846) 43. — Type: *Edgeworth 356* (K holo) N.W. India (Saharanpur) Sakranda, fl. IV-1844.

O. *cordata* Thw., En. Ceyl. Pl. 1 (1858) 70, 409. — O. *squarrosa* L. var. *cordata* Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 524; Trim., Handb. Fl. Ceyl. 1 (1893) 233. — *Diporidium cordatum* v. Tiegh. in Morot, J. Bot. 16 (1902) 127. — *Polythecium cordatum* v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 369. — Type: *Thwaites C.P. 1222 ex* Hb. Gardner (BM, K, P, PDA holo?) (Jaffna) fr.

O. *moonii* Thw., En. Ceyl. Pl. 1 (1858) 70, *p.p. excl. var.* β = O. *lanceolata* Spreng., *excl. syn.* O. *squarrosa* L. *sensu* Moon = O. *jabotapita* L.; Walp., Ann. 7 (1868) 543; Bedd., Fl. Sylv. 3 (1869) 51; Alston in Trim., Handb. Fl. Ceyl. 6 (1931) 42. — O. *wightiana* Wall. *ex* W. & A. var. *moonii* Trim., Handb. Fl. Ceyl. 1 (1893) 234, *p.p.* — *Polythecium moonii* v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 369. — Type: *Thwaites C.P. 1224* (BM, BO, P, PDA holo?) fl. 1853.

Polythecium thwaitesii v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 369, *nom. nud.* — Specimen: *Thwaites C.P. 1223 ex* Hb. Gardner (BM, K, P holo) fr. 1853.

Polythecium pedunculatum v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 373. — Type: *Falconer 333* (L, P holo, S) India, Gurhwal, fl.

Polythecium kingii v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 374. — Type: *King s.n.* (P holo) Saharumpore, Bot. Gard.

Polythecium discolor v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 158; Ann. Sc. Nat.

Bot. VIII, 18 (1903) 54. — Type: *Wight 162* = *K.D. 392* (E, GL, K, L, P holo, S) Quilon, fr. VI-1836.

Discladium dalzellii v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 161; Ann. Sc. Nat. Bot. VIII, 18 (1903) 44. — Type: *Dalzell & Stocks s.n.* (BM, K, L, P holo, S) Canara, fl.

Discladium leschenaultii v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 162. — *Pleopetalum leschenaultii* v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 164; in Morot, J. Bot. 17 (1903) 99; Ann. Sc. Nat. Bot. VIII, 18 (1903) 46. — Type: *Leschenault s.n.* (P holo) Ceylon, fl. & fr. 1820.

Discladium gaudichaudii v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 163. — *Pleopetalum gaudichaudii* v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 164; in Morot, J. Bot. 17 (1903) 99; Ann. Sc. Nat. Bot. VIII, 18 (1903) 47. — Type: *Gaudichaud 210* (P holo) *ex* Hort. Bot. Calc., fl. & fr. 1837.

O. gamblei King *ex* Brandis, Ind. Trees (1906) 128; Gamble, Fl. Madr. 1 (1915) 166. — Type: *D. Brandis*, Madras, Kambakum Hill, 1881 (not seen).

O. beddomei Gamble, Fl. Madr. 1 (1915) 166, *nom. nud.*; Kew Bull. 1916, 34, *descr.*; Calder & *al.*, Rec. Bot. Surv. Ind. 11 (1926) 94. — Lectotype: *Beddome s.n.* (K) Kurnool, fl. — Paratype: *Cameron 600* (K) (Mysore) Bengalore, fr. III-1891.

Undershrub, shrub, or treelet, up to 10 m (?) high, deciduous. Branchlets slender or stout. Stipules 3—8(—16) by 2—3 mm. *Leaves* with 1—5 mm long petiole; lamina elliptic, (obovate-)oblong or (obovate-)lanceolate, (3—)5—18 by 2½—8 cm, apex mostly acute or a little acuminate, sometimes rounded or obtuse, base mostly acute or a little attenuate, sometimes rounded, obtuse, or a little emarginate, margin more or less finely denticulate, subcoriaceous. *Inflorescences* 2—3-flowered cymes or many-flowered thyrses with 1—5-flowered branches, mostly monochasial, sometimes dichasial at base. Torus ½—1 mm high, 1½—3 mm Ø, in fruit up to 5 mm high, 10 mm Ø. *Sepals* (3—)5, ovate to ovate-oblong, 10—20 by 4—10 mm. *Petals* 5—10, obovate, 15—25 by 7½—15 mm, tapering at base or subunguiculate. *Stamens* 30—70(—120); filaments 1½—3 mm long, a little flattened; anthers (3—)6—12 by 0.4—0.7 mm. *Ovaries* 5—10, 0.6—1.2 by 0.4—0.8 mm; style 8—12 by *c.* 0.5 mm, in fruit up to 20 mm long. *Fruits* mostly 3—5, up to 10 by 7½ mm.

Distribution: 3 varieties in India, S. Himalayan States, East Pakistan, Ceylon.

Ecology: From sea-level up to *c.* 1200 m, generally in rather dry jungle, scrub, and open grassland vegetations on poor, sometimes sandy or rocky soils. Flowering shortly before or during development of new leaves: in North & Central India from February to April, in Ceylon from May to July.

Use: The root is used by the Santals as an antidote to snake-bite; a decoction of the root is given in certain menstrual complaints ('*sitka*'), also for consumption and asthma (Rev. A. Campbell). The plant is used as an ornamental in tropical Asia and perhaps also in Africa (Sayeedud-Din, 1938).

Properties of wood: Reddish-brown, moderately hard and close-grained; weight 51 lbs. per cubic foot (Watt, 1890) = ± 0.82 kg/dm^3.

Remarks: The name of *O. squarrosa* L. (1762) has been commonly in use for this species for a long time, but it is an illegitimate synonym of *O. jabotapita* L. (1753).

The taxonomic status of *O. nitida* Thunb. has been uncertain ever since this name was published as a *nomen nudum* in 1794. Thunberg's concept of the species was probably based on a mixture, as Juel (1918) enumerated three collections under that name from his herbarium in Upsala, originating from the Cape of Good Hope and from Ceylon. The name was validated by De Candolle (1811), who based his description of the species on material of Indian or Ceylonese origin in Hb. Delessert, that might have been named by Thunberg (not seen). It must be conspecific with either *O. jabotapita* L. or *O. obtusata* DC., as *O. lanceolata* Spreng., the only other species of *Ochna* in the area, has much smaller leaves. It is not possible to make a decision beyond doubt from the original description and plate, but *O. obtusata* DC. is the most probable synonym in my opinion. Therefore I do not accept Planchon's emendation of the description (1846), as it was based on collections of *O. jabotapita* L.

The position of *O. nitida* Thunb. *ex* DC. (1811) has no nomenclatural consequences since it is a later homonym of *O. nitida* Swartz (1788). In this context it should be mentioned that Lamarck (1797) cited the latter West Indian species from the correct book and page, erroneously giving Thunberg as the author. As a result, De Candolle (1811, 1824) gave the same wrongly composed citation together with his own description of the Thunbergian species. This was misinterpreted again in Index Kewensis, where 'Thunb., Prod. Pl. Cap. 67' is incorrectly cited as the original publication of *O. nitida* Thunb.

The name *O. pumila* Buch.-Ham. was validated by De Candolle (1824) and not by Don (1825) as stated in several floras. Both descriptions are possibly based on the same collection, but De Candolle's specimen should be designated as the holotype. This specimen was originally in the Lambert herbarium and is now preserved in BM.

O. lucida Griff. (1854) is not synonymous with *O. lucida* Lamk., as accepted by several later authors. Griffith gave a completely new description, based on one of his own collections, without a reference to Lamarck and so his name is a later homonym. Lamarck's name is an illegitimate synonym of *O. jabotapita* L., whereas Griffith's species is conspecific with *O. integerrima* (Lour.) Merr.

O. moonii Thwaites (1858) is made up of three different elements. The type collection *Thwaites C. P. 1224* is regarded by me as belonging to *O. obtusata* DC. The variety β is considered as being conspecific with *O. lanceolata* Spreng. (see under that species). Finally, *O. squarrosa sensu* Moon is cited as a synonym, but this is probably the same as *O. jabotapita* L.

'*O. squarrosa*' was listed for Burma by Kurz (1877) and later authors. From my own studies I conclude that *O. obtusata* DC. does not occur in the wild state in Burma and the adjacent mountains of Assam. It is likely, however, that *O. jabotapita* L. was introduced in Burma at some time as an ornamental species.

KEY TO THE VARIETIES

1. Inflorescences thyrses on up to 1½ cm long peduncles, with many distichously conferted, caducous bracts, leaving a broad annulus of scars. Shrubs or treelets.
   2. Leaves not waxy, chartaceous or subcoriaceous, mostly acute to acuminate at apex. Branchlets 1½—2½ mm ∅ near the tip . . . . **a. var. obtusata**
   2. Leaves waxy, whitish or glaucous, coriaceous, obtuse or rounded at apex. Branchlets rather succulent, 2½—5 mm ∅ near the tip . . . . **b. var. gamblei**
1. Inflorescences simple cymes on 3—7 cm long peduncles, without annulus. Undershrubs, sprouting yearly from tuberous stembase . . . . **c. var. pumila**

a. var. **obtusata** — *Discladium dalzellii* v. Tiegh. — *D. gaudichaudii* v. Tiegh. — *D. leschenaultii* v. Tiegh. — *O. cordata* Thw. — *O. grandiflora* Moon — *O. lucida* Lamk. — *O. moonii* Thw. — *O. obtusata* DC. *s.s.* — *Polythecium discolor* v. Tiegh. — *P. kingii* v. Tiegh. — *P. thwaitesii* v. Tiegh.

Type: *ex Hb. Linn.* (G holo?) Ind. Or.

Shrub or treelet with slender branchlets, 1½—2½ mm ∅ near the tip. Stipules 3—8 mm long. *Leaf-blades* variable, mostly acute to acuminate at apex, mostly acute to attenuate at base, margin finely denticulate, chartaceous or subcoriaceous, not waxy. *Inflorescences* compound, many-flowered, rachis ½—4(—6) cm long; pedicels 1½—3½ cm long, in fruit up to 4 cm long, the lower ¼—1 cm persistent. *Petals* 5—10. *Stamens* 30—60; anthers 6—12 mm long, more than 2 × as long as the filaments.

Distribution: India, East Pakistan, Nepal, and Ceylon.

INDIA. Bombay, S. Konkan: *Dalzell s.n.* (DD, K); Vuyala: *Dalzell 1667* (P); Deccan: *Cooke 48* (CAL). — Goa: *Dalzell s.n. ex* Hb. Hook. (K). — Mysore, Kanara: *Dalzell & Stocks s.n.* (BM, K, L, P, S); N. Kanara, Naka: *Talbot s.n.* (DD); Anshi: *Talbot 116 k* (DD, K), *Braganza 140* (DD); Karwar: *Fernandes 2124* (CAL), *Talbot 116* (K); Chandwar: *Ritchie 1667* (K). — Kerala, Malabar Coast: *Koenig s.n.* (S); Travancore, Quilon: *Wight 162 = K.D. 392* (E, GL, K, L, P, S). — Madras, Nilgiris, Kaudahs V. J.: *Lawson s.n.* (K); Coimbatore: *Kistnasawmy Naidoo s.n.* (DD); Ponnachi Belta: *Narayamasamy 19595* (DD); Salem, Ariyur Res.: *Latham s.n.* (DD, K); Kolli Hills: *For. Ranger s.n.* (DD, K); Chingleput: *Barnes s.n.* (DD); Adijar: *Gamble 17567* (BM); Kambakkam Hills: *N. N. 8850* (K); Madras: *Shutu s.n.* (K); Coromandel Coast: *Koenig s.n.* (BM). — Andhra Pradesh, Nellore, Krishnapatam: *Fischer 4129* (CAL); Godavery, Gorge: *Bourne 3496* (K); N. Circars: *Cleghorn s.n.* (E); Vishakhapatnam, Ragupaliem: *Barber 1535* (K); Karaka: *Barber 1678* (K). — Madhya Pradesh, Bastar, Chitrakot: *Mooney 3* (DD), *170* (K); Bailadilla: *Mooney 389* (K); Chuta?: *Donald 2162* (DD). — Orissa, Ganjam, Russellkonda: *Beddome 1081* (BM), *Gamble 17086* (BM, DD, K), *Krishnan s.n.* (DD); Kuicholi: *Dampier 14220* (K); Puri: *Draper 3* (CAL); Khandpara: *Mooney 209* (K); Parikud Isl.: *Carter 517* (CAL); Barumi F. R.: *Haines 5523* (K); Chandka F. R.: *Haines 5525* (DD, K); Kalapathar: *Haines 5527* (K); Dhenkanal, former Athmallik State: *Haines 5526* (K); Mayurbhanj, Lulung: *Econ. Pl. Surv. 3* (DD); Kahasah: *Econ. Pl. Surv. 823* (DD); Sonakalla: *Gamble 9323* (K). — Bihar, Santal Parganas: *Haines 2380 b* (K); Burio: *Haines 2380 a* (K); Burhait: *Haines 2380* (DD); Maharajpore: *Kurz s.n.* (BM); Banbripore: *Bassu in Hb. Watt 258* (E). — Assam: *Jenkins s.n.* (BO); Kamrup: *Hamilton 1243* (E); Gauhati: *Chatterjee s.n.* (BO, P); Panighat: *King's coll. s.n.* (CAL, P). — Tripura, Agartala: *Debbarman 670* (CAL).

E. PAKISTAN. East Bengal, Dacca, Kashimpore: *Clarke 6818* (BM); Sylhet: *Clarke 7116* (CAL); Chittagong, Cox Bazar: *Sinclair 4047* (E); Silrope Jaldi: *Cowan 2421* (E).

NEPAL. Amlekhganj: *Brough 564* (BM); Dhankuta: *Stainton 77* (BM, E).

CEYLON. *Thwaites C. P. 1224* (BM, BO, P); *Brodie 119* (E); *Leschenault s.n.* (P). — North. Prov., Jaffna: *Thwaites C. P. 1222 ex Hb. Gardner* (BM, K), *Thwaites C. P. 1223 ex Hb. Gardner* (BM, K, P), *Dyke s.n.* (K). — N.W. Prov., Karaitivu: *Simpson 9846*; Puttalam: *fide* Trimen (1893). — East. Prov., Trincomalee, Sober Isl.: *Worthington 1202* (BM); Foul Point: *Worthington 875* (BM); Batticaloa: *Dpt. Agr. Perad. s.n.* (DD). — Sabaragamuwa Prov., Balangoda: *Worthington 3766* (BM). —? Chempianpattu: *Simpson 8004* (BM); Nugattene Gap: *Simpson 8466* (BM); Belihuloya: *Worthington 434* (BM).

Ecology: From sea level up to about 1200 m altitude in hilly country, especially the Western and Eastern Ghats and also in the southern foothills of the Central Himalayan Mts.

Vernacular names: India. Bombay: *kanak-champa* (Konkani). — Mysore: *muda(li)*, *narole*, *ramatanachampaka* (Kanarese). — Madras: *padalakkonai* (Salem Dist.), *panjaram*, *shengodu*, *sherundi*, *shilandi* (Tamil). — Andhra Pradesh: *sunari*, *tammichetta*, *yerra-jammi*, *yerra-juvi* (Teligu). — Orissa: *buin-champa*, *kaniari*, *nobiniswоro*, *pata-champa* (Uriya). — Bihar: *champa-baha* (Santali).

Ceylon. *mal-kéra* (Singhalese), *chilanti*, *sellendi* (Tamil).

Apart from data on herbarium sheets, those of local floras were used and especially the works of Watt (1891) and Kirtikar & Basu (1933) were consulted.

Remarks: Rather variable in appearance, especially in Ceylon, from where some separate species have been described in the past that are regarded here as conspecific. This variability is found in shape and size of the leaves and, to a lesser extent, of the flower parts too. It could be explained as caused by differences in ecological circumstances of the respective localities. On the other hand, it is likely that it is caused at least partly by the separation of the marginal Ceylonese populations from the centre of the gene pool in Peninsular India. I found it impossible, however, to distinguish useful infraspecific taxa on the island. Only studies in the field can elucidate the matter further.

Perhaps this variety is not found in the Upper Gangetic Plain in a wild state. As an ornamental is has been collected from the botanic gardens of Calcutta, Lucknow, Moradabad, Dehra Dun, Saharanpur, and as far to the northwest as Lahore in West Pakistan.

b. var. **gamblei** (King *ex* Brandis) Kanis, *stat. nov.* — *O. beddomei* Gamble — *O. gamblei* King *ex* Brandis.

Shrub or treelet of slightly succulent appearance with stout branchlets, 2½—5 mm ∅ near the tip. Stipules 3—4 mm long. *Leaf-blades* (obovate-)oblong, obtuse to rounded at apex, mostly obtuse or rounded, sometimes a little emarginate at base, margin faintly denticulate, crenate, or subentire, coriaceous, waxy, glaucous or whitish. *Inflorescences* compound, many-flowered; rachis 1½—2(—4) cm long; pedicels 2—4 cm long, in fruit up to 5 cm, the lower ¼—¾ cm persistent. *Petals* 5—8. *Stamens* 35—70; anthers 5½—8½ mm long, more than 2 × as long as the filaments.

Distribution: Central and NE. Peninsular India.

INDIA. Bombay, Chanda, Bjalputti: *Duthie 9556* (DD); Wardaguran: *Duthie 10058* (DD, K); Nandhigaw: *Haines 2945* (K). — Madhya Pradesh?, Dhaba: *Donald 38* (DD), *Haines 2943, 2944* (K). — Orissa, Ganjam, Goomsur: *Beddome 1079* (BM). — Andhra Pradesh, Karimnagar, Mahadeopur, *Edwards s.n.* (K); Godavery: *Beddome 1082* (BM); Perakonda: *Gamble 15849* (K); Kurnool: *Beddome s.n.* (K); Nallamalai Hills: *Hooper s.n.* (K); Nellore, Murrenikinda: *Ramaswami 1269* (CAL); Anantapur, Kotlakota: *Gamble 15246* (DD, K), *Bingham 15260* (DD); Cuddapah: *Beddome 1083* (BM); Nallamalai Hills: *Brandis s.n.* (K); Horsleykonda: *Gamble 15144* (DD); Ballipalle: *Gamble 16545* (BM, K); Chittoor, Horsleykonda: *Fischer 4376* (CAL), *s.n.* (K); Palmaner: *Fischer s.n.* (K). — Mysore, Bangalore: *Cameron 600* (K). — Madras: *Gamble s.n.* (DD); Chingleput, Kambakam Hill: *Bourne 2561* (K), *Fischer s.n.* (E).

Ecology: From low altitudes up to 1350 m, in inland stations of Peninsular India. Thick bark, stout branches, and coriaceous, waxy leaves are suggestive of a better adaptation to dry habitats than in the previous var. *obtusata*. Stands of both varieties are found near each other occasionnally.

Vernacular names: India. Madras: *koorykaly* (Tamil?). — Andhra Pradesh: *kuka-movi* (Teligu). — Madhya Pradesh: *rakat-rohan* (Hindi?). — Bombay: *sonari-chattu* (Marathi?).

Remarks: Originally *Ochna gamblei* was King's manuscript name for some of Gamble's collections in CAL. It has been validated by Brandis (1906) who gave several localities for the new species. Only one of his own collections is mentioned there, however, and consequently this has to be regarded as the type collection. I have not seen this material, but probably it is kept at CAL or DD.

Gamble (1916) mentioned several collections by Beddome, Cameron, and himself from different localities along with the description of his new species *O. beddomei*, without indicating any of these as the type collection. In K only two of the collections mentioned were named by himself. One of these is bearing flowers and was chosen by me as lectotype.

Wight K.D. 392 from Quilon in K was named *O. gamblei* King by Brandis according to Gamble (1915). I admit that the specimen concerned has a superficial resemblance to other collections under that name. However, the duplicates of this collection in L and S are much more suggestive of *O. obtusata* DC. var. *obtusata*. Besides, all the leaves are rather thin and not waxy. Occurrence of the more succulent var. *gamblei* in Travancore is not very probable, because of the rather moist climate there.

c. var. **pumila** (Buch.-Ham. *ex* DC.) Kanis, *stat. nov.* — *O. collina* Edgew. — *O. nana* Buch.-Ham. *ex* W. & A. — *O. pumila* Buch.-Ham. *ex* DC. — *Polythecium pedunculatum* v. Tiegh.

Undershrubs with slender stem, mostly 30—60 cm high, only branching at base, sprouting yearly from woody, tuberous roots. Stipules 8—16 mm long. *Leaf-blades* obovate-oblong, mostly obtuse to acute at apex, acute at base, margin faintly but distinctly denticulate, herbaceous or chartaceous. *Inflorescences* 2—3(—4)-flowered cymes; peduncles (2—)3—7(—8½) cm long, the lower at the stem the longer, without scales, not branching; pedicels 1—4 cm long. *Stamens* 70—120; anthers 2½—4 mm long, about as long as the filaments or a little longer.

Distribution: Central N. & NE. India, Himalayan States.

INDIA. Uttar Pradesh, Saharanpur, Sakranda: *Edgeworth 356* (K); Garhwal: *Falconer 333* (L, P, S); Pilibhit, Bargad: *Inayat 21683a* (DD, K); Kheri: *Inayat 21683b* (DD, K); Dudwa: *Harsukh 21683b* (DD); Chandan Choki: *Inayat 21683c* (DD, K); Doutulpur Khera: *Edgeworth s.n.* (DD, K); Bahraich, Chakia: *Inayat 23580* (DD, E); Kankraha: *Harsukh 21683a* (DD); Gorakhpur: *Hamilton 1242* (E); Daibhar: *Harsukh 21683* (DD). — Madhya Pradesh, E. Satpura Hills: *Thompson 86 CP* (K); Chhindwara, Khapa: *Haines 2942* (K); Panna, Bira: *Hearle s.n.* (DD); Mandla, Sathia: *Nat. Ranger s.n.* (DD); Surguja, Bhumka: *Mooney 754* (K); Upar Ghat, Jashpur Ra.: *Bashi Ram 57* (DD); Kunjara: *Mooney 809* (K). — Bihar, Dhanbad: *J. Campbell 37* (CAL); Pokhuria: *A. Campbell 7714* (E); Tundi: *A. Campbell 8409* (E); Biswadih: *A. Campbell 8466* (E). — W. Bengal, Tarai: *Modder 309 k* (CAL); Darjeeling: *Gamble 653B* (BM); Champasari?: *Gamble 1818A* (K), *1819B* (DD), *1819E* (CAL); Kurseong: *Hira Lall 309K* (DD); Jalpaiguri: *Parker s.n.* (DD); Ramshaihat: *Haines 438* (K); Sarashwatipur: *Mukerjee 927* (DD). — Assam: *Mann 31* (BO, DD), *Fischer s.n.* (BO).

NEPAL. Terriany: *Buchanan Hamilton s.n. in Hb. Lambert* (BM).

SIKKIM. *Hooker s.n.* (K).

Ecology: From 300 up to 900 m and possibly higher, in jungle, (stunted) Dipterocarp (= *sal*) forests, and open grassland vegetation. Mainly in hilly country: foothills of the Himalayan Mts. and hills S. of the Upper Gangetic Plain. Coming up yearly after the jungle fires.

Vernacular names: India. Bihar: *champa-baha* (Santali), *simalkata* (Hindi).

Remarks: *O. pumila* Buch.-Ham. *ex* DC. has been regarded as a separate species by all previous authors because of its conspicuous habit. I have a strong suspicion that it is only a pyromorphic form of *O. obtusata* DC., a phenomenon that has been found also in species of several other families (see also van Steenis, Fl. Mal. I, 4, 1954, p. XXXVII). I treat it here as a separate variety, however, as distinction by inflorescence and androecium is rather easy. My evidence is based on two collections from the foothills of the Himalayan Mts. in Nepal (*Brough 564*, *Stainton 77*) that are named by me *O. obtusata* DC. var. *obtusata*. The specimens concerned have been collected inside the area of var. *pumila*, but their stems have grown during two successive seasons and their inflorescences and flowers are very much similar to those in var. *obtusata*. Proof can only be given by protecting a natural stand of pyromomorphic plants from fire and other hazards for a couple of years and by growing from selected seeds in a protected garden. Perhaps it will be found eventually that the pyromorphic appearance of the plants is completely caused by ecological conditions and that the morphological characters in the generative parts are the result of the morphogenetical consequences thereof. It is also possible that some of the typical characters will be found to be hereditary, for burning is certainly an old agricultural measure in India and it could have caused a noticeable selection for certain genotypes. Finally there is a possibility that the pyromorphic plants are also better adapted to the cool winter climate in the northern hills.

Certainly not all dwarfed forms of *O. obtusata* DC. do belong to var. *pumila*. This variety has been erroneously recorded for Peninsular India by Dalzell & Gibson (1861), Nairne (1894), Cooke (1902), and Gamble (1915) as already noted by Talbot (1909). *O. fruticulosa* Kurz from Lower Burma is also different and is regarded by me as conspecific with *O. integerrima* (Lour.) Merr.

4. **Ochna integerrima** (Lour.) Merr., Trans. Am. Phil. Soc. N.S. 24, 2 (1935) 265, *emend.*; Masam., Fl. Kait. (1943) 205. — *Elaeocarpus integerrimus* Lour., Fl. Cochinch. (1790) 338; ibid., ed. Willd. (1793) 412. — Neotype: *de Pirey in Hb. Chevalier 41165* (L, P holo) Annam, Long Quang Tri, '*bong mai vang*', fl. II-1919. — Para-neotype: *de Pirey 29 = Chevalier 41180* (P) Annam, Long Quang Tri, '*bong mai do*', fr. V-1919.

O. wallichii Planch. in Hook, Lond. J. Bot. 5 (1846) 650; Walp., Ann. 1 (1849) 179; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 524, *excl. syn. O. stipulacea* Colebr. *nom. nud.*; Kurz, J. As. Soc. Beng. II, 44 (1875) 140; Prel. Rep. Pegu (1875) App. A, 30, App. B, 35; For. Fl. Br. Burma 1 (1877) 205; Laness., Pl. Util. Col. Franç. (1886) 304, 727; Watt, Dict. Econ. Prod. Ind. 5 (1891) 439; King, J. As. Soc. Beng. 62, II (1893) 231; Bartell., Malpighia 15 (1901) 155; Brand., Ind. Trees (1906) 128; Ridl., J. Str. Br. R. As. Soc. 59 (1911) 83; Hoss., Beih. Bot. Centralbl. 28, 2 (1911) 412; Craib, Fl. Siam. En. 1 (1931) 244; Burk., Dict. Econ. Prod. Mal. Pen. 2 (1935) 1569; Kanj. & Das, Fl. Assam 1 (1936) 219; Gagnep., Suppl. Fl. Gén. Indo-Ch. 1 (1946) 674; Hundl. & Chit, List Trees *&c.* ed. 3 (1961) 42; Lars., Dansk Bot. Ark. 23 (1963) 71. — *Diporidium wallichii* Kuntze, Rev. Gen. Pl. 1 (1891) 105, *incl.* var. *normale.* — *Discladium wallichii* v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 351. — Type: *Wallich 2804* (BM, K holo) Burma, Amherst, fl. 3-II-1827.

O. brevipes Planch. in Hook., Lond. J. Bot. 5 (1846) 652; Walp., Ann. 1 (1849) 180; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 525; Hundl. & Chit, List Trees *&c.* ed. 3 (1961) 42. — *Diporidium brevipes* Kuntze, Rev. Gen. Pl. 1 (1891) 105. — Type: *Hb. Hook.* (K holo) Ind. Or., fl.

O. crocea Griff., Not. Pl. As. 4 (1854) 463; Kurz, J. As. Soc. Beng. 40, II (1871) 49, *err. in syn. Gomphia sumatrana* Jack; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 525; King, J. As. Soc. Beng. 62, II (1893) 232. — *Ouratea crocea* Burk., Dict. Econ. Prod. 2 (1935) 1614; Kew Bull. (1935) 318, *p.p. quoad typus.* — Type: *Griffith 'Mergue. Ad littoram maris Ins. Madamaca Pator: 1835, fructifer tant'* (not seen).

O. lucida (*non* Lamk.) Griff., Not. Pl. As. 4 (1854) 464, Ill. t. 605, f. 6, *nom. illeg.*; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 523, *err. in syn. O. squarrosa* L.; Kurz, Prel. Rep. Pegu (1875) App. A, 30. — Type: *Griffith, 'ad litoram maris prope Amherst: Feb. 1835'* (not seen).

O. parviflora Griff., Not. Pl. As. 4 (1854) 464. — *O. wallichii* var. *parviflora* Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 524; Bartell., Malp. 15 (1901) 155. — Type: *Griffith, 'in sylvis prope Moulmein'* (not seen).

O. squarrosa (*non* L.) Kurz, Rep. Andam. Is. (1870) 74; J. As. Soc. Beng. II, 44 (1875) 140; Prel. Rep. Pegu (1875) App. B, 35; For. Fl. Br. Burma 1 (1877) 205; Hundl. & Chit, List Trees *&c.* ed. 3 (1961) 42; Nair, Fam. Burm. Fl. Pl. 1 (1963) 126.

O. andamanica Kurz, Rep. Andam. Is. (1870) 33, *nom. nud.*; J. As. Soc. Beng. II, 41 (1872) 295, *descr.*; ibid. 44 (1875) 140; Prel. Rep. Pegu (1875) App. A, 30, App. B, 35; For. Fl. Br. Burma 1 (1877) 205. — Type: *Kurz s.n.* (CAL holo, K, P) South Andaman, fl.

O. fruticulosa Kurz, J. As. Soc. Beng. 41, II (1872) 295; ibid. 44, II (1875) 140; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 524, *err. in syn. O. pumila* Ham. *ex* DC.; Kurz, For. Fl. Br. Burma 1 (1877) 206; *non* Gilg, Bot. Jahrb. 33 (1904) 238, *nom. illeg.*; Brand., Ind. Trees (1906) 128; Hundl. & Chit, List Trees *&c.* ed. 3 (1961) 42. — Type: *Scott s.n.* (CAL holo) Rangoon (Pegu), fl.

Diporidium wallichii (Planch.) Kuntze var. *brevifolium* Kuntze, Rev. Gen. Pl. 1 (1891) 105. — Type: *Kuntze* (NY holo) Cambodia, N'Cor, fr. IV-1875.

Diporidium wallichii (Planch.) Kuntze var. *longifolium* Kuntze, Rev. Gen. Pl. 1 (1891) 105. — *Polythecium helferi* v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 374. —

Type: *Helfer 788* (K, P) Tenasserim, plain between Salween R. and Gyaing R., fr. III-1837.

Discladium harmandii v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 351. — *O. harmandii* (v. Tiegh.) Lecomte, Fl. Gén. Indo-Ch. 1 (1911) 706, f. 75; Merr., Lingn. Sc. J. 5 (1927) 129; Craib, Fl. Siam. En. 1 (1931) 244; Gagnep., Suppl. Fl. Gén. Indo-Ch. 1 (1946) 674, f. 82: 14; Hô & Du'o'ng, Fl. Vietn. (1960) 178, f. 62 D; Lars., Dansk Bot. Ark. 23 (1963) 70. — Type: *Harmand 1229* (E, K, P holo) Laos, Attopeu, fl. 2-III-1877.

Diporidium poulocondorense v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 360. — Type: *Harmand 762* (P holo) Cochinchine, Poulo Condor, fl. 1875.

Polythecium griffithii v. Tiegh., Ann. Sc. Nat. Bol. VIII, 16 (1902) 374. — Lectotype: *Griffith K.D. 785* (K, P holo) Mergui, fl. — Paratype: *Griffith 1088 = K.D. 787 p.p.* (K, P), Mergui, fr.

Polythecium pellucidum v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 374. — Lectotype: *King s.n.* (L, P holo) S. Andaman, Nabee Boh, fr. IV-1890. — Paratype: *King's coll. s.n.* (P, U) S. Andaman, Bajajag, fr. 29-IV-1893.

Polythecium thorelii v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 375. — *Polythecanthum thorelii* v. Tiegh., ibid. IX, 5 (1907) 175. — Type: *Thorel 970* (C, E, P holo) Cochinchine, fl. 1862—66.

Polythecium cochinchinense v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 375. — *Polythecanthum cochinchinense* v. Tiegh., ibid. IX, 5 (1907) 175. — Type: *Thorel 970* (CAL, K, P holo) Cochinchine, fr. 1862—66.

Polythecium lefevrei v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 375. — *Polythecanthum lefevrei* v. Tiegh., ibid. IX, 5 (1907) 175. — *O. harmandii* var. *annamensis* Lecomte, Fl. Gén. Indo-Ch. 1 (1911) 707, *p.p.* — Lectotype: *Lefèvre 578* (P holo) Poulo Condor, fl. VIII-1864. — Paratype: *Harmand 803* (P) Poulo Condor, fr. 1875.

Polythecium inaequale v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 375. — *O. harmandii* var. *annamensis* Lecomte, Fl. Gén. Indo-Ch. 1 (1911) 707, *p.p.* — Type: *d'Orléans s.n.* (P holo) Laos, Luang Prabang, fl. IV-1892.

Polythecium latifolium v. Tiegh., Ann. Sc. Nat. Bot. IX, 5 (1907) 174. — *O. harmandii* var. *latifolia* Lecomte, Fl. Gén. Indo-Ch. 1 (1911) 707; Gagnep., Suppl. Fl. Gén. Indo-Ch. 1 (1946) 675. — Type: *Pierre 7036* (P holo) Cochinchine, Tay-ninh, Mt. Deon-ba, III-1866.

Polythecium pruinosum v. Tiegh., Ann. Sc. Nat. Bot. IX, 5 (1907) 174. — *O. pruinosa* Lecomte, Fl. Gén. Indo-Ch. 1 (1911) 705. — Type: *Pierre 33* (P holo) Cochinchine, Baria, Cap Tiwan, fl. VIII-1868.

Polythecium pierrei v. Tiegh., Ann. Sc. Nat. Bot. IX, 5 (1907) 175. — *O. harmandii* var. *retusa* Lecomte, Fl. Gén. Indo-Ch. 1 (1911) 707. — Lectotype: *Pierre 1804* (P holo) Phu Quoc, fl. II-1877. — Paratypes: *Pierre 1804* (P) Bien Hoa, Bao Chiang, fr. IX-1865 & *Pierre 1804* (BM, CAL, K, P) Baria, Mt. Dinh, fr. III-1867.

Polythecanthum cambodianum v. Tiegh., Ann. Sc. Nat. Bot. IX, 5 (1907) 176. — *O. harmandii* var. *cambodiana* Lecomte, Fl. Gén. Indo-Ch. 1 (1911) 707. — Lectotype: *Pierre 7033* (C, P holo) Cambodia, Prov. Samrong Tong, Pen Lover, fl. III-1870. — Paratype: *Pierre 7032* (P) Cambodia, Prov. Samrong Tong, fr. III-1870.

O. grandis Ridl., J. Str. Br. R. As. Soc. 59 (1911) 83; Fl. Mal. Pen. 1 (1922) 365. — Lectotype: *Ridley 15037* (BM, CAL, K, SING holo) Perlis, Ginting Kabok, fr. III-1910. — Paratype: *Keith s.n.* (SING) Thailand, Bangtaphanoi, fr. 27-III-1890.

O. pumila (*non* Buch.-Ham. *ex* DC.) Hundl. & Chit, List Trees &c. ed. 3 (1961) 42; Nair, Fam. Burm. Fl. Pl. 1 (1963) 126.

Undershrub, shrub, or treelet up to 12 m high, dbh. up to 45 cm, deciduous. Branchlets slender. Stipules 5—8 by 2—3 mm. *Leaves* with 2—5 mm long petiole; lamina mostly obovate-oblong or (obovate-)lanceolate, rarely obovate or linear-lanceolate, 6—20(—25) by 2—7 cm, mostly acuminate, sometimes acute or obtuse at apex, mostly acute, sometimes obtuse at base, margin finely denticulate, chartaceous. *Inflorescences* compound, many-flowered; rachis ½—1½(—4) cm long; branches 1—3-flowered, monochasial; pedicels 2—4 cm long, in fruit up to 5 cm, the basal 2—8 mm persistent. *Torus* ½—1 mm high, 1½—2½ mm Ø, in fruit up to 6 mm high, 10 mm Ø, turning dark red. *Sepals* 5, ovate to ovate-oblong, 10—16 by 4—9 mm, turning dark red in fruit. *Petals* 5—6(—10), obovate, 15—25 by 8—15 mm, tapering at base or subunguiculate. *Stamens* (25—)30—60 (—75) with 2½—7 mm long filaments, unequal, the outermost the longest; anthers 4—6 by 0.4—0.8 mm. *Ovaries* 6—10(—15), 0.7—1.1 by 0.5—0.7 mm; style 10—15 by *c.* ½ mm, in fruit up to 20 mm long; stigmas sometimes on up to 1 mm long branches. *Fruits* mostly 2—3, up to 11 by 8 mm.

Distribution: N.E. India, E. Pakistan, Burma, Thailand, N. Malaya, Laos, Cambodia, S. Vietnam, Hainan.

ASSAM. *Simons s.n.* (BO, L); Garo Hills, Tura: *Kanjilal 5308* (CAL), *Koeltz 24890a* (L), *24906* (L), *Thakur Rup Chand 2976* (L), *3018* (L); Khasi Hills: *Native coll. s.n.* (BO, DD, L); Cherrapunjee: *Koeltz 29979* (L), *Thakur Rup Chand 5685* (L).

E. PAKISTAN. *Hooker s.n.* (K); Sylhet: *Wallich 2805B* (BM, E, GL, K, P, SING), *Clarke 7123* (K); Chittagong Hill Tracts, Kassalong Res.: *Range Off. 16 KL* (DD).

BURMA. Arakan Prov., Akyab Distr., Ran R.: *Rogers 164* (DD); Ta Ywe R.: *Rogers 173* (DD). — Sagaing Prov., Ruby Mines Distr., Sampanego: *Lace 5310* (CAL, DD, E, K). — Mandalay Prov., Yemethin Distr., Pyinmana: *Rodger 359* (CAL). — Magwe Prov., Pakokku Distr., Pyinchaung: *Oliver A67* (DD, K). — Irrawadi Prov., Henzada Distr., Sebjauk Res.: *Rogers 53* (DD); Bassein Distr., Bassein Ra., Alejyami: *Lovy 10316* (DD); Myaungmya Distr., Labutta: *Lace 2980* (E, K). — Pegu Prov.: *Eyre s.n.* (BO), *Kurz 1920* (SING); Prome Distr.: *McLelland s.n.* (K), *Wallich 2805A* (K); Toungoo Distr., Toukyeghat, 7 Pagodas: *Kurz 51* (E); Toukyeghat valley: *Kurz 429* (CAL, K); towards Pyu: *Lace s.n.* (E); Insein Distr., Wagyaung Fts.: *Parkinson 80* (CAL); Myankhlaing Res.: *Po Khant 95, 221, 238* (DD); Rangoon Distr.: *Scott s.n.* (CAL), *Hamilton s.n.* (BM), *Maingay K.D. 294/2* (K), *McLelland s.n.* (K); University Estate: *Parkinson 14080, 14388* (DD); Myangone: *Po Khant 1165* (DD). — Tenasserim Prov.: *Gallatly 490* (L), *600, 796, 802* (K), *Helfer K.D. 786, 787* (K, P), *789* (K), *790* (K, P); Amherst Distr., Moulmein: *Falconer 311* (BO, DD), *313* (DD), *Lobb s.n.* (K), *Meebold 16896* (S), *Parish 172* (K); Amherst: *Falconer 314* (BO, DD, SING), *316* (BO, DD, L), *Wallich 2804* (BM, K); Tavoy Distr.: *Meebold 14988* (CAL), *Parish 237* (K), *Shaik Mokim 428* (CAL, L, P, U), *585* (BO, DD); Kaleinaung Res.: *Ba Pe 880* (DD); Mergui Distr.: *Griffith K.D. 785* (K, P), *956* (K), *1088 = K.D. 787* (K, P); Tenasserim: *Badul Khan 81* (CAL); Mergui I.: *Proudlock 8* (BM, E); Thatay Kyun: *Po Khant 11351* (DD). — Kachin State, Bhamo Distr., Mezaligön (Kaukwe): *Cubbitt 342* (E). — Shan State: *Abdul Huk 82* (CAL). — Karin State, Menyaw Headwaters: *Chin 6763* (E); Melaung to Paing Kyun, E. of Salween R.: *Lace 4586* (CAL, E, K); between Salween and Gyaing: *Helfer K.D. 788* (K, P); Thaungyin: *Beddome 1084* (BM), *Dickason 6851* (E, L).

ANDAMAN Is. *King's coll. 87* (BM, K, L), *286* (CAL, K), *Parkinson 1182* (CAL, DD), *Prain's coll. 80* (E), *84* (BM), *s.n.* (P); Middle Andaman: *Parkinson 34* (DD); S. Andaman: *Kurz s.n.* (CAL, K, P); Nabee Boh: *King s.n.* (L, P); Port Mouat: *King s.n.* (CAL, P, SING); Dhani Khari: *King's coll. s.n.* (DD, K, U); Bajajag: *King's coll. s.n.* (P, U); Brookesabad: *King's coll. s.n.* (P).

NICOBAR Is. Kamorta: *Kurz 25965* (BO, K); Bara Nicobar, Tambalu: *King's* coll. *s.n.* (P, U).

THAILAND. Payap Circle, Chiang Dao: *Winit 91* (K), near Mae Taeng: *Sörensen, Larsen & Hansen 1339* (C); Chiang Mai, Doi Sutep: *Hosseus 445* (BM, E, K, P), *Kerr 544* (CAL, K, P), *Smitinand 100 = RFD 4827* (BKF), *Sörensen, Larsen & Hansen 2547—2555, 2583, 3398* (C); Chom Thong: *Garrett 1346* (K, L, P), *Kerr 5352* (K); Lamphun, Mae Li: *Winit 1566* (K); 23 km N. of Li: *King 5447* (K, L); Doi Mae Hot: *Kulchat Nitikul 1 = RFD 9812* (BKF); Huai Tak: *Bunnak 50* (L), *N.N. 605 = RFD 5398* (BKF); Bo Luang: *Sörensen, Larsen & Hansen 7051* (C); Mae Fang: *Garrett 18* (K); Muang Payao: *Put 3978* (K). — Maharat Circle, Phrae: *Vanpruk 176* (K), *199* (BKF, K). — Nakhon Sawan Prov., Tak: *Gram & Syrach-Larsen 108* (C); Ampur Lee: *Gram & Syrach-Larsen 121* (C). — Rachaburi Circle, Tripagodas Pass: *Kasin 343* (BO, K, L, P, SING); Wangka: *Kerr 10469* (K); Sai Yok: *Larsen 9217* (C); Pong Nam Ron: *Bunchwai 87 = RFD 26227* (K, L); Sankra: *Prayoon Bunkhruy 81 = RFD 26226* (L); Kanchana Buri:

Boomkrong 82 = *RFD 26235* (K), *Kerr 10578* (K), *Teysmann H.B. 6047* (BO, L, U); Wang Kanai: *Marcan 2160* (K); Hua Hin: *Marcan 2470* (K); Prachuap, Kan Kradai: *Put 2307* (K); Kao Tao: *Kerr 16162* (K), *Marcan 2443* (K); Bang Saphan: *Keith s.n.* (SING). — Surat Circle, Chumphon (Sapli): *Haniff & Nur SF 4248* (BO, K, SING); Ko Tao: *Kerr 12721* (K). — Udon Circle, Loei, Par Sook Din Dang: *Dee 653* = *RFD 10114* (L); Wang Saphung, Sitarn: *Smitinand 1196* = *RFD 7231* (K); Khon Kaen, Phu Wieng: *Lakshnakara 1324* (K). — Rachasima Circle, Korat, Ban Chum Seng: *Put 2827* (K). — Ubon Circle, Kruat, Kao Saming: *Put 607* (K). — Prachinburi Circle, Si Racha: *Collins 889* (K), *Marcan 132* (K); Khao Chalat: *Collins 971* (C, E, K); Ko Loy: *Collins 98, 234* (K). — Chanta Buri Circle, Rayong, Ban Phe: *Put 2725* (E, K); Chanta Buri, Ban Plaing: *Lakshnakara 518* (K); Makham Plain: *Sörensen, Larsen & Hansen 193* (C); Dan Chumpon: *Kerr 17647* (K); Pliu, Khao Sabab: *Seidenfaden 2777* (C, SING); Trat, Ko Chang: *Bunnak 324* = *RFD 19963* (L), *Kerr 6857* (K, SING), *Schmidt 627b, 865* (C, K), *Sörensen, Larsen & Hansen 7114* (C); Ko Chang Noi: *Schmidt 698g* (C, S); Ko Saket: *Schmidt 335* (C).

LAOS. *Spire 185* (P); Luang Prabang: *d'Orléans s.n.* (P); Pac Bac: *Poilane 20472* (P); Vientiane, Ban Met: *Dussaud 98* (P); E. of Vientiane: *Talbot de Malahido 137* (SING); W. of Paksane: *Talbot de Malahido 124* (SING); Savannakhet: *Poilane 11743* (BO, K, P), *11919* (P); between L. A Xingh and L. Xoan: *Poilane 13688* (K, P, SING); Saravane, between L. Sa Roi and L. A Loi: *Poilane 13239* (BO, P); between L. Loi and L. Pata: *Poilane 13758* (P); Pakse, Attopeu: *Harmand 1229* (E, K, P); ? Bang Nun: *Thorel s.n.* (P).

CAMBODIA. *Béjeaud 317* (P), *Couderc s.n.* (P), *Pierre in Hb. Hance 19773* (BM); Siem Reap?, Pagode de Choam Mong: *Couderc s.n.* (P); Pursat: *Chevalier 31984, 31999* (P); Kg. Thom, Preah Vihear: *Poilane 14908* (K, P); Tonlé Sap: *Lecomte & Finet 61* (P); Srok Santuk, Prey Phnom: *Magnen & al. 5* (E, P); Kg. Irai: *Béjeaud 18* (P); Kg. Chhnang, Prey Anghop: *Chevalier 36189* (*Duquesnoy*) (P); Kdey Ahnot: *Chevalier 36999* (P); Kralanh F.R.: *Chevalier 31741* (*Fleury*) (P); Kg. Speu, Srok Samrong Tong: *Pierre 7032* (P); Penh Lover: *Pierre 7033* (C, P); Phnom Penh: *Alleizette 7* (P), *Gourgand s.n.* (P); Kampot: *Geoffray 403* (P), *Poilane 14598* (P); Khet Mondolkiri, N'Cor R.: *Kuntze 4028* (NY).

VIETNAM. Cochinchina: *Talmy 74* (P), *Thorel 970* (C, CAL, E, K, P); Phu Quôc: *Contest Lacour 307* (P), *Pierre 1804 p.p., 7035 p.p.* (P); Phong Dinh, Can Tho: *Chevalier 30327* (K, P); Tây ninh, Tha Byh: *Muller 996* (P); Mt. Deon Ba: *Pierre 7036* (P); Long An, Thu Duc: *Pierre 7034* (C, P); Point A: *Lefèvre 528* (P); Bien Hoa, Mt. Bao Chiang: *Pierre 1804 p.p.* (K, P); Phuoc Tuy, Cape Ti Wan: *Pierre 33* (P); Mt. Dinh: *Pierre 322* (BM, K, P), *1804 p.p.* (BM, CAL, K, P); Mt. Zuin: *Pierre 7035 p.p.* (P); Long Khánh, Giaray: *Poilane in Hb. Chevalier 40851* (P, S, SING); Vo Dat: *Chevalier 36692* (P); Côn Son (= Poulo Condor): *Harmand 762, 803* (P), *s.n.* (K, P), *Lefèvre 578* (*Lemesle*) (P). — Annam, Ninh Thuân, Ca Na: *Poilane 5639* (BO, P), *Schmid s.n.* (P); Khánh Hoa, Nha Trang: *Chevalier 30455, 30528, 30529* (P), *Poilane 2804* (BO, P), *Robinson 1033* (K, P); Nui Han Heo Peninsula: *Poilane 6865* (P); Hon Tre I.: *Poilane 2931, 3084* (P); Massif de la Mère et de l'Enfant: *Poilane 6754* (K, P); Thua Thiên, Hue: *Lecomte & Finet 1273, 1274* (P), *Eberhardt 3318* (P); Quang Tri: *Chevalier 41165* (*de Pirey s.n.*), *41180* (*de Pirey 29*) (P). — Tonkin, Haiphong, Nui Deo: *Alleizette 5, 266* (P).

HAINAN. *Liang 65435* (K, P); Lin-kao Distr., Lin Fa Shan: *Tsang 258* = *LU 17007* (BM, BO, CAL, K, L, P, SING); Ch'ang-kiang Distr., Ka Chik Shan: *Lau 1641* (BM, P); Chung Ngo Chang: *Lau 3352* (P, S); Kan-en Distr., Chim Fung Ling: *Lau 3390, 3655* (P, S); Yai Distr.: *How 70518* (K, P), *How & Chun 70300* (P); Yeung Ling Shan: *Lau 38* (BM, E, K, P); Wan-ning Distr.: Fan-ta: *McClure CCC 9138* (BM, E, K, P).

MALAY PENINSULA. Thailand. — Puket Circle, Ranong: *Haniff 358* (SING); Ko Phayam (Delisle I.): *Kerr 16628* (K), *Kloss 6640* (K); Ko Yao Yai: *Kerr 17310* (K); Tunkah: *Goldham in Hb. Curtis 3055* (K, SING); Trang?, Lam Lung: *Vanpruk 605* = *RFD 5398* (BKF, K); Batong Is., P. (L)adang: *Kerr 14033* (K); P. Butang: *Ridley 15746* (BM, K, SING). — Surat Circle, Ban Don, Kong Ta: *Seidenfaden 2488* (C, SING). — Nakon Si Thamarat Circle, Ko Samui: *Kerr 12543* (K); Ta Samet: *Kerr 14297* (K); Sonkhla: *Annandale s.n.* (CAL, K, SING). — Malaya. — Perlis, Ginting Kabok: *Ridley 15037* (BM, CAL, K, SING). — Kedah, Koh Mai F. R.: *Kiah S.F. 35131* (BO, K, L, S, SING); Langkawi Is.: *Batten Pooll s.n.* (SING); P. Langkawi: *Corner S.F. 37888* (A, SING), *Wyatt Smith K. F. N. 71204* (K).

Vernacular names: Assam: *khimdabeng* (Garo). Burma: *indaing-seni* (N. Burma), *yodaya* (S. Burma), *mok-song-hu* (Shan), *myauk-min-thwege* (?). Thailand: *t'a-chi-bang* (Karen), *tan-luang* (N. Lao), *chang-nao* (N.E. Lao), *kra-chè* (N. Thai), *champanam* (S. Thai). S. Vietnam: *(cây-bông-)mai-do*, *mai-nui* or *mai-vàng*, *huỳnh-mai* (Annam), *câm-lai*, *xo'-lai* (Moi).

Ecology: From sea level up to 1200 m in hilly country, in moist or dry, deciduous forests, often of a mixed Dipterocarp type, on loamy, sandy, or rocky soils. Tall specimens are found near river banks, small shrubs near sea shores, and pyromorphic undershrubs in stunted, dry hill forest. Flowering shortly before or during development of new leaves: in the northern part of the area mainly in February and March, in the southern part generally a little earlier, but less restricted, especially in the Malay Peninsula.

Use: The bark tastes bitter and yields a digestive tonic (Lanessan, 1886). The flowers are appreciated as decorative by the Vietnamese, especially during the Buddhist New Year (*têt*). The wood is recorded as used for huts in the Andamans.

Properties of wood: Light-brown, hard, close-grained and brittle; weight 54 lbs. per cubic foot (Watt, 1890) = $\pm$ 0,87 kg/dm^3.

Remarks: All *Ochna* specimens found between the hills of Assam, the Malay Peninsula, and Hainan are considered by me as conspecific. Several names have been commonly in use in this part of the world, not only because of local traditions, but also because of the variability of this species. Differences in shape and size of the vegetative parts are sometimes remarkable, but I found it impossible to distinguish clear and useful infraspecific taxa among the herbarium specimens studied. Small-leaved forms are dominant among materials from Indo-China and adjacent parts of Thailand, but they do come from Burma and Assam too and this might be at least partly caused by ecological circumstances. On the whole there is a striking similarity in the flowers.

I have no doubt that Merrill (1935) has correctly interpreted and emended the description of *Elaeocarpus integerrimus* Lour. and I accept the combination O. *integerrima* (Lour.) Merr. as the correct name for the species treated here.

I have seen some pyromorphic specimens from Burma and N. Thailand with low stems, sprouting from tuberous roots. Unlike the Indian pyromorphic specimens of O. *obtusata* DC., that are united in a separate variety, these are not very different from O. *integerrima* (Lour.) Merr. in characters of flowers, inflorescences, and leaves. The only exception is in the calyx, which is not reflexed in fruiting specimens seen by me, but this character is probably not of a very fundamental nature. Originally some of the specimens concerned have been named O. *fruticulosa* Kurz. This name is considered by me as synonymous with O. *integerrima* (Lour.) Merr. and not with O. *obtusata* DC.

Griffith (1854) described three new *Ochna spp.* from Tenasserim. Although I have seen several of his collections, I have not been able to trace Griffith's holotype specimens in CAL or elsewhere. From the descriptions it is highly probable, however, that all three are conspecific with O. *integerrima* (Lour.) Merr.

Ochna crocea Griff. was described from a fruiting specimen. The characters: '*filamentis pluribus persistent*' and '*ovaria plura abortiva ...*' are indicating a position in *Ochna* with many distinctly filamented stamens and up to 15 ovaries rather than *Gomphia* with only 10 subsessile stamens and 5 ovaries. Besides, the characters of the torus and the embryo are also more in accordance with those of *Ochna*. This species was considered by Kurz (1871) as conspecific with *Gomphia sumatrana* Jack. He did not give any arguments for his decision, but it was accepted by Bennett (1875), King (1893), and other authors. It is the more probable, however, that Kurz made a mistake, as no other records of *Gomphia spp.* were given from Burma ever since.

Ochna lucida Griff. was newly described and depicted from a flowering specimen collected by Griffith in Amherst. No reference is made to O. *lucida* Lamk. and consequently Griffith's name is a later homonym and illegitimate. Both names were incorrectly considered as synonymous by later authors and consequently Bennett (1875) wrongly referred Griffith's plant to O. '*squarrosa*' = O. *obtusata* DC.

Ochna parviflora Griff. is probably a form of O. *integerrima* (Lour.) Merr. with slightly smaller flowers and leaves, as was already noticed by Bennett (1875). In my opinion, as already stated above, such local forms do not deserve any taxonomical status.

2. BRACKENRIDGEA

A. Gray, New Gen. Pl. (1853) 5, offprint of Proc. Am. Ac. Arts & Sc. 3 (1857) 51; U.S. Expl. Exp. Bot. 1 (1854) 361; Walp., Ann. 4 (1857) 421; B. & H., Gen. Pl. 1 (1862) 318; Seem., Fl. Vit. (1865) 34; Oliv. in Hook., Ic. Pl. 3, 1 (1871) 77; Baill., Hist. Pl. 4 (1873) 359; F.-Vill., Fl. Filip. Nov. App. (1880) 39; Gilg in E. & P., Nat. Pfl. Fam. 3, 6 (1895) 142; Bailey, Queensl. Fl. 1 (1899) 221; Bartell., Malpighia 15 (1901) 160; v. Tiegh. in Morot, J. Bot. 16 (1902) 46, 202; Ann. Sc. Nat. Bot. VIII, 16 (1902) 393; Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 74; A. C. Smith, J. Arn. Arb. 36 (1955) 284; Furt., Gard. Bull. Sing. 19 (1962) 181. — Type species: *B. nitida* A. Gray.

Campylopora v. Tiegh., Bull. Mus. Hist. Nat. Paris 8 (1902) 547; Ann. Sc. Nat. Bot. VIII, 16 (1902) 404. — Type species: *C. australiana* (F. v. M.) v. Tiegh. = *Brackenridgea nitida* A. Gray.

Notochnella v. Tiegh., Bull. Mus. Hist. Nat. Paris 8 (1902) 549; Ann. Sc. Nat. Bot. VIII, 16 (1902) 403. — Type species: *N. fascicularis* (Blanco) v. Tiegh. = *Brackenridgea fascicularis* (Blanco) F.-Vill.

Trees or treelets with spreading branches. *Stipules* small, free, often more or less laciniate, caducous. *Leaves* chartaceous, glossy above, nerves strongly curved to the apex, often some of the lower ones partly parallel to the margin, the higher ones joining successively, veinlets branching, ± transverse. *Inflorescences* thyrsoid but of umbelloid appearance, made up of simple or compound, distichously arranged, shortened cymes, the rachis often growing on vegetatively after flowering; bracts small, caducous, often many at base of inflorescence with small, axillary buds; pedicels filiform, a little growing and turning red in fruit, ultimately caducous. *Flowers* with ± hemispherical torus, which is distinctly tumid and red in fruit. *Sepals* 5, enlarged, fleshy and red in fruit. *Petals* 5(—10), white or yellow. *Stamens* 10 (or ∞); filaments subterete; anthers dehiscing from the apex downwards by longitudinal slits. *Ovaries* 5(—10), obovoid; ovule camptotropous, epitropous, ± annularly curved around 2 connecting intrusions of the endocarp; stigma small. *Fruits* 1—2(—5), reddish, turning black or almost so when ripe.

Distribution: 5 species in the Andamans, Ko Chang, Sumatra, the Malay Peninsula, Borneo, the Philippines, Celebes, New Guinea, NE. Queensland, and Fiji.

Ecology: Confined to the everwet tropical areas, up to *c.* 1000 m altitude. Dispersal mainly by birds because of conspicuous, black fruits on red torus and calyx (Guppy, Obs. Nat. Pacif. 2, 1906, 569; Ridley, Disp. Pl., 1930, 265). The fruits are also capable of floating because of two air-filled spaces between exocarp and endocarp; this was recorded from the Kapuas R. (Beccari, Wand. Borneo, 1904, 187) and from the New Guinea seadrift (Hemsley, Bot. Chall. Exp. 3, 1885, 289, pl. 54).

Remarks: The genus *Brackenridgea* was published by Asa Gray in 1853. The generic description is followed by the name of a new species from Fiji: *B. nitida*, and by a new combination: '? *B. hookeri* (Planch.)'. Since the name *B. hookeri* follows a question-mark, I presume the generic description is based solely on materials from Fiji and therefore it is a *descriptio generico-specifica*.

KEY TO THE SPECIES

1. Petals 5—7(—10); stamens 10—45; ovaries 5—10. (Sect. A. *Notochnella*) . . . **1. B. fascicularis**
1. Petals 5; stamens 10; ovaries 5. (Sect. B. *Brackenridgea*).
    2. Inflorescences never axillary, but sometimes terminal on short side-branches.
        3. Inflorescences made up of many-flowered cymes, the pedicels in 2 or more tiers; leaves mostly 7½—20 cm long . . . . **2. B. hookeri**

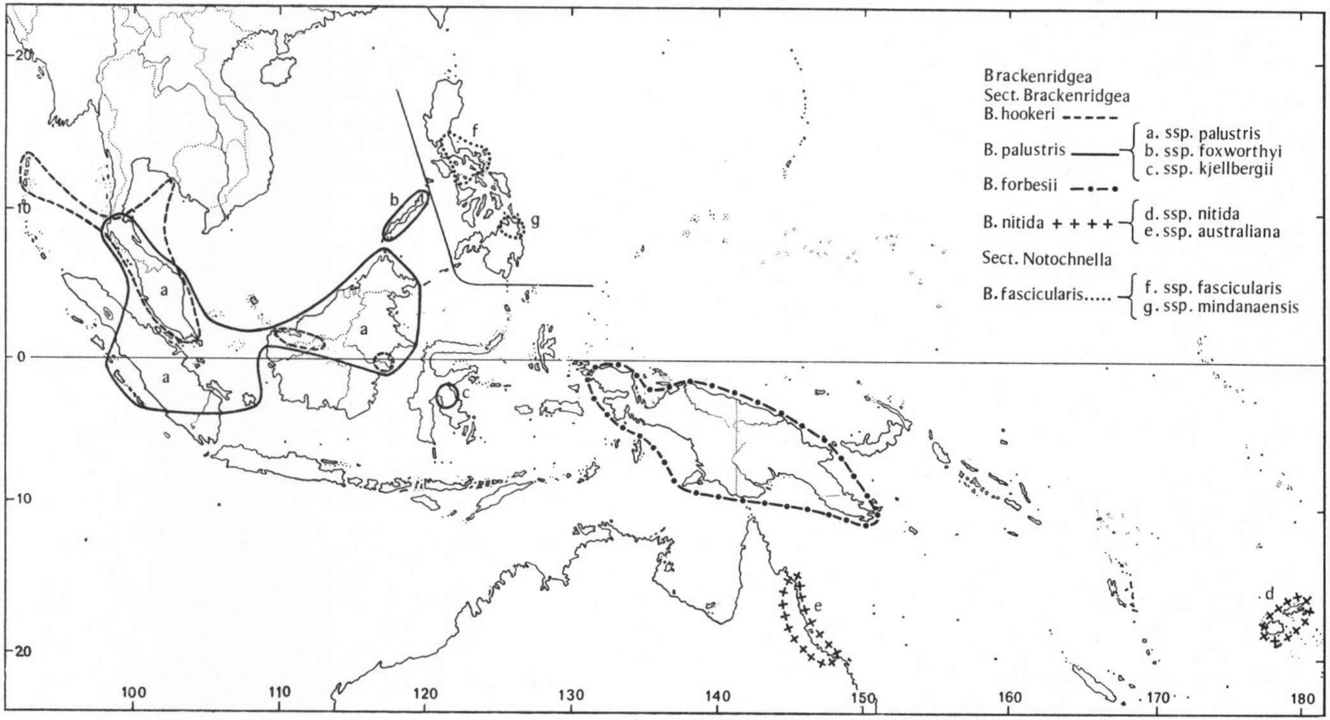

Fig. 6. Distributional map of the species of *Brackenridgea* in Malesia and neighbouring areas. Outlined areas are only slightly generalised from cited localities.

3. Inflorescences made up of 3(—5)-flowered cymes, the pedicels in 1 tier; leaves mostly 4—12½ cm long . . . . 3. **B. palustris**
2. Axillary inflorescences always present when in fertile state.
   4. Anthers *c.* 1½ by ¼ mm, about as long as filaments . . . . 4. **B. forbesii**
   4. Anthers 2—3 by ½—⅝ mm, more than 3 times as long as filaments . . . . . . 5. **B. nitida**

Section A. **Notochnella**

(v. Tiegh.) Kanis, *stat. nov.* — *Notochnella* v. Tiegh.

Cymes ± remote; peduncle ± distinct; branches ± shortened, sometimes unequal in length, the longer overtopping the central flower; pedicels articulate, the short basal part persistent. Flowers of 1 cyme flowering successively. Corolla irregular, yellow. Stamens ∞, in more than 1 whorl. Ovaries 5—10; style correspondingly ribbed; stigma minute, papillose.

Distribution: 1 species in the Philippines, excluding Palawan Prov.

Remark: For a discussion on the establishment of this new section see under *B. fascicularis.*

1. **Brackenridgea fascicularis** (Blanco) F.-Vill., Fl. Filip. Nov. App. (1880) 40. — *Ochna fascicularis* Blanco, Fl. Filip. ed. 2 (1845) 245; ibid. ed. 3, 2 (1878) 92; Vidal, Syn. Fam. & Gen. Pl. Filip. (1883) 19, t. 27A; Rev. Pl. Vasc. Filip. (1886) 79; Bartell., Malpighia 15 (1901) 162; Merr., Govt. Lab. Publ. Philip. 27 (1905) 29; Sp. Blanc. (1918) 263; En. Philip. Fl. Pl. 3 (1923) 68. — *Diporidium fasciculare* O. Kuntze, Rev. Gen. Pl. 1 (1891) 105; v. Tiegh. in Morot, J. Bot. 16 (1902) 203. — *Notochnella fascicularis* v. Tiegh., Bull. Mus. Hist. Nat. Paris 8 (1902) 549; Ann. Sc. Nat. Bot. VIII, 16 (1902) 403. — Neotype: *Vidal 1023 p.p.* (A, L), Luzon, Bulacan Prov., Angat, fl.

Ouratea mindanaensis Merr., Philip. J. Sc. 17 (1920) 287; En. Philip. Fl. Pl. 3 (1923) 68. — Type: *Ramos & Pascasio B.S.* 34479 (A, K, P, PNH holo †?), Mindanao, Surigao Prov., fr. 25-IV-1919.

Tree up to 25 m high; dbh. up to 30 cm. Stipules up to 5 by 1½ mm, laciniate. *Leaves* with 4—8 mm long petiole; lamina oblong to lanceolate, 5—15 by 2—5 cm, sometimes obtuse, mostly acute to a little acuminate at apex, obtuse to acute, sometimes a little attenuate at base, margin entire or ± finely denticulate. *Inflorescences* terminal, made up of a varying number of many-flowered, ± shortened cymes, sometimes separate cymes in the axils of normal leaves; bracts mostly triangular, up to 5 by 2 mm, ± caducous; pedicels 1—2 cm long, up to 3 cm in fruit, the basal 1—5 mm persistent. *Torus c.* 1 mm high, 1½ mm ∅, in fruit up to 4 mm high, 7 mm ∅. *Sepals* elliptic to obovate, 6—8 by 3—4 mm. *Petals* obovate to obovate-lanceolate, 6—8 by 2½—4½ mm. *Stamens* with 1½—2½ mm long filaments; anthers 2½—3 by *c.* ½ mm. *Ovaries* 0.7—0.8 by 0.5—0.7 mm; style *c.* 4 mm long, in fruit up to 7 mm long. *Fruits* up to 7 by 6 mm.

Distribution: 2 subspecies in the Philippines excluding Palawan Prov.

Ecology: In primary forests at low and medium altitudes (Merrill, 1923). Once reported from logged Dipterocarp forest and once along a stream.

Remarks: Blanco (1845) described this species in the genus *Ochna* L., since it has more latter floral parts than *Brackenridgea s.s.* Fernandez-Villar (1880) transferred it to the latter genus on account of its annular embryo; consequently he emended the description of this genus. Most later authors have followed Blanco rather than Fernandez-Villar, but Van Tieghem (1902) placed this species closer to *Brackenridgea* giving it the status of a separate genus.

The indefinite number of the floral parts certainly indicates a relationship with *Ochna.*

On the other hand, the annular embryo, the free stipules, and the characters of the leaf blade, especially of the venation, refer to *Brackenridgea*. The inflorescences represent intermediate stages between the distinctly branched thyrses that are found in *Ochna* and the essentially similar, but strongly reduced inflorescences of *Brackenridgea s.s.* The somewhat intermediate position of the species is best reflected by placing it in a separate section in *Brackenridgea.*

In have indicated *Vidal 1023* as a neotype, since it is not very likely that Blanco's original material from Angat is still existing. Vidal's collection is very suitable as it originates from the same area and as there is no doubt about the interpretation of this species.

KEY TO THE SUBSPECIES

1. Stamens 20—45. Cymes with 2—5 mm long peduncles . . . . **a.** ssp. **fascicularis**
1. Stamens 10—15. Cymes with 5—10(—20) mm long peduncles . . . . **b.** ssp. **mindanaensis**

a. ssp. **fascicularis.** — *Ochna fascicularis* Blanco.

Inflorescences with 1—2½ cm long rachis; cymes with 2—5 mm long peduncles, up to 15-flowered. Sepals 5. Petals 5—7(—10). Stamens 20—45. Ovaries 7—10.

Distribution: Luzon, N. Visayas.

LUZON. Central Luzon: *Vidal 155d* (A). — Zambales Prov., Subic: *Merrill Bur. Agr. 2099* (K). — Bulacan Prov., Angat: *Vidal 155bis* (K), *1023* (A, K, L). — Rizal Prov.: *Ahern's coll. 3077* (BO, K, P, SING), *3174* (BO, K, P, SING), *Merrill Sp. Blanc. 857, 916* (A, BM, BO, K, L, P); Tanay: *Merrill Bur. Agr. 2297* (A, K, SING); Boso[2]: *Merrill Bur. Agr. 2691* (BM, K), *2695* (K), *Ramos B.S. 2119* (BO); Pilea: *Ramos B.S. 3296* (BO); San Andales: *Edaño B.S. 48803* (A, BM, E, K). — Laguna Prov., San Antonio: *Ramos B.S. 14925* (L, P). — Quezon (Tayabas) Prov.: *Oro F.B. 30684, 30979, 31067* (SING). — Camarines Norte Prov.: *Andrade F.B. 28144* (SING); Paracale: *Vidal 692* (K, L); Makahadok: *Riviera 8* (A). — Albay Prov., Cagraray I.: *Bautista F.B. 28669* (A, P). — Catanduanes Prov.: *Ramos & Edaño B.S. 75269* (CAL, SING).

VISAYAS. Romblon Prov., Sibuyan I.: *Franco F.B. 18831* (K).

Vernacular names: Luzon: *aniatan, dirigkalin, bitas, mala-kiting*[2], *masalisi* (Tag.); Visayas: *bansilai* (Bis.). All names according to Merrill (1923).

b. ssp. **mindanaensis** (Merr.) Kanis, *stat. nov.* — *Ouratea mindanaensis* Merr.

Inflorescences with 2—6 cm long rachis, often indistinct by development of bracts to normal leaves; cymes with 5—10(—20) mm long peduncles, up to 7-flowered. Sepals (3—)5. Petals (3—)5. Stamens (8—)10—15. Ovaries 6—7.

Distribution: Mindanao.

MINDANAO. Agusan Prov., Butuan, San Mateo Bo.: *Mendoza P.N.H. 41896* (L, SING). — Surigao Prov., Surigao Distr.: *Mallonga F.B. 27003* (A, BM, BO, K, P); iron deposits at NE. coast: *Ramos & Pascasio B.S. 34479* (A, K, P).

Remarks: *Ouratea mindanaensis* Merr. was described as rather similar to *Ochna fascicularis* Blanco. It was referred to *Ouratea* Aubl. because of the small numbers of flower parts, but in other characters of flower, inflorescence, and leaf venation it is clearly different from that genus and similar to *Brackenridgea*, especially *B. fascicularis* (Blanco) F.-Vill.

The type collection is remarkable for the strong reductions in calyx, corolla, and androecium. In duplicates from A and K, I found 3 or 4 sepals per flower, which is probably due to connation between 1 or 2 pairs of the original 5. The same might be the case in the corolla, judging from Merrill's description, but all petals were shed on the sheets seen by me. I expect that this is only an occasional deviation of little or no taxonomical importance. The specimen is apparently young, for many of its leaves are distinctly denticulate (see also under *B. palustris*).

Section **B. Brackenridgea**

Brackenridgea A. Gray, *s.s.* — *Campylopora* v. Tiegh.

Cymes much conferted; peduncle and branches much shortened; pedicels ultimately caducous, leaving distinct scars. Flowers of 1 cyme flowering simultaneously. Corolla regularly 5-merous, white. Stamens 10, in 1 whorl. Ovaries 5; style 5-ribbed; stigma small, 5-lobed.

Distribution: 4 species in the Andamans, Ko Chang, Sumatra, the Malay Peninsula, Borneo, Palawan, Celebes, New Guinea, NE. Queensland, Fiji.

2. **Brackenridgea hookeri** (Planch.) A. Gray, New Gen. Pl. (1853) 6, offprint of Proc. Am. Ac. Arts & Sc. 3 (1857) 51; U.S. Expl. Exp. Bot. 1 (1854) 361; Walp., Ann. 4 (1857) 421; Furt., Gard. Bull. Sing. 19 (1962) 182. — *Gomphia hookeri* Planch. in Hook., Lond. J. Bot. 6 (1847) 3; Walp., Ann. 1 (1849) 182; Miq., Fl. Ind. Bat. 1, 2 (1859) 675, *errore* '*G. glaberrima* Planch.'; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 525; King, J. As. Soc. Beng. 62, II (1893) 233, *excl.* var. *corymbosa*; Ridl., Fl. Mal. Pen. 1 (1922) 366; Hundley & U Chit, List Trees & Shrubs ed. 3 (1961) 42. — *Gomphia umbellata* Hook. *f. ex* Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 526, *nom. nud.* — *Ochna hookeri* O. Kuntze, Rev. Gen. Pl. 1 (1891) 106. — *Ouratea hookeri* Burk., Kew Bull. (1935) 318; Dict. Econ. Prod. Mal. Pen. 2 (1935) 1615. — Type: *Phillips s.n.*, *ex* Herb. Hook. (K holo), Malaya, P. of W. Isl. = P. Penang.

B. perakensis v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 396. — Type: *King's coll. 7310* (BO, CAL, E, K, P holo, SING), Malaya, Perak, Larut, 1500—2000 ft., fl. & fr. II-1885.

Gomphia corymbosa (King) Ridl., J. Str. Br. R. As. Soc. 54 (1910) 33, *p.p. excl. typus*; Fl. Mal. Pen. 1 (1922) 367. — *B. denticulata* Furt., Gard. Bull. Sing. 19 (1962) 183. — Type: *Ridley 10738* (BM, K, SING holo), Singapore, Bt. Timah, fl. II-1900.

Tree, up to 33 m high; dbh. up to 1 m. Stipules up to 8 by 1½ mm, laciniate. *Leaves* with 5—12 mm long petiole; lamina oblong to lanceolate, 7½—20 by 2½—6 cm, obtuse to acute, sometimes acuminate at apex, acute, often a little tapering at base, margin entire, ± acicular denticulate in young treelets. *Inflorescences* terminal, made up of many-flowered, shortened, sessile cymes, flowering successively or simultaneously, the rachis often not growing on vegetatively after flowering; bracts small, triangular, entire or pectinate; pedicels 10—15 mm long, up to 20 mm in fruit, those of one cyme fixed close together in *c.* 3 ± distinct tiers. *Torus c.* ½ mm high, 1 mm ∅, in fruit up to 3 mm high, 5 mm ∅. *Sepals* ovate to obovate, 4—5 by 1½—2 mm. *Petals* ovate to obovate, 3½—5 by 1½—1¾ mm. *Stamens* with 1—1½ mm long filaments; anthers 1½—2 by *c.* ½ mm. *Ovaries c.* 0.7 by 0.5 mm; style 1½—3 mm long, in fruit up to 5 mm long. *Fruits* up to 6½ by 5½ mm.

Distribution: Andamans, Ko Chang (NE. Gulf of Siam), the Malay Peninsula, Borneo.

ANDAMANS. Middle Andaman: *Parkinson 53* (DD, K), *1203* (CAL, DD).

THAILAND. Ko Chang: *Schmidt 614* (C, K), *665* (C).

MALAY PENINSULA. Thailand, Surat Circle, Ko Phangan: *Put 769* (K). — Malaya: *Hervey s.n.* (K). — P. Penang: *Phillips s.n.* (K); *Haniff 306* (BO), *2409* (BM, SING); Government Hill: *Curtis 1147* (K, SING), *2154* (SING), = *2154* (BM, E, P, SING). — Perak, Larut: *King's coll. 7310* (BO, CAL, E, K, P, SING). —

Negri Sembilan, G. Tampin: *Burkill 3167* (SING). — Malacca: *Maingay 1369* (K); S. Hudang: *Derry 935* (SING); S. Ujong: *Alvins s.n.* (SING). — Johore, G. Pulai: *Henderson s.n.* (SING); NW. of Mawai: *Corner S.F. 28993* (A, BO, K, SING). — Singapore: *Cantley's coll. s.n.* (SING); Bajau: *Ridley 3987* (SING); Seletar Res.: *Sinclair 6760 = S.F. 39136* (E, L, SING); Bt. Timah: *Hullett 436* (SING), *910* (K, SING); *Ridley s.n.* (BM), *10738* (BM, K, SING); *Kanis B 21* (L); *Sinclair 4354 = S.F. 39573* (E, SING).

BORNEO. Sarawak, 1st Div., Lundu Distr., G. Gading For. Res.: *Paie 13589* (A, K, L, SING); Kuching Distr., Bako Nat. Park, Bt. Gondol: *Shah P 5649* (BO, K, L, SING); Kuala Serait: *Kanis B 16, B 16a* (L); Semengoh For. Res.: *Mead Sar 10* (SING); *Kanis B 10* (L); Sadong Distr., Sabal For. Res.: *Muas 13387* (A, K, L, SING). — W. Borneo, P. Madjang: *Teysmann H.B. 8465 p.p.* (BO). — E. Borneo, Samarinda reg.: *Kostermans s.n.* (K, L).

Vernacular names: Malay Peninsula: *bunga kelat merah, bunga maskam, kayu luru* (Malacca); Borneo: *empodat* (Sarawak).

Ecology: From sea level up to 750 m, reported from kerangas forests on sandy soils, dry hillocks in swampy forests, primary lowland Dipterocarp forests, and hill forests.

Remarks: *Gomphia corymbosa* (King) Ridley (1910) was evidently based on *Gomphia hookeri* var. *corymbosa* King (1893). King did not mention any material and Ridley based his species on *Ridley 10738* and *King's coll. 4673*, indicating the former as the type collection. However, the latter collection is the only one described by King, for all sheets bear the name var. *corymbosa* in the same handwriting, while the Calcutta sheet gives King as the author. Evidently *King's coll. 4673* has to be regarded as the type of both, the variety and the species.

The 2 collections, mentioned by Ridley, are regarded by me as belonging to different species. Since only *Ridley 10738* is referred to *B. hookeri*, *Gomphia corymbosa* Ridl. is no real synonym of this species.

Furtado (1962) came to about the same conclusion, but he again typified his new species *B. denticulata* with *Ridley 10738*. He stated that this species differs very little from *B. hookeri*, except in the finely denticulate margin of its leaves. It was based on five collections from Singapore, one of unknown locality and four from Bt. Timah. In my opinion, *B. denticulata* is conspecific with *B. hookeri*, as I could observe in the field (Sarawak: Semengoh For. Res.; Singapore: Bt. Timah) that leaves of juvenile specimens of the latter species are denticulate as a rule.

3. **Brackenridgea palustris** Bartell., Malpighia 15 (1901) 165, t. 10; Furt., Gard. Bull. Sing. 19 (1962) 183. — Type: *Beccari 3472* (A, FI holo, K, P), W. Borneo, Danao Lamadgian, fr. V-1867.

B. hookeri (Planch.) A. Gray var. *leucocarpa* Scheff., Nat. Tijd. N.I. 32 (1873) 411. — Lectotype: *Teysmann s.n.* (BO holo, L), Banka, Djebus, 'mensulung kaju', fr. — Paratype: *Buddingh s.n.*, Banka (not seen).

Gomphia hookeri Planch. var. *corymbosa* King, J. As. Soc. Beng. 62, II (1893) 233. — *B. corymbosa* v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 395. — *Gomphia corymbosa* Ridl., J. Str. Br. R. As. Soc. 54 (1910) 33, *p.p.*; Fl. Mal. Pen. 1 (1922) 367. — Type: *King's coll. 4673* (BM, BO, CAL holo, K, L, P, SING), Malaya, Perak, Gopeng, 500—1000 ft., fl. & fr. VII-1883.

B. serrulata Bartell., Malpighia 15 (1901) 163, t. 9; Furt., Gard. Bull. Sing. 19 (1962) 184. — Type: *Beccari 3469* (FI holo, K), W. Borneo, Danao Lamadgian, fr. V-1867.

B. kingii v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 395. — Type: *King's coll. 6396* (BM, K, L, P holo), Malaya, Perak, Larut, 100 ft., fr. VI-1884.

B. rubescens v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 396. — Type: *Ridley 2072* (CAL, K, P holo, SING), Singapore, Changi, fl. 1890.

Ochna foxworthyi Elm., Leafl. Philip. Bot. 5 (1913) 1823; Merr., En. Philip. Fl. Pl. 3

(1923) 68. — *B. foxworthyi* Furt., Gard. Bull. Sing. 19 (1962) 184. — Type: *Elmer 13074* (A, BM, BO, CAL, E, K, L, P, PNH holo †?, U), Palawan, Puerto Princesa, Mt. Pulgar, fl. IV-1911.

Tree, up to 30 m high, dbh. up to 1.20 m. Stipules up to 8 by 1½ mm, entire or laciniate. *Leaves* with 3—10 mm long petiole; lamina (ovate-)oblong to (ovate-)lanceolate, 4—12½ by 1½—5 cm, up to 20 cm long in young treelets, mostly acute to acuminate, sometimes obtuse at apex, rounded to acute, often a little tapering at base, margin entire, ± acicular denticulate in young treelets. *Inflorescences* terminal, made up of 3(—5)-flowered, shortened cymes, sessile, or with up to ½ cm long peduncle, flowering simultaneously, sometimes 2 inflorescences of different stages in close succession, the 5—10(—25) mm long rachis growing on vegetatively, sometimes branching in the lower parts; bracts broadly linguiform, up to 3½ by 2½ mm, ± laciniate; pedicels 8—15 mm long, up to 20 mm in fruit, those of one cyme fixed close together in one tier. *Torus c.* ½ mm high, 1 mm ∅, in fruit up to 4 mm high, 6 mm ∅. *Sepals* ovate to oblong, 3½—6 by 1½—3 mm. *Petals* ovate to obovate-lanceolate, 3½—7 by 1½—3 mm. *Stamens* with (½—)1—2(—2½) mm long filaments; anthers 1½—3 by *c.* ½ mm. *Ovaries c.* 0.7 by 0.5 mm; style (1—)2½—4 mm long, a little growing in fruit. *Fruits* up to 8 by 6 mm.

Distribution: 3 subspecies in Sumatra, the Malay Peninsula, Borneo, Palawan, Celebes.

Remarks: Up till now generally not recognized as different from *B. hookeri* in Sumatra and Borneo.

B. serrulata Bartell. was published together with *B. palustris* Bartell. Studies of the type material and other collections in the herbarium and also observations in the field in Sarawak have convinced me that material under the former name only represents a juvenile form of the latter. Young trees still bearing larger and relatively long, denticulate leaves, are often found to be fertile already. I have chosen the name *B. palustris*, since denticulate leaves also occur in other species.

KEY TO THE SUBSPECIES

1. Anthers 1½—2 mm long. Style 2½—4 mm long during anthesis . . . . a. ssp. **palustris**
1. Anthers 2—3 mm long. Style 1½—2½ mm long during anthesis.
   2. Filaments *c.* 2 mm long during anthesis. Ovaries *c.* 0.7 by 0.5 mm . . . . . b. ssp. **foxworthyi**
   2. Filaments *c.* ½ mm long during anthesis. Ovaries *c.* 0.5 by 0.3 mm . . . . . c. ssp. **kjellbergii**

a. ssp. **palustris.** — *B. hookeri* var. *leucocarpa* Scheff. — *Gomphia hookeri* var. *corymbosa* King. — *B. palustris* Bartell. — *B. serrulata* Bartell. — *B. kingii* v. Tiegh. — *B. rubescens* v. Tiegh.

Cymes 3-flowered, sessile, up to 5-flowered and with up to ½ cm long peduncle in young treelets. Sepals 3½—5½ by 1½—3 mm. Petals 3½—6 by 1½—3 mm. Stamens with 1—2 mm long filaments; anthers 1½—3 mm long. Ovaries *c.* 0.7 by 0.5 mm; style 2½—4 mm long during anthesis. Fruits up to 8 by 6 mm.

Distribution: Sumatra, the Malay Peninsula, Borneo.

SUMATRA. N. Sumatra, S. Bila near Labuanbilik: *Lörzing 14290* (L); Kota Pinang Distr., S. Kanan, Langga Pajung: *Rahmat si Toroes 3293* (A, K, L), *3432* (A, L), *3491* (A), *3616* (A, L); Sibungan: *Rahmat si Toroes 3752* (A, K, L), *3799* (A, L); Si Mandi Angin: *Rahmat si Toroes 4162* (A), *4187* (A, K, L). — W. Sumatra, Tiku near Pariaman: *Meijer & Vermeulen 5498* (L). — Riau, B. Sosa near Dalu[a]: *v. d. Voort 27* (BO); Tamansari: *Beguin 287* (BO); P. Bengkalis: *Bruinier 64* = *NIFS bb 724* (BO, L); P. Tebing Tinggi: *Bruinier 81* = *NIFS bb 741* (BO); S. of Selat Pandjang: *Beguin 526* (BO, L); P. Rangsang, Panglang 222: *Beguin 514* (BO, L, U); Kuantan Distr., Djake: *NIFS bb 26482* (A, BO, L). — S. Sumatra, S. Sekanak near Palembang: *de Voogd 348* = *NIFS bb 13603* (BO). — Mentawai, P. Siberut: *Iboet 214* (BO, K, L, SING, U); *Kloss 14530* (BM, BO, K, SING). — Banka: *Teysmann H. B. 3284* (BO, L); Djebus: *Teysmann s.n.* (BO, L); Rindik: *NIFS bb 11823* (BO). — Belitung, Tg. Pandan: *NIFS bb 14739* (BO).

MALAY PENINSULA. Thailand, Surat Circle, Tako-Langsuan: *Put 1738* (K). — Kedah, G. Jerai: *Robinson & Kloss 5989* (K, SING), *Mustafa 20734* (SING), *Kochummen K.F.N. 99967* (K), *Cheang & Chang C 656* (SING), *C 663* (K, L, SING). — Perak, Larut: *King's coll. 6396* (BM, K, L, P); Kinta, Gopeng: *King's coll. 4673* (BM, BO, CAL, K, L, P, SING). — Selangor, Klang, Telok F. R.: *Kochummen K.F.N. 98563* (K). — Malacca: *Maingay K.D. 246* (A, BM, K, L); *Alvins 876* (SING). — Pahang, Kuantan Res., Baloh: *Yeop 835* (K, SING); Praman, Pekan: *Ridley 1192* (A, BM, CAL, L, SING). — Johore, Labis: *Gopaladen 16* (SING). — Singapore, Tg. Gul: *Goodenough 1957* (SING); Choa Chu Kang: *Ridley 5896* (BM, SING); Tampinis R.: *Ridley s.n.* (SING); Tampinis Road: *Ridley 4807* (BM, K, SING); Changi: *Ridley 2072* (CAL, K, P, SING).

BORNEO. Sarawak, 1st Div., Lundu Distr., S. Senibung: *Anderson 9148* (BO, L, SING); Kuching Distr.: *Haviland 2224* (BM, K, SING), *2704* (K); S. Lemidin: *Bujang 13137* (K, L); near Bt. Matang: *Haviland 1021* (BM, K, L, SING); *Brooke 9715* (BM, L, SING); Bako Nat. Park: *Brunig S 7711* (K, L, SING), *S 12052* (K, L); Telok Asam: *Purseglove P 4919* (K, L, SING); Lintang path: *Paie S 17904* (K, L); 2nd Div., Betong Distr., Saribas For. Res.: *Anderson 8516* (BO, L); 3rd Div., Bintulu Distr., Merurong Plateau: *Brunig S 8704* (K); 4th Div., Bg. Baram: *Anderson S 3054* (SING). — Brunei, Bt. Pasir Puteh: *Ashton Brun 5036* (K, L, SING). — Sabah, Interior Res., Sipitang Dist., Marintaman For. Res.: *Nicholson San 27988* (K, L); Sandakan Res., Leila For. Res.: *Fabia & Patrick San 22187* (L). — West Borneo, Sambas reg., Paloh: *NIFS bb 15328* (BO, L); S. Kenepai: *Hallier B 2209* (BO, K, L, P); Danau Lamadjang: *Beccari P.B. 3469* (FI, K), P.B. *3472* (A, FI, K); P. Madjang: *Teysmann H.B. 8465 p.p., 8466, 8495* (BO, L); S. Semitau: *Hallier B 1295* (A, BO, K, L). — East Borneo, Lao Djanan reg.: *Kostermans 9943* (BO, K, L); Sanga[2] reg.: *Kostermans 7780* (BO, K, L).

Vernacular names: Sumatra: *majang*[2], *mampat, rampat dahan, sĕniang* (Malay); *kaju barat laut, k. galugus badak, k. lude, k. saholat, k.topa*[2] (Kota Pinang Distr.); *madu luai, mĕnsulung kaju* (Banka); *mensolongang* (Belitung); Malay Peninsula: *lidah mura* (Pahang); *pĕndorah, thĕharahan* (Malacca); Borneo: *mata undang* (Sambas), *sĕmukau, timur bĕsih* (P. Madjang).

Ecology: Normally found in the lowlands, but occasionally up to 1000 m, reported from peat-swamp forests and from kerangas forests on sandy, sometimes rather rocky soils, with humic podsols.

Use: The wood is reported twice as being used in housebuilding (Malacca, Sarawak).

b. ssp. **foxworthyi** (Elm.) Kanis, *stat. nov.* — *Ochna foxworthyi* Elm.

Cymes 3-flowered, sessile. Sepals 5—6½ by 2—3 mm. Petals 5—7 by 1½—2 mm. Stamens with 1¾—2¼ mm long filaments; anthers 2—3 mm long. Ovaries *c.* 0.7 by 0.5 mm, style 1½—2½ mm long during anthesis. Fruits up to 5 by 4 mm.

Distribution: Palawan.

PHILIPPINES. Palawan: *Foxworthy B.S. 903* (A, BO, K); Panacan, Victoria Mts., Karaniogan R.: *Sulit P.N.H. 12425* (A, BO, L, SING); Puerto Princesa, Mt. Pulgar: *Elmer 13074* (A, BM, BO, CAL, E, K, L, P, U); Bacungan: *Edano P.N.H. 177* (A, BO, L, SING).

Ecology: Reported from sea level, along river in forest, and from 150 m altitude on rocky hillside near riverbank.

c. ssp. **kjellbergii** Kanis, *ssp. nov.*

Type: *Kjellberg 2888* (BO, L holo, S), Celebes, Matana Lake, 400 m, fl. 18-XI-1929.

Flos sepalis 4—5½ mm longis 1½—2 mm latis; petalis 4—4½ mm longis 1¾—2¼ mm latis; filamentis ¼—¾ mm longis; antheris 2½—3 mm longis; ovariis c. ½ mm longis ⅓ mm latis; stylis 1—2 mm longis. Fructus ad 5 mm longus 4 mm latus.

Cymes 3-flowered, sessile. Sepals 4—5½ by 1½—2 mm. Petals 4—4½ by 1¾—2¼ mm. Stamens with ¼—¾ mm long filaments; anthers 2½—3 mm long. Ovaries *c.* 0.5 by 0.3 mm; style 1—2 mm long during anthesis. Fruits up to 5 by 4 mm.

Distribution: Celebes.

CELEBES. Malili reg., Lampea: *Kjellberg 2046* (BO, L, S); Matana Lake: *Kjellberg 2808* (BO, L, S).

Ecology: Reported from sea level in swamp and from 400 m altitude at the edge of a lake.

4. **Brackenridgea forbesii** v. Tiegh. in Morot, J. Bot. 16 (1902) 46, *nom. nud.*; Ann. Sc. Nat. Bot. VIII, 16 (1902) 395, *descr.*; Pulle, Nova Guinea 8 (1912) 667; Rendle, J. Bot. (1923) Suppl. 7. — Type: *Forbes 237* (BM, FI, K, L, P holo), New Guinea, Sogeri reg., fl. 1885—6.

Tree, up to 30 m high; dbh. up to 55 cm. Stipules up to 6 by $\frac{3}{4}$ mm, laciniate. *Leaves* with 3—5 mm long petiole; lamina oblong to lanceolate, 5—15 by $1\frac{1}{2}$—5 cm, acute to acuminate at apex, acute or a little tapering at base, margin entire. *Inflorescences* terminal and axillary, made up of a varying number of mostly 3- to 5-flowered, shortened, sessile cymes, flowering simultaneously, the 2—5(—10) mm long rachis mostly growing on vegetatively when terminal, sometimes when axillary; bracts broadly linguiform, up to 2 by 2 mm, more or less laciniate; pedicels *c.* $\frac{1}{2}$ cm long, up to 1 cm in fruit, those of one cyme fixed close to each other in one tier. *Torus c.* $\frac{1}{3}$ mm high, $\frac{1}{2}$—$\frac{3}{4}$ mm ∅, in fruit up to $2\frac{1}{2}$ mm high, 4 mm ∅. *Sepals* ovate to elliptic, 3—$4\frac{1}{2}$ by $1\frac{1}{4}$—$1\frac{3}{4}$ mm. *Petals* obovate-lanceolate, 3—$4\frac{1}{2}$ by 1—$1\frac{1}{4}$ mm, acute at apex. *Stamens* with *c.* $1\frac{1}{2}$ mm long filaments; anthers *c.* $1\frac{1}{2}$ by $\frac{1}{3}$ mm. *Ovaries c.* 0.6 by 0.5 mm; style $1\frac{1}{2}$—2 mm long, in fruit up to 3 mm. *Fruits* up to 6 by 5 mm.

Distribution: New Guinea.

NEW GUINEA. W. New Guinea, Vogelkop Peninsula, Warsamson Plain, E. of Sorong: *Schram BW 12262*, *Moll BW 12761* (L), *BW 12793* (L); Boden R., SE. of Sarmi: *Koster BW 8085* (L); Kota Baru (Hollandia): *NIFS bb 25646* (A, BO, K, SING); *Versteegh BW 4816* (K, L, SING); S. of Bivak Hollandia: *Gjellerup 319* (BO, K, L, U); Merauke Distr., Bot. R., between Bupul and Lake Wam: *van Royen 4730* (BO, K, L, SING). — E. New Guinea, Western Distr., Middle Fly R., Lake Daviumbu: *Brass 7910* (A, BO, L); Port Moresby Distr., Laloki R.: *NGF 4515* (BO, K, L, SING); Central Distr., Sogeri reg.: *Forbes 208* (BM), *228* (BM, K, L), *237* (BM, FI, K, L, P), *371* (BM, E, K, L); Kokoda trail, Ower's Corner: *Hartley TGH 10768* (L); N. of Sogeri: *Schodde 3037* (K, L).

Vernacular names: W. New Guinea: *jobias* (Je); *obaisang* (Mooi); *serukdeho* (Manikiong).

Ecology: Reported from primary rainforest on flat country to steep slopes, up to 750 m altitude, on clay, sand, or peat, on sites which may be inundated during the wettest season.

5. **Brackenridgea nitida** A. Gray, New Gen. Pl. (1853) 6, offprint of Proc. Am. Ac. Arts & Sc. 3 (1857) 51; U.S. Expl. Exp. Bot. 1 (1854) 362, t. 42; Walp., Ann. 4 (1857) 421; Seem., Fl. Vit. (1865) 34; Schnizl., Iconogr. 4 (1870) t. 248, f. 2—7, 10—14, *errore B. linearis*; A. C. Smith, J. Arn. Arb. 36 (1955) 284. — Type: *U.S. Expl. Exp. s.n.* (A holo, K, P), Fiji Islands, Vanua Levu, Sandalwood Bay, fl. & fr. 1838—42.

B. australiana F. v. M., Fragm. 5 (1865) 29; Bailey, Queensl. Fl. 1 (1899) 222; Compr. Cat. Queensl. Pl. (1913) 85, f. 70. — *Gomphia australiana* F. v. M., Fragm. 5 (1865) 29. — *Campylopora australiana* v. Tiegh., Bull. Mus. Hist. Nat. Paris 8 (1902) 547; Ann. Sc. Nat. Bot. VIII, 16 (1902) 404. — Type: *von Mueller s.n.* (A, K, MEL holo?), Queensland, Rockingham Bay, fl. 1865.

Tree, up to 20 m high. Stipules up to 8 by 1 mm. *Leaves* with 3—8 mm long petiole; lamina (ovate-)oblong to (ovate-)lanceolate, 5—18 by 2—$7\frac{1}{2}$ cm, acute to acuminate at apex, acute or a little tapering at base, margin entire. *Inflorescences* terminal and axillary, made up of a few 3- to many-flowered cymes, sessile or shortly peduncled, flowering simultaneous, the 3—10 mm long rachis mostly growing on vegetatively when terminal, sometimes when axillary; bracts triangular to linguiform, up to 2½ by 1½ mm; pedicels *c.* 1 cm long, up to 2 cm in fruit. *Torus c.* ½ mm high, 1 mm ∅, in fruit up to 3 mm high, 6 mm ∅. *Sepals* ovate to obovate, 4—6 by 2—4 mm. *Petals* obovate, 3½—5 by 2—3 mm. *Stamens* with *c.* ½ mm long filaments; anthers 2—3 by ½—¾ mm. *Ovaries c.* 0.8 by 0.6 mm; style 1½—3 mm long, in fruit up to 5 mm long. *Fruits* up to 6 by 5 mm.

Distribution: 2 subspecies in NE. Queensland and the Fiji Is.

Remark: For a discussion on the date of publication see under the generic description.

KEY TO THE SUBSPECIES

1. Anthers *c.* 3 by ¾ mm; sepals 5—6 mm long; petals 4½—5 mm long . . . . **a.** ssp. **australiana**
1. Anthers *c.* 2 by ½ mm; sepals 4—5 mm long; petals 3½—4½ mm long . . . . . . **b.** ssp. **nitida**

a. ssp. **australiana** (F. v. M.) Kanis, *stat. nov.* — *B. australiana* F. v. M.

Cymes sessile or shortly peduncled, with up to 3 mm long branches, 3- to many-flowered. Sepals mostly ovate, 5—6 by 3—4 mm. Petals 4½—5 by 2½—3 mm. Anthers *c.* 3 by ¾ mm. Style 2½—3½ mm long during anthesis.

Distribution: NE. Queensland.

QUEENSLAND. Thornton Peak: *Brass 2313* (A); Atherton Tableland, Boonjie: *Kajewski 1273* (A, BM, K, L, P); Bellenden Ker: *Gibbs 6322* (BM, K); Rockingham Bay: *von Mueller s.n.* (A, K); Mt. Spec: *White 8992* (A, P).

Ecology: Reported from 300, 600, and 700 m altitude, in (light) rainforest.

b. ssp. **nitida.** — *B. nitida* A. Gray.

Cymes sessile, with shortened branches, 5- to many-flowered. Sepals mostly obovate, 4—5 by 2—2¾ mm. Petals 3½—4½ by 1¾—2¼ mm. Anthers *c.* 2 by ½ mm. Style 1½—2½ mm long during anthesis.

Distribution: Fiji Islands.

FIJI. *Horne 596* (A, K, P). — Viti Levu, S. Nausori Highlands, Nandronga and Navosa: *Greenwood 483C* (A, K, L), *A. C. Smith 4608* (A, K, L, S); Wai-wai: *Horne 897* (A, K); Rakiraki: *Degener & Ordoñez 13695* (A, K); Penang: *Greenwood 483B* (K). — Vanua Levu: *Parham 1* (BM); Mbua Distr., Sandalwood Bay: *U.S. Expl. Exp. s.n.* (A, K, P); Na Sau: *Parham 35* (K); lower Wainunu R.: *A. C. Smith 1834* (A, BO, K, P, S); Macuata Distr., Korovuli R.: *Parham 13429* (K); Natua: *A. C. Smith 6647* (A, K, L, S), *Dept. Agr. 12860* (K); Macuata Coast: *Seemann 93* (A, BM, K, P); Nanduri: *Tothill 446* (A, BO, K), *446A* (K); Lambasa: *Greenwood 483, 483A* (K); Naketei: *Bola 92* (K); S. slope Mt. Numbuiloa: *A. C. Smith 6331* (A, K, L, S); Thakaundrove Distr., E. Yanawai R. drainage: *Degener & Ordoñez 14113* (A, K); Natewan Peninsula, W. of Mbutha Bay: *A. C. Smith 813* (A, BO, K, S);? Seagaga: *Watkins 787* (K); Rambi I.: *Horne 513* (K).

Vernacular name: *mbelembele* (Vanua Levu).

Ecology: From sea level up to 500 m, in dense and open forest, in patches of forest in open rolling country, in dry open hillside thickets, and in scrub vegetation.

DOUBTFUL SPECIES

6. Brackenridgea elegantissima (Wall.) Kanis, *comb. nov.* — *Euthemis? elegantissima* Wall. in Roxb., Fl. Ind. 2 (1824) 305; in Hook., Bot. Misc. 2 (1831) 77, note; Planch. in Hook., Lond. J. Bot. 5 (1846) 647; ibid. 6 (1847) 2, *err. in syn.* of *Gomphia sumatrana* Jack; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 526, *err. in syn. idem*; King, J. As. Soc.

Beng. 52, II (1893) 235; Bartell., Malpighia 15 (1901) 160, *err. in syn. idem*; Ridl., Fl. Mal. Pen. 1 (1922) 368. — *Euthemis? pulcherrima* Wall. *ex* Benn. in Hook. *f.*, l.c., *err. in syn.* of *Gomphia sumatrana* Jack; King, l.c. 233, *err. in syn. idem*; Bartell., l.c., *err. in syn. idem.* — Type: *Wallich 2518* (K holo), Singapore, ster. IX-1822.

Remarks: The collection *2518* was listed in Wallich's Catalogue under the name '*Euthemis? pulcherrima* Wall.' He also added '*Gomphia sp.?*', expressing some doubt as to what genus this species really belongs. Under *no. 2803* he listed '*Gomphia sumatrensis* Jack', adding the remark '*ad Euthemis elegantissima No. 2518 huc referenda?*' From this I conclude that *Euthemis elegantissima* is an alternative manuscript name for the collection named *Euthemis pulcherrima*. The former name was validly published in Wallich's edition of Roxburgh's Flora Indica. A similar collection under the same name is found in P: *Pierre 5877*, 'Insula Singapore, ad chasserianum monticolum', XI-1877

In the views of most authors this species is conspecific with *Gomphia sumatrana* Jack, but King thought it to be distinct. In my opinion it is certainly a *Brackenridgea sp.* as concluded from both Wallich's description and type specimen. Its specific identity, however, is rather uncertain, as the material is sterile and with large, serrulate leaves obviously taken from a juvenile plant. It resembles very much the collection *B 21* made by me in Singapore of a seedling that I refer to *B. hookeri* (Planch.) A. Gray. On the other hand I can not exclude the possibility that Wallich's species belongs to *B. palustris* Bartell., both species occurring in Singapore I.

The combination *B. elegantissima* (Wall.) Kanis has been made, because it has priority over all other specific names in the genus.

3. GOMPHIA

Schreb., Gen. Pl. ed. 8, 1 (1789) 291, *p.p.*; Willd., Sp. Pl. ed. 4, 2 (1799) 569; DC., Ann. Mus. Paris 17 (1811) 414; Prod. 1 (1824) 736; Endl., Gen. Pl. (1840) 1142; Miq., Fl. Ind. Bat. 1, 2 (1859) 675; B. & H., Gen. Pl. 1 (1862) 318; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 525; Kurz, For. Fl. Br. Burma (1877) 206; Boerl., Handl. Fl. N.I. 1 (1890) 174; Trim., Handb. Fl. Ceyl. 1 (1893) 234; King, J. As. Soc. Beng. 62, II (1893) 232; Ridl., Fl. Mal. Pen. 1 (1922) 365; Kanis, Taxon 16 (1967) 420, 422. — *Gomphia* sect. *Gomphiastrum* Planch. in Hook., Lond. J. Bot. 6 (1847) 2. — *Ouratea* '*Gruppe Reticulatae*' Engl., Bot. Jahrb. 17 (1893) 80. — *Ouratea* sect. *Palaeouratea* subsect. *Reticulatae* Gilg in E. & P., Nat. Pfl. Fam. 3, 6 (1895) 142. — *Campylospermum* v. Tiegh. in Morot, J. Bot. 16 (1902) 40, 194, *s.l.*, *nom. illeg.*; ibid. 197, *s.s.*; Ann. Sc. Nat. Bot. VIII, 16 (1902) 193, 296; ibid. 18 (1903) 28. — *Ouratea* subg. *Palaeouratea* sect. *Reticulatae* Gilg, Bot. Jahrb. 33 (1903) 250; in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 73. — Type species: *Gomphia zeylanica* (Lamk.) DC. = *Gomphia serrata* (Gaertn.) Kanis.

Ochna Linné, Sp. Pl. 1 (1753) 513; Gen. Pl. ed. 5 (1754) 229, *p.p.*, *excl. typus*; Lamk., Enc. Méth. 4 (1797) 509. — *Jabotapita* Plum. *ex* Adans., Fam. Pl. 2 (1763) 364, *p.p.*, *excl. syn. Ochna L.*, *nom. illeg.*

Ouratea [*non* Aubl., Hist. Pl. Gui. Fr. 1 (1775) 397] Baill., Hist. Pl. 4 (1873) 367, *emend.*, *p.p.*; Bartell., Malpighia 15 (1901) 155; Lecomte, Fl. Gén. Indo-Ch. 1 (1911) 703; Alst. in Trim., Handb. Fl. Ceyl. 6 (1931) 42; Back. & Bakh. *f.*, Fl. Java 1 (1963) 327.

Meesia Gaertn., Fruct. & Sem. Pl. 1 (1788) 344, *nom. rej.*; *non* Hedw., Sp. Musc. (1801) 173, *nom. cons.*, cf. Kanis, Taxon 16 (1967) 419. — *Walkera* Schreb., Gen. Pl. ed. 8, 1 (1789) 150, *nom. illeg.*, cf. Kanis, Taxon 16 (1967) 419; Willd., Sp. Pl. ed. 4, 1 (1797) 1145; DC., Ann. Mus. Paris 17 (1811) 421; Prod. 1 (1824) 737; W. & A., Prod. Fl. Pen. Ind. Or. 1 (1834) 153; Endl., Gen. Pl. (1840) 1142; Planch. in Hook., Lond. J. Bot. 5 (1846)

593; *non Walkera* Mill. *ex* Ehret, Phil. Trans. 53 (1763) 131. — Type species: *Meesia serrata* Gaertn. = *Gomphia serrata* (Gaertn.) Kanis.

Cercinia v. Tiegh. in Morot, J. Bot. 16 (1902) 198; Bull. Mus. Hist. Nat. Paris 8 (1902) 376; Ann. Sc. Nat. Bot. VIII, 16 (1902) 194, 309; ibid. 18 (1903) 31; ibid. IX, 5 (1907) 162. — Type species: *Cercinia thorelii* v. Tiegh. = *Gomphia serrata* (Gaertn.) Kanis.

Campylocercum v. Tiegh., Bull. Mus. Hist. Nat. Paris 8 (1902) 546; Ann. Sc. Nat. Bot. VIII, 16 (1902) 194, 304; ibid. 18 (1903) 28. — Type species: *Campylocercum striatum* v. Tiegh. = *Gomphia serrata* (Gaertn.) Kanis.

Shrubs or treelets with spreading branches. *Stipules* small, intrapetiolarly united, caducuous. *Leaves* chartaceous, nerves close, parallel, almost straight, curving upward near the margin, forming an inconspicuous marginal nerve and a conspicuous, somewhat wavy nerve parallel to the margin at some distance, veinlets reticulate, joining in irregular secondary nerves parallel to the primary ones. *Inflorescences* lateral and/or terminal thyrses, with ± reduced branches; peduncle ± persistent with sometimes a few bracts at base, not leaving a distinct annulus of scars; pedicels filiform, articulate at base. *Flowers* with a short, columnar, 5-ribbed gynophore, enlarging and sometimes turning subglobular in fruit. *Sepals* 5, tinged pinkish, enlarging in fruit. *Petals* 5, yellow, creamy, or white. *Stamens* 10 in 1 whorl; filaments terete, very short; anthers opening with 2 apical pores. *Ovaries* 5, obovoid; ovule camptotropous, epitropous; stigma punctiform. *Fruits* 1—2(—5) yellowish, turning dark purple or blue-black when ripe.

Distribution: One species in SW. Peninsular India, Ceylon, E. Thailand, Indo-China, Hainan, Sumatra, the Malay Peninsula, Borneo, the Philippines, and Celebes; 30—35 species in Africa S. of the Sahara and Madagascar.

Ecology: Confined to tropical areas with an everwet climate or a moderately dry monsoon, up to 1500 m. altitude. Dispersal possibly by birds, but the fruits are not as conspicuous as in *Ochna* and *Brackenridgea*, since calyx and torus are not coloured.

Remarks: The name *Gomphia* Schreb. (1789) has been commonly in use for a long time. Only gradually it was replaced by *Ouratea* Aublet (1775), with which it was generally considered to be synonymous. Most authors did not accept the ideas of Van Tieghem, who has split *Ouratea s.l.* into 34 poorly defined genera, published in several papers between 1901 and 1907. However, a distinction at sectional or subgeneric level was often made between the species from the Old and New Worlds respectively (Planchon, 1847; Gilg, 1895, 1925). Furthermore, the African species were often divided into two or three sections or subsections (Engler, 1893; Gilg, 1895, 1925).

In recent years there is a tendency to reconsider Van Tieghem's criteria and to propose a more moderate division into distinct genera. Farron (Bull. Soc. Bot. Suisse 73, 1963, 196—217) recognized 3 different genera in Africa, *Campylospermum* v. Tiegh., *Rhabdophyllum* v. Tiegh., and *Idertia* Farr., correctly reserving the name *Ouratea* Aubl. for the American species. He used partly new characters, derived from embryology, leaf anatomy, and blastogeny, which are quite convincing to me. Recently (1967) I have proposed to resurrect the name *Gomphia* Schreb. for the majority of the Old World species, including those of Asia. Schreber has described his genus as a segregate from *Ochna* L., but a type species was never indicated. I have chosen as lectotype *Gomphia zeylanica* (Lamk.) DC., which is a segregate of *Ochna jabotapita* L., the type species of *Ochna* L.

Gomphia differs according to Gilg (1925) from the American *Ouratea* by a curved ovule and seed and mostly ± intra-axillary, connate, incised stipules, rarely lateral, free, subulate ones. Moreover, the sepals in *Gomphia* are persistent.

In *Ouratea s.s.* the ovule and seed are straight, the stipules never connate, mostly small, caducous, and scale-like, rarely persistent and subulate. Sepals are caducous.

Campylospermum v. Tieghem (1902) has never been typified. Since it includes the type species of *Gomphia* Schreb. (1789), it automatically becomes a superfluous synonym of the latter generic name.

Meesia Gaertn. (1788) was wrongly defined as having 5 stamens per flower. The holotype specimen of its only species has been found to contain 10 stamens per flower. *Meesia* Gaertn. is certainly an older synonym of *Gomphia* Schreb., but it can not be used since it has been rejected.

Walkera Schreb. (1789) was introduced as a new name for *Meesia* Gaertn. (1788) which was considered a later homonym of *Meesia* Hedw. In later years, 1801 was appointed as the starting point for Musci, making *Meesia* Gaertn. a legitimate name whereas *Walkera* Schreb. became superfluous and hence illegitimate. This status was not changed by the later rejection of *Meesia* Gaertn. Furthermore, *Walkera* Schreb. should be considered a later homonym of *Walkeria* Mill. *ex* Ehret (1763) under Art. 75 of the present Code.

1. Gomphia serrata (Gaertn.) Kanis, Taxon 16 (1967) 422. — *Meesia serrata* Gaertn., Fruct. & Sem. Pl. 1 (1788) 344, t. 70, f. 6. — *Walkera serrata* Willd., Spec. Pl. ed. 4, 1 (1797) 1145; DC., Ann. Mus. Paris 17 (1811) 421; Prod. 1 (1824) 737; Moon, Cat. Ceyl. Pl. (1824) 17, *err.* '*Walkeria*'; W. & A., Prod. Fl. Pen. Ind. Or. 1 (1834) 153; Planch. in Hook., Lond. J. Bot. 5 (1846) 593. — *Ouratea serrata* Robs., Taxon 11 (1962) 50—51. — Type: *Koenig ex Coll. Sem. Hort. L.-B.* (L holo) Ceylon, 'Walkaera', fl. & fr.

Gomphia angustifolia Vahl, Symb. Bot. 2 (1791) 49; Willd., Spec. Pl. ed. 8, 2 (1799) 569; DC., Ann. Mus. Paris 17 (1811) 417; Prod. 1 (1824) 736; Spreng., Syst. Veg. 2 (1825) 318; W. & A., Prod. Fl. Pen. Ind. Or. 1 (1834) 152; Grah., Cat. Pl. Bomb. (1839) 38; Walp., Repert. 1 (1842) 526; Planch. in Hook., Lond. J. Bot. 6 (1847) 3; Walp., Ann. 1 (1849) 182; Thw., En. Ceyl. Pl. 1 (1858) 71; Drury, Handb. Ind. Fl. 1 (1864) 221; Bedd., Fl. Sylv. 3 (1869) 51, t. 8, f. 4; Scheff., Nat. Tijdschr. N.I. 32 (1873) 411; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 525; F.-Vill., Fl. Filip. Nov. App. (1880) 39; Vidal, Syn. Fam. & Gen. Pl. Filip. (1883) 19; Rev. Pl. Vasc. Filip. (1886) 79; Watt, Dict. Econ. Prod. Ind. 3 (1890) 533; Trim., Handb. Fl. Ceyl. 1 (1893) 235; Vid. & Sol., Phan. Cum. Philipp. (1895) 101; Cooke, Fl. Pres. Bomb. 1 (1902) 197; Brand., Ind. Trees (1906) 129; Talb., For. Fl. Bomb. & Sind 1 (1909) 214; Back., Schoolfl. Java (1911) 194. — *Ouratea angustifolia* Baill. *ex* Laness., Pl. Util. Col. Fr. (1886) 607; Gilg in E. & P., Nat. Pfl. Fam. 3, 6 (1895) 142; Koord., Exk. Fl. Java 2 (1912) 107; Gamb., Fl. Madr. 1 (1915) 167; Hall. *f.*, Beih. Bot. Centralbl. 34, 2 (1916) 34; Merr., J. Str. Br. R. As. Soc. 86 (1921) 387; En. Philipp. Fl. Pl. 3 (1923) 68; Ridl., Kew Bull. (1930) 76; Kirt. & Basu, Ind. Med. Pl. ed. 2, 1 (1933) 516; *non* Gilg, Bot. Jahrb. 33 (1903) 269, *nom. homon. illeg.* — *Ochna angustifolia* O. Kuntze, Rev. Gen. Pl. 1 (1891) 106. — *Campylospermum angustifolium* v. Tiegh. in Morot, J. Bot. 16 (1902) 197; Ann. Sc. Nat. Bot. VIII, 16 (1902) 298; Bull. Mus. Hist. Nat. Paris 9 (1903) 74; Ann. Sc. Nat. Bot. VIII, 18 (1903) 14. — Type: *Koenig in Hb. Vahl* (C holo, P) Ind. Or., Ceylon, fl.

Ochna zeylanica Lamk., Enc. Méth. 4 (1797) 512. — *Gomphia zeylanica* DC., Ann. Mus. Paris 17 (1811) 415; Prod. 1 (1824) 736; Spreng., Syst. Veg. 2 (1825) 318, *err.* '*ceylanica*'; W. & A., Prod. Fl. Pen. Ind. Or. 1 (1834) 153. — *Campylospermum zeylanicum* v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 77; Ann. Sc. Nat. Bot. VIII, 18 (1903) 19. — *Ouratea zeylanica* Alst., Ann. R. Bot. Gard. Perad. 11 (1929) 209; in Trim., Handb. Fl. Ceyl. 6 (1931) 42; Airy Shaw, Kew Bull. (1940) 249. — Type: *Burman* (Inst. de France holo?) cf. Thes. Zeyl. (1737) 123, t. 56.

Gomphia malabarica DC., Ann. Mus. Paris 17 (1811) 416; Prod. 1 (1824) 736; Spreng., Syst. Veg. 2 (1825) 318. — *Campylospermum malabaricum* v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 77; Ann. Sc. Nat. Bot. VIII, 18 (1903) 19. — Type: prob. not preserved, cf. Rheede, Hort. Malab. 5 (1685) t. 52, '*poeatsjetti*'.

Gomphia sumatrana Jack, Mal. Misc. I, 5 (1821) 29; Hook., Bot. Misc. 2 (1830) 77; Walp., Repert. 1 (1842) 526; Planch. in Hook., Ic. Pl. II, 4 (1845) t. 712; Walp., Repert. 5 (1846) 399; Planch. in Hook., Lond. J. Bot. 6 (1847) 2; Walp., Ann. 1 (1849) 181; Miq., Fl. Ind. Bat. 1, 2 (1859) 675; ibid., Suppl. 1 (1860) 209, 534; Scheff., Nat. Tijdschr. N.I. 32 (1873) 411; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 525, *err.* '*sumatrensis*'; Kurz, J. As. Soc. Beng. 44, II (1875) 141; Prel. Rep. For. & Veg. Pegu (1875) App. A, 30, App. B, 35; For. Fl. Br. Burma 1 (1877) 206; King, J. As. Soc. Beng. 62, II (1893) 232; Ridl., Trans. Linn. Soc. Bot. 3 (1893) 285; Brand., Ind. Trees (1906) 129; Ridl., Fl. Mal. Pen. 1 (1922) 365; Rendle, J. Bot. (1924) Suppl. 16; Ridl., Kew Bull. (1925) 79; Fl. Mal. Pen. 5 (1925) 296; Merr., J. Arn. Arb. 33 (1952) 226; Hundl. & Chit, List Trees *&c.* ed. 3 (1961) 42. — *Ochna sumatrana* O. Kuntze, Rev. Gen. Pl. 1 (1891) 106. — *Ouratea sumatrana* Gilg. in E. & P., Nat. Pfl. Fam. 3, 6 (1895) 142; Bartell., Malpighia 15 (1901) 160; Hall. *f.*, Beih. Bot. Centralbl. 34, 2 (1916) 35; Merr., J. Str. Br. R. As. Soc. 86 (1921) 387; Ridl., Kew Bull. (1930) 76. — *Campylospermum sumatranum* v. Tiegh. in Morot, J. Bot. 16 (1902) 197; Ann. Sc. Nat. Bot. VIII, 16 (1902) 298; ibid. 18 (1903) 21. — Type: *Jack*, Sumatra, Sibooru †.

Ouratea borneensis Bartell., Malpighia 15 (1901) 156, t. 6; Merr., J. Str. Br. R. As. Soc. 86 (1921) 387; Ridl., Kew Bull. (1930) 76. — *Campylospermum borneense* v. Tiegh. in Morot, J. Bot. 16 (1902) 197; Ann. Sc. Nat. Bot. VIII, 16 (1902) 301. — Lectotype: *Beccari P.B. 3138* (FI holo, K, P) Sarawak, Marop, fl. III-1867. — Paratype: *Beccari P.B. 3414* (FI holo) Pontianak Prov., S. Kanta, fr. V-1867.

Ouratea neriifolia Bartell., Malpighia 15 (1901) 158, t. 7, *sphalm.* '*neerifolia*'; Merr., J. Str. Br. R. As. Soc. 86 (1921) 387; Airy Shaw, Kew Bull. (1940) 249. — *Campylocercum neriifolium* v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 304. — Type: *Beccari P.B. 3547* (FI holo) Sarawak, Tg. Datu, fl. IV-1867.

Ouratea beccariana Bartell., Malpighia 15 (1901) 159, t. 9; Merr., J. Str. Br. R. As. Soc. 86 (1921) 387; Airy Shaw, Kew Bull. (1940) 249. — *Campylospermum beccarianum* v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 301. — Type: *Beccari P.B. 4025* (FI holo, K) Sarawak, Bintulu, fr. IX-1867.

Cercinia thorelii v. Tiegh. in Morot, J. Bot. 16 (1902) 198; Bull. Mus. Hist. Nat. Paris 8 (1902) 376; Ann. Sc. Nat. Bot. VIII, 16 (1902) 310; ibid. IX, 5 (1907) 162, 184. — *Ouratea thorelii* Lecomte, Fl. Gén. Indo-Ch. 1 (1911) 704; Craib, Fl. Siam. En. 1 (1931) 246; Gagn., Fl. Gén. Indo-Ch. Suppl. 1 (1946) 671, f. 82, 13; Hô & Du'o'ng, Fl. Vietn. (1960) 178. — Type: *Thorel 643* (C, CAL, E, P holo) Cochinchina, between Saigon and Bien-hoa, 1862—66. — Paratype: *Godefroy 355* (K, P) Cambodia, Route de Pursat, fr. VI-1875.

Campylocercum striatum v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 304. — *Ouratea striata* Lecomte, Fl. Gén. Indo-Ch. 1 (1911) 703; Merr. & Chun, Sunyats. 2 (1935) 282; Masam., Fl. Kait. (1943) 205; Gagnep., Fl. Gén. Indo-Ch. Suppl. 1 (1946) 673, f. 82, 7—12. — Type: *Gaudichaud 291* (P holo) Annam, Tourane, fr. I-1837.

Campylocercum zollingeri v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 305. — Type: *Zollinger 3075* (BM, BO, L, P holo) Sumatra, Lampongs, between Tarabangi and Henyala, fr. IX-1845.

Cercinia brevis v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 310; ibid. IX, 5 (1907) 184. — Type: *Harmand 131* (BM, E, K, P holo) Laos, Bassin de Sé-Moun, Mt. S. Treng, XII-1875.

Campylospermum retinerve v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 75; Ann. Sc. Nat. Bot. VIII, 18 (1903) 16. — Type: *ex Hb. Vaillant* (P holo) India, 'Gurunda Karpata'.

Campylospermum vahlianum v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 76; Ann. Sc. Nat. Bot. VIII, 18 (1903) 17. — Type: *Breyn s.n.* (C?, P holo) India.

Campylospermum wallichianum v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 76; Ann. Sc. Nat. Bot. VIII, 18 (1903) 17. — *Gomphia oblongifolia* Ridl., Kew Bull. (1925) 281; Fl. Mal. Pen. 5 (1925) 296. — *Ouratea crocea* (Griff.) Burk., Kew Bull. (1935) 318, *p.p. excl. typus.* — Type: *Wallich 2803* (A, BM, E, K, P holo) Singapore & Dindings, fr. 1822.

Campylospermum leschenaultii v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 76; Ann. Sc. Nat. Bot. VIII, 18 (1903) 17. — Type: *Leschenault s.n.* (P holo) Ceylon, fl.

Campylospermum walkeri v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 76; Ann. Sc. Nat. Bot. VIII, 18 (1903) 18. — Type: *Walker 54* (P holo) Ceylon, fl. 1837.

Campylospermum thwaitesii v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 77; Ann. Sc. Nat. Bot. VIII, 18 (1903) 18. — Type: *Thwaites C.P. 2412 p.p.* (BM, BO, CAL, K, P holo) Ceylon, 1854.

Campylospermum nodosum v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 77; Ann. Sc. Nat. Bot. VIII, 18 (1903) 18. — Type: *Thwaites C.P. 2412 p.p.* (P holo?) Ceylon 1854.

Campylospermum rheedei v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 78; Ann. Sc. Nat. Bot. VIII, 18 (1903) 19. — Type: prob. not preserved, cf. Rheede, Hort. Malab. 5 (1685) t. 48, '*tsjocatti*'.

Campylospermum plicatum v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 78; Ann. Sc. Nat. Bot. VIII, 18 (1903) 19. — Type: *Hombron s.n.* (A, P holo) Singapore, 1838—40.

Campylospermum strictum v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 79; Ann. Sc. Nat. Bot. VIII, 18 (1903) 20. — Type: *Derry 987* (CAL, P holo, SING) Malacca, Batu Tiga, 1892.

Campylospermum kingii v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 79; Ann. Sc. Nat. Bot. VIII, 18 (1903) 21. — Type: *King's coll. 3370* (K, L, P holo) Perak, Larut, 300—500 ft, fl. IX-1882.

Campylospermum perakense v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 80; Ann. Sc. Nat. Bot. VIII, 18 (1903) 21. — Type: *King's coll. 4545* (A, BM, K, L, P holo, SING) Perak, Larut, 0—500 ft, fl. & fr. VII-1883.

Campylospermum abbreviatum v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 80; Ann. Sc. Nat. Bot. VIII, 18 (1903) 21. — Type: *King's coll. 6598* (P holo) Perak, Larut, 0—100 ft, fl. IX-1884.

Campylospermum cumingii v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 80; Ann. Sc. Nat. Bot. VIII, 18 (1903) 22. — Type: *Cuming 1520 p.p.* (P holo) Luzon, Manila, fl.

Campylocercum paucifolium v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 86; Ann. Sc. Nat. Bot. VIII, 18 (1903) 29. — Type: *Hohenacker 89 p.p.* (BM, E, K, L, P holo) Canara, Mangalore.

Campylocercum hohenackeri v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 86; Ann. Sc. Nat. Bot. VIII, 18 (1903) 29. — Type: *Hohenacker 89 p.p.* (BM, E, K, L, P holo) Canara, Mangalore.

Campylocercum metzii v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 86; Ann. Sc. Nat. Bot. VIII, 18 (1903) 29. — Type: *Metz 2225* (P holo) India, fr. 1858.

Cercinia wightii v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 87; Ann. Sc. Nat. Bot. VIII, 18 (1903) 31; ibid. IX, 5 (1907) 162. — Type: *Wight K.D. 396 p.p.* (P holo) Ceylon, fr. III-1836.

Cercinia doumerii v. Tiegh., Bull. Mus. Hist. Nat. Paris 9 (1903) 87; Ann. Sc. Nat. Bot. VIII, 18 (1903) 32. — Type: *Doumer s.n. ex Hb. Brogniart* (P holo) India, fr. 1821.

Cercinia annamensis v. Tiegh., Ann. Sc. Nat. Bot. IX, 5 (1907) 163, 184. — Type: *Harmand in Hb. Pierre 7027* (P holo) Annam, Hué, fl. 1877.

Cercinia elongata v. Tiegh., Ann. Sc. Nat. Bot. IX, 5 (1907) 163, 184. — Type: *Harmand 144 = Hb. Pierre 7026* (P holo) Cochinchina, 1876—77.

Gomphia microphylla Ridl., Fl. Mal. Pen. 1 (1922) 365, f. 38. — *Ouratea microphylla* Craib, Fl. Siam. En. 1 (1931) 255. — Type: *Robinson 6197* (K holo) Lankawi Is., P. Dayang Bunting, fl. & fr. XII-1916.

Ouratea arcta Craib, Kew Bull. (1926) 341; Fl. Siam. En. 1 (1931) 245; Gagnep., Fl. Gén. Indo-Ch. Suppl. 1 (1946) 673; Lars., Dansk Bot. Ark. 23 (1963) 70; Back. & Bakh. *f.*, Fl. Java 1 (1963) 327. — Type: *Kerr 6849* (K holo, SING) Ko Chang, Klong Mayum, fl.

Ouratea megacarpa Ridl., Kew Bull. (1930) 76. — Type: *Ridley s.n.* (K holo) Sarawak, Mt. Matang, fr. I-1915.

Ouratea sumatrana (Jack) Gilg *var. nervosa* Craib, Fl. Siam. En. 1 (1931) 245. — Type: *Haniff & Nur 2047* (BM, BO, K holo, SING) Puket, Kopah, fl. 8-XII-1917.

Ouratea lobopetala Gagnep., Fl. Gén. Indo-Ch. Suppl. 1 (1946) 671, f. 82, 1—6. — Lectotype: *Poilane 6604* (P holo) Annam, Nhatrang, massif de la Mère et de l'Enfant, 15—1700 m, fl. 20-V-1923. — Paratypes: *Poilane 12256* (P) Annam, Cu-bi R., 7—800 m, fr. 28-VII-1925; *Poilane 3354* (BO, P) Annam, Nhatrang, Song Co, 700 m, fr. 18-V-1922.

Shrub or tree, up to 25 m high, dbh. up to 40 cm. *Branchlets* of young plants sometimes scrambling. *Stipules* 3—4 by 1—2 mm. *Leaves* with 2½—7½ mm long petiole; lamina ovate- to obovate-lanceolate, 6—20 by 2—6 cm, up to 35 by 10 cm in young plants, mostly acute to acuminate, sometimes obtuse at apex, acute or a little tapering at base, margin finely denticulate, chartaceous. *Inflorescences* many-flowered; rachis (2½—) 5—20(—35) cm long, primary branches of terminal inflorescences usually up to 10(—15) cm long, secondary branches or primary ones of lateral inflorescences usually reduced or up to 1 cm long, cymose, with (1—)3—7(—∞), ± conferted flowers; pedicels ½—¾ cm long, up to 1 cm in fruit, deciduous. *Torus* 0.7—1 mm high, 0.7—1 mm ⌀, in fruit up to 5 mm high, 5 mm ⌀. *Sepals* mostly ovate to elliptic, sometimes obovate, 4—7 by 2½—4 mm, mostly acute to obtuse, sometimes rounded, enlarging in fruit. *Petals* obliquely obovate to broad-spatulate, 4½—8 by 2½—6 mm, obtuse, rounded, or truncate, mostly yellow, sometimes creamy or white. *Stamens* subsessile or with up to ½ mm long filaments; anthers 2½—5(—6) by 0.5—0.8 mm. *Ovaries* 0.7—1 by 0.4—0.6 mm; style 3—5 mm long, up to 7 mm in fruit; stigma minute. *Fruits* up to 8(—10) by 6(—8) mm.

Distribution: SW. Peninsular India, Ceylon, E. Thailand, Indo-China, Hainan, Sumatra, the Malay Peninsula, Borneo, the Philippines, and Celebes.

INDIA. *Breyn s.n.* in Hb. Vahl (C, P); *Doumer s.n.* in Hb. Brogniart (P); Hb. Madras = *Wallich 2802B* (E, K); *Metz 2225* (P); *van Royen s.n.* (BM); *Hb. Vaillant s.n.* (P). — Mysore, South Canara: *Beddome 1086* (BM), *Hohenacker 2225* (BM); Mangalore: *Hohenacker 89* (BM, E, K, L, P, U), *Wight K.D. 396 p.p.* (K). — Kerala: *Bélanger s.n.* (P); Calicut: *Bourne 4815* (K); Travancore: *Ramakan 934* (DD), *Hb. Wight 469 = Wallich 2802A* (E, GL, K, P); Quilon: *Wight 164* (E), *K.D. 396 p.p.* (K). — Madras, Tirunelveli, Kuttalam: *Wight 163* (E). — ? Colatinpolay: *Bourdillon 129* (K).

CEYLON. *Fraser 115* (BM, FI, K), *Hb. Hermann s.n.* (L), *König s.n.* (BM, C, L, P), *Leschenault s.n.* (P), *Macrae 12* (BM), *Hb. Pallas 53* (BM), *Pamplin s.n.* (E), *Rottboell s.n.* (C), *Thwaites C.P. 2412* (BM, BO, CAL, K, P), *Walker 9* (E, U), *54* (P), *89* (U), *427* (K), *1059* (E, GL), *s.n.* (E, GL, K, P), *Wight 165, 166* (E), *K.D. 396* (P). — Central Prov., Sigiriya: *Worthington 33* (BM); Nalanda: *Worthington 1034* (BM); Kandy: *Macrae 28* (BM, K); Nawalapitiya: *Worthington 372* (BM); Hanguranketta: *Simpson 9208* (BM). —

Southern Prov., Galle: *Dubuc s.n.* (E), *Pierre 212* (P). — ? Hautane: *Gardner 168* (BM, K); Murutallawa Rd.: *Simpson 8099*; Madugoda: *Simpson 8784* (BM).

THAILAND. Udon Circle, Udon Thani: *Anuwat 54* (K); Ubon Circle, Surin: *Put 630* (K); Sangka: *Kerr 8270* (K), *8270A* (C, K); Srisaket, Kanthalak, Nongtha: *Phenkhlai 908* = *R.F.D. 32311* (L); Ubon, Warin: *Lakshnakara 877* (K); Chantaburi Circle, Kao Kuap: *Kerr 17690* (K); Tha Khum: *Put K.D. 2888* (C, E, K, L); Klung: *Kerr 17927* (C, E, K); Ko Chang, Klong Mayum: *Kerr 6849* (K, SING), *Schmidt 600* (C, K), *603* (C), *Smitinand 5633* = *R.F.D. 22852* (L), *Sörensen & al. 7119* (C, L); Nipple: *Schmidt 667a* (C); Ko Chang Nun: *Murton 19* (K).

LAOS. Savannakhet: *Poilane 11713, 12086* (P); Se-Moun Basin, Mt. S. Treng: *Harmand 131* (BM, E, K, P); Kang (= Khong?): *Thorel 649 p.p.* (E).

CAMBODIA. *Schmid s.n.* (P); Siem Reap, Angkor: *Harmand in Hb. Pierre 7025* (P); Pursat: *Chevalier 31994* (P), *Godefroy 355* (P); Kg. Thom, W. of Cheom Ksan: *Poilane 14112* (BO, K, P); Kg. Soai: *Béjeaud 148* (P); Kg. Chhnang: *Chevalier 31958* (P); Kralanh F.R.: *Chevalier 31731 (Fleury)*, *36944* (Chea Mb 10) (P); Kampot: *Geoffray 74, 285* (P); Bokor, Mt. Popokvil (Elephant): *Geoffray 285 bis* (P), *Poilane 214, 22972* (P); Kep: *Chevalier 36188* (P); Prey Veng, Srok Kamchay: *Hahn s.n.* (P).

VIETNAM. Cochinchina: *Harmand 144* (P), *Talmy s.n.* (P), *Thorel 643* (BM, C, CAL, E, P); Tây Ninh, Mt. Deon Ba: *Pierre 323 p.p.* (K, P); Long An, Thu Dau Mot: *Chevalier 30211 (Fleury)* (P), *Pierre 323 p.p.* (P); Thu Duc: *Pierre 323 p.p.* (P); Point A: *Lefèvre 315, 533* (P), *Thorel 649 p.p.* (C, K, P); Biên Hoa: *Phung Van Dieu 129* (P), *Pierre 323 p.p.* = *212* (P), *Poilane s.n.* (BO, SING); Zi Tinh: *Pierre 323 p.p.* (BM, CAL, P); Tri Huyen, waterfall: *Pierre 323 p.p.* (E); Phuoc Tuy, Phuoc Le (= Baria): *Phung Van Dieu 40* (P), Mt. Dinh: *Pierre 323 p.p.* (E, K, P). — Annam, Ninh Thuân, Ca Na: *Evrard 2355, 2398* (P); Khanh Hoa, Nha Trang: *Robinson 1490* (P); Ninh Hoa: *Poilane 8221* (P); Song Ko R.: *Poilane 3354* (BO, P); Nui Hon Heo Peninsula: *Poilane 4896, 6221* (P), *6224* (BO, P), *6238, 6854* (P); Cô Inh Massif: *Poilane 4611* (K, P, SING), *4801* (P); Massif de la Mère et de l'Enfant: *Poilane 6604* (P); Quang Nam, Da Nang (= Tourane): *Clemens 3377* (BM, K, P, U), *Gaudichaud 291* (P), *s.n.* (FI); Col des Nuages: *Poilane 7842* (BO, P), *8000* (P, SING); Ba Na: *Clemens 4266* (K, P), *Poilane 7109, 7216* (P); Thua Thiên, Hue: *Clemens 3417* (BM, K, P, U), *Eberhardt 2078* (P), *Harmand in Hb. Pierre 7027* (P); Bai Ka: *Eberhardt 2473* (P); Toang: *Eberhardt 2328* (P); Nui Bach Ma: *Poilane 27794* (K, P), *29843* (BO, P); Quang Tri, Sa Lung: *Poilane 31273* (P); Cu Bi Valley: *Eberhardt 1965* (P), *Poilane 12256* (P); Dong Che Massif: *Poilane 11280* (P); Dent du Tigre: *Poilane 10410* (P, SING). — ? Thua Lun: *Lecomte & Finet 1313* (P).

HAINAN. *How & Chun 70110* (E, K, P), *Liang 64840* (K), *Wang 33331* (P); Yai Distr.: *Liang 62577* (E), *62704* (P); Dung Ka, to Wen Fa Shi: *Chun & Tso 43751* (E).

SUMATRA. W. Sumatra, Pajakumbuh, Taram, S. Tjampo: *Ismael 61* (K, L), *Meijer 6989a* (L); Solok, Silunkang: *Buurman van Vreeden 253* (BO, L); Padang Lawas, Purbasinumba: *b.b. 6198* (BO); Sidjundjung: *b.b. 6069* (BO, L). — Riau, Upper S. Siak, Pakanbaru, S. Tenajan: *Soepadmo 167* (C, E, K, L); Upper S. Indragiri, Taluk, Taratuk Air Hitam: *Amiroeddin & al. 66* (L); Riau Arch., P. Durian: *Rahmat 60* (BO, L); P. Karas: *Teijsmann s.n.* (BO, L); Lingga Arch., P. Selajar: *Bünnemeijer 7427* (BO); P. Singkep, Manggu: *Bünnemeijer 7147* (BO); Kg. Baru: *Bünnemeijer 7380* (BO); Anambas Is., P. Djemadja, S. Air Maras: *Henderson S.F. 20455* (BO, K, SING). — Djambi, Bangko, road to S. Manau: *Posthumus 708* (BO, L). — S. Sumatra, Benkulen: *Brooks 7599* (K), *? Jack s.n. in Hb. Hasskarl* (L), *Marsden s.n. in Hb. Hooker* (K, P); Talang Ampat: *Ajoeb 40* (BO); Palembang: *Teijsmann s.n.* (BO, L); Bajung Lentjir: *Dorst T1/P703* (BO, L); Muara Enim: *Teijsmann s.n.* (BO); Tjaban F.R.: *Kostermans 12043* (K, L), *s.n.* (L); Batu Radja: *Teijsmann H.B. 3696* (BO, L, U); Ulu A. Ogan: *Teijsmann H.B. 3961* (BO, L, U); Tubuan: *Teijsmann H.B. 3651* (BO); N. of Ranau Lake, between Simpang and Sepatuhu: *van Steenis 3397* (BO, L, SING); Niru: *de Voogd 231* (BO, L); Lampongs: *Forbes 472* (BM, CAL), *1776a, 3055a* (BM), Ulu W. Tukang Bawang: *Teijsmann s.n.* (BO, L); Menggala Mas (Mangala): *Teijsmann s.n.* (BO); Kota Bumi: *Gusdorf 185* (BO); Ulu W. Pengubuan, Gedong Arta: *Teijsmann s.n.* (BO); between Menggala and Terbanggi Besar: *Zollinger: 3075* (BM, BO, L, P); G. Sugi: *Elbert s.n.* (L); Natar: *Teijsmann H.B. 4254* (BO, L, U); Telok Bt. Ranggal: *Elbert s.n.* (BO, L); Tulung Bujut: *Engles-Julius 19* (BO); Bangka, Muntok, G. Menumbing: *Teijsmann s.n.* (BO, K, L); Telok Klabat, P. Bau: *Teijsmann s.n.* (BO, K, L, SING); G. Maras: *Kostermans & Anta 1319, 1340* (BO, K, L, P, SING); S. Liat: *b.b. 34229* (L); G. Betong: *Teijsmann s.n.* (A, BO, L); G. Mangol: *Kostermans & Anta 1346* (A, BM, BO, K, L, SING); Lobok Besar: *Kostermans & Anta 448* (A, BO, K, L, P, SING).

MALAY PENINSULA. Thailand, Puket Circle, Krabi, Tambon Kao Panom: *Kerr 18776* (K); Trang, Kuo Soi Dao: *Kerr 19131* (K); Kopah-Janjan: *Haniff & Nur 2074* (BM, BO, K, SING); Satul: *Lakshnakara 331* (K); Khlong Ton: *Kerr 14464* (K). — Pattani Circle, Kao Ri Chow: *Lakshnakara 722* (K). — Malaya, Kedah, Koh Mai F. R.: *Kiah S.F. 35144* (A, K, SING); Jerai F. R.: *Mat Sani C.F. 17934* (SING); Langkawi Is., P. Dayang Bunting: *Robinson 6197* (K); Tg. Terai: *Corner S.F. 37854* (BO, K, L, SING); P. Chupa, Selat Panchor: *Corner S.F. 37815* (A, BM, BO, K, SING); P. Terkam: *Corner s.n.* (SING); P. Songsong: *Curtis s.n.* (SING). — Penang: *Curtis = 221, 3195, s.n.* (SING), *Kunstler 1520* (CAL); Batu Feringgi: *Paul? s.n.* (SING), *Curtis 221* (BM, CAL, SING); Bt. Penara: *Yahya S.F. 21450* (A, BO, K, SING);

Penang Hill: *Curtis = 221* (SING), *Nauen S.F. 37657* (A, BO, K, SING), *s.n.* (SING); Reservoir: *Hamid C.F. 2309* (K); Suloh Bahang: *Curtis s.n.* (SING); T. Pahang: *For. Guard 4* (SING); Telok Aling: *Sinclair S.F. 39306* (E, K, L, SING). — Perak: *King's coll. 6598* (P), *Scortechini 99* (CAL, SING), *99b* (BO, K, SING), *537* (BO, CAL, SING), *562* (U), *s.n.* (K, SING), *Wray 3125* (SING); Larut: *King's coll. 3370* (BM, K, L, P), *3552* (K); Taiping Hill: *Henderson S.F. 11592* (SING); G. Arang Para: *Scortechini 567* (SING); P. Sarajah: *King's coll. 4168* (E, SING); Kinta, Gopeng: *King's coll. 4545* (A, BM, K, L, P, SING), *Scortechini 567a* (SING); G. Bujong Malaka: *Allen & Kadim MK. 463* (A, K, L, SING); Batang Padang near Ulu Selangor: *King's coll. 8694* (BM, L, SING); Dindings, P. Pangkor: *Corner S.F. 31652* (K, SING), *Scortechini s.n.* (E), *Wallich 2803B* (K); Kg. S. Pinang: *Burkill & Shah HMB. 250* (BO, K, L, SING); Sembilan Is., Pulau Rumbia: *Kloss s.n.* (K); P. Lalang: *Seimund s.n.* (BO, SING). — Selangor, Kuala Lumpur, Maxwell Rd.: *Ahmad C.F. 5415* (SING); Sg. Buloh: *Burkill & Shah HMB. 1034* (K, L, SING); S. Wai: *Hashim C.F. 474* (K); Klang Gates: *Hume F.M.S. 7205* (SING); Kepong: *Hamid C.F. 16897* (K, SING); Bt. Lagong F.R.: *Wyatt Smith K.F.N. 65520*; Wild Hills Res.: *Ahmad C.F. 2480* (K), *Ja'amat C.F. 12649* (SING). — Negri Sembilan, G. Angsi: *Nur S.F. 11646* (BM, BO, SING), *Ridley? s.n.* (SING); G. Tampin Res.: *C.F. 906* (SING). — Malacca: *Alvins 1166* (SING), *Griffith s.n.* (BO, L); Bt. Sadanan: *Derry 384* (CAL, SING); Batu Tiga: *Derry 987* (CAL, P, SING); Brisu: *Derry 1054* (CAL, SING); Bt. Baru: *Maingay 1581B = K.D. 295 p.p.* (K); Bt. Panchor: *Ridley 249* (SING). — Kelantan, Gua Musang, S. Ketil: *Henderson S.F. 22662* (BO, SING). — Trengganu, Ulu S. Brang: *Moysey & Kiah S.F. 33841* (A, BO, SING), *S.F. 33897* (SING); Kemaman, Bt. Kajang: *Corner S.F. 30470* (K, SING). — Pahang: *Hashim C.F. 906* (K); Raub, Gorge of S. Tras: *Burkill & Haniff S.F. 16949* (SING); Bentong, Bt. S. Nilam: *Nong C.F. 5515* (K, SING); S. Perting: *Poore 372, 374* (K); S. Tahan, Rhinoceros Camp: *Ridley 2458* (CAL, SING); Kuantan: *Mahmud C.F. 3715* (A, SING), *Soh C.F. 15101* (SING), *Yeob C.F. 3630* (SING); Rompin: *Bidin C.F. 15663* (E, SING); P. Tioman, Tg. Saik: *Henderson S.F. 18496* (BO, SING). — Johore: *Castlewood s.n.* (A); Pinerong: *Cantley's coll. 47* (K, SING); G. Ledang & G. Mering: *Ridley 3227* (SING); Kuala Batu Pahat: *Lake & Kelsall 4058* (SING); Banang F.R.: *Chelliah K.F.N. 98237* (K), *Santiago & Lindong K.F.N. 71522* (K); S. Sembrong: *Holttum S.F. 24931* (BO, K, SING); G. Lambak: *Holttum S.F. 9373* (A, SING); G. Pulai: *Sinclair S.F. 39551* (E, SING); Mersing F.R.: *Kochummen K.F. 77930* (K); S. Sedili, Danau: *Corner S.F. 25974, s.n.* (K, SING); Mawai-Jemaluang Rd.: *Corner S.F. 32991* (K, SING); P. Pelandok: *Holttum S.F. 24964* (BO, CAL, SING); P. Tinggi: *Feilding s.n.* (SING), *Burkill s.n.* (SING). — Singapore: *Anderson 178* (K), *Cantley's coll. s.n.* (SING), *Hombron s.n.* (A, P), *Hullett 132* (SING), *Kunstler 20* (BM, BO), *Pierre 5874* (P), ? *Walker 246* (K), *Wallich 2803A* (A, BM, E, K, P); Tg. Gul: *Ridley? s.n.* (BM), *Sinclair 9375* (E, K, L, SING), *S.F. 39639* (BO, E, L, SING); Tengah: *Ridley s.n.* (SING); Bt. Timah: *Hullett 456* (SING), *879* (K), *Ridley s.n.* (A, BM), *Burkill S.F. 2029* (BM, BO, K, SING), *Liew S.F. 36482* (A, BO, SING), *Ngadiman S.F. 36492* (A, BO, K, SING); Tampenis: *Ridley s.n.* (SING); P. Ubin: *Ridley s.n.* (BM, SING); ? P. Baru: *Smith s.n.*

JAVA. Karimundjawa: *Karta 376* (BO, L, SING), *Koorders 40374* (BO, L).

BORNEO. Sarawak, 1st Div., Lundu Distr., Tg. Datu: *Beccari P.B. 3547* (FI); Lundu: *Ridley s.n.* (SING); P. Sampadi: *Native coll. 5231* (A); Kuching Distr., G. Serapi (= Mt. Matang): *Ridley s.n.* (K); Kuching: *Bartlett s.n.* (BM), *Haviland 507* (K); Penrissen Rd.: *Abang Muas SAR 0088* (SING); G. Sepadang: *Haviland s.n.* (K, SING); G. Santubong: *Bujang 13475* (K, L, SING), *Haviland = 507* (BM, K, SING), *Ilias Paie 8316* (K, L, SING); Bako Nat. Park: *Anderson S. 16244* (K, L); Telok Asam: *Ashton S. 17818* (K, L), *Purseglove P. 4910, 4984, 5045* (K, L, SING); Lintang Path South: *Kanis B.15* (L), *Sinclair & Kadim 10307* (L, SING); Telok Paku: *Chai S.18026* (K); Bt. Gondol: *Anderson 12482* (K, L); S. Raya F.R.: *Brooke 9371* (BM, L); 2nd Div., Ulu Btg. Lupar, Marop: *Beccari P.B. 3138* (FI, K, P); Btg. Saribas, S. Paku: *Haviland & Hose 3179* (BM, K, L); 3rd. Div., Kapit Distr., Bt. Raya: *Chai S.18938* (K, L, SING); Nanga Pelagos: *Daud & Tachun S.F. 35673* (K, L, SING); Hose Mts., Ulu Mujong, N. Amau: *Othman b. Haron S.19941* (K, L, SING); Belaga: *Haviland 2130* (BM, K); Bt. Dulit, Ulu Koyan: *Richards 1920* (A, K, SING), *2488* (A, BO, K, SING); 4th Div., Bintulu Distr.: *Brunig S.11909* (K, L, SING); S. Anap, Ulu Muput Kanan: *Ashton S.19356* (K, L); Ulu Anap, Bt. Mersing: *Sibat ak Luang S.21977, 22167* (K, L), *22179* (K, L, P); Bintulu: *Beccari P.B. 4025* (FI, K); Similajau F.R.: *Brunig S.8681* (K, L); Miri Distr., Nyalau F.R.: *Brain ak Tada S.15942* (K, L, SING); Niah: *Haviland & Hose = 507* (BM, BO, K, L); Bt. Lambir, S. Bakam: *Fuchs 21298, 21305* (L); Riam Rd.: *Au & Ashton S.16788* (K, L); Baram Distr.: *Haviland & Hose = 507* (A); S. (En-)toyut: *Hose 450* (K); Bt. Mentagai, S. Bok — S. Tisam: *Sibat ak Luang S.23206* (K, L, SING); Dulit Ra., Long Kapa: *Richards 1525, 1957* (A, BO, K, SING); Ulu Tinjar, Long Dapoi: *Haji Suib S.23435* (K, L); Ulu Dapoi: *Sibat ak Luang S.22988* (K, L); Bt. Kalulong, N. slope: *Pickles SAR 3724, 3734, 3741, 3761* (BM, L, SING); G. Sewabok (near Lio Matu?): *Moulton S.F. 6665* (K, SING); G. Api: *Anderson 4601* (K, L, SING); Bario, S. Marario: Anderson *S.20043* (K, L); 5th Div., Lawas: *Brooke 9939* (BM, L, SING). — Brunei, S. Belait, Kg. Ingei: *Ashton BRUN 185* (L); Kg. Mendaram: *Hotta 12621, 12794* (KYO, L); Tutung: *Brunig S.1170* (K), *Suhaile K.F. 37058* (K, L); Berakas F.R.: *Anderson S.4877* (SING), *Ashton S.7841* (BO, K, L); Temburong, Bt. Bangar: *Hotta 13100, 13105* (KYO, L); Road near Labu: *Hotta 13548* (KYO); Kuala Belalong: *Ashton A 1* (K). — Sabah: *Agama 474, 479* (A), *Castillo 595* (BO, L), *Wood 1210, 1863* (A), *2120* (A, BO, SING); Interior Res., Labuan I.: *Treacher s.n.* (S); Kuala Penyu Distr., Bt. Batayan: *Ampuria SAN 40809* (K, L); Beaufort Distr., Beaufort Hill: *Madius SAN 50054* (L); Pangi: *Wood SAN 15096* (SING); Crocker Ra. F.R. South: *Masirom Rundi SAN 43013* (K, L); Melap: *Angian 10507* (K, SING); Rayoh F.R.: *Ampuria SAN 41444* (L); West Coast Res., Jesselton Distr., P. Gaya: *Ampuria SAN 41392* (K, L), *Haviland 1443* (K), *Mujin SAN 33561a* (K, L, SING), *Sinanggul SAN 40134* (K, L); Kota Belud Distr., Tabilong: *Wood & Wyatt Smith A. 4326* (L, SING); Mt. Kinabalu, Bt. Nunkok above Lobang: *Clemens 32670* (BO); Penibukan: *Clemens 31780* (BO), *30858* (A, BO, K, L), *40849* (A, K, L); Dallas: *Clemens 30323* (BO); Dallas-Tenompok ridge: *Clemens 27546* (BO, L), *27706* (K, L); Ranau Distr., Mt. Kinabalu, E. Shoulder: *Chew & al. 1013* (K, L, SING); Ranau near Resthouse: *Darnton 173* (K, L); Kudat Distr., Kedayan F.R.: *Apostol 5919* (K, SING), *Belajadia 4045* (K, SING); Labuan F.R.: *Apostol 7680* (K, L), *Brand SAN 30904* (K, L); S. Matunggong: *Valera 4687* (K, L, SING); Marudu Bay, Tg. Batu: *Mail 3184* (A, BO, K); Sandakan Res., Labuk & Sugut Distr., Labuk Rd. mile 82: *Abu Bakar SAN 36223* (K, L); Sandakan Distr.: *Clemens 9438* (A, K), *9519* (A, BO, K), *Creagh s.n.* (BM, K), *Monarca 661* (A), *Panching 818* (SING), *Ramos 1557* (A, BM, BO, P), *1687* (A, BO), *Tahir 675* (SING), *Wood 809* (A), *836* (CAL, SING), *867* (A), *1149* (*Melegrito*) (BM, BO); Chinese Cemetery: *Keith 7187* (A, BO, K, L, P, SING), *Meijer SAN 20050* (K); Buli Sim Sim: *Pereira SAN 41059* (K); Leila F.R.: *Arsat 684* (A), *Sayuh Elleh SAN 38883* (L); Kebun China F.R.: *Meijer SAN 34605* (K, L), *Sam SAN 34677* (K, L); Batu Sapi: *Sayuh Elleh SAN 38818* (K, L); S. Kapur: *Meijer SAN 22606* (K); Kabili-Sepilok F.R.: *Enchai 10410* (K, SING), *Enggoh 7289* (A, BO, K, L, SING), *Nicholson SAN 21198* (L, SING), *Sam & al. SAN 42924* (L); Elopura F.R., Segaliud: *Kadir A2800* (K, L, SING); Kinabatangan Distr.: *Evangelista 879* (A, SING), *968* (BO); Bilit, Bt. Lubuk Buaya: *Meijer SAN 23111* (K, L, SING); Batu Puteh: *Burot Ho 1897* (BO, K), *Maidin 1691* (A, BO, K); S. Lokan: *Maidin 1459, 1460* (K); Tawau Res., Lahad Datu Distr., Bt. Silam: *Mujin SAN 37851* (K); Dam Segama: *Chai SAN 31652* (K, L); Chin Lok Yu Concession: *Chai SAN 29735* (K, L); P. Sakar: *Agam Ambullah SAN 36066* (K, L); *Brand SAN 24574* (K, L, SING), *Chai SAN 21661* (K, L, SING), *Wood SAN 16169* (L, SING); Kennedy Bay, Silabukan F.R.: *Ahmad Talip SAN 47633* (L); Ulu Kalumpang F.R. East: *Chai SAN 33409* (K, L); Tawau Distr.: *Elmer 21070* (A, BM, BO, C, K, L, P, SING); Kalabakan F.R.: *Aban Gibot SAN 30441* (K, L, SING); *Abu Bakar SAN 24982* (K, L); Kuala Umas[2]: *Otik 5240* (K, L, SING); Merutai: *Maidin 2710* (A, BO, K), *Mail 2714* (BO, K); Beradaya F.R.: *Singh & Nordin SAN 48754* (K); Garson Rd. mile 11: *Brand SAN 21453* (K, L); mile 24: *Sinanggul SAN 40605* (L); Kuala Apas Rd.: *Abu Bakar SAN 25040* (K, L, SING); Kinabutan Kechil: *Aban Gibot SAN 35893* (L); Mt. Lucia, S. Pinayas: *Orolfo 11* (K, SING); P. Sebatik, S. Simpang Tiga: *Meijer SAN 19651* (K, L, SING); ? Penangsoo: *Belajadia 2910* (A, BO, K). — West Borneo: *De Vriese s.n.* (L); Mempawa, Bala: *b.b. 15589* (BO, K, L); Kapuas Lakes, Sinkadjang: *Teijsmann HB 8462* (BO); S. Kantu: *Beccari P.B. 3414* (FI); Ulu Mandai, Bt. Lianggagang: *Hallier B.2631, 2742, 2863* (BO, L); S. Melawi, Kalawaideras: *b.b. 28125* (BO, L, SING); St. Barbe I. = ? P. Pedjantan: *Langlassé 239* (P, SING). — South Borneo; Bandjarmasin: *Motley 923* (K). — East Borneo, S. Semenggaris: *Amdjah 996, 1023* (BO), *1047* (BO, L); Bulungan, Salimbatu: *b.b. 11266* (BO, L); Berau, Dumaring: *b.b. 18893* (A, BO, L); P. Nunukan: *Kostermans 8677* (BO, K, L), *8981, 9070* (BO), *Meijer 2092* (BO, L); P. Tarakan: *Meijer 2504, 2571* (BO); Ulu Mahakam, Bt. Kasian: *Amdjah 197* (BO); S. Blu-u: *Jaheri 418* (BO); S. Magne: *Jaheri 614, 654* (BO); Kutai, G. Kemul: *Endert 3577* (BO, L); S. Belajan, Tabang, Bt. Palimasan: *Kostermans 12796* (BO, K, L); S. Kelindjau, Bentuk: *Kostermans 12629* (BM, BO, K, L, SING); Sangkulirang, S. Mandu: *Kostermans 13306* (BO, K, L); Samarinda, Loa Djanan: *Kostermans 6498* (BO, K, L, SING), *6606* (A, BO, K, L, SING); Balikpapan, G. Beratus: *Kostermans 7456* (L).

PHILIPPINES. Palawan: *Merrill B.S. 1234* (A, BM, BO, CAL, L, P, SING), *Cenabre & al. F.B. 27890* (A), *Cenabre F.B. 30100* (L); Victoria Mts.: *Edaño 2968 = P.N.H. 14226* (A), *Sulit 3785 = P.N.H. 12349* (A, BO, L); Puerto Princesa, Mt. Pulgar: *Elmer 12740* (A, BO, CAL, E, K, L, P, U); Balabac I., Cape Melville: *Fenix B.S. 15658* (BM, K, P, SING); Paragua I.: *Vidal 155 bis* (A), *2278, 2279* (A, K); Cuilon I.: *Merrill Bur. Agr. 611* (K); Busuanga I.: *Ramos B.S. 41219* (A, BO, SING); Lipuun I.: *Mendoza & Cordero P.N.H. 91380* (L). — Luzon, Ilocos Norte, Bangui towards Claveria: *Ramos B.S. 32966* (A, SING); Zambales, Santa Cruz: *Vidal 155* (A, K, L); Rizal, Manilla?: *Cuming 1520 p.p.* (P); Batangas: *Cuming 1520 p.p.* (K); Cagayan: *Alvarez F.B. 18493* (BM), *Cenabre & Agelar F.B. 28883* (A); Isabela, Sierra Madre, San Mariano: *Gutierrez 61—10 = P.N.H. 77991, 61—222 = P.N.H. 78184* (K, L); Palanan: *Gutierrez 61—347 = P.N.H. 78295* (L); Aurora, Baler: *Escritor B.S. 21197* (BM, L), *Quisumbing P.N.H. 7658* (A); Quezon, Guinayangan: *Escritor B.S. 20721* (BM), *20774* (K), *20842* (BO, SING); Mulanai: *Alcasid & Edaño P.N.H. 4615* (A); ? Dimilngen Creck: *Alcasid & Edaño P.N.H. 4683* (A); Camarines Norte, Paracale: *Ramos & Edaño B.S. 33541* (A); Camarines Sur, Sipaco, Sagonoy: *Canicosa 40, 45 = F.B. 30306* (BO, E, SING); Bical N.P.: *Canicosa P.N.H. 9767* (A). — Visayas, Mindoro I.: *Cuming 1520 p.p.* (A, BM, E, FI); Puerto Galera: *Sulit 5710 = P.N.H. 32829* (A, L); Mt. Yagaw: *Conklin 264 = P.N.H. 18679* (A, L); Romblon I.: *Escritor B.S. 1211* (A, BM, BO, CAL, L, P, SING), *Ramos & Edaño B.S. 31545* (A); Masbate I.: *Merrill B. Gov. Lab. 3085* (BM, K, P); Panay I., Iloilo: *Vidal 155 c* (A); Guimaras I.: *Gammill F.B. 313* (BM, K); Buenavista: *Sulit 3611 = P.N.H. 11751* (A, L, SING). — Sulu Archipelago, Tawitawi:

Ramos & Edaño B.S. 44192 (A, C). — Mindanao, Zamboanga: *Belin & Acuna F.B. 22684* (A), *Miranda F.B. 22781* (BO), *Tarroso F.B. 12461* (BO, CAL, L), *Villamil F.B. 22060* (K); Cotabato, Bango: *Whitford & Hutchinson F.B. 1021* (BO).

CELEBES. Central Celebes, Malili: *b.b. 13584* (BO, L), *Cel. IV/194*; Usu: *Cel. III/34* (BO, L), *161* (BO), *190* (BO, L); Kawata: *Cel. II/438* (A, BO, K, L, SING); La Rona: *b.b. 2386, 2413* (BO); Matalena: *b.b. 24099* (BO, L); SE. Celebes, Kendari, Lasao: *Kjellberg 1172* (BO).

Vernacular names: India, Mysore: *punde gida*; Kerala: *anai vilavu, chokatti, puachetti*; Madras?: *gurunda kırpata.* — Ceylon: *bo kaera gass, wal* (or: *mal*) *kaera* (Singhalese), *go* (Tamil?). — Thailand, Udon: *chang nao*; Ubon: *hang kwa pu*; Chantaburi: *kapi to.* — Laos: *ton ang quan.* — Cambodia: *domchung chhkê, kompes, kompuat chwuk, konkea chmaul, so prote.* — Vietnam: *(a)may, cay dua bep, cay gioi, cay roi tia, trung quân* (Annamite), *aluan am* (Moï). — Sumatra, North: *kaju ndolak* (Batak); West: *kalek djambak, sebalusi* (Menankabau); South: *kaju sepah, kaju mat, lakodjong, madjang*[2]; Bangka: *mentungging, mesulung putih.* — Malay Peninsula, Thailand: *tong pling*; Malaya: *bunga kĕlimbing besi, chinta mula, lidah mura, mata kĕtam batu, mĕnarah, mĕmbatu, mĕndapor, mĕramong, murmagong, pokok lĕbah, pokok luas, pĕnarah, pĕngling, tampang bĕsi*; several compound names were recorded occasionally with *gĕronggang* (= *Cratoxylon*), *jambu* and *kĕlat* (= *Eugenia*). — Borneo, Sarawak: *kĕladang, kĕlutak* (Iban), *aam* (Kenyah); compound names with *ubah* or *ubar* (= *Eugenia*) were recorded occasionally; Brunei: *chĕnaga lampong* (Iban), *pinis* (Malay); Sabah: *quintalai, majang*[2] (Kadazan), *antimagas gimbaan* (Murut), *kolambang* (Rungus Dusun), *pcsoon, tulangkara* (Kinabatangan), *alas, tampalanuk* (Tidong), *bakan bitanag, biobi, malatangor, ondogong* (Malay); West Borneo: *melindingan* (Dayak); East Borneo: *amir burgang* (Dayak), *batu*[2], *mulak, tengkedjing kering* (Malay). — Philippines, Palawan: *anduyong, bibingo, huisac*; Luzon: *salactoc* (Zambales), *simahima* (Bicol), *sasahit* (Tagalog); Visayas: *bulocauan, caranan* (Panay), *minsaray* (Mindoro). — Celebes: *lebani, paıasinga tjila* (Bugi), *mampa* (Rangkas), *morosisio, wulisi mapute* (Tobela).

Uses: The wood is reported as being used as poles or planks for the construction of houses in Ceylon, Vietnam, Sumatra, the Malay Peninsula, and Sarawak. Roots and leaves are bitter and are decocted in Kerala for a stomachic and anti-emetic tonic. Young branches are used against tooth-aches in Cambodia. The leaves are chewed by jungle tribes in Malaya.

Properties of wood: dull red or red-brown, hard and strong, apt to split in drying.

Ecology: Repoıted from sea level up to 1200 m, up to 1500 m on Mt. Kinabalu; in primary and secondary vegetation: lowland and submontane, mixed Dipterocarp forests, peat swamp forests, high kerangas forests, ridge forests, and open scrub vegetation; on level land to steep slopes, also near river banks and on cliffs near the sea. Soils are rocky, sandy, loamy, or clayish, but usually acid; limestone is reported occasionally, but it is very probable that the soils in the localities concerned have been leached out.

Remarks: As this species grows under rather different ecological conditions, the variation in its morphological characters is understandable. Apart from these variations, some geographically more or less separated 'races' can be recognized. It is therefore understandable that in certain floras two or three different species have been recognized, although the distinctive characters can hardly be used at a specific level. Over a large area it is impossible to make a key to the 'races', because the same differences occur in remote parts of the specific area.

In the western part of the area, a distinction could be made between a race '*zeylanica*' and a race '*malabarica*', the former with slightly longer sepals, petals, and anthers, and hardly branched inflorescences, the latter with relatively small panicles.

In the basin of the Me-Kong there is a race '*thorelii*' with relatively large leaves and profuse flowering at ± unbranched, lateral inflorescences. In Annam and possibly in Hainan, the race '*striata*' has smaller and more narrow leaves, terminal inflorescences and smaller flower parts like those in Ceylon. In the Chantaburi Circle of Thailand the race '*arcta*' is found with long flower parts and terminal, unbranched inflorescences.

The differentiation in Malesia is less clear. In Sumatra and the Malay Peninsula plants are relatively uniform. The greatest variation is found in Borneo, especially in Sarawak. In more exposed habitats, on cliffs, and on poor kerangas soils, specimens often have small leaves. On limestone in the Langkawi Islands, a race '*microphylla*' is found with small leaves and very reduced inflorescences. Similar, but less pronounced forms are found elsewhere along the coasts of the Malay Peninsula.

The holotype of *Meesia serrata* Gaertn. has been found in the collections of the Rijksherbarium in Leiden. It could be demonstrated that the flowers were wrongly described originally as having 5 stamens. The species is doubtless a true *Gomphia* and its epithet is considered the correct one for the type species of this genus.

Gomphia sumatrana Jack has been listed for Burma many times. Probably these records all go back to Kurz (J. As. Soc. Beng. 40, II, 1871, 49) and King (J. As. Soc. Beng. 62, II, 1893, 233), who considered *Ochna crocea* Griff. (Not. Pl. As. 4, 1854, 465) synonymous with Jack's species, but without arguments. I have not succeeded in tracing Griffith's original specimen, but from the description it is more likely that this species is conspecific with *Ochna integerrima* (Lour.) Merr. No other records of specimens from Burma are known to me.

SUBFAM. 2. SAUVAGESOIDEAE

Lindl., Nat. Syst. Bot. ed. 2 (1836) 64, *sub 'subordo Sauvagesiae'*. — *Ochnaceae 'ser. albuminosae'* Engl., Nova Acta Leop.-Carol. Akad. 37, 2 (1874) 21. — '*Albuminosae*' Gilg in E. & P., Nat. Pfl. Fam. 3, 6 (1895) 138; D.-T. & H., Gen. Syph. (1903) 316; Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 63. — *Albuminosoideae* Decker, Phytomorphology 16 (1966) 46, *nom. illeg.* — Type genus: *Sauvagesia* L.

Trees, shrubs, or undershrubs. *Leaves* alternate, not distichous, the lamina ± decurrent into the usually short petiole; nerves numerous, straight or slightly curved, parallel. *Inflorescences* racemose or paniculate. *Flowers* bisexual or functionally polygamous. Petals 5. Staminodes 0—∞. Stamens 5, free or connate at base. Carpels 2—5, fused into 1 ovary, with 2—∞ ovules per carpel; style apical. *Fruit* a berry or capsule; torus not distinctly enlarged. *Seeds* albuminous.

Distribution: The tribe *Sauvagesieae* is pantropical and is mainly represented in the neotropics; 2 monogeneric other tribes are confined to West and Central Africa (*Lophireae*) and the West Malesian area (*Euthemideae*) respectively.

Remarks: The African genus *Lophira* Banks *ex* Gaertn. was included in a separate tribe by Gilg (1895, 1925), which was considered by him as related to the *Ochneae* because of its exalbuminous seeds. It was even treated as a distinct family by Van Tieghem in Morot, J. Bot. 15 (1901) 169—194 on various morphological and anatomical grounds.

I consider its position as representing a separate tribe within the *Sauvagesoideae* more natural, because of its non-distichous leaves and carpels with 5—10 ovules. Besides, the shape and venation of the leaves show a good resemblance to those in the *Sauvagesieae* and the pollen is similar to that of certain Malesian genera of that tribe.

The tribe *Lophireae* is distinct from other *Sauvagesoideae* by the 1-seeded fruit, winged by a considerable, but unequal enlargement of the outer 2 or 3 sepals, and exalbuminous seeds. Like in several neotropical genera of the *Sauvagesieae*, there are many stamens.

Tribe 2. EUTHEMIDEAE

Planch. in Hook., Lond. J. Bot. 5 (1846) 593, 647; Walp., Ann. 1 (1849) 179; B. & H., Gen. Pl. 1 (1862) 319; Walp., Ann. 7 (1868) 543; Engl., Nova Acta Leop.-Carol. Akad. 37, 2 (1874) 21; Gilg in E. & P., Nat. Pfl. Fam. 3, 6 (1895) 152; D.-T. & H., Gen. Syph. (1903) 316; Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 64; Decker, Phytomorphology 16 (1966) 46. — Type genus: *Euthemis* Jack.

Shrublets. Lateral nerves of leaves reaching the marginal nerve. Staminodes 0(—5). Stamens free; anthers opening by an apical pore. Ovary 5-carpelled, 5-celled; ovules 2 per cell. Fruit a berry with 5, usually 1-seeded pyrenes.

Distribution: 1 genus in West Malesia.

4. EUTHEMIS

Jack, Malay Misc. 1, 5 (1821) 15; Wall. in Roxb., Fl. Ind. 2 (1824) 303; Jack in Hook., Bot. Misc. 2 (1831) 69; Endl., Gen. Pl. (1840) 1143; Walp., Repert. 5 (1846) 60, 400; Miq., Fl. Ind. Bat. 1, 2 (1859) 674; B. & H., Gen. Pl. 1 (1862) 319; Walp., Ann. 7 (1868) 221; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 526; Baill., Hist. Pl. 4 (1873) 360, 369, f. 385; Boerl., Handl. Fl. Ned. Ind. 1 (1890) 175; King, J. As. Soc. Beng. 62, II (1893) 234; Gilg in E. & P., Nat. Pfl. Fam. 3, 6 (1895) 152; Bartell., Malpighia 15 (1901) 166; Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 86; Merr., J. Arn. Arb. 33 (1952) 224; Vidal, Adansonia 1 (1961) 59. — Lectotype species: *E. leucocarpa* Jack.

Shrubs or shrublets, sparsely branched. *Stipules* free, caducous. *Leaves* coriaceous, glabrous, margins denticulate, nerves numerous, parallel, from the midrib curving sidewards, straightly ascending to the marginal nerves at an angle of *c.* 80°. *Inflorescences* terminal, many-flowered, compound racemes, bracts small, caducous. *Flowers* ⚥ or polygamous, actinomorphic. *Sepals* 5, turning purplish red in fruit. *Petals* 5, white or pinkish. *Staminodes* 0(—5), filamentous. *Stamens* 5, free; anthers subsessile, rostrate. *Ovary* 5-celled; ovules 2 per cell, pendulous, axile; stigma minute. *Fruit* a berry with 5 pyrenes. *Seeds* 1 or 2 per cell.

Distribution: Two species in SW. Cambodia, Sumatra, the Malay Peninsula, and Borneo.

Ecology: Confined to everwet tropical areas below 1250 m altitude, in kerangas forests, on low ridges in peat-swamp forests, and in open ridge forests, on poor, mostly sandy soils. Dispersal probably by birds because of conspicuous white, rose-pink, or red berries (Ridl., Disp. Pl., 1930, 410).

KEY TO THE SPECIES

1. Inflorescence a panicle, branches well developed with scattered flowers. Leaves 8—40 cm long, margin distinctly denticulate . . . . **1. E. leucocarpa**
1. Inflorescence a very slender, often cernuous raceme, nearly all branches reduced with conferted flowers. Leaves 4—15 cm long, margin faintly denticulate . . . . **2. E. minor**

1. **Euthemis leucocarpa** Jack, Malay Misc. 1, 5 (1821) 16; Wall. in Roxb., Fl. Ind. 2 (1824) 303; Jack in Hook., Bot. Misc. 2 (1831) 69; Walp., Repert. 1 (1842) 528; Planch. in Hook., Ic. Pl. II, 4 (1845) t. 711; Walp., Ann. 1 (1849) 179; Miq., Fl. Ind. Bat. 1, 2 (1859) 675; ibid. Suppl. 1 (1860) 208, 533; Scheffer, Nat. Tijd. N.I. 32 (1873) 411; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 526; King, J. As. Soc. Beng. 62, II (1893) 234; Ridl., Trans. Linn. Soc. Bot. 3, 9 (1893) 285; Bartell., Malpighia 15 (1901) 167; Hall. *f.*,

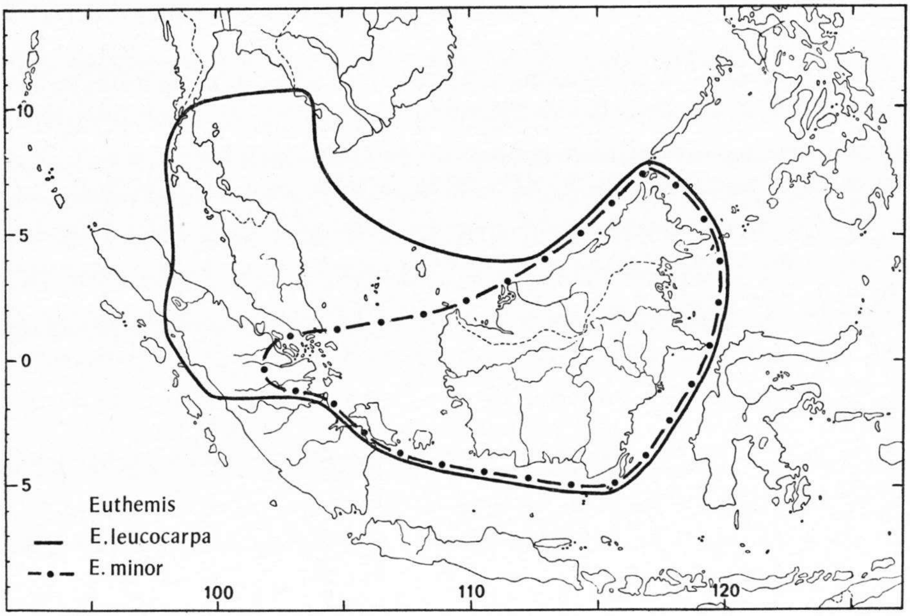

Fig. 7. Distributional map of the species of *Euthemis*. Outlined areas are only slightly generalised from cited localities.

Beih. Bot. Centralbl. 34, 2 (1917) 30; Merr., J. Str. Br. R. As. Soc. 86 (1921) 388; Ridl., Fl. Mal. Pen. 1 (1922) 368; Diels, Bot. Jahrb. 60 (1926) 311; Burk., Dict. Econ. Prod. Mal. Pen. 1 (1935) 987; Airy Shaw, Kew Bull. (1940) 249; Merr., J. Arn. Arb. 33 (1952) 224; Vidal, Adansonia 1 (1961) 60. — '*E. jackiana*' Hook. *f. ex* Index Kew. Suppl. 10 (1947) 92, *sphalm.*, *nomen nudum.* — Type: *Jack* †, Singapore. — Neotype: *Wallich 2516* (K), Singapore, fl. & fr. 1822.

E. robusta Hook. *f.*, Trans. Linn. Soc. 23 (1862) 163; Walp., Ann. 7 (1868) 544; Bartell., Malpighia 15 (1901) 168; Hall. *f.*, Beih. Bot. Centralbl. 34, 2 (1917) 32; Ridl., Fl. Mal. Pen. 1 (1922) 368. — Type: *Lobb s.n.* (K holo, P), Borneo, fr. 1853.

E. leucocarpa Jack var. *latifolia* Miq., Fl. Ind. Bat. Suppl. 1 (1860) 208, 533. — Type: *Teijsmann H.B. 3375* (BO, L holo, U), Banka, Plangas, fl.

Shrub up to 6 m high. *Branchlets* stout, green. *Stipules* ovate, 4—6 by *c.* 2 mm, acute to acuminate, ciliate. *Leaves* with 2—5 cm long, winged petiole; lamina oblong to linear oblong, 8—40 by 2—10 cm, acute at apex, tapering at base, margin distinctly and irregularly denticulate, nerves 1—2 mm apart. *Inflorescences* erect panicles, 8—20 cm long; pedicels 4—10 mm long, articulate at base; bracts 8—10 by 2—4 mm, lanceolate, acute. *Flowers* ⚥, erect, often in pairs. *Sepals* obliquely ovate to elliptic, unequal, 4—7 by 2—3½ mm, ciliate. *Petals* obliquely obovate to spathulate, 4—10 by 2½—5 mm. Anthers 3—5 by *c.* 1 mm, yellow. *Ovary* ovoid to bottle-shaped, 2—4 by *c.* 1 mm, style 1½—3 mm. *Fruit* globular, up to 1 cm ∅, fleshy, via red turning white. *Seeds* like sectors of a sphere, *c.* 4 by 2 mm.

Distribution: SW. Cambodia, Sumatra, the Malay Peninsula, and Borneo.

CAMBODIA. Kg. Som: *Smitinand 6456* = *R. F. D. 24420* (K), *Schmid s.n.* (P).
SUMATRA. N. Sumatra, P. Musala: *Batten Pooll s.n.* (SING). — W. Sumatra, Indragiri Uplands, S.

Bankar: *Buwalda 6573* (K, L). — Riau, B. Rengat: *Polak 597* (BO, L); P. Bengkalis: *de Haan 15* (BO); P. Rangsang: *de Haan 60* (BO); P. Karimun: *Hullett s.n.* (BM), *Ridley s.n.* (SING); P. Batam: *Ridley 12577* (K, SING); P. Bintan: *Teijsmann s.n.* (BO, L); P. Lingga, G. Daik: *Bünnemeijer 6600, 6602* (BO), *Hullett s.n.* (K, SING); G. Tanda: *Bünnemeijer 6874* (BO), *Teijsmann s.n.* (BO, L); Anambas Arch., P. Djemadja: *Henderson S.F. 20446* (BO, K, SING). — S. Sumatra, Banka: ?*Horsfield 106* (BM); Djebus: *Teijsmann H.B. 3211* (BO, L, U); Petar: *Berkhout 60* (BO, L); Plangas: *Teijsmann H.B. 3375* (BO, L, P, U); Belinju: *Teijsmann s.n.* (BO, K, L, SING); G. Bui: *Bünnemeijer 1793* (BO), *Teijsmann s.n.* (BO, L); S. Selan: *Berkhout 1059* (BO); Southwest coast: *Bünnemeijer 2468* (BO); Billiton, Tg. Pandan: *Teijsmann H.B. 11093* (BO, Fl, L).

Malay Peninsula. Thailand, Surat Circle, Tako-Langsuan: *Kerr 11893* (K). — Kedah, G. Jerai: *Bell & Haniff s.n.* (K), *Flippance s.n.* (SING), *Evans & Gordon 61* (SING), *Lobb s.n.* (K), *Ridley 5220* (BM, SING), *Robinson & Boden Kloss 5967* (K, SING), *s.n.* (K), *Samsuri Sa 267* (L), *Sa 308* (K, L). — Penang, West. Hill: *Curtis 1768* (K, SING); Penang Hill (= Govt. Hill): *Bireh s.n.* (SING), *Curtis = 1768* (SING), *Maingay 2207 = K.D. 297 p.p.* (BM, FI, K, P), *Ridley 1768* (SING); Rifle Ra. Rd.: *Burkill S.F. 1518* (BM, BO, SING). — Perak: *Scortechini s.n.* (K); Bruas: *Curtis s.n.* (SING); G. Bujong Malaka: *King's coll. 7159* (K), *Scortechini 1870?* (K). — Selangor, Ulu Bubong: *King's coll. 10907* (K). — Negri Sembilan, Tampin: *Ridley s.n.* (SING). — Malacca: *Ridley 7144* (P). — Pahang, Pekan: *Ridley 1367* (BM, CAL, SING); Pontian: *Ngadiman S.F. 36635* (A, BO, K, SING). — Johore, G. Ophir: *Griffith K.D. 793* (K, P), ?*Hullett 850* (BM, SING), ?*Lobb s.n.* (K), *Maingay 2207B = K.D. 297 p.p.* (A, FI, K, L), *Ridley 601, s.n.* (SING); G. Penggaram: *Ridley 11052* (K); G. Belumut: *Holttum 10656* (BM, SING); G. Panti: *Burkill H.M.B. 3193* (K), *Corner s.n.* (SING), *Holttum s.n.* (SING), *Corner S.F. 32215* (A, BO, K, SING), *Kuswata 424* (L), *Sinclair 4759* (E), *Stone et al. 4819* (L); S. Pelepah Kiri: *Corner S.F. 33569* (SING), *S.F. 33576* (BO, K, SING); S. Buloh: *Corporal 772* (SING); Tanah Runto: *Goodenough s.n.* (SING). — Singapore: *Anderson s.n.* (P), *Cantley's coll. s.n.* (SING), *Ridley 1941* (BO, SING), *Wallich 2516 p.p.* (K); Bajau: *Nur & Burkill s.n.* (SING); Chua Chu Kang: *Ridley 14192* (BM, K, SING); Jurong Rd.: *Burkill 6440* (BM); Kranji: *Goodenough 275* (BM), *Ridley 275* (SING), *s.n.* (BO); Bt. Timah: *Goodenough s.n.* (SING); Pasir Panjang: *Ridley 14156* (BM, SING); Woodlands: *Beccari? s.n.* (FI); Changi: *Ridley s.n.* (BM, CAL, SING); S. Murai: *Goodenough 1941* (SING), *Ridley s.n.* (BM); Bt. Mandi: *Langlassé 65* (P).

Borneo. Sarawak, 1st Div.: *Beccari P.B. 3118* (FI, K), *Native coll. 661* (A, BO, L), *1634* (A), *1695* (SING), *1929, 2170* (A, P); G. Serapi (Mt. Matang): *Beccari P.B. 1289* (FI), *1378* (FI, K), *Brooke 8714* (L), *Chai S. 17131* (K), *Clemens 22335* (A, BO, E, K), *Haviland 486* (K), *Hullett s.n.* (BM, SING), *Kanis B 20* (L), *Native coll. E 212* (E), *5081* (A), *Ridley s.n.* (K); Kuching: *Bartlett s.n.* (BM, SING), *Beccari P.B. 107* (FI), *1239* (FI, K), *Brooke 8017* (BM, L), *8340* (BM), *8351* (L), *9701* (BM, L, SING), *9827* (L), *10789* (BM, L), *Browne 9664* (K, L), *Haviland = 486* (K), *Haviland & Hose = 486* (BO, K, L); Bako N.P.: *Brunig S.1157* (K), *Chai S. 18013* (K); Telok Asam: *Purseglove 4898* (K, SING); Tg. Po: *Brooke 10639* (BM, L); towards Kuala Serait: *Kanis B 17* (L); 2nd Div., Betong, Saribas F.R.: *Anderson 8569* (L); 3rd Div., Binatang, P. Bruit: *Anderson 9014* (L); Kelapaan: *Brooke 8837* (BM, L); Hose Mts., Ulu Mujong: *Othman b. Haron S. 14386* (K, L); 4th Div., Niah: *Haviland & Hose = 486* (BM); Miri, NE. Lambir Hills: *Au S. 17260* (K, L); Marudi: *Richards 2660* (A, K); Tinjar, Long Dapoi: *Suib S. 23432* (K); Bt. Dulit: *Synge 1870* (K); Baram: *Haviland & Hose 3180* (K), *Hose 175* (BM, E, K); Ulu Baram, Bario: *Anderson S. 20108* (K); G. Murud: *Moulton 209* (K, SING). — Brunei, Badas F.R.: *Smythies, Ashton & Wood 5881* (BO, K, L); Lumut Hills: *Fuchs 21192, 21199* (K, L); Tutong, Telamba Bridge: *Jacobs 5687* (K, L). — Sabah: *Lobb s.n.* (K, P); Interior Res., Weston: *Melegrito 3401* (A, K); Sandakan Res., Beluran, Sapi F.R.: *Meijer SAN 25463* (K, L); Sandakan: *Native coll. 1316* (BO), *Orolfo 693* (A, SING), *Rahman 1026* (A), ?*Ramos 1144* (L), *1316* (A, BM, L, P); Leila F.R.: *Pereira SAN 43416* (K); Tawau Res., G. Silam: *Wood SAN 15470* (L); East coast (Tawau?): *Creagh s.n.* (BM, K). — W. Borneo: *Jaheri s.n.* (BO, L); Paloh: *Bianchi 55* (BO); Mandor: *Mondi 293* (BO, K, L), *297* (BO, L); Manan: *Polak 237a* (BO); Bt. Singkadjang: *Teijsmann H.B. 8461* (BO, L); G. Kelam: *Hallier B2363* (BO, L), *B2467* (BO), *Langlassé 79* (P); Liang Gagang: *Hallier B2698* (BO, L); G. Kenepai: *Hallier B1461* (BO, L); St. Barbe I. (= P. Pedjantan?): *Langlassé 232* (P). — Central Borneo, Sampit: *Buwalda 7641, 7662* (BO), *7671* (BO, K, L), *Kostermans 7918* (L). — S. Borneo, Djihi: *Hub. Winkler 3266* (BM, BO, K, L). — E. Borneo, G. Djempanga: *Amdjah 717* (BO, L); Bulungan, S. Sebakis: *Kostermans 9267* (BO, L); S. Binai: *Rutten 21* (BO, U); S. Belajan, G. Palimasan: *Kostermans 12749, 12771A* (BO, L), *12789A* (L), *12906* (BO, L); Samarinda, S. Tiram: *Meijer 1058* (BO); P. Nunukan: *Kostermans 8771, 9001* (BO, K, L); P. Tarakan: *Meijer 2487* (BO), *2513* (BO, K, L).

Ecology: From sea level up to 1000 m, on poor soils, preferable in moist, shady places.

Vernacular names: Malaya: *pělawan běrok*. Sumatra: *bělusung putih, kaju padang, mata pělanduk* (Banka); *balong* (Biliton). Borneo: *tambu* (Sarawak); *ranggas hutan* (Sabah); *iur iur* (W. Borneo).

Use: Medical application of the roots is reported from Malaya. In Brunei the fruits are used against eye-diseases.

Remarks: Jack's original specimen was collected at Singapore in 1819 and most probably was lost by shipwreck in 1824. Cowan does not mention this species among Jack's plants in Edinburgh (Not. R. Bot. Gard. Edinb. 21, 1954, 219—227). The Kew specimen that is marked as the type of this species, is certainly a duplicate from the collection Wallich 2516 p.p. made at Singapore in 1822. I accept this collection as neotype of *E. leucocarpa* Jack.

The name '*E. jackiana*' is cited in Index Kew. with reference to Hooker *f.*, Trans. Linn. Soc. 23 (1860) 163. In the latter paper two new species were published and regarding *Euthemis robusta* it was stated: 'Ab *E. leucocarpa*, Jack, differt omnibus partibus duplo majoribus, (....). *Fructus E. Jackianae*, sed duplo major'. Obviously, the expression '*E. Jackianae*' was used for '*Jack's Euthemis*' (= *E. leucocarpa*) in comparison with his own new species (*E. robusta*) and it cannot be mistaken for another one.

Among the specimens examined, there are two sheets that undoubtedly have been mislabelled. The Leyden specimen of *Ramos 1144* is from the *Herbier d'Alleizette* and is reported from the Philippines. This annotation is very doubtful, however, as the genus has otherwise never been collected in the Philippines. Probably the collection was made by Ramos at Sandakan and vicinity in 1920.

A Kew specimen, collected by Horsfield and bearing no date and collector's number, is labelled 'Java'. Since no native *Ochnaceae* occur in that island, I presume this material is collected during Horsfield's exploration of Banka and Palembang in 1812—1813.

2. **Euthemis minor** Jack, Malay Misc. 1, 5 (1821) 18; Wall. in Roxb., Fl. Ind. 2 (1824) 304; Jack in Hook., Bot. Misc. 2 (1831) 69; Walp., Repert. 1 (1842) 528; Ann. 1 (1849) 179; Miq., Fl. Ind. Bat. 1, 2 (1859) 675; ibid. Suppl. 1 (1860) 209, 534; Scheffer, Nat. Tijd. N.I. 32 (1873) 412; Benn. in Hook. *f.*, Fl. Br. Ind. 1 (1875) 526; King, J. As. Soc. Beng. 62, II (1893) 235; Bartell., Malpighia 15 (1901) 168; Ridl., J. Str. Br. R. As. Soc. 54 (1910) 34; Hall. *f.*, Beih. Bot. Centralbl. 34, 2 (1917) 32; Merr., J. Str. Br. R. As. Soc. 86 (1921) 388; Ridl., Fl. Mal. Pen. 1 (1922) 368; Airy Shaw, Kew Bull. (1940) 250; Merr., J. Arn. Arb. 33 (1952) 224. — Type: *Jack* †, Singapore. — Neotype: *Wallich 2517* (K), Singapore, fl. & fr. 1822.

E. obtusifolia Hook. *f.*, Trans. Linn. Soc. 23 (1862) 163; Walp., Ann. 7 (1868) 544; Bartell., Malpighia 15 (1901) 169; Hall. *f.*, Beih. Bot. Centralbl. 34, 2 (1917) 33; Merr., J. Str. Br. R. As. Soc. 86 (1921) 389; Airy Shaw, Kew Bull. (1940) 250. — Type: *Lobb s.n.* (K holo, P), Borneo, fl. 1853.

E. engleri Gilg in E. & P., Nat. Pfl. Fam. 3, 6 (1895) 152, f. 78; Bartell., Malpighia 15 (1901) 169; Hall. *f.*, Beih. Bot. Centralbl. 34, 2 (1917) 33; Airy Shaw, Kew Bull. (1940) 250. — Type: unknown collection in B †?, Labuan I.

E. ciliata Pearson, Kew Bull. (1906) 3; Hall. *f.*, Beih. Bot. Centralbl. 34, 2 (1917) 33. — Type: *Ridley 9000* (K holo, P, SING), Sumatra, Siak, Penassa, fl. XI-1897.

E. hackenbergii Diels, Bot. Jahrb. 60 (1926) 310; Airy Shaw, Kew Bull. (1940) 250. — Type: *Hackenberg 10* (B †?), S. Borneo, Sampit, fl. 11-VI-1923.

Shrublet up to 3 (—5 ?) m. Branchlets slender, blackish. *Stipules c.* 3 by 1 mm, acuminate, serrulate. *Leaves* with up to $1\frac{1}{2}$ cm long, winged petiole; lamina oblong to oblanceolate, 4—15 by $1\frac{1}{2}$—4 cm, obtuse at apex, mucronate, tapering at base, margin faintly denticulate, nerves *c.* 1 mm apart. *Inflorescences* lax racemes, 5—30 cm long, often pseudo-lateral, sometimes drooping; rachis slender; branches ± shortened; bracts on the rachis 5—12 by 1—2 mm, caducous, on branches trigonous, *c.* 1 mm long, acuminate. *Flowers* functionally polygamous, complete, often 2 or more conferted. *Sepals* obovate, unequal, 4—4½ by 2½—3½ mm, ciliate near the apex, acuminate. *Petals* lanceolate, 6—8 by 2½—3 mm, distinctly reflexed in ♂ flowers. *Anthers* 3½—4½ by *c.* 1 mm, yellow. *Ovary* in ♀ or ⚥ flowers obovoid, 5-ribbed, *c.* 2½ by 1⅓ mm; style *c.* 2½ mm long, widening into the ovary; ovary in ♂ flowers very much reduced, depressed globular, shallowly 5-lobed, *c.* 0.2 by 0.4 mm; style *c.* 0.2 mm long, broadly conical at base. *Fruit* globular, up to 6 mm ∅, acuminate, 5-ribbed, red. *Seeds* semiannular, *c.* 4 by 2½ mm.

Distribution: Sumatra, S. Malay Peninsula, and Borneo.

SUMATRA. Riau, S. Siak, Penassa: *Ridley 9000* (K, P, SING); P. Batam: *Ridley 12525* (BM, SING), *s.n.* (SING); P. Lingga: *Nong Chie s.n.* (SING); Batu Rajah: *Hullett 5725* (BM, SING); G. Daik: *Bünnemeijer 6705* (BO), *6713* (BO, L, SING), *Hullett 5699* (BM, CAL, SING); G. Tanda: *Bünnemeijer 6859* (BO, K, L, SING, U), *6875*, *6887* (BO), *Teijsmann s.n.* (BO, L). — S. Sumatra, Banka, Djebus: *Teijsmann s.n.* (BO, L); Plangas: *Teijsmann H.B. 3373* (BO, L, SING, U); G. Bui: *Bünnemeijer 1787* (BO, L), *Teijsmann s.n.* (BO, K, L); G. Maras: *Kostermans & Anta 1256* (BO, K, L), *De Leeuw 5* (BO, L, SING).

MALAY PENINSULA. Singapore: *Pierre 5876* (P), *Wallich 2517* (K); Chua Chu Kang: *Ridley 14191* (K, SING).

BORNEO. Sarawak, 1st Div.: *Native coll. 2226* (A); G. Serapi (Mt. Matang): *Bartlett s.n.* (SING), *Beccari 1712* (FI, K), *2525* (FI), *Haviland s.n.* (SING), *Native coll. E211* (E), *Ridley s.n.* (K); Bungoh Ra.: *Brunig S 7627* (SING); G. Santubong: *Native coll. C 48* (E), *Haviland s.n.* (K, SING); Kuching: *Brooke 9779* (L, SING); Bako N.P.: *Brunig S 7669* (SING), *Carrick & Enoch JC/13* (K, L), *Smitinand 28331* (L); Lintang Path: *Jacobs 5504* (K, L), *Kanis B 13*, *B 14* (L); Telok Asam: *Purseglove 4888* (K, L, SING), *5544* (K, L); Bt. Tambi: *Sleumer 4679* (L); Telok Tajor: *Chai S. 18012* (K, L); Telok Pandan Path: *Chai & Paie S. 17285* (K, L); G. Stupong: *Native coll. 5123* (A, BO, SING); 3rd Div., Kabang near Sibu: *Wyatt Smith C.F. 79332* (K); Hose Mts., Ulu Tiau: *Asahak Unyong S. 21206* (K, L); 4th Div., Bt. Dulit: *Richards 1647* (K), *1662* (A, K, SING), *2131* (K); Bg. Baram: *Anderson S. 2882* (SING); Marudi, Lobok Pasir: *Fuchs 21244* (K), *Yacup S. 11220* (K, L); Usun Apau Plat.: *Pickles SAR 2987* (L), *S. 3924* (SING); G. Sanaboh: *Moulton 6772* (K, SING). — Sabah: *Lobb s.n.* (K, P); Interior Res., Sipitang, Menggalong F.R.: *Meijer SAN 21807* (K, L); Bt. Pantai: *Lumau 2607* (A, BO, K); Sandakan Res.: *Ramos 1315* (A), *Rycroft s.n.* (BM); Leila F.R.: *Meijer SAN 20031* (K, L), *SAN 47343* (K, L), *Sam SAN 26505* (K, L). — W. Borneo: *Jaheri s.n.* (BO, L); Pangkalan: *Dunselman 156* (BO); Tajan: *Main 1704* (BO, K, L); Sintang, Parret Mas: *Main 1794* (BO); G. Kelam: *Hallier B 2364* (BO, L); G. Kenepai: *Hallier B1445* (BO, K, L), *B2193* (BO, L); Pladjang: *Main 1890* (BO, L); P. Madjang: *Teijsmann H.B. 8463*, *8464* (BO, L); G. Amai Ambit: *Hallier B3408* (BO, L); S. Bika: *Hans Winkler 1421* (L); P. Karimata: *Teijsmann H.B. 1599* (BO). — Central Borneo, Sampit: *Buwalda 7646* (A, BO, K, L, SING), *7738* (BO). — S. Borneo, Djihi: *Hub. Winkler 3268* (K, L, SING). — E. Borneo, Müller Mts.: *Amdjah 159* (BO); Bulungan, S. Sebakis: *Kostermans 9251* (BO, L), *9273* (BO, K, L); Tabang, G. Palimasan: *Kostermans 12938* (K, L).

Ecology: From sea level up to 1250 m, often found near the previous species, but generally in drier and more exposed places.

Vernacular names: Sumatra: *bĕlusung mèrah, kĕtjing pĕlanduk* (Banka). Borneo: *buah itĕk* (Sarawak); *pĕtikawo* (Sabah, Kedayan); *mata pĕlandok* (W. Borneo).

Remarks: The typification of this species meets with the same difficulties, already explained for *E. leucocarpa.*

Polygamy was not recorded in *Euthemis* before, but in this species I examined many specimens which are doubtlessly functionally male. I am not certain whether fruiting specimens generally have bisexual or functionally female flowers, but these possibilities are probably both realised.

Tribe 3. SAUVAGESIEAE

Ging. *ex* DC., Prod. 1 (1824) 315, *err.* '*Sauvageae*'; Lindl., Intr. Nat. Syst. Bot. (1830) 148; Meisn., Pl. Vasc. Gen. 1 (1836) 21; ibid. 2 (1836) 64; B. & H., Gen. Pl. 1 (1862) 120; Walp., Ann. 7 (1868) 220; Le Maout & Decne., Traité Gén. Bot. (1868) 432; Baill., Hist. Pl. 4 (1873) 339; Engl., Nova Acta Leop.-Carol. Akad. 37, 2 (1874) 22; Eichl., Blütendiagr. 2 (1878) 257—259; Soler., Syst. Anat. Dicot. (1899) 95—97. — *Luxemburgieae* [*non* Planch. in Hook., Lond. J. Bot. 5 (1846) 593, 595] Gilg in E. & P., Nat. Pfl. Fam. 3, 6 (1895) 145; D.-T. & H., Gen. Syph. (1903) 316; Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 64, *emend. illeg.*; Decker, Phytomorphology 16 (1966) 39—55. — Type genus *Sauvagesia* L.

Trees, shrubs, or undershrubs. Lateral nerves of leaves archingly joined near the margin. Staminodes 10—∞ in 1 or more whorls. Stamens ± adnate at base to a short tube of inner staminodes; anthers opening by 2 lateral slits. Ovary 2—3-carpelled, 1-celled with intruding placentas; ovules ∞. Fruit a coriaceous capsule, acuminate by the style, dehiscing along sutures which represent the margins of the carpels. Seeds usually ∞, small.

Distribution: 6 genera confined to SE. Asia, the Malesian area, and the western Pacific; 1 genus occurring in Africa and America, and several others confined to the neotropics.

Remarks: The following deviations from the general characteristics given above are found in American genera:

(a) Staminodes absent.
(b) Stamens 10 or ∞.
(c) Ovary 3-celled.
(d) Ovary 5-carpelled, 5-celled.

5. SINIA

Diels, Notizbl. Bot. Gart. Berlin 10 (1930) 888; Vidal, Bull. Soc. Bot. Fr. 111 (1965) 347, 350. — Type species: *Sinia rhodoleuca* Diels.

Shrublets. *Stipules* entire. *Nerves* ascending at an angle of 70—80°, slightly curved. *Inflorescences* terminal, many-flowered, compound racemes; branches much shortened. *Flowers* bisexual. *Staminodes* ∞ of 2 types, the inner 10 in 2 alternating whorls, mutually and with the stamens connate at base. *Ovary* 3-carpelled; stigma 1. *Fruit* and *seeds* unknown.

Distribution: One species in SE. China.

1. **Sinia rhodoleuca** Diels, Notizbl. Bot. Gart. Berlin 10 (1930) 889; Vidal, Bull. Soc. Bot. Fr. 111 (1965) 350, f. 1b. — Type: *Sin 8197* (B † holo, K, SYS), Kwangsi, Mt. Yao-shan, Lohsiang, 600—1000 m alt., fl. 4-V-1929.

Shrublet up to 1¼ (?) m high. *Stipules* narrowly lanceolate, up to 2 mm long, glandulose-ciliate. *Leaves* with 2—5 mm long petiole; lamina obovate-lanceolate, 8—13 by 2—3½ cm, sharply acuminate at apex, ± tapering at base, margin irregularly serrulate, papyraceous, nerves *c.* 1 mm apart. *Inflorescences* 5—8 cm long; pedicels filiform, *c.* ½ cm long (?);bracts small, glandulose-ciliate. *Flowers* erect (?). *Sepals* ovate to ovate-oblong, 4—5 by 1¾—3 mm, glandulose-ciliate. *Petals* elliptic, 4—5 by *c.* 3 mm, pinkish white. Outer *staminodes* ∞, gland-like or somewhat spatulate, 1—1¾ mm long; inner staminodes 10, spatulate, *c.* 1 mm connate at base, those opposite to the stamens 3—6 by 1—1½ mm, with 3—5 ± distinct, parallel nerves, the alternating ones 3—5 by ½—¾ mm, with 1 distinct nerve. *Stamens* with *c.* 1 mm long filaments; anthers *c.* 2 mm long. *Ovary* ovoid, 1½—3 mm long; style 1½—3 mm long; stigma minute. *Fruit* and *seeds* unknown.

Distribution: SE. China.

CHINA. Kwangsi, Mt. Yao-shan, Lohsiang: *Sin 8152* (A, B†, SYS), *8197* (B†, K, SYS).

Ecology: Reported from 600—1000 m altitude. Flowering in April and May.

Remarks: Diels' original specimens have been burnt in the Berlin herbarium. The specimens in A and K are only fragments, but photographs of the Cantonese specimens are available in P. Since good material is difficult to obtain, the data presented here are mainly compiled from Diels' description.

6. INDOSINIA

Vidal, Bull. Soc. Bot. Fr. 111 (1965) 405. — *Distephania* [*non* Steud., Nomencl. ed. 2, 1 (1840) 521 = *Distephana* Juss., Ann. Mus. Paris 6 (1805) 396] Gagnep., Bull. Soc. Bot. Fr. 95 (1948) 31, *nom. illeg.*; Vidal, ibid. 111 (1965) 346—350. — Type species: *Indosinia involucrata* (Gagnep.) Vidal.

Shrubs with slender branchlets. *Stipules* lacerate. Nerves ascending at an angle of 70—80°, straight or slightly curved near the margin. *Inflorescences* terminal, many-flowered panicles. *Flowers* bisexual, with an anthophore (prolonged axis between calyx and corolla). *Petals* in anthesis soon surpassing the sepals in size. *Staminodes* 10, in 2 alternating whorls, mutually and with the stamens connate at base. *Ovary* 2-carpelled; stigma 1. *Style* of ripe fruits splitting into 2 parts. *Seeds* not winged.

Distribution: One species in S. Vietnam.

1. Indosinia involucrata (Gagnep.) Vidal, Bull. Soc. Bot. Fr. 111 (1965) 405. — *Distephania involucrata* Gagnep., Bull. Soc. Bot. Fr. 95 (1948) 31, *nom. illeg.*; Du Chalard, ibid. 97 (1950) 85, fig.; Duchaigne & Du Chalard, ibid. 98 (1951) 106—108, f. 1, 2; Vidal, ibid. 111 (1965) 346, f. 1a, 2, pl. 1. — Lectotype: *Poilane 3498* (P), Annam, Nha Trang, forest, 1700 m alt., fl. 20-V-1922. — Paratype: *Poilane 6489* (K, L, P), Annam, Nha Trang, N. of Ninh Hoa, fl. 17-V-1923.

Shrubs up to 2½ (?) m high. *Stipules* ± triangular, 1—2 mm long, acuminate. *Leaves* with 5—10 mm long petiole; lamina obovate-lanceolate to linear-lanceolate, 5—15 by 1—3 cm, obtuse to acute at apex, ± tapering at base, margin serrulate, chartaceous, nerves *c.* 1 mm apart. *Inflorescences* 14—18 cm long; pedicels filiform, 1—2 cm long, up to 3 cm in fruit; bracts ovate-oblong, up to 4 by 1½ mm, acute, glandulose-ciliate. *Flowers* erect. *Sepals* ovate-oblong, 3—4 by *c.* 1 mm, acute, glandulose-ciliate, distinctly reflexed in fruit. *Petals* ovate-oblong, 6½—8 by *c.* 2½ mm, acute, white, distinctly reflexed. *Staminodes* linear-lanceolate, purplish, those opposite to the stamens 7—8 by *c.* 1¼ mm, with 2 distinct, parallel nerves, the alternating ones 6—6½ by *c.* ¾ mm with 1 distinct nerve. *Stamens* with short filaments, adnate to tube of staminodes; anthers subtriangular, 2—2½ by 1 mm, the connective terminating in a little mucro. *Ovary* ovoid, 2—3 mm long; style 3—4 mm long, stigma capitulate. *Fruit* ovoid, cuspidate by the style, *c.* 12 mm long, *c.* 6 mm ∅. *Seeds* obliquely obovoid, *c.* 3 by 1—1½ mm, testa reticulately ribbed.

Distribution: S. Vietnam.

S. VIETNAM. Nha Trang: *Poilane 3498* (P); Cascade W. of Nha Trang: *Poilane 3656* (K, L, P); N. of Ninh Hoa: *Poilane 6489* (K, L, P).

Ecology: Reported twice from forest at 1700 m altitude. Flowering and fruiting in May.

Remarks: The genus *Distephania* was wrongly described by Gagnepain (1948) as a member of the *Saxifragaceae-Escalonieae*. He interpreted the calyx as an involucre, because of the bract-like appearance of the sepals, separated from the rest of the flower by an anthophore. Consequently, the corolla was interpreted as a calyx and 5 of the staminodes as petals.

Van Steenis already doubted Gagnepain's interpretation of the flowerparts as early as 1951. He presumed the taxonomic status of the genus to be in the *Ochnaceae* (personal communication). It was also referred (in sched.) to the *Ochnaceae* by Hoogland in 1959 and later on it was more precisely placed within the *Luxemburgieae* by Mme Lecompte (Vidal, 1965).

Vidal (1965) published a reinterpretation of the flower. He referred the genus to the *Ochnaceae-Sauvagesieae*. He also introduced the new name *Indosinia*, since *Distephania* Gagnep. has to be treated as a later homonym of *Distephana* Juss. under Art. 75 of the present Code.

7. NECKIA

Korth., Ned. Kruidk. Arch. 1 (1848) 358; Walp., Ann. 2 (1852) 67; B. & H., Gen. Pl. 1 (1862) 120; Baill., Hist. Pl. 4 (1873) 355; Gilg in E. & P., Nat. Pfl. Fam. 3, 6 (1895) 148, f. 70f; Ridl., J. Str. Br. R. As. Soc. 49 (1908) 11; Fl. Mal. Pen. 1 (1922) 134; Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 81, f. 33F; Airy Shaw, Kew Bull. (1940) 252 (key). — Type species: *Neckia serrata* Korth.

Shrublets or undershrubs. *Stipules* pectinate. Nerves ascending at an angle of 70—80°, slightly curved. *Inflorescences* axillary, much reduced; the rachis bearing some small bracts, but only 1 terminal flower; pedicels articulate. *Flowers* bisexual. *Staminodes* ∞, of 2 types, the inner ones forming a tube at base; *stamens* adnate to the tube. *Ovary* 3-carpelled; stigma 1. Style of ripe fruit splitting into 3 parts. *Seeds* not winged.

Distribution: One species in Sumatra, S. Malay Peninsula, Borneo, and the Philippines.

1. **Neckia serrata** Korth., Ned. Kruidk. Arch. 1 (1848) 358; Walp., Ann. 2 (1852) 67; Miq., Fl. Ind. Bat. 1, 2 (1859) 118; Ann. Mus. Bot. Lugd. Bat. 4 (1869) 218; Boerl. & Koord., Ic. Bogor. 1, 4 (1901) 1, t. 76; Ridl., J. Str. Br. R. As. Soc. 49 (1908) 13, 14; Merr., J. Str. Br. R. As. Soc. 86 (1921) 388. — Type: *Korthals s.n.* (L holo, U), Sumatra, G. Singgalang & G. Malintang, fr.

N. lancifolia Hook. *f.*, Trans. Linn. Soc. 23 (1860) 158; Walp., Ann. 7 (1868) 221; Ridl., J. Str. Br. R. As. Soc. 49 (1908) 13; Airy Shaw, Kew Bull. (1940) 252. — Type: *Lobb s.n.* (K holo), N. Borneo, fl. 1853.

N. humilis Hook. *f.*, Trans. Linn. Soc. 23 (1860) 159; Walp., Ann. 7 (1868) 221; Ridl., J. Str. Br. R. As. Soc. 49 (1908) 14. — Lectotype: *Lobb s.n.* (K), N. Borneo, Labuan I., fr. — Paratype: *Motley 314* (K), N. Borneo, Labuan I., fr.

N. malayana Ridl., J. Str. Br. R. As. Soc. 49 (1908) 11; Fl. Mal. Pen. 1 (1922) 134, f. 13. — Lectotype: *Kloss s.n.* (SING), Johore, S. Pelepak, fl. & fr. 1905. — Paratypes: *Lake & Kelsall s.n.* (SING), Johore, G. Janeng, fr. 20-X-1892; *Hullett s.n.* (SING), Lingga, 200—300 ft., fr. 16-VII-1893.

N. malayana Ridl. var. *angustifolia* Ridl., J. Str. Br. R. As. Soc. 49 (1908) 11. — *N. malayana* Ridl. f. *major* Ridl., Fl. Mal. Pen. 1 (1922) 135. — *N. lancifolia* Hook. *f.* f. *major* Airy Shaw, Kew Bull. (1940) 252. — Type: *Ridley 2269* (BM, K, SING holo), Pahang, Tahan R., fr. 1891.

N. distans Ridl., J. Str. Br. R. As. Soc. 49 (1908) 12; Merr., J. Str. Br. R. As. Soc. 86 (1921) 388; Airy Shaw, Kew Bull. (1940) 250. — Type: *Ridley 9054* (K, SING holo), N. Borneo, Labuk Bay, Bongaya, fl. X-1887.

N. klossii Ridl., J. Str. Br. R. As. Soc. 49 (1908) 13. — Type: *Kloss s.n.* (K, SING holo), Riau, P. Batam, fl. III-1906.

N. parviflora Ridl., J. Str. Br. R. As. Soc. 49 (1908) 14; Merr., J. Str. Br. R. As. Soc.

86 (1921) 388. — Type: *Ridley 12320* (K, SING holo), Sarawak, Puak, fr. IX-1905.

N. ovalifolia Capit., Bull. Soc. Bot. Fr. 57 (1910) 397, t. 13; Merr., J. Str. Br. R. As. Soc. 86 (1921) 388; Airy Shaw, Kew Bull. (1940) 252. — Lectotype: *Jaheri 453* (BO holo, L), Borneo, S. Bloe-oe, fl. & fr. 1896—97. — Paratype: *Hallier 638* (BO), Borneo, G. Damoes, fl. 22—24-X-1893.

Sauvagesia jaheriana Capit., Bull. Soc. Bot. Fr. 57 (1910) 397, t. 13; Merr., J. Str. Br. R. As. Soc. 86 (1921) 388. — Type: *Jaheri 1626* (BO holo, L), Borneo, Bt. Batu Ajah, fl. 1896—97.

N. malayana Ridl. f. *minor* Ridl., Fl. Mal. Pen. 1 (1922) 135. — Type: *Ridley 4164* (K, SING holo), Johore, G. Panti, fr. X-1892.

N. grandifolia Ridl., Kew Bull. (1925) 77. — Type: *Brooks 7605* (K holo), Sumatra, Bengkulu, Lebongtandai, 1000 ft., fl. VI-1922.

N. klossii Ridl. var. *borneensis* Airy Shaw, Kew Bull. (1940) 251. — Type: *Richards 1479* (K holo), Sarawak, Mt. Dulit near Long Kapa, *c.* 700 m, fl. & fr. 27-VIII-1932.

N. obovata Airy Shaw, Kew Bull. (1940) 251. — Type: *Richards 1413* (K holo), Sarawak, Mt. Dulit near Long Kapa, under 300 m, fl. & fr. 23-VIII-1932.

N. philippinensis Merr. & Quis., Philip. J. Sc. 82 (1954) 329, pl. 2. — Type: *Sulit P.N.H. 6248* (L, PNH holo?), Samar, Concord, Bagacay, fr. IV—V-1948.

Shrublet up to 1 m high, often much smaller, often unbranched. *Stipules* compound, 1—3 mm wide, the parts unequal, acicular, ½—1 cm long, lacerate. *Leaves* with up to 15 mm long petiole; lamina obovate to long obovate-lanceolate, 3—25 by ¾—7½ cm, mostly acute to acuminate, sometimes obtuse, tapering at base, biserrulate, membranous to chartaceous, nerves 1½—3 mm apart. *Inflorescences* with filiform rachis, 1—5 cm long; bracts up to 10, linear, *c.* 2 mm long, sometimes with small stipules; pedicels filiform, 8—15 mm long. *Flowers* pendulous. *Sepals* lanceolate, 4—7½ by 1—3 mm, acute, margins dentate, creamy or pinkish green, turning dark red. *Petals* elliptic, 2½—5 by 1¼—2 mm, white. Outer *staminodes* ∞, unequal, long spatulate or gland-like, ¼—1 mm long; inner staminodes 15—25, 1—1¾ mm long, ± half connate, the free lobes spatulate, the 5 lobes alternating with the stamens longer. *Stamens* with terete filaments, the free part up to 1 mm long; anthers lanceolate, 1—1½ by *c.* ½ mm, yellow. *Ovary* ovoid, 1—1.2 by 0.5—0.6 mm, style *c.* 1 mm long; stigma clavate. *Fruit* subtrigonous in cross-section, *c.* 5 by 2½ mm. *Seeds* ellipsoid, about 0.5 by 0.3 mm, areolate.

Distribution: Sumatra, S. Malay Peninsula, Borneo, and the Philippines.

SUMATRA. N. Sumatra, Sibolga: *Batten Pooll s.n.* (SING); Batu Is., P. Pini: *Raap 567* (BO). — W. Sumatra, G. Singgalang & G. Malintang: *Korthals s.n.* (L); Taram: *Meijer 6854, 6952, 6963* (L); Muarapadjanki: *Buwalda 6412* (K, L); Mentawei Is., Siberut: *Kloss S.F. 14076* (BO, K, SING), *Iboet 200* (BO, L, SING). — Riau, S. Segati: *Koorders 15775* (BO); Taluk: *Meijer 4249* (L); Riau Arch., P. Battam: *Kloss s.n.* (K, SING); Lingga Arch., P. Lingga: *Bünnemeijer 6583* (BO, L), *Hullett s.n.* (SING), *Nong Chie s.n.* (SING), *Teijsmann s.n.* (BO). — Djambi, S. Karing: *Posthumus 653* (BO); Bangko: *Posthumus 600* (BO, L, SING). — S. Sumatra, Bengkulu, Lebongtandai: *Brooks 7605* (K).

MALAY PENINSULA. Trengganu, Kemaman, S. Nipa: *Corner s.n.* (SING). — Pahang, G. Tahan: *Haniff & Nur S.F. 8093* (SING); Tahan R.: *Ridley 2269* (BM, K, SING); Kuala Tahan: *Seimund 938* (SING); Endau: *Mahmud C.F. 15546* (K, SING). — Johore, S. Gatong, Labis: *Henderson S.F. 38253* (SING); G. Janeng: *Lake & Kelsal s.n.* (SING); Kluang F.R.: *Ng K.F.N. 98017* (K); G. Blumut: *Holttum S.F. 10619* (BM, BO, SING); G. Pulai: *Sinclair S.F. 39626* (K, L, SING); G. Panti: *Ridley 4164* (K, SING), *Holttum S.F. 18090* (BM, SING), *S.F. 19666* (SING), *Merton 5003* (K); Kota Tinggi: *Shah MS 444* (K, L); Ulu Segum: *Corner s.n.* (SING); Rotan Susor: *Nur S.F. 19995* (BO, SING); Pelepah: *Kloss s.n.* (SING).

BORNEO. Sarawak, 1st Div., G. Pueh: *Purseglove 4807* (L, SING); Puak: *Ridley 12320* (K, SING); G. Matang: *Anderson 15* (SING), *Beccari P.B. 1459* (FI), *Miss Brooke 9512* (L), *Clemens 20921* (K), *Hullett s.n.* (SING), *Ridley s.n.* (BM, K, SING); G. Santubong: *Mjöberg 161* (BM); Bako Nat. Park, Telok Asam: *Purseglove 4877* (K, L); Telok Tajor: *Purseglove 4935* (K, L); Tg. Po: *Miss Brooke 10610* (BM, G, L);

Ulu Serait: *Chai & Paie S. 17835* (K, L), *Kanis B 18, B 19* (L); Serian, Krusin: *Miss Brooke 9613* (BM, G, L); G. Gaharu: *Anderson S. 15315* (K, L); 2nd Div., G. Apeng: *Collenette 745* (K); Bg. Lupar, Bantin: *Beccari P.B. 499* (FI); Lubok Antu: *Miss Brooke 10682* (G, L); Bg. Saribas, Kalong: *Haviland 1546* (K); 3rd Div., Long Bah: *Miss Brooke 9012* (L); Hose Mts., Ulu Temalad: *Ashton S. 17612* (K); Ulu Mujong: *Ashton S. 21236* (K, L); Upper Rejang, Gat: *Clemens 21821* (K); Gilam Bakun: *Miss Brooke 9085* (G, L); G. Teneong: *Miss Brooke 9187* (L); 4th Div., Bintulu, E. Bt. Kana, Ulu Bejangung: *Hotta 15341* (L); Similajau F. R., Ulu Sinrok: *Ashton S. 18313* (K, L); Baram Distr.: *Haviland & Hose 3155* (BM, K); Dulit Ra., Long Kapa: *Richards 1381, 1413, 1479* (K); Bt. Dulit: *Richards 1672* (A, BO, K, SING); 5th Div., Lawas: *Miss Brooke 10006, 10246* (L). — Brunei, Seria, Bt. Teraja: *Hotta s.n.* (L); Temburong, N. Bt. Bangar: *Hotta 13258* (L); near junction S. Temburong and S. Belalong: *Jacobs 5578* (K, L). — Sabah: *Lobb s.n.* (K), *Burbidge s.n.* (BM); Interior Res., S. Padas: *Kidman Cox 253* (K); Labuan I.: *Barber s.n.* (K), *Lobb s.n.* (K), *Motley 314* (K); West Coast Res., Kota Belud: *Darnton 500* (BM); Mt. Kinabalu, Marai Parai: *Clemens 10906* (K), *32489* (BO); Penibukan: *Clemens 31018, s.n.* (A, BO, G, K, L); Bahandoi: *Kanis SAN 53971* (K); Sandakan Res., Labuk, Bay, Bongaya: *Ridley 9054* (K, SING); Sandakan: *Arsat: C.F. 835* (K), *Clemens 9498* (A, BO), *Ramos 1122* (A, BM, BO, L, P), *Topping 1370* (BO); Leila F.R.: *Kanis & Meijer SAN 53480* (K); Kebun China F. R.: *Sinanggul SAN 36613* (K). — W. Borneo, Landak: *Teijsmann s.n.* (BO, FI); Sambas, G. Damus: *Hallier 638* (BO); S. Malang: *Hans Winkler 1273* (L); Bt. Mehipit: *Hans Winkler 656* (L). — E. Borneo, Upper Mahakam, S. Bluhu: *Jaheri 453* (BO); Bt. Batu Ajah: *Jaheri 1626, 1636a* (BO); G. Palimasan on S. Belajan: *Kostermans 12786* (L); Long Puhus on S. Telen: *Endert 4897* (A, BO, K, L, SING); Balikpapan, S. Wain: *Kostermans 4049* (BO, L); P. Nunukan: *Kostermans 9087, 9090* (BO, K, L), *Meijer 2022* (BO), *2215, 2215a* (BO, L); P. Tarakan: *Meijer 1856* (BO).

Philippines. Samar, Concord, Bagacay: *Sulit P.N.H. 6248* (L).

Ecology: Found up to 1200 m altitude, in moist, shady places in kerangas forests as well as in richer rainforests, especially on boulders, cliffs, and wet slopes, along brooklets and small rivers, sometimes near waterfalls or subject to occasional inundation. Soils are reported as sandstone, acid sand, sandy loam, loam, or tuff.

Remarks: Airy Shaw met with the difficulty to identify some *Neckia* specimens collected by the Oxford University Expedition to Sarawak in 1932. In 1940 he published a tentative key of the genus based on the earlier descriptions and on the specimens he had at hand. He accepted the species described by Hooker and Ridley, except for *N. malayana* Ridl. which he united with *N. lancifolia* Hook. *f.* Though he was not able to see the original material, he presumed *N. ovalifolia* Capit. to be conspecific with one of the other Bornean species. As most of the *Neckias* collected are fruiting specimens, his key was mainly based on leaf-characters and a species with relatively broad, obovate leaves was newly added.

Fortunately I had the opportunity to study more than 100 collections of *Neckia* from the whole area, among which type material of all taxa described in the genus. This material gives a fine survey of the variability in *Neckia*. It appears impossible to draw any demarcations within this abundance of specimens which form together a fully intergrading mass. The specimens Airy Shaw described under the name of *N. obovata* have a rather uncommon habit indeed: one specimen (*Richards 1381*) has leaves which are rounded at apex, the other (*Richards 1413*, type), however, has some leaves that are distinctly obtuse. Other specimens from Mt. Dulit (*Richards 1479, 1672*) show more normal, narrower leaves with an acute to acuminate apex and in my opinion the forms from this mountain are still closely related.

The variability in the genus *Neckia* must primarily be due to variation in the ecological conditions. I could not find correlation of measurements with the altitude, but *Neckia* is not found over 1200 m and, as a rule, the influence of the altitude is shown better in montane and subalpine zones. I am convinced that, most of all, the plants need moist, shady places and will be capable to germinate and to produce a few flowers even while growing in a moss carpet over boulders. The smaller specimens I have seen in the field are regarded by me to be dwarfed forms by lack of nutrition. Shade, water-supply, occasional inundation, or other ecological circumstances may also exert influence upon the habit of the plants.

In my opinion the genus *Neckia* Korth. is monospecific. There will probably be genetic differences between local populations, but it seems impracticable to me to distinguish infraspecific taxa, since no useful differences are found in the geographical distribution of morphological characters. Generally speaking, the greatest variability is found among Bornean specimens, whereas the plants with the largest leaves are found in Sumatra.

From the Geneva Herbarium I saw one specimen of *Neckia serrata* Korth. labelled 'J. & M. S. Clemens 3420, Flora of New Guinea, Morobe Distr., Yoangen to Yunzaing, 4500—5500 ft., 18-VI-1936'. As this would be the only specimen of *Neckia* ever found in eastern Malesia, I presume it was erroneously labelled and belongs to former collections of the Clemenses from Borneo made in 1933. No duplicate of this number was found in the other herbaria consulted.

8. INDOVETHIA

Boerl., Feestbundel P. J. Veth (1894) 89; Ic. Bogor. 1 (1897) 9; Engl. in E. & P., Nat. Pfl. Fam. Nachtr. 2 (1900) 45; Bartell., Malpighia 15 (1901) 170; Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 80. — Type species: *Indovethia calophylla* Boerl.

Shrublets. *Stipules* pectinate. Nerves ascending at an angle of 60—70°, slightly curved. *Inflorescences* terminal, many-flowered, compound racemes; mostly some lower branches well developed, the other ones much shortened with a few flowers; bracts small. *Flowers* bisexual. *Staminodes* 10 in 2 alternating whorls, mutually and with the stamens connate at base. *Ovary* 3-carpelled; stigma 1. Style of ripe fruits splitting into 3 parts. *Seeds* not winged.

Distribution: One species in Central E. Sumatra and NW. Borneo.

1. Indovethia calophylla Boerl., Feestbundel P. J. Veth (1894) 90, plate; Ic. Bogor. 1 (1897) 10, t. 1; Bartell., Malpighia 15 (1901) 173; Merr., J. Str. Br. R. As. Soc. 86 (1921) 388. — Type: *Teijsmann 10893* = *H.B. 1610* (BO, FI, K, L holo), Borneo, Montrado, fl. & fr. 1874?.

I. beccariana Bartell., Malpighia 15 (1901) 172, t. 11; Merr., J. Str. Br. R. As. Soc. 86 (1921) 388. — Lectotype: *Beccari P.B. 763* (FI), Sarawak, Kuching, fl. X-1865. — Paratype: *Beccari P.B. 1413* (FI), Sarawak, G. Singhi, fl. IV-1866.

Shrublet about 1 m high. *Stipules* compound, the segments unequal, lanceolate, 5—10 by 2—4 mm, margins lacerate. *Leaves* with hardly distinct petiole; lamina oblanceolate, 10—35 by 2½—8½ cm, acute to acuminate at apex, tapering at base, biserrulate, membranous, stouter nerves 3—7½ mm apart. *Inflorescences* 5—20 cm long; rachis *c.* 2 mm across; pedicels filiform, mostly short, up to 12 mm long when fruiting; bracts with small stipules, lanceolate, the lower ones up to 8 by 2 mm, the higher ones smaller, shortly pubescent underneath. *Flowers* erect. *Sepals* suborbicular to obovate, 3½—5 by 3—3½ mm, margins denticulate. *Petals* obovate, 3—4 by 2—3 mm, white. *Staminodes* spatulate, those opposite to the stamens 1¾—2½ by *c.* ¾ mm, with 3 ± distinct, parallel nerves, the alternating ones 1½—2 by *c.* ½ mm, with 1 distinct nerve. *Stamens* with flattened filaments, 0.2—0.4 mm long; anthers 1¼—1¾ by 0.5—0.8 mm, the anther cells basally separated by the cuneate connective with *c.* ½ mm long mucro. *Ovary* subglobose, *c.* 1 mm Ø; style *c.* 1 mm long; stigma minute, trigonous. *Fruit* subglobose, up to 12 mm Ø, papillate. *Seeds* *c.* 0.8 by 0.2 mm, areolate.

Distribution: Central E. Sumatra and NW. Borneo.

SUMATRA. Riau, Siak, Kelantan: *Ridley 9009* (K, SING); Indragiri, Taluk: *Meijer 4162* (L, SING); Kuantan, Pangian: *Buwalda 6256* (L).

BORNEO. Sarawak, 1st Div.: *Hullett 270* (CAL), *300* (SING), *Native coll. 54* (E), *2401* (A, K); Sematan, S. Sebako: *Brunig S. 4653* (K); Puak: *Ridley 12324* (K, SING); G. Matang: *Brooke 9455* (BM, L); G. Singhi: *Beccari P.B. 1413* (FI); Bau: *Brooke 9918* (L); near Kuching: *Beccari P.B. 763* (FI), *Haviland & Hose 3609* (K), *3609B* (BM); Pankalan Ampat: *Haviland 759* (K); S. Samarahan: *Brooke 9671* (BM, L, P); Serian, Krusin: *Brooke 9596* (SING);? Mt. Koum: *Haviland 1789* (K).—W. Borneo, Monterado: *Teijsmann 10898 = H.B. 1610* (BO, FI, K, L); Landak, Ngebang: *Teijsmann H.B. 1468* (BO, L); G. Kelam: *Hallier B 2500* (BO).

Ecology: Probably a lowland species, reported from 150 m altitude and lowland forest; generally in moist, shady places: in 'young jungle' (Haviland), in 'Dipterocarpaceous forest on loamy hills' (Meijer), 'on ground in forest', 'under old trees at the edge of a lake', 'on bank above a torrent in the forest' and 'under rubber' (Miss Brooke).

Remark: The second specimen cited by Boerlage, *De Fretes s.n.* from Ambon, was named afterwards *Schuurmansia theophrasta* Hall. *f.* (Rec. Trav. Bot. Néerl. 10, 1913, 346), a species regarded by me as conspecific with *Schuurmansia henningsii* K. Schum.

9. SCHUURMANSIELLA

Hall. *f.*, Rec. Trav. Bot. Néerl. 10 (1913) 344; Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 80. — Type species: *Schuurmansiella angustifolia* (Hook. *f.*) Hall. *f.*

Shrubs with slender branchlets. *Stipules* acicular. Nerves ascending at an angle of *c.* 80°. *Inflorescences* terminal, many-flowered, compound racemes; branches much shortened, with flowers of successive age; bracts small, those of one branch conferted. *Flowers* bisexual. *Petals* in anthesis soon surpassing the sepals in size. *Staminodes* ∾, of 2 types, the inner ones mutually and with the stamens connate at base. *Ovary* 3-carpelled; stigma 1. Style of ripe fruits also splitting into 3 parts. *Seeds* not winged.

Distribution: One species in NW. Borneo.

1. Schuurmansiella angustifolia (Hook. *f.*) Hall. *f.*, Rec. Trav. Bot. Néerl. 10 (1913) 345, t. 7; Merr., J. Str. Br. R. As. Soc. 86 (1921) 387. — *Schuurmansia angustifolia* Hook. *f.*, Trans. Linn. Soc. 23 (1860) 157; Walp., Ann. 7 (1868) 220. — Type: *Lobb s.n.* (K holo), Borneo, Sarawak, fl. & fr. 1857.

Shrub up to 7 m high. *Stipules* up to 12 by *c.* ½ mm. *Leaves* with 5—10 mm long petiole; lamina linear-oblong, 8—17 by ¾—1½ cm, long acuminate at apex, ± tapering at base, chartaceous, margin serrulate, nerves ½—1 mm apart. *Inflorescences c.* 15 cm long; rachis *c.* 1 mm across; branches with up to 5 flowers; pedicels filiform, up to 12 mm long when fruiting; bracts acicular, 2—3 mm long under branches, smaller at base of pedicels. *Flowers* erect. *Sepals* ± linguiform, 1—1¼ by ¾—1 mm. *Petals* ovate, 3½—4½ by 1¾—2¼ mm, white or pinkish, purplish at base, distinctly reflexed. Outer *staminodes* ∾, small; inner ones 25—30, linear, 2—3 mm long, purplish. *Stamens* with flattened filaments, ½—1 mm long, purplish; anthers lanceolate, 1½—2½ by 0.3—0.6 mm. *Ovary* ovoid, *c.* 1.2 by 0.7 mm; style *c.* 0.3 mm long, purplish; stigma capitate. *Fruit* ellipsoid, subtrigonous in cross-section, *c.* 8½ by 3 mm. *Seeds* 0.5—1 by 0.2—0.5 mm, tomentose.

Distribution: NW. Borneo.

BORNEO. Sarawak, 1st Div.: *Beccari P.B. 1606* (FI, K, L, P), *Lobb s.n.* (K), *Native coll. 2580* (A, L, P); G. Matang: *Clemens 22352* (K), *Collenette 697* (L), *Haviland s.n.* (SING); Tegora Mine: *Smythies S. 15332* (K); Bidi: *Ridley 11765* (BM, SING); S. Sarawak: *Haviland 33* (K, SING); Tg. Sipang: *Brunig S. 12058*

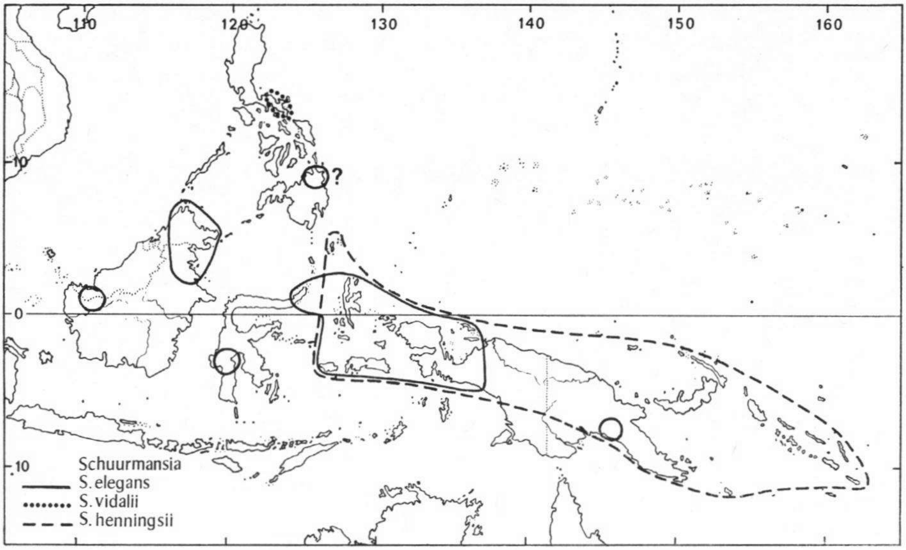

Fig. 8. Distributional map of the species of *Schuurmansia*. Outlined areas are only slightly generalised from cited localities.

(K, L); G. Santubong: *Anderson 8368* (K, L), *Bujang 12990* (K), *Othman b. Haron S. 21431* (K, L); Bako Nat. Park, Telok Asam: *Abang Muas 5139* (K, L), *Ashton S. 17912* (K, L), *Carrick (3) 530* (K), *Carrick & Enoch JC/371* (L), *Kanis B 11* (L), *Purseglove 4911* (K, L, SING); Bt. Gondol: *Anderson 12486* (A, K, L), *Brunig S. 7690* (K, L, SING); 4th Div., Bg. Baram, Mt. Irekan: *Hose 1* (BM, K, L, SING).

Ecology: Probably a lowland species, reported from up to 600 m altitude, especially in kerangas forest, on poor soils, on sandstone, and on cliffs near the sea.

10. SCHUURMANSIA

Blume, Mus. Bot. Lugd. Bat. 1 (1850) 177, t. 32; Walp., Ann. 2 (1852) 68; Miq., Fl. Ind. Bat. 1, 2 (1859) 117; B. & H., Gen. Pl. 1 (1862) 120; Miq., Ill. Fl. Arch. Ind. 1 (1871) 66; Baill., Hist. Pl. 4 (1873) 355; Gilg in E. & P., Nat. Pfl. Fam. 3, 6 (1895) 147; Bartell., Malpighia 15 (1901) 171; Hall. *f.*, Rec. Trav. Bot. Néerl. 10 (1913) 340, 345; Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 79; A. C. Smith, J. Arn. Arb. 22 (1941) 524; Kanis, Nova Guinea, Bot. 6 (1961) 63. — Type species: *Schuurmansia elegans* Blume.

Trees or treelets with stout, often hollow branches. *Stipules* entire. *Leaves* conferted at intervals; glandular along the margins, nerves almost straightly ascending at an angle of 60—70°. *Inflorescences* terminal, many-flowered panicles, often with many hypsophylls at base; peduncle and branches distinctly ribbed, often with con- or recaulescences. *Flowers* bisexual or polygamous. *Staminodes* ∞, in 1 or 2 whorls, the inner ones mutually and with the stamens connate at base. *Ovary* 3-carpelled; stigmas 1 or 3. *Fruit* opening with 3 longitudinal slits, the style usually not splitting. *Seeds* winged like a propeller with 2 blades.

Distribution: Three species in Borneo, the Philippines, Celebes, the Moluccas, New Guinea, the Bismarck Archipelago, and the Solomon Is.

Ecology: Pioneer plants reported from sea level up to 3000 m, especially from natural or anthropogenous secondary vegetation.

KEY TO THE SPECIES

1. Style as long as the ovary or longer; stigma capitate or punctiform. . . . . **1. S. elegans**
1. Style half as long as the ovary or shorter; stigma 3-lobed.
   2. Filaments ± twice the length of the anthers. . . . . **2. S. vidalii**
   2. Filaments as long as the anthers or shorter. . . . . **3. S. henningsii**

1. Schuurmansia elegans Blume, Mus. Bot. Lugd. Bat. 1 (1850) 178, t. 32; Walp., Ann. 2 (1852) 68; Miq., Fl. Ind. Bat. 1, 2 (1859) 118; Ill. Fl. Arch. Ind. 1 (1871) 66, t. 29; Capit., Bull. Soc. Bot. Fr. 57 (1910) 397; Hall. *f.*, Rec. Trav. Bot. Néerl. 10 (1913) 346; Merr., Philip. J. Sc. 11 (1916) Bot. 19; En. Philip. Fl. Pl. 3 (1923) 68; Heine in Fedde, Rep. 54 (1951) 240; Pfl. Samml. Clemens Kinabalu (1953) 63; Kanis, Nova Guinea, Bot. 6 (1961) 64, f. 1a. — Type: *Zippelius s.n.* (L holo), Amboina, fl.

S. parviflora Ridl., Trans. Linn. Soc. Bot. 9 (1916) 18. — Type: *Kloss s.n.* (BM holo, K), W. New Guinea, Utakwa R., to Mt. Carstensz, 45 m, fl. 1912—'13.

S. borneensis Ridl., Kew Bull. (1930) 77. — Type: *Haviland 500* (K holo), Sarawak, Mt. Braang, 420 m, fr.

Treelet or tree, up to 15(—30?) m high, sometimes with low stilt-roots. *Stipules* linguiform, 1½—4 by 1½—2½ mm, sometimes shortly ciliate. *Leaves* with 1½—6 cm long petioles; lamina obovate-oblong to lanceolate, 10—30 by 2½—10 cm, rounded or somewhat acuminate at apex, slightly tapering at base, margins somewhat involute, nerves 1—1½ mm apart, chartaceous; surface of dried leaves very finely reticulate by protruding intercellular walls of epidermis cells, giving an impression of striation parallel to the nerves. *Inflorescences* 10—25 cm long; peduncle 2—5 mm ⌀; pedicels filiform, 3—6 mm long, bracts broadly linguiform, up to 2 mm long, sometimes shortly ciliate. *Flowers* bisexual, erect. *Sepals* elliptic to obovate, 3—6 by 1½—4 mm. *Petals* obovate, 4—8 by 2—5 mm. Outer *staminodes* 0—∞, linear, 1—1½ mm long; inner staminodes 15—25, linear to spatulate, 2½—5 mm long, with 1 distinct nerve. *Stamens* with 1—2 mm long filaments; anthers 1¼—2 by *c.* ½ mm, connective distinctly protruding. *Ovary* subovoid, 1½—3 by 1¼—2 mm, papillate, sometimes with a few glandular capitate hairs; style 1½—3 mm long, growing in fruit, widening into the ovary; stigma small, capitate or punctiform. *Fruit* fusiform, up to 2½ by ½ cm, acuminate. *Seeds c.* ¾ by ¼ mm, with *c.* 3 mm long, slender wings.

Distribution: Borneo, the Philippines (Mindanao?), Celebes, the Moluccas, New Guinea.

BORNEO. Sarawak, 1st Div., G. Braang: *Haviland 130* (SING), *500* (K). — Sabah, W. Coast Res., Mt. Kinabalu, Kiau: *Clemens 10309* (A), *33063* (A, BO, K, L), *s.n.* (SING); Penibukan: *Clemens 30479* (A, BO, K, L, SING), *40425* (A, BM, K, L); Gurulau: *Carr S.F. 27078* (SING); Sandakan Res., Kg. Kalangan: *Alabazo A 3636* (K, L). — E. Borneo, W. Kutai, L. Petah: *Endert 3112* (A, BO, K, L).

PHILIPPINES. Mindanao, Agusan: *Cortez & Fernandez F.B. 24353* (PNH † ?), *fide* Merrill (1923).

CELEBES. Minahassa: *de Vriese & Teijsmann s.n.* (L, U); Makale-Rantepao, Tg. Kesu: *Thung N.I.F.S. bb. 24127* (A, BO, K, L, SING).

MOLUCCAS. Halmahera, G. Sembilan: *Pleyte 412* (BO, L); Ceram, Riring: *Rutten 2180* (BO, L, U); Roho: *Kornassi 522* (BO, L, U); Amboina: *Binnendijk 18498* (BO), *Robinson 2036* (A, BM, BO, K, L, P), *Teijsmann H.B. 1961* (BO, L, U), *de Vriese & Teijsmann s.n.* (L), *Zippel s.n.* (L); Galala, G. Malintang: *Rant 798* (BO, K, L); Ema, G. Hori: *Teijsmann s.n.* (BO, L); Hutumuri: *Teijsmann s.n.* (BO, K, L, U); Wae, G. Salahutu: *de Wiljes-Hissink 33* (A, L).

NEW GUINEA. W. New Guinea, Vogelkop Peninsula, SE. of Sorong: *Versteegh BW 4681* (L); Klabala

R. near waterfall: *van Royen 3209* (L); Teminabuan, Beriat: *Schram BW 6044* (L), *Versteegh BW 4896* (L); Upper Kamundan R. Basin, Ije R.: *van Royen & Sleumer 7645* (K, L); Anggi Lakes, Mt. Misjnuk: *Sleumer & Vink BW 14053* (L); Ransiki, Waren: *Kanehira & Hatusima 13153* (BO, L); Bomberai, Babo: *Aet 706* (A, BO, K, L), *bb. 22347* (BO, L, SING); Geelvink Bay, Nabire, Bumi R.: *Kanehira & Hatusima 12709* (BO); Japen I., Serui, Wasabori: *Aet & Idjan 428* (A, BO, K, L); Mimika, Utakwa R.: *Kloss s.n.* (BM, K). — SE. New Guinea (Papua), Gulf Distr., estuary of Vailala R., Ihu: *Pullen 6433* (L).

Ecology: Reported from sea level up to 2000 m altitude in primary and secondary forest, on level land to steep slopes, sometimes near riverbanks or in swampy localities, on clay or more sandy or rocky soils.

Vernacular names: Mindanao: *tanang* (Manobo), *fide* Merrill (1923); Celebes: *labo*[2], (Toradja); Amboina: *wat lopu*; New Guinea, Vogelkop Penins.: *hikselah* (Tehid).

Remark: Merrill (1923) reported a sterile specimen from Agusan, Mindanao, which was identified as *Schuurmansia* cf. *elegans*: *Cortez & Fernandez F.B. 24353*. I did not see this collection; it would be the only record from the Philippines (see the remark under the next species).

2. Schuurmansia vidalii (F.-Villar) Merr., Philip. J. Sc. 11 (1916) Bot. 19; En. Philip. Fl. Pl. 3 (1923) 69; Kanis, Nova Guinea, Bot. 6 (1961) 69, f. 1c. — *Calophyllum vidalii* F.-Villar in Ceron, Cat. Pl. Herb. Manila (1892) 229 + plate. — Type: *Vidal 2134* (A, K, PNH holo †?), Luzon, Camarines Sur, Mt. Isarog, fl. III-1886.

S. parvifolia Merr., Philip. J. Sc. 11 (1916) Bot. 19. — Type: *Ramos B.S. 23648* (A, BM, BO, BRI, K, L, P, PNH holo †?, SING), Luzon, Sorsogon, Lake Polog, fl. VIII-1915.

Treelet or tree? *Stipules* c. ½ by 1¼ mm. *Leaves* with ½—2 cm long petiole; lamina obovate-lanceolate, 5—11 by 1½—4 cm, obtuse to obtusely acuminate at apex, tapering at base, margins somewhat involute, nerves ½—1 mm apart, papyraceous to chartaceous. *Inflorescences* 7—15 cm long; peduncle 1½—2 mm ∅; pedicels 1—2 mm long; bracts very small, semi-annular to triangular. *Flowers* bisexual, erect. *Sepals* obovate, 2—2¾ by 1½—2 mm. *Petals* obovate, c. 3½ by 2½ mm, white or pink. Outer *staminodes* 10—∞, filiform, ¾—1 mm long; inner staminodes c. 25, linear, 1½—2 mm long, c. ½ mm connate at base. *Stamens* with c. 1¾ mm long filaments; anthers ¾—1 by 0.4—0.5 mm. *Ovary* subglobular, slightly 3-lobed, 0.4—0.5 mm ∅, glabrous; stigma 3-lobed, subsessile. *Fruit* and *seeds* unknown.

Distribution: Philippines (SE. Luzon).

PHILIPPINES. Luzon, Camarines Sur Prov., Mt. Isarog: *Vidal 2134* (A, K); Sorsogon Prov., Lake Polog: *Ramos B.S. 23648* (A, BM, BO, BRI, K, L, P, SING).

Ecology: According to Merrill (1923) in mossy forest from 1000 m upward.

Remarks: Fernandez-Villar incorrectly described the ovary to contain 1 erect ovule.

Unfortunately only two collections of this species from Luzon are known to me. Another collection of uncertain identity from Mindanao could also be this species: see under *S. elegans* Blume.

3. Schuurmansia henningsii K. Schum., Bot. Jahrb. 9 (1888) 210; K. Schum. & Hollr., Fl. K. Wilhelmsland (1889) 50; Warb., Bot. Jahrb. 13 (1891) 283; E. & P., Nat. Pfl. Fam. 3, 6 (1895) f. 75; K. Schum. & Laut., Fl. Deut. Schutzgeb. Südsee (1901) 448; Pulle, Nova Guinea 8 (1912) 667; Hall. *f.*, Rec. Trav. Bot. Néerl. 10 (1913) 346; E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) f. 41; Lane Poole, For. Res. (1925) 116; White & Francis, Proc. R. Soc. Queensl. 38 (1927) 247; White, J. Arn. Arb. 10 (1929) 241;

Kanis, Nova Guinea, Bot. 6 (1961) 65, f. 1b. — Type: *Hollrung 216* (B holo †, K), NE. New Guinea, Finschhafen, Sattelberg, Kakulu, fl. VII-1886.

S. bamleri K. Schum. & Laut., Fl. Deut. Schutzgeb. Südsee (1901) 448; Hall. *f.*, Rec. Trav. Bot. Néerl. 10 (1913) 350. — Type: *Bamler 20* (B holo †, BRSL), NE. New Guinea, Sattelberg, 200—400 m, fl. 18-XII-1898.

S. bamleri K. Schum. & Laut. var. *longifolia* Laut. in K. Schum. & Laut., Fl. Deut. Schutzgeb. Südsee Nachtr. (1905) 318; Hall. *f.*, Rec. Trav. Bot. Néerl. 10 (1913) 351. — *S longifolia* Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 80; A. C. Smith, J. Arn. Arb. 22 (1941) 524. — Type: *Schlechter 14646* (B holo †, BRSL), New Ireland, Punam, 500 m, fl. VII-1902.

S. gilgiana Laut. in K. Schum. & Laut., Fl. Deut. Schutzgeb. Südsee Nachtr. (1905) 319, Hall. *f.*, Rec. Trav. Bot. Néerl. 10 (1913) 348. — Type: *Schlechter 14583* (B holo †, BO, K), NE. New Guinea, Torricelli Mts., 100 m, fl. IV-1902.

S. microcarpa Capit., Bull. Soc. Bot. Fr. 57 (1910) 398, t. 11, 12, 17; Baker, J. Bot. 61 (1923) Suppl. 4. — Lectotype: *Forbes 613* (BM, BO holo, L), Papua, Sogeri region, fl. 1885—86. — Paratypes: *Sayer s.n. ex* MEL (BO), Papua, Mt. Obree Ra., fl. & fr. 1889; ? *Macgregor s.n. ex* MEL (BO), Papua, Mt. Yule, fr.

S. theophrasta Hall. *f.*, Rec. Trav. Bot. Néerl. 10 (1913) 346; Holth. & Lam, Blumea 5 (1942) 213. — Lectotype: *Teijsmann H.B. 291* (BO, K, L holo), Ambon, Hutumuri, fr. IX-1876. — Paratype: *de Fretes H.B. 5524* (BO, CAL, L, U), Ambon, sterile.

S. pseudopalma Hall. *f.*, Rec. Trav. Bot. Néerl. 10 (1913) 347. — Lectotype: *de Vriese H.L.B. 47* (L holo), Ternate, sterile 1857—61. — Paratype: *de Vriese & Teijsmann s.n.* (L), Halmaheira, sterile, 1859—60.

S. rauwolfioides Hall. *f.*, Rec. Trav. Bot. Néerl. 10 (1913) 349. — *S. sp.* K. Schum., Bot. Jahrb. 9 (1888) 211. — Type: *Forbes 677* (BM, K, L holo), Papua, Sogeri region, fl. 1885—86.

? *S. tophiroides* Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 80. — Type: not indicated (B †?).

? *S. oreophila* Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 80. — Type: not indicated (B †?).

? *S. schlechteri* Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 80. — Type: not indicated (B †?). — Specimen: *Schlechter 16639* (A, K, L), Kaiser Wilhelmsland, Kani Mts., 500 m, fl. 5-X-1907.

? *S. crassinervia* Gilg in E. & P., Nat. Pfl. Fam. ed. 2, 21 (1925) 80. — Type: not indicated (B †?).

S. coriacea A. C. Smith, J. Arn. Arb. 22 (1941) 525. — Type: *Brass 5076* (A holo, BM, BO, BRI), Papua, Mt. Tafa, 2400 m, fl. 5-VIII-1933.

S. montana A. C. Smith, J. Arn. Arb. 22 (1941) 526. — Type: *Brass 4743* (A holo, BRI), Papua, Wharton Ra., Murray Pass, 2840 m, fl. 6-IX-1933. — Paratype: *Brass 4706* (A, BM, BO, BRI), idem, fr. 6-IX-1933.

S. grandiflora A. C. Smith, J. Arn. Arb. 22 (1941) 527. — Type: *Lane Poole 371* (A holo, BRI, K), Papua, Owen Stanley Ra., 1800 m, fl. II-1923.

Treelet or tree, up to 15(—20?) m high, sometimes with stiltroots, up to 1 m high. *Stipules* ½—5 by ½—3 mm, often up to 3 mm long ciliate. *Leaves* with up to 4 cm long petiole; lamina obovate-lanceolate, 6—85 by 1½—15 cm, obtuse to acuminate at apex, tapering at base, margins somewhat involute, nerves 2—7 mm apart, chartaceous or subcoriaceous. *Inflorescences* 7—65 cm long, peduncle 1½—8 mm ⌀; pedicels filiform, 2—5 mm long; bracts usually very small, ± triangular, sometimes larger and transitional to leaves. *Flowers* polygamous or functionally unisexual, erect. *Sepals* obovate to elliptic, 3—5 by $1\frac{1}{2}$—3 mm, greenish, sometimes purplish. *Petals* obovate-oblong, 4—$7\frac{1}{2}$ by $1\frac{1}{2}$—4 mm, white, creamy, pink, or purplish red. Outer *staminodes* 0—∞, filiform, *c.* 1 mm long; inner staminodes 5—30, filiform to linear, $1\frac{1}{2}$—2 mm long. *Stamens* in ♂ flowers with $\frac{3}{4}$—$2\frac{1}{2}$ mm long filaments; anthers $1\frac{1}{2}$—$2\frac{1}{2}$ by $\frac{1}{2}$—$\frac{3}{4}$ mm; in ♀ flowers with $\frac{1}{4}$—$\frac{1}{2}$ mm long filaments; anthers *c.* 1 by $\frac{1}{3}$ mm. *Ovary* subglobular to ovoid, slightly 3-lobed, glabrous, in ♂ flowers $\frac{1}{2}$—1 by $\frac{1}{3}$—$\frac{3}{4}$ mm, in ♀ flowers *c.* 3 by 2 mm; style cylindric, up to 1 mm long; stigma 3-lobed. *Fruit* fusiform, up to $1\frac{1}{2}$ by $\frac{3}{4}$ cm, acuminate. *Seeds c.* 1 by $\frac{1}{3}$ mm with *c.* $2\frac{1}{2}$ mm long, slender wings.

Distribution: Moluccas, New Guinea, Bismarck Archipelago, Solomon Islands.

MOLUCCAS. Talaud, Karakelong, G. Duata: *Lam 2946* (BO, L); Halmahera: *de Vriese & Teijsmann s.n.* (L); Foramadiahi: *Beguin 1519* (BO, K, L, U); Ternate: *Teijsmann H.B. 5169* (BO, CAL, L), *de Vriese H.L.B. 47* (L); Tidore: *Lam 3768* (BO, L); Ceram, Wai Kahula: *Kornassi 1227* (BO, L); Amboina: *de Fretes H.B. 5524* (BO, L, U), *Rant 303* (BO); G. Horiel: *Boerlage 65* (BO, L), Hutumuri: *Teijsmann H.B. 291* (BO, K, L); Wae, G. Salahutu: *Kuswata & Supadmo 274* (BO, K, L).

NEW GUINEA. W. New Guinea, Vogelkop Peninsula, Ajamaru: *Versteegh BW 4987* (L); Kebar Valley: *Versteegh BW 10362* (L); S. of Andjai: *Koster BW 6851* (L); Nertoi to Mt. Tobi: *van Royen & Sleumer 6844* (K, L); Anggi Lakes, from Momi: *Kanehira & Hatusima 14164* (BO); Mt. Gwamongga: *Sleumer & Vink BW 14263* (L); Onin Peninsula, Fakfak (Kapaor): *Beccari s.n.* (FI); Geelvink Bay, Wasior: *Koster BW 13760* (L); S. of Nabire, Dalman: *Kanehira & Hatusima 12089* (BO); Biak I., Kg. Son: *Versteegh & Vink BW 8296* (L); Japen I., Ansus: *Beccari s.n.* (FI); Aisau: *Vink BW 11297* (L); Rouffaer R., Tributary Camp: *Docters van Leeuwen 10461* (BO, K, L); Wissel Lakes, Ginambarai-Djembodini: *Eyma 4625* (A, BO, K, L); Swart Valley, Kadubaka: *Bergman 22* (L); Mamberamo Valley, Pionier Bivouac, Otken R.: *Lam 481* (BO, K, L), *Thomson 661* (BO, L); Gautier Mts.: *Gjellerup 834* (BO, L); Idenburg R., Bernhard Camp: *Brass 12766* (A, BO, BRI, L); Cycloop Mts., Ifar: *van Royen & Sleumer 5661* (K, L); towards Ormu: *van Royen & Sleumer 6007, 6138* (K, L); Sentani Lake, N. of Simboro: *Sigafoos 145* (A); mouth of Tami R.: *Kalkman BW 3395* (BO, K, L); Hellwig Mts.: *Pulle 980* (L), *von Römer 968* (BO, L); Star (Sterren) Mts., Sibil Valley: *Kalkman 4295* (BM, L); junction Bon R.—Minam R.: *Kalkman 4338* (BM, L). — NE. New Guinea, Sepik Distr., Torricelli Mts.: *Schlechter 14583* (BO, K); Madang Distr., Kaulo: *Schlechter 16754, 17516* (A, K, L); Kani Mts.: *Schlechter 16639, 17490* (A, K, L); Finisterre Mts. Butemu: *Sayers N.G.F. 21266* (L); Western Highlands Distr., N. of Wabag, Merimanta: *Womersley N.G.F. 11337* (K, L); Lufamunda: *Flenley 2028* (K, L); S. of Mt. Hagen: *Hoogland & Pullen 6128* (BM, BO, K, L); E. of Mt. Giluwe: *Robins 423* (L); Minj-Nona Divide: *Pullen 255* (L); Nondugl, Warranga R. near Warapuri R.: *van Royen N.G.F. 18272* (K, L); Al R.: *Womersley & al. N.G.F. 5159* (A, BO, K, L, SING); Eastern Highlands Distr., Chimbu, Pengagl Creek: *Millar & Sayers N.G.F. 23721* (L); E. of Mt. Wilhelm: *Brass 30354* (K, L); E. of Mt. Kerigomna: *Hoogland & Pullen 5356* (BM, BO, K, L); Asaro-Mairi Divide, Daulo Camp: *Hoogland & Pullen 5432* (BO), *Pullen 439* (L), *Saunders 908* (L); S. of Mt. Otto: *Brass 30964* (K, L); NE. of Mt. Michael: *Brass 31197* (K, L), *Womersley N.G.F. 11428* (BO, K, L); Okapa: *White N.G.F. 9581* (BO, K, L); Wanatabi: *Hartley 13165* (L); Aiyura: *Smith N.G.F. 1035* (L); Sassaura: *Dunstone 12053* (L); Morobe Distr., Huon Peninsula, Mt. Sarawaket, Ogeramnang: *Clemens 4738, 4842* (A); Matap: *Clemens 41199* (A); Yunzaing: *Clemens 3905* (A); Yunzaing & Joangey: *Clemens 3371* (A); Joangey: *Lane Poole 580* (BRI); Cromwell Mts., Mannasat: *Hoogland 9560* (BM, K, L); Mongi Valley, Pindiu: *Hoogland 8856* (K, L), *8954* (L); Rawlinson Ra., Sambui: *van Royen N.G.F. 16112* (K, L); Sattelberg: *Bamler 20* (BRSL), *Clemens 139, 435* (A, L); Hopi: *Warburg 20057* (A); Kakulu: *Hollrung 216* (K); Malolo: *Clemens 4411* (A); Mararuo: *Floyd N.G.F. 5457* (A, BO, K, L, SING), *N.G.F. 5458* (A, BO, K, L); Selileo: *Hellwig 556* (BO, K); Simbang: *Kärnbach s.n.* (BM, K); W. of Lae, Oomsis: *Brass 29335* (A, K, L); Red Hill: *Hartley 10447* (L); Wau, Edie Creek: *Womersley N.G.F. 13340* (K), *Womersley & Sleumer N.G.F. 13949* (BM, K, L); Morobe: *Womersley N.G.F. 3130* (A, BRI, K); ? Andarora village: *Blockwood 142* (K, L). — SE. New Guinea (Papua), Western Distr., Palmer R. below junction with Black R.: *Brass 7153* (A, BO, BRI, L); Southern Highlands Distr., Mt. Kerewa: *Kalkman 4786* (L); Mt. Ne: *Kalkman 4871* (L); Lake Kutub, Imu: *Schodde 2232* (K, L); Mendi Valley, Kiburu: *Schodde 1422* (K, L); Anga Valley, Ebenda: *Schodde 1623* (K, L); W. of Mt. Giluwe, Klareg: *Schodde 2035* (K, L); Gulf Distr., Murua R.: *Brass 1340* (A, BRI, K, P, SING); Central Distr., Akaifu R., Maipa: *Darbyshire 1015* (K, L); Mt. Yule: *?Macgregor s.n.* (BO); Mafulu: *Brass 5291* (A, BO, BRI); Mt. Tafa: *Brass 5076* (A, BM, BO, BRI); Mt. Scratchley, Neneba: *Giulianetti s.n.* (K); Gap region: *Carr 13789* (A, K, L, SING); Boridi: *Carr 13572, 14798* (A, K, L, SING); Isuarava: *Carr 15382, 15750* (A, K, L, SING); Kagi: *Carr 14947* (A, K, L, SING); Piati: *Carr 16472* (K, L); Owen's Corner: *Hartley 10688* (L), *Schodde 2961* (K, L); Sogeri region: *Forbes 613* (BM, BO, L), *677* (BM, K, L); Bisiatabu: *C. T. White 356* (BRI); Mt. Obree: *Sayer s.n.* (BO); ? Woitape: *Corner & Gray N.G.F. 12909* (K, L); Northern Distr., Wharton Ra., Murray Pass: *Brass 4706* (A, BM, BO, BRI), *4743* (A, BRI); Owen Stanley Ra.: *Lane Poole 371* (A, BRI, K); Saiho: *Hoogland 3507* (A, K, L); Hydrographers R.: *Lane Poole 237* (BRI); Tufi, Oi-ai: *Hoogland 4429* (A, K, L); Milne Bay Distr., N. of Mt. Dayman: *Brass 22804* (A, L); Agupon: *Crutwell 650* (K, L); Gumini R., Cameron Plateau: *Womersley N.G.F. 19309* (K, L); Louisiades Arch.: *Macgregor s.n.* (BO); Misima I., N. of Mt. Sisa: *Brass 27484* (A, L).

BISMARCK ARCHIPELAGO. New Britain, Mt. Lollo: *White N.G.F. 10851* (K, L); New Ireland, Punam: *Schlechter 14646* (BRSL).

SOLOMON ISLANDS. Bougainville, Kupai Gold Field: *Kajewski 1692* (A, BRI); SE. New Georgia, Kalena Bay: *Kere B.S.I.P. 5937* (K, L); NW. Santa Isabel, Kolokofa R.: *Beer's coll. B.S.I.P. 6810* (L); SW. of Paehena Pt.: *Beer's coll. B.S.I.P. 7756* (L); Guadalcanal, Mt. Jonapau: *Whitmore & Womersley B.S.I.P. 1024* (K, L); San Cristoval, Anganiwai: *Walker B.S.I.P. 259* (A, BRI, K, L); Hinuahaoro: *Brass 3018* (A, BO, BRI, L); Star Harbour: *Brass 3112* (A, BRI, L).

Ecology: Reported from sea level up to 3000 m in primary and secondary forests, on landslides and in artificial grasslands, on level land to steep slopes, sometimes near riverbanks or in swampy localities, on clay or more sandy or rocky soils. Scattered or locally common in open habitats.

Vernacular names: Moluccas, Talaud Is.: *arisusu urune*; Tidore: *maletope*; Amboina: *ut lapu, was lapu*; W. New Guinea, Ajamaru: *batsjevak* (Maibrat); Biak I.: *rambuan*; NE. New Guinea, Wabag: *opaga, orpach*; Hagen: *pappai, popai, porkai, pupai*; Minj: *bubar, bubus*; Chimbu: *akessa, akesse, a'ulareh, hahessa, menmeh*; Aiyura: *arebi*; Budemu: *sipulund*; Huon Peninsula, Sambui: *pelip*; Sattelberg: *(m)beli*; Andarora: *haiwinge* (Nauti), *yatsiga* (Manki); SE. New Guinea, Tari: *obbo*; Kutubu: *karadewa*; Mendi: *op*; Kairuku: *engefukenge*; Buna: *kembusa*; Bausa: *werawera*; Solomon Is., S. Isabel: *du'ugwau sa'iabura*; Malaita: *abekweto*.

Remarks: In *Schuurmansia henningsii* K. Schum. I have united several names of species that were distinguished mainly on differences in leaf-characters. The variation in vegetative characters is striking indeed, but it is certainly caused for the greater part by differences in ecological conditions. The greatest influence is exercised by the altitude. New Guinea material, arranged according to increasing altitude, showed a very regular decrease in leaf size, especially between 1000 and 3000 m. At the same time the leaves became more coriaceous and more distinctly petioled. There are no gaps in series made of collections from larger areas. Exposition and age of the plants play a less important role in the determination of the leaf size.

The dimensions and colours of flower parts are rather variable too and less easy to correlate with other data. These variations might be expressions of genetical differences between local populations. More detailed local studies would be necessary to decide whether any infraspecific taxa can be distinguished.

Some authors described the species as dioecious and the flowers as (functionally) unisexual. In a previous paper (1961) I have expressed doubt as to the correctness of their observations, because all flowers are complete and 'pistillate flowers' are rare among herbarium materials. Further examinations have convinced me that a majority of the specimens has relatively large anthers and small pistils, and consequently I have described these above as male. A minority has relatively small anthers and big pistils and has been described as female. This is in accordance with field observations by Dr. P. van Royen, formerly in Lae, who found that most specimens in a profusely flowering stand had relatively big anthers and did not set fruit (personal communication). I am not certain, however, that the flowers are always functionally unisexual. Polygamy is likely to occur, as the reduction of either stamens or ovary is never complete.

S. crassinervia, *S. lophiroides*, *S. oreophila*, and *S. schlechteri* were published by Gilg in a key and no types were indicated. The brief key hardly permits identification since it is mainly based on leaf-characters, but I consider all of them identical with *S. henningsii*. This view is supported by some Berlin duplicates of Schlechter 16639 in A, K, and L, labelled *S. schlechteri*, which undoubtedly belong to *S. henningsii*.

EXCLUDED

Capusia Lecomte, Bull. Mus. Hist. Nat. Paris 32 (1926) 95 = **Siphonodon** Griff. (*Celastraceae*), *fide* Merr., J. Arn. Arb. 21 (1940) 108.

Gomphia magnoliaefolia Zipp. *ex* Span., Linnaea 15 (1841) 186, *nom. nud.* = **Pycnarrhena longifolia** (Decne.) Becc. (*Menispermaceae*), *fide* Diels in Pflanzenreich Heft 46 (1910) 51.

Ochna decaisnei v. Tiegh., Bull. Mus. Hist. Nat. Paris 8 (1902) 47—49. — *Diporidium decaisnei* v. Tiegh., Ann. Sc. Nat. Bot. VIII, 16 (1902) 356. — Type: *Riedlé s.n.* (P holo), Timor?, 1803 = **O. mauritiana** Lamk.

The description was based on one branchlet, originally bearing one fruiting flower. The specimen must have been collected during Capt. Baudin's expedition on 'Ile de France' (Mauritius) on the way to Timor. It must have been mislabelled later on.

Sauvagesia erecta Linné, Sp. Pl. 1 (1753) 203; Miq., Fl. Ind. Bat. 1, 2 (1857) 118; Koord., Exk. Fl. Java 2 (1912) 607; Back. & Bakh. *f.*, Fl. Java 1 (1963) 327.

Erroneously recorded for Java by Miquel without reference to material or other source of information. Later authors only refer to Miquel.

Miquel's error might be caused by a collection of *Sauvagesia erecta* L. in G, which is labelled: 'Perrottet, Java, 1819'. It is true that Perrottet visited the eastern part of Java in that particular year. However, no other collections of *Ochnaceae* are known from that island and *Sauvagesia* is not known otherwise from the Indo-Pacific area. It is very probable that the specimen concerned was mislabelled and in fact was collected in Cayenne on the same voyage. This view is supported by Mr. C. Sastre of the Muséum National d'Histoire Naturelle, who kindly drew my attention to this collection.

Tetramerista Miq., Fl. Ind. Bat. Suppl. (1860) 534, belongs to the *Theaceae*, *fide* Gilg, Ber. Deut. Bot. Ges. 11 (1893) 22, & *auct. div.*

INDEX

New names are in **bold type**, synonyms in *italics*. Numbers refer to number of genus and accepted species or variety. 'Excl.' refers to excluded names listed at the end.