

FLORAE MALESIANAE PRAECURSORES XLIX.
MALESIAN SPECIES OF LITHOCARPUS BL. (FAGACEAE)

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SUMMARY

Lithocarpus Bl. (1826) is here considered to include the following genera: *Synaedrys* Lindl. (1836), *Cyclobalanus* (Endl.) Oersted (1867, p.p.), and *Pasania* (Miq.) Oersted (1867, p.p.). In Malesia 104 species are recognized, of which 25 are new to science and 7 are new combinations. Apart from these there are 10 more species which are considered as doubtful, as from the specimens so far examined it is difficult to decide their correct status. *Pasania littoralis* (Bl.) Oersted (basionym: *Quercus littoralis* Bl.) is excluded from the genus, and the species has been reidentified by Dr. A.J.G.H. Kostermans (Bogor) as *Atuna scabra* (Hassk.) Kosterm.

In Malesia most species of *Lithocarpus* may be distinguished from those of *Castanopsis* by the ridged inner surface of their bark, uniseriate and multiseriate wood-rays, spiral arrangement of leaves and bud-scales, and by their cupule which always encloses one fruit only, and which are solitary or in dichasial clusters along the rachis, possessing interseminal cupule segments and a scattered pattern of vascularization.

ACKNOWLEDGEMENTS

The present paper is the outcome of work performed at the Rijks-herbarium, Leiden (L), the Netherlands, between the period of October 1966 and February 1968, with specimens received on loan from or examined at the Herbaria of the Arnold Arboretum (A), Berlin (B), the British Museum (Natural History) (BM), Bogor (BO), Calcutta (CAL), Cambridge (CGE), Edinburgh (E), Florence (F), Kew (K), Forest Research Institute, Kepong (KEP), Michigan (MICH), New York (NY), Paris (P), Forest Department, Sandakan (SAN), Forest Department, Kuching (SAR), Singapore (SING), Utrecht (U), Berkeley (UC), Washington (US), and Breslau (WRSL). Grateful acknowledgements are due to the Directors of these Institutions.

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For advice and guidance, I feel very much obliged to Professor Dr. C.G.G.J. van Steenis, Director of the Rijksherbarium Leiden. To Dr. M.

Jacobs (Leiden) I am very grateful for his constructive criticisms, and for preparing the Latin descriptions of the new species and the Index presented at the end of this paper.

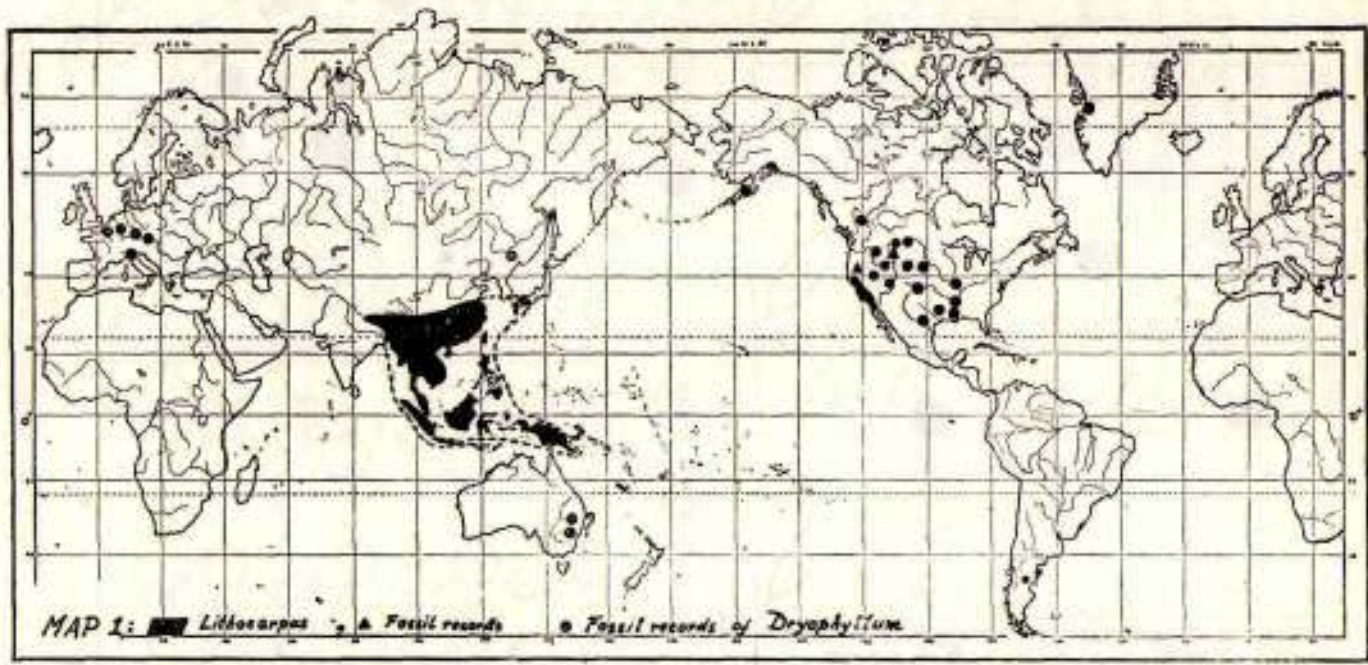
During my work at Leiden I had at my disposal a copy of a MS on Malesian *Lithocarpus* prepared by Dr. S. Hatusima (now Professor of Botany at Kagoshima University, Kyushu, Japan) during the years 1943 — 1945 at Bogor and based on literature and specimens available at the Herbarium Bogoriense. Insofar as novelties proposed by him coincide with my opinion about their status and circumscription I have mentioned him as author and I have found fit to commemorate his name in *Lithocarpus hatusimae* to honour his work in the group.

Finally, I would like to thank Dr. B.C. Stone, School of Biological Sciences, University of Malaya, Kuala Lumpur, who went through the manuscript.

INTRODUCTION

From previously published accounts on the Malesian Fagaceae, it is learned that the main controversy centers on the disagreement among botanists on whether the genus *Lithocarpus* is sufficiently different from *Quercus*, and on whether the genus should be subdivided into at least 2 or 3 smaller genera. In 1968 (*in Gard. Bull. Singapore* 22(3) pp. 356—367) I listed 8 of the most important features distinguishing *Lithocarpus* from *Quercus*. To that list it may be added that species of *Quercus* are wind-pollinated, while those of *Lithocarpus* are insect-pollinated-

Oersted (1867, 1871) subdivided the genus into two smaller genera, *Cyclobalanus* (in which are included all species with lamellate cupule) and *Pasania* (included here are those species with squamose cupule). Prantl (1887, 1894), on the other hand, placed all species in one genus *Pasania*, while Schwarz (1936) preferred to split the genus into three smaller genera, *Lithocarpus* s.str. (to include *L. javensis* and its related species), *Cyclobalanus*, and *Pasania*. Koidzumi (1916), though agreeing with Prantl to include all species in one genus, used the name *Synaedrys* Lindl. (1836) for the genus, as he was of the opinion that the generic name *Lithocarpus* had been used by Blume for another genus belonging to a different family. Rehder & Wilson (1916) corrected Koidzumi's mistake and reinstated *Lithocarpus* as the correct name for the genus. Among the later authors who have agreed with Rehder & Wilson, are: Rehder (1919, 1929), Barnett (1943, 1944), A. Camus (1954) and Forman (1966, 1967).



Map 1. For explanation see text.

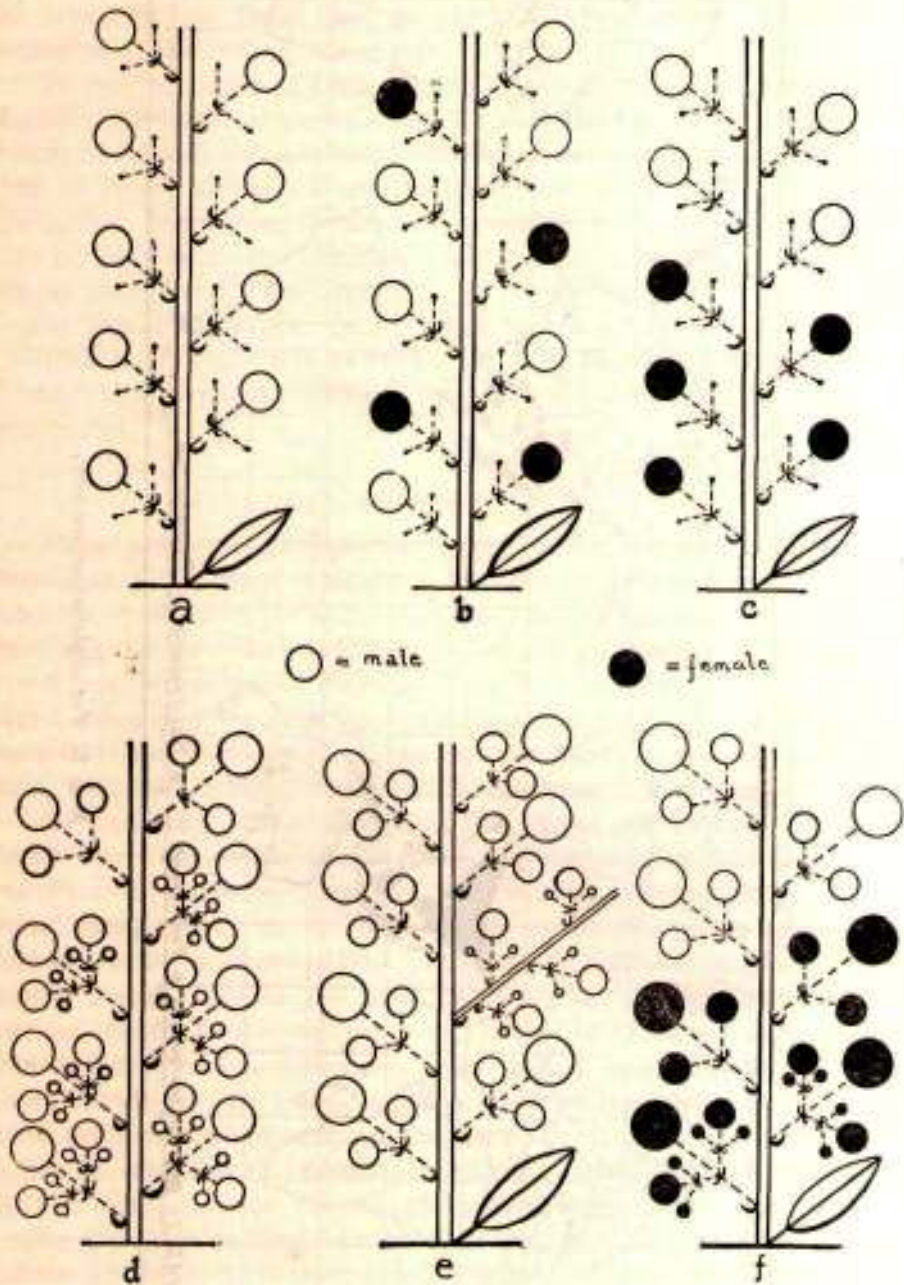


fig. 1. For explanation see text.

Oersted and Schwarz used the characters of the cupule to distinguish 2 or 3 smaller genera which they recognized. As has been indicated in the genus *Quercus* (Soepadmo, 1968), it is clear that generic distinction based on a single character is always unsatisfactory, both for practical purposes and for phylogenetic considerations. In *Lithocarpus*, of which now we know more species than did Oersted and Schwarz, the validity of such a narrow generic limit is further minimized by the fact that there are many species, e.g. *L. indutus*, *urceolaris* and many related species, in which one cannot decide for sure whether the cupule is truly lamellate or squamose. In addition to this fact it may be mentioned that within the genus there is a uniformity in floral structure, pollen morphology, wood anatomy, and floral biology, so that there is no single feature (vegetative or reproductive) by which one can distinguish those smaller genera. As a conclusion, therefore, Oersted and Schwarz's narrow generic concept should be rejected.

DISTRIBUTION

In her monograph of the genus, A. Camus (1954) recognized more than 300 species, and attributed not less than 136 species in Malesia. Of these only 64 are accepted as good species.

The distribution (Map 1) of the genus covers the areas of N.E. India (Nepal, Bhutan, and Assam), Burma, Thailand, Indo-China, China, Korea, Japan, Formosa, Hainan, and Malesia. Outside Asia the genus is represented by one species (*L. densiflorus*) occurring in Oregon and California in the U.S.A. In Malesia the area of distribution of *Lithocarpus* is the widest among the genera of Fagaceae, extending from the Malay Peninsula east and southwards to Java, New Guinea and Sudest and Rossel Islands. The genus is, however, absent from the driest parts of E. Java, Madura, Lesser Sunda Islands, and from S. E. parts of the Moluccas. In altitudinal range, species of *Lithocarpus* may be found from sea-level up to about 3000 m, with the majority of the species occurring between 300 and 1500 m. Several species such as *L. elegans*, *lucidus*, *7vssa*, and *sundaicus* occur both at low and high altitudes and they seem to be indifferent to soil types. Others, e.g. *L. andersonii* and *dasystachyus*, are apparently confined to peat-swamp and heath forests. Several species have been recorded as growing on limestone hills and quartzite ridges.

FLOWERING AND FRUITING PERIOD

In general it may be said that in Malesia the flowering season of *Lithocarpus* species immediately follows the driest months of the year.

In Malaya for example, the flowering period takes place around March and April, whereas in Java it occurs about July and August. The fruits become mature about 6 months later. Several species, e.g. *L. elegans*, *sundaicus*, *wallichianus* and *cyclophorus*, are known to produce flowers at least once every year, while others flower irregularly. Germination of the seeds is hypogeal, and under a favourable climatic condition (high humidity and temperature), the germination may take place within 1—2 weeks after the fruits are shed from the trees.

MORPHOLOGY

General

In Malesia species of *Lithocarpus* are trees of medium to large size, or rarely shrubs 1—3 m tall (*L. atjehensis*, *orbicularis*, *suffruticosus*). The bark is usually grey-brown, finely fissured, and marked with circular rings outside and with longitudinal ridges inside as in *Quercus* and *Trigonobalanus*. Buttresses, if present, are usually low and thin. The wood is very similar to that of *Quercus* and *Trigonobalanus*, and differs from that of *Castanopsis* by the presence of both uniseriate and multiseriate rays. Leaves are spirally arranged, mostly rather thick-coriaceous, entire, with obscure nerves and areolate reticulation, or distinct nerves and scalariform reticulation. Surfaces are either concolorous or discolorous, the lower one either glabrous or variously pubescent. The petiole is thickened at its base and gradually becomes thinner towards the base of the lamina.

Inflorescence

In *Lithocarpus* there are at least four different types of inflorescence, i.e. male, female, androgynous, and mixed. In an androgynous inflorescence the male flowers are situated along the upper part and the female flowers along the lower part of the rachis (Fig. 1c, f). In a mixed inflorescence, on the other hand, the male and female flowers are alternately arranged along the rachis (Fig. 1b & 2b). Unlike those of *Quercus*, the inflorescences in *Lithocarpus* are rigid and erect, and in many species, especially the male ones, are much-branched (Fig. 1e). The male inflorescence in all species appears first in the axils of lower leaves, followed later by the female androgynous or mixed ones appearing in the axils of higher leaves or from the axils of bracts on the upper parts of the paniculate (much-branched), terminal or subterminal inflorescences. In *L. atjehensis*,

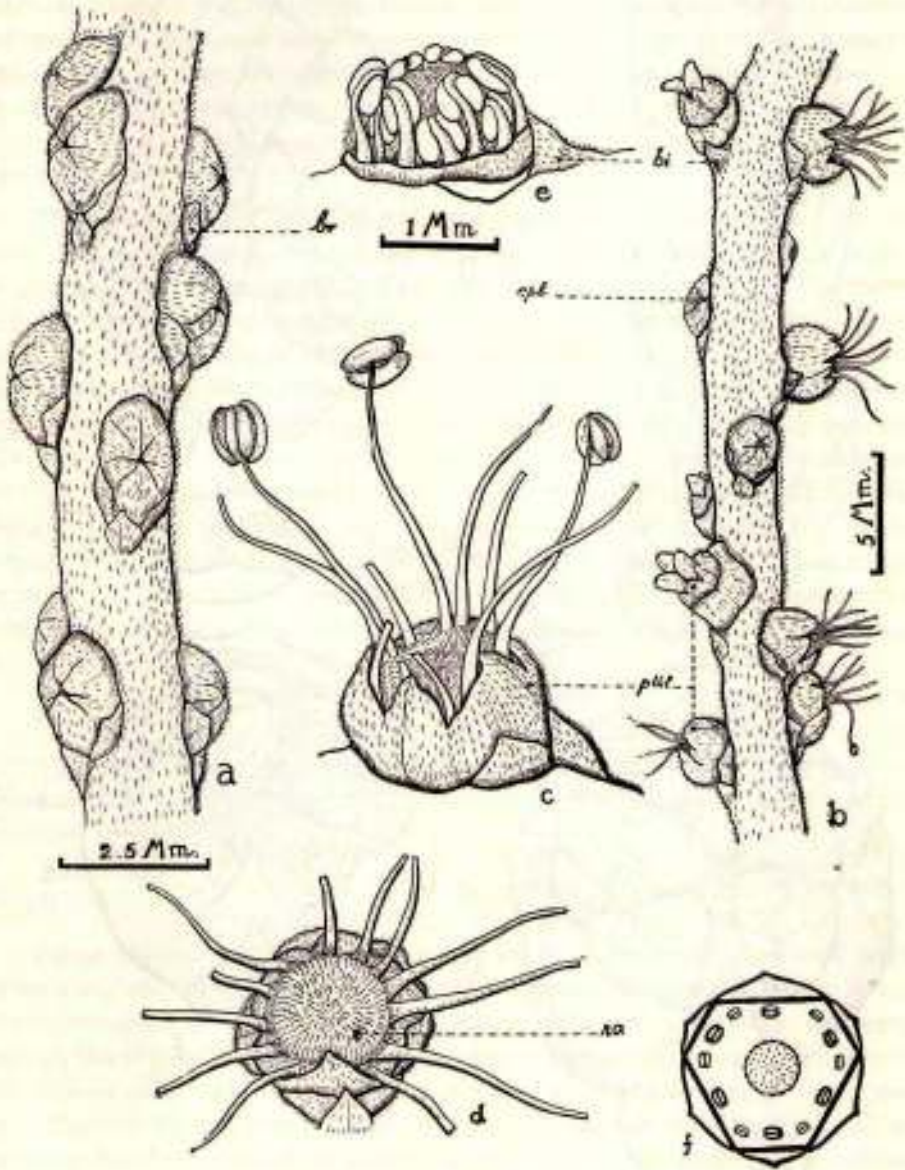


Fig. 2 For explanation see text.

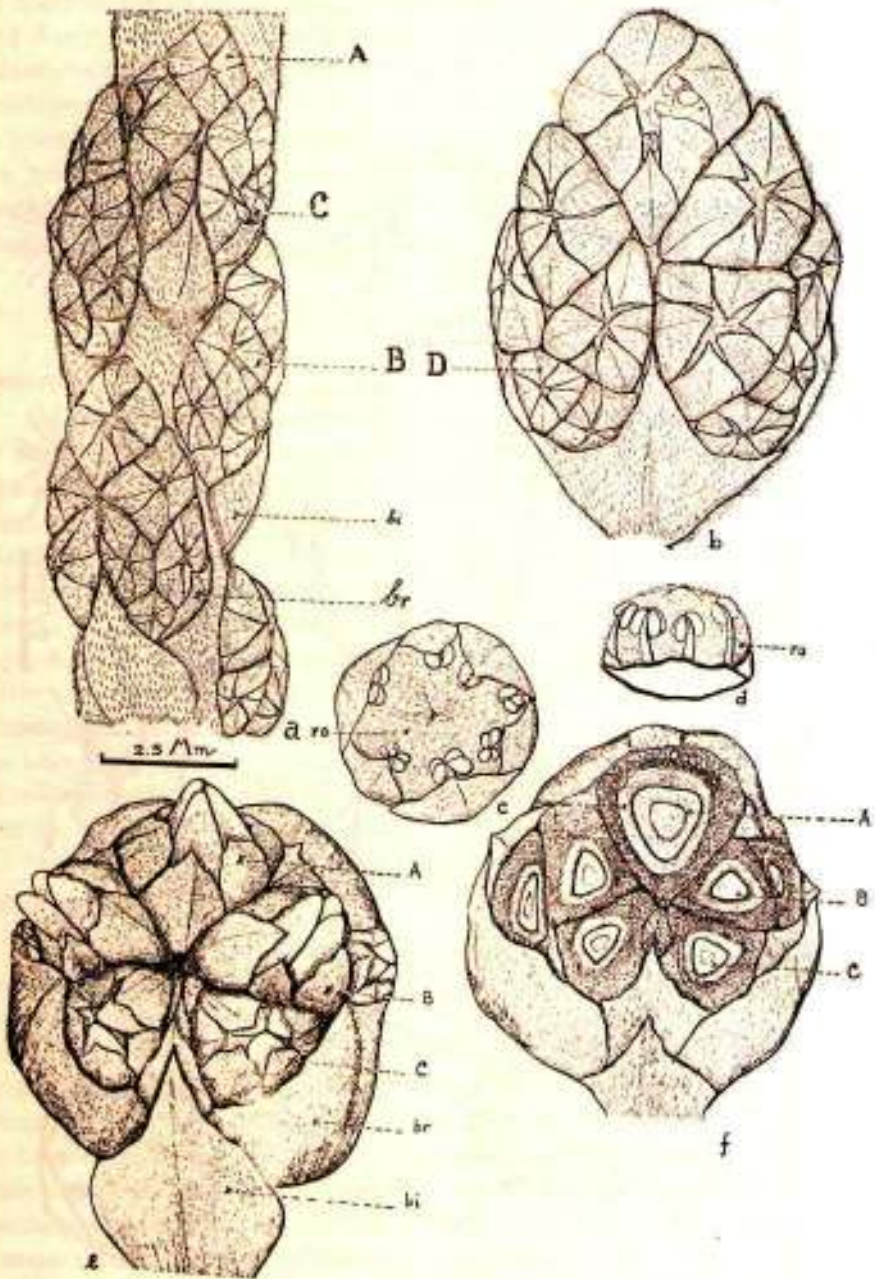


Fig. 3. For explanation see text.

bullatus, *falconeri*, *jacobsii*, *revolutus*, and several others, the inflorescence is either male or female, whereas in *L. blumeanus*, *encleisacarpus*, *hatu-simae*, *lucidus*, *turbinatus*, and many others the inflorescence may be male, female or androgynous. Combination of male and mixed inflorescences occurs in *L. apoensis*, *bancanus*, *dasystachyus*, *ewyckii*, *ferrugineus*, and several others. The majority of Malesian species have a combination of male and androgynous inflorescences.

Flowers

The male flowers are either solitary along the rachis as in *L. atjehensis*, *bancanus*, *crassivervius*, *ferrugineus*, and *kunstleri* (Fig. 1a & 2a), or more commonly arranged in dichasial clusters of 3—24 along the rachis as in *L. andersonii*, *caudatifolius*, *elegans*, *jacobsii*, *lampadarius* and many others (Fig. 1d & 3a, b). Each male flower consists of 6 perianth lobes, 10—12 stamens with dorsifixed, 0.25—0.50 mm long anthers, and a pistillode (Fig. 2c & 3c, d). Similarly the female flowers are either solitary along the rachis, e.g. in *L. andersonii*, *bancanus*, *beccarianus*, *eehinifer*, *kostermansii*, and *lauterbachii* (Fig. 1c), or in dichasial clusters of 2—10 along the rachis (e.g. in *L. elegans*, *hendersonianus*, *jacobsii* and *megacarpus*). Each female flower consists of 6 perianth lobes, 10—12 staminodes, an inferior, 3—6 loculed ovary with 3—6 cylindrical styles with terminal punctiform stigmas. The ovules are 2 in each locule, anatropous, apical and pendulous.

In *L. ruminatus* and *turbinatus* both from Borneo, the staminodes in the female flower are well-developed and exceed the length of the perianth lobes, and they produce apparently normal pollen grains. It is, however, not known whether the flowers are functionally unisexual or bisexual.

Cupule (morphology).

As in *Quercus*, each female flower of *Lithocarpus* is surrounded by its own cupule. In the case of clustered female flowers, the cupules are also aggregated in dichasial arrangements (Fig. 3e—f & 5h). In many species, though the cupules are aggregated in the earlier stage, at maturity only one is fully developed, the other being abortive or partly developed and attached to the base of the well-developed one. In *Castanopsis*, on the other hand, the cupule is always solitary along the rachis and encloses 1—3 (or more female flowers) and at earlier stages, it maybe distinguished from that of *Lithocarpus* by its definite number (2—4 or more) of growing

points situated at both (external) sides of the fruits. These growing points produce acrosopical rows of spine- or tubercle-primordia (Fig. 4a, b, e), separated from one another by vertical rows of scales (suture areas). Furthermore, in a species of *Castanopsis* where the cupule encloses more than one female flowers or fruits, there are no cupule-segments or valves situated between the adjacent female flowers (one exception occurs in *C. chrysophylla* where the fruits are separated from one another by single-layered interseminal cupule-segments). In *Lithocarpus*, on the other hand, since each female flower or fruit is surrounded by its own cupule, in the case of aggregated cupules, the flowers or fruits are separated from one another by interseminal cupule-parts which are double in nature. A fully developed cupule of Malesian *Castanopsis* is either spiny or tuberculate, and that of *Lithocarpus* is never truly spiny nor tuberculate.

In *Lithocarpus* fully developed cupules may completely enclose the fruits (e.g. in *L. encleisacarpus*, *longispinus* and *maingayi*. — Fig. 5, a—c) or cup- to saucer-shaped and enclosing the lower parts of the fruits only (Fig. 5d—h). In *L. beccarianus*, *hallieri*, *javensis*, *maingayi*, *ruminatus* and *turbيناتus* the fruit is, for its greater part, fused to the cupule and free only at the flat or convex upper portion. In *L. encleisacarpus* and *longispinus*, on the other hand, though the fruit is also completely enclosed by the cupule, the former is free from the latter except for the scar region at the base (Fig. 5b—c). The upper free part of the fruit of *L. schlechteri* and related species (Fig. 5d) is much wider in area than that of *maingayi*, and the large scar is embedded in the deeply cup-shaped cupule. In *L. elegans*, *hatusimae*, *hystrix*, *sundaicus* (Fig. 5h, e, g, f respectively) the fruit is, except for the scar, completely free from the cupule. Truly lamellate cupules are found in *L. encleisacarpus*, *hatusimae*, *maingayi* and many others (Fig. 5a, c, e), and truly muricate cupules in *L. hystrix*, *longispinus*, *cooperatus* and many others (Fig. 5b, f). In *L. elegans*, *ferrugineus*, *jacobsii*, *kunstleri* and *nieuwenhuisii* the cupule is squamose with the scales adpressed and imbricate (Fig. 5h), whereas in *L. sundaicus* and its related species, though the cupule is also squamose, the scales are set in concentric rings (Fig. 5g). Tuberculate cupules are found in *L. rotundatus*, *schlechteri* and *pulcher*. The cupule in *L. cyclophorus*, *indutus*, *luteus* and *urceolaris* is neither clearly lamellate nor squamose. In *L. elegans* (Fig. 5h), *erythrocarpus*, *jacobsii*, *lampadarius* and *wallichianus* they are aggregated in dichasial clusters along the rachis, whereas in the majority of Malesian species the cupules are solitary along the rachis.

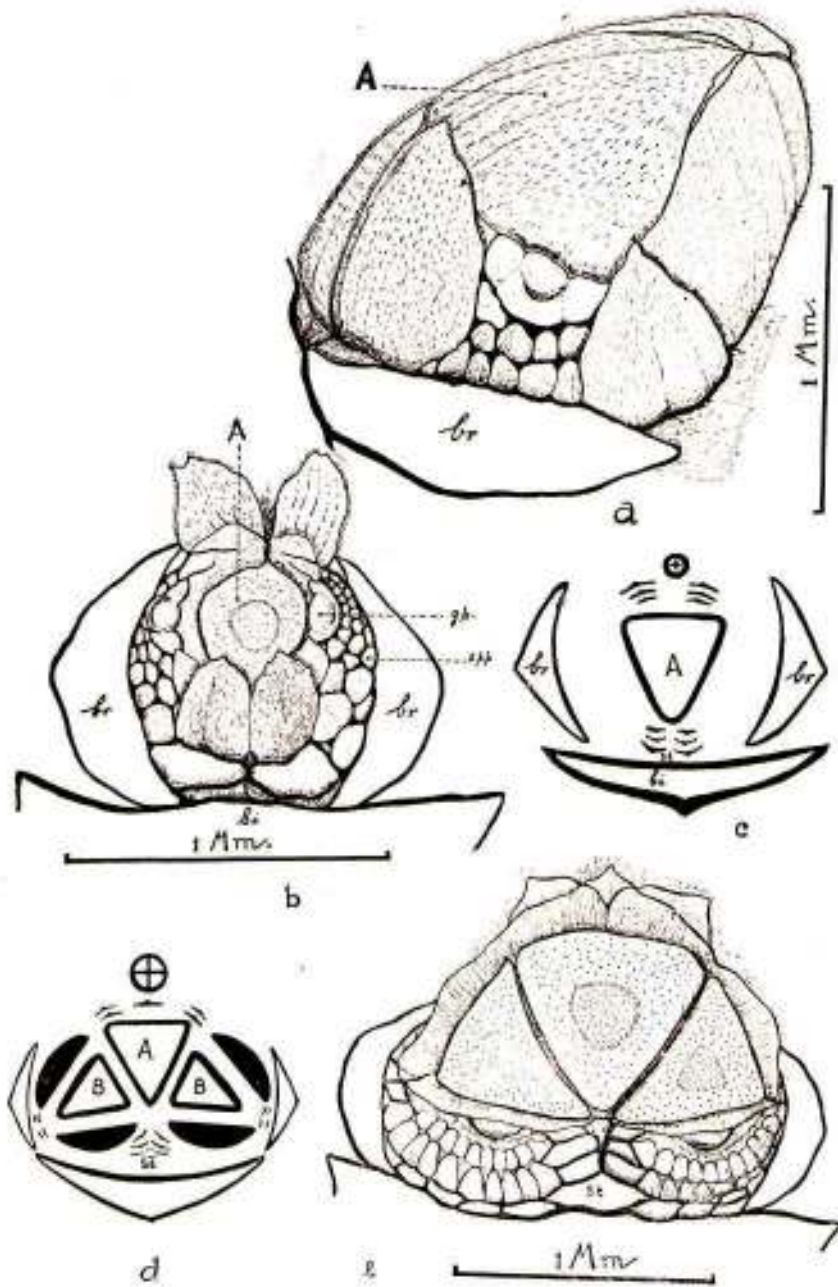


Fig. 4. For explanation see text.

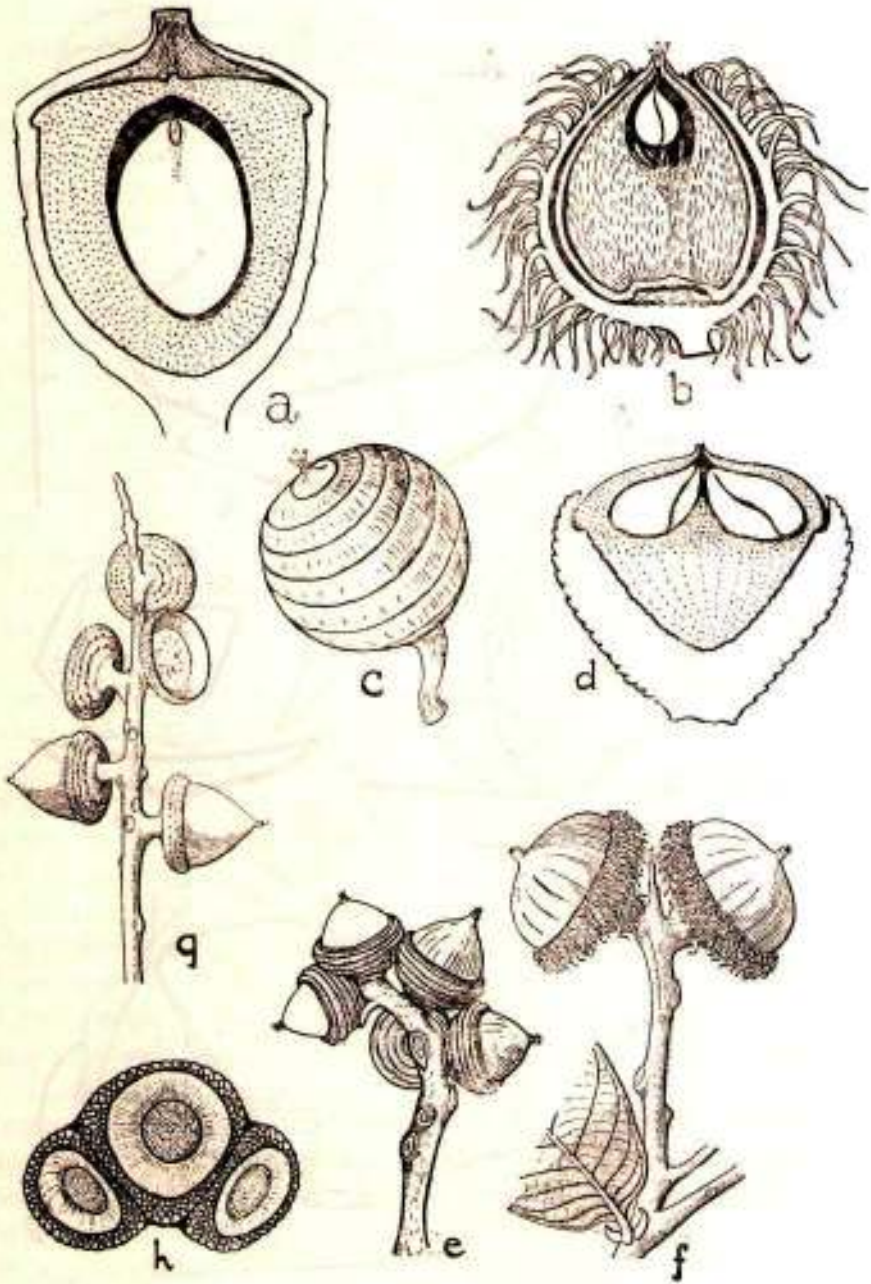


Fig. 5. For explanation see text.

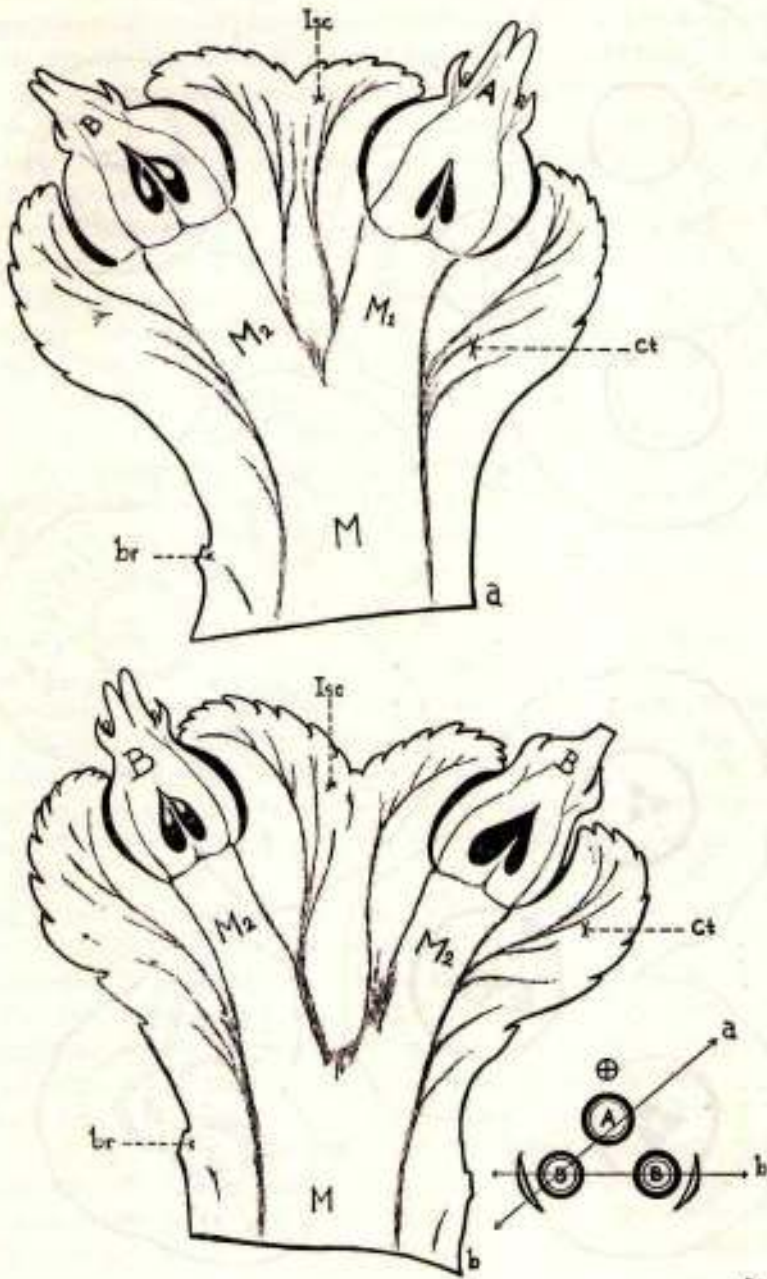


Fig. 6.

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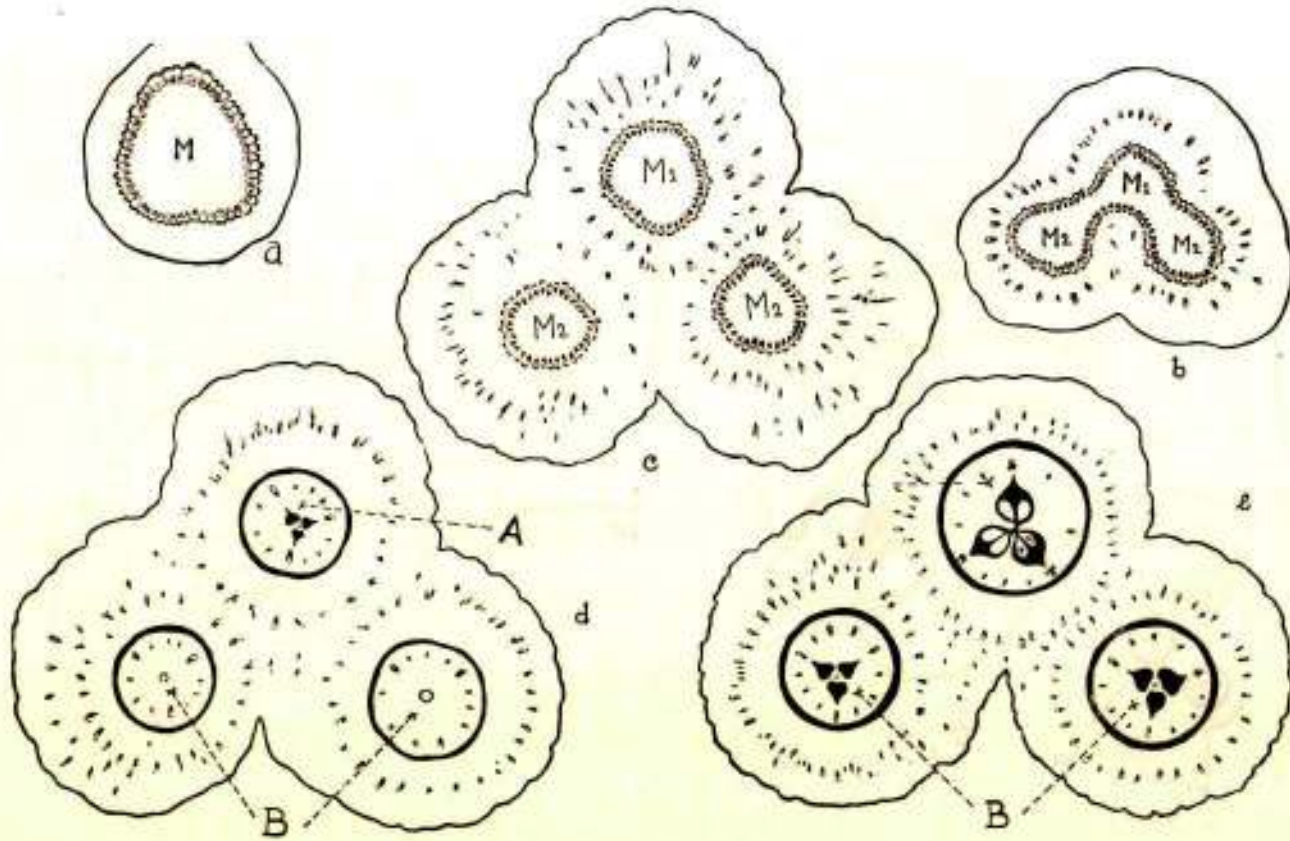


Fig. 7. For explanation see text.

Cupule (anatomy)

The organization of the vascular system in a solitary cupule of *Lithocarpus* is exactly the same as that of *Quercus*. In a dichasial cluster of 3 female flowers, a longitudinal section through the primary (A) and secondary (B) flowers (Fig. 6a) shows that at the level above the attachment of the braeteoles (br) the main vascular cylinder (M) forks into a central tract (M1) supplying the primary flower and a lateral tract (M2) leading to the secondary flower. From each of these two tracts arise scattered vascular traces which give rise to the vascularization of the cupule (ct). In the interseminal parts of the cupules (isc) two vascular traces appear, one arising from the central tract (M1) and the other from the lateral tract (M2). This type of vascularization indicates that the interseminal parts of the cupule in *Lithocarpus* are double in nature unlike those of *Castanopsis chrysophylla* which are singular. In another longitudinal section through the two secondary flowers (Fig. 6b) the main vascular cylinder is divided into two lateral tracts (M2) which lead to the secondary flowers. From each of these lateral tracts also appear, at different levels, several separate traces which give rise to the vascular system of the cupule (ct).

In a transverse section through the base of the peduncle a similar pattern of vascularization to that of a solitary cupule is seen (Fig. 7a). At the base of the cupule (Fig. 7b) the main vascular cylinder is divided into a central (M1) and two lateral (M2) tracts. At this level it may be noted that numerous scattered vascular traces supplying the cupule (ct) are beginning to appear around the main vascular tracts. Further up from this level (Fig. 7c) the division of the main vascular cylinder into a central tract (M1) supplying the primary flower and two lateral tracts (M2) leading to the secondary flowers, as well as numerous scattered vascular traces, is completed. At the base of the fruits the central and lateral tracts are further differentiated into numerous vascular traces which are responsible for the vascularization of the floral parts. The scattered traces supplying the cupule are also further divided into smaller traces which at this level are arranged in a more or less circular pattern surrounding the main tracts (Fig. 7d). A cross-section further up from the insertion of the fruit, where the ovary wall is completely free from the cupule, shows where the differentiation of the vascular tracts into traces leading to various floral parts typical in the genus is achieved (Fig. 7e).

For comparison it may be shown here that the organization of the vascular system in the cupule of *Castanopsis* is very different from that of *Lithocarpus* and *Quercus*. In an unifloral cupule, e.g. *Castanopsis acumi-*

natissima (Fig. 8), a transverse section through the peduncle (Fig. 8a—c) shows that the vascular cylinder originating from the rachis is not circular as in *Quercus* and *Lithocarpus*, but laterally elongated. At the base of the cupule (Fig. 8c), from the central vascular cylinder (M) arise two lateral tracts (ct) which supply the cupule-segments. At the level where the female flower is inserted on the cupule (Fig. 8d) the central vascular cylinder undergoes a further differentiation. In a transverse section further up from this point, where the ovary wall is completely free from the cupule, the central vascular cylinder is further divided into a central cluster of smaller traces supplying the placental region and twelve other traces leading to the various parts of the flower. A longitudinal section through the cupule and parallel to the rachis (Fig. 8f) further shows that the organization of the vascular tissue in the cupule of *Castanopsis* is dichasial in pattern as in *Castanea*, *Fagus* and *Nothofagus*. The dichasial pattern of vascularization in the cupule is more clearly demonstrated in a 3-flowered cupule as shown in Fig. 9, where M1 is the central vascular cylinder supplying the primary flower (A), M2 are lateral vascular tracts leading to the secondary flowers (B), and ct denotes the vascular traces supplying the cupule-segments.

Conclusion

From the brief discussion given above, it is clear that though in floral characters species of *Lithocarpus* are very similar to those of *Castanopsis*, they may be distinguished by the following combination of characters:

	<i>Castanopsis</i>	<i>Lithocarpus</i>
a. Bark	: Inner surface not ridged	Inner surface longitudinally ridged.
b. Leaves and bud-scales	: Tend to be in a distichous arrangement	Always spirally arranged.
c. Wood-rays	: Exclusively uniseriate.	Uniseriate and multiseriate.
d. Cupule	: Always solitary along the rachis and enclosing 1-3 or more fruits; has a definite number of growing points separated by vertical rows of scales; interseminal parts absent; vascular system dichasial in pattern.	Solitary or in dichasial cluster, and enclosing 1 fruit only; growing point continuous and circular, no suture; interseminal parts always present and double in nature; vascular system not in dichasial pattern.

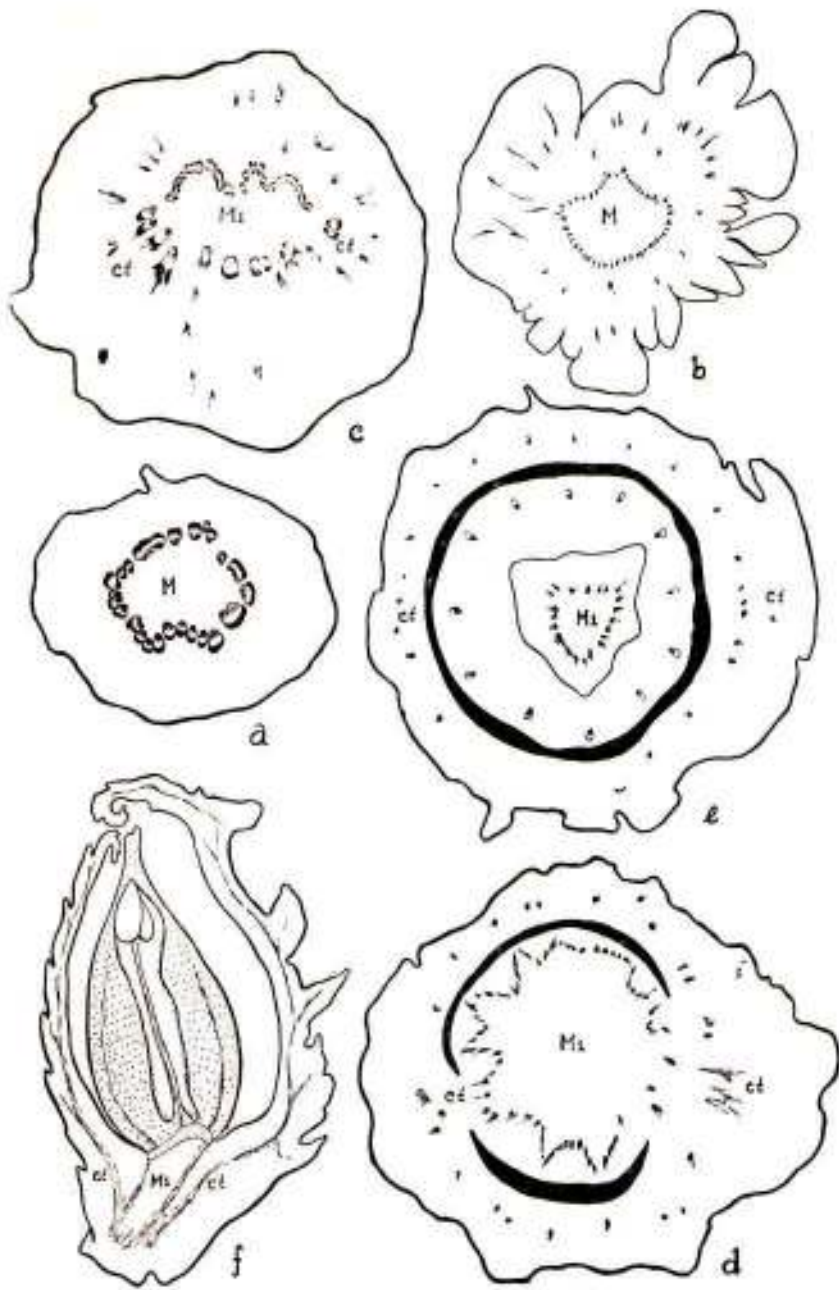


Fig. 8. For explanation see text.

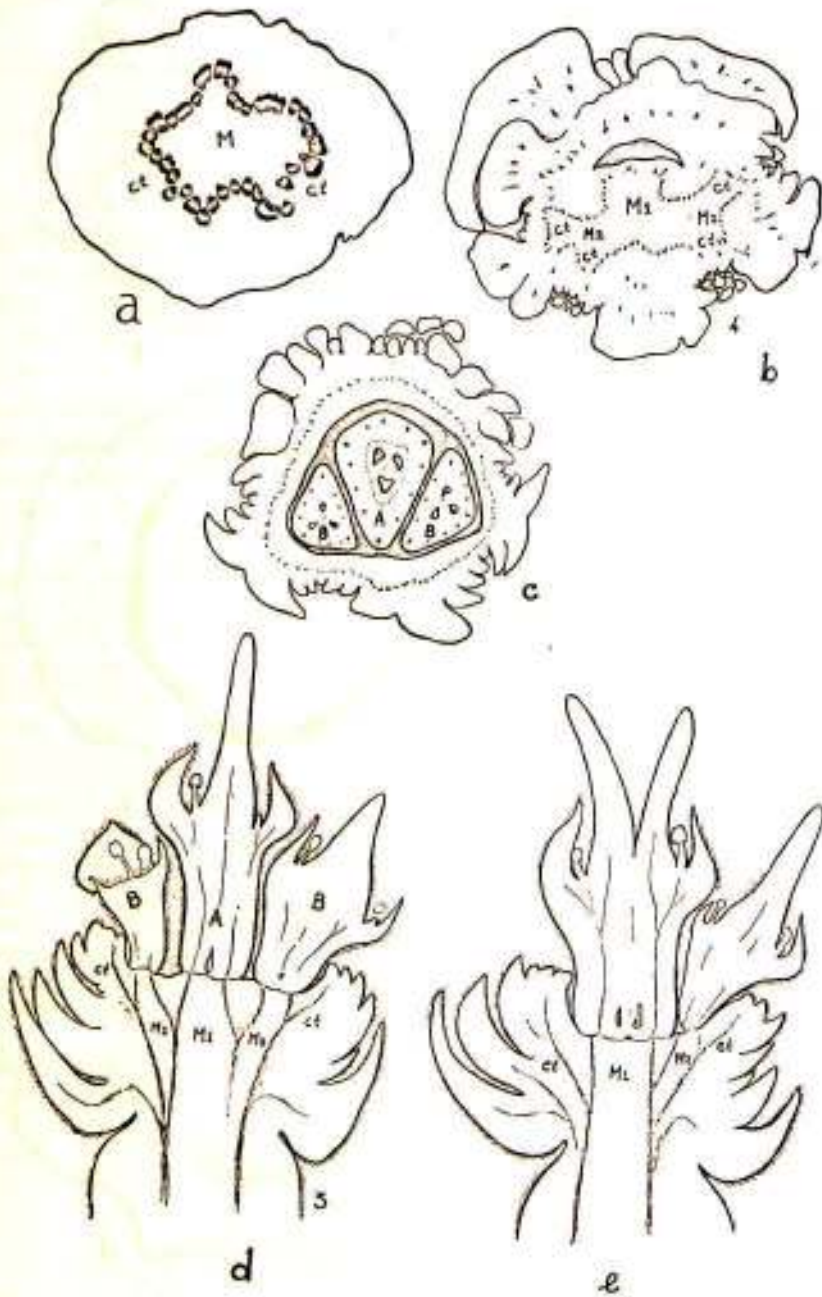


Fig. 9. For explanation see text.

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SPECIES ENUMERATION

Lithocarpus andersonii Soepadmo, *spec. nov.* — Fig. 10

Arbor 7—27 m alta 20—60 cm diametro, radicibus gralliformibus ad 1.8 m altis, cortice cinereo laevi. Ramuli ab initio tomentosi, pilis sparsis cinereis brevibus stellatis, glabrescentes, deinde fuscis, lenticellis minutis sparse vel dense intructis. Gemma terminalis ovoidea ellipsoidea 3—4 mm longa 2 mm lata, squamis anguste ovatis acutis. Stipulae anguste ovatae acutae vel subulatae 3—4 mm longa 1 mm lata. Folia rigida tenue coriacea indice 2—3, (6—)7—10(—11½) cm longa, (2—)2½—3½ (—5) cm lata circum medium latissima, basi acuta vel rotundata margine recurvata apice obtusa vel acuta 1—1½ cm acuminata, supra glabra nitida pallide cinereo-iridida vel flavo-brunnea infra pallide cinerea vel badia, pilis sparsis adpressis stellatis tomentosis glabrescentia, costa utrinque valde prominentia, nervis tenuibus utrinque obscuris vel infra distinctis in latere unico 9—11 subparallelis angulo 45—60° marginem versus arcuatis anastomosantibusque; reticulatione subtili areolata utrinque obscura; petiolo glabro 5—8 mm longo 1 mm crasso sulcato.

Cupula juvenilis sessilis obconicoidea tomentosa pilis densis fuscis adpressibus stellatis, lamellis 5—6 denticulatis. Cupula matura sessilis ad 3—4 pedunculata, discoidea 2—6 mm longa 1.5—2.2 cm diametro margine tenui undulata laevi recurvata fructus partem basalem obtegens, extus tomentosis pilis simplicibus. Fructus maturus ovoideus-conoideus glaber purpureo-brunneus 1.2—2.2 cm longus 1.6—2.3 cm diametro apice rotundatus acuminatus basi rotundatus cicatrice profunde concava 0.9—1.5 cm diametro, pariete osseo ca 1.2 mm crasso; cotyledones plano-convexae.

TYPUS: *Anderson 5102*, Borneo, Sarawak, Mukah, in peat swamp forest at low alt., fr. 30-III-1957 (K!, L! holo).

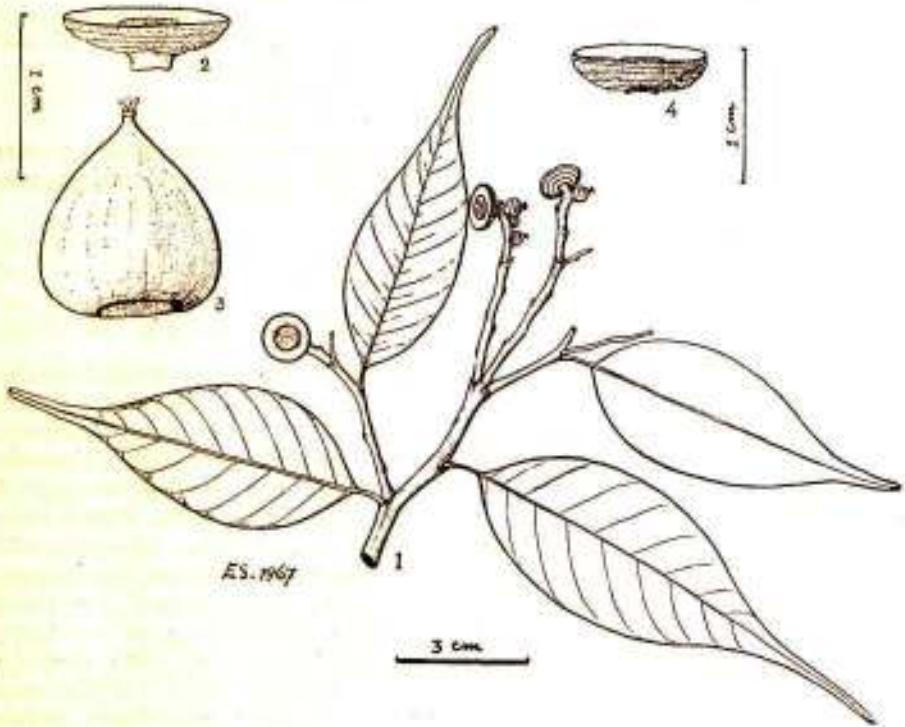


Fig. 10. *Lithocarpus andersonii* Soepadmo (1 — 3 after Anderson 4560, 4 after S. 12046).

BORNEO. Sarawak: Sibü Distr., Lassa peat swamp forest, *Anderson R. 14*; Ladang Kalong, Sulhi 5054; Binatang Distr., Surong Irit and Daro F.R., *Samsi b. Tahir 5229, 9728*; Sg. Kelepar, Pulau Beruit, *Anderson 8013*; Loba Kabang peat-swamp forest, *Anderson S. 2682*; Betong Distr., Saribas F.R., *Anderson (S) 13256*; Kuching and vicinity: many. Kalimantan: Sampit, *bb. 32407*.

NOTE. Near to *L. rassa* from which it differs by its flatter cupule with fewer lamellae, thinner leaves with long acuments and shorter petiole, and by its fruits which are as long as or longer than broad. This species is named after Dr. J.A.R. Anderson of the Forestry Dept., Kuching, Sarawak, who in the last ten years or so has enriched our collection of *Fagaceae* from different parts of Sarawak.

LITHOCARPUS APOENSIS (Elmer) Rehd.

Lithocarpus apoensis (Elmer) Rehd. in *J. Arn. Arb.* 1: 123. 1919. — *Quercus apoensis* Elmer in *Leaf. Philip. Bot.* 3: 945. 1910. — Type: *Elmer 11887*, Philippines, Mindanao, Mt. Apo, alt. 1000 m, fr. IX-1909 (A! holo, BM!, L!, WRSL!).

Quercus apoensis var. *ulajan* Elmer, *Lc.* 946. — Type: *Elmer 11811*, Mindanao, Mt. Apo, alt. 1650 m, yfr. IX-1909 (A!, BM!, K!, NY! holo, US!, WRSL!).

PHILIPPINES. Mindanao: Mt. Apo, *ANU 1648*, and several others; Mt. Abucay, *BS 75217*; Mt. Katanglad, *PNH 10150*. Luzon: Quezon Prov., Infanta, *PNH 40622*; Rizal Prov., Boso-boso, *Merrill 2680*.

LITHOCARPUS ASPERICUPULA (Markg.) Rehd.

Lithocarpus aspericupula (Markg.) Rehd. in *J. Arn. Arb.* 10: 123. 1929. — *Pasania aspericupula* Markg. in *Bot. Jahrb.* 59: 78, f.1. 1924. — Type: *Ledermann 8729*, Eastern New Guinea, in forest at 40–100 m alt., ♂ fl., 16-IX-1912 (WRSL!).

NEW GUINEA. West New Guinea: Vogelkop Peninsula, Seta, N.E. of Ajamaru Lake, *BW 15351*. East New Guinea: locality not known, *Ledermann 8729*.

NOTE. This is poorly known species, very near to *L. jordanae* from the Philippines, but differing by its thinner leaf without recurved margin, coarse but lax reticulation, and by its depressed subglobose fruit. In New Guinea this species differs from the others there by its cupule, which is covered with rather long, recurved spine-like scales. Its nearest ally in New Guinea is *L. rufovillosus*, but this species has much larger leaves, cupules and fruits, and the leaves are densely (at least initially) covered with reddish-brown indumentum consisting of adpressed stellate and curled stellate or tufted hairs.

Lithocarpus atjehensis Hatus. ex Soepadmo, *spec. nov.*

Frutex. Ramuli dense tomentosi pilis fulvis adpressis stellatis atque pilis fasciculatis erectis lanuginonsi, picei, fragiles. Gemma terminali

ovoidea-globosa ca 3 mm longa 2 mm diametro squamis ovatis. Folia crasse coriacea rigida fragilia indice 1.7—2, (6—)8—10(—12) cm longa (3—)4—5(—7) cm lata infra medium latissima, faciebus discoloribus supra fusee badia plus minusve nitida pilis fasciculatis erectis sparse pubescentia praesertim ad costa nervisque, infra pallide fumoso-grisea pilis adpressis stellatis, pilis fasciculatis erectis interspersis dense tomentosa, basi rotundata ad subcordata apice 1—1½ cm acute acuminata, costa utrinque prominente, nervis lateralibus 12—14 infra prominentibus supra impressis, subparallelis angulo 60—70° marginem versus arcuatis anastomosantibusque, reticulo grosso subscalariformi infra distincto; petiolo 7—10 mm longo 2 mm crasso supra appanato dense piloso. Rachis mascula 2—4 mm longa 2 mm crassa pilis erectis stellatis dense tomentosa, bracteis bracteolisque ovata 1—1½ nun longis 2/3—1 mm latis, floribus *S* solitarii perianthio 6-lobato, staminibus 10—12 filamentis 2—2 ½ mm longo anthera 0.3 mm longo, pistillodio subgloboso circiter 1 mm diametro. Infructescentia juvenilis 3—5 cm longa 3 mm crassa cupulas juveniles 5—10 obconoideas ferens. Fructus juvenilis perianthio 6-lobato, staminodiis 12 abortivis stylis 3 conoideis 2—2½ mm longis recurvatis. Cupula juvenilis subsessilis poculiformis ca 1 cm longa 2 cm diametro, intus pilis simplicibus adpressis fulvis dense tomentosa extus pilis brevibus stellatis dense tomentosa, margine tenue, fructum circiter partem 1/3 infra obtegens, lamellis 5—6 concentricis tenuibus denticulatis. Fructus juvenilis ovoideus-conoideus pilis adpressis simplicibus stellatisque fulvis dense tomentosus, ca 1 ½ cm longus diametrosque, apice acutus basi rotundatus cicatrice concava ca 3/4 cm diametro, pariete lignoso ca 1/2 mm crasso.

TYPUS: *Van Steenis* 8563, N. Sumatra, Mt. Losir, alt. 3000 m, fr. 1-II-1937 (BO!, K!, L! holo).

SUMATRA. North Sumatra, Putjuk Angasan, Gajo-Alas Lands, *Van Steenis* 8U9; Mt. Goh Lembuh, *Van Steenis* 9143.

NOTE. This new species is very close to *L. conocarpus*, but can be distinguished by its different type of indumentum, rounded to subcordate leaf-base, and by its fruit which is not long-acuminate and is covered with fulvous stellate hairs.

LITHOCARPUS BANCANUS (Scheff.) Rehd.

Lithocarpus bancana (Scheff.) Rehd. in J. Arn. Arb. 10: 132. 1929. — *Quercus bancana* Scheff. in Nat. Tyd. Ned. Ind. 31: 361. 1870. — *Synaedrys bancana* (Scheff.) Koidzumi in Bot. Mag. Tokyo 30: 190. 1916. — *Pasania bancana*, (Scheff.) Markg. in Bot. Jahrb. 59: 79. 1924, *quoad nomen*. — Type: *Teysmann* 22k, Bangka, Batu Balai, <*S*, ?, yfr. (BO! holo).

Quercus rajah Hance in J. Bot. 16: 198. 1878. — *Synaedrys rajah* (Hance) Koidzumi in Bot. Mag. Tokyo 30: 192. 1916. — *Pasania rajah* (Hance) S. Moore in J. Bot. 6S, Suppl.: 115. 1925. — *Lithocarpus rajah* (Hance) A. Camus in Riviera Scientif. 18: 41. 1932. — Type: *HB. 11484*, Cultivated in Bogor Botanic Gardens, fr. (BM!, BO! holo).

Quercus scyphigra, Hance var. *riedelii* King in Ann. Roy. Bot. Gard. Calc. 2: 39. 1889. — *Litlwearpus scyphigera* (Hance) A. Camus var. *riedelii* (King) A. Camus, Chênes 3: 962. 1954. — Type: *Teysmann HB. 11182*, Belitung, £ fl., yfr. (BO! L!).

SUMATRA. West Coast: Padang Lawas, Sidjundjung, 66. 2972, 5808; Palembang, Muara Mengkulen, *Forbes 3036a*; East Coast: Labuhan Batu, *Rachmat 3257, 357k, 4040, 4101*; B a n g k a : Bakung, Lobok Besar, 66. 34140, *Kostermans & Anta 466, 1069*; Gn. Mangkol, *Kostermans & Anta 805*; Batu Balai, *Teysmann HB. 21085, 21086*; Blinju, *Grashoff 68*. B e l i t u n g : Tanjung Pandan, *Teysmann HB. 11182, 11183*.

MALAY PENINSULA. P a h a n g : Rompin, *KEP/CF 4163, Seimund 965*; J o h o r e : 86 mile Endau Road, *Burkill & Shah 2509*; Mersing-Kluang Road, *Whitmore 403*.

BORNEO. S a r a w a k : near Kuching, *Haviland 1701*; Lundu Distr., Gn. Sebandar, *SAR 9649*. B r u n e i : Andulau P.R., *BRVN 607*. K a l i m a n t a n : West Kutei, Poehoes Lake, *Endevl 5009*; Balikpapan Distr., Mentawir River, *Kostermans 10184a*.

NOTE. In the past there has been a serious confusion regarding the real identity of this species. Scheffer (1870) described *Q. bancana* based on specimens (*Teysmann 224*) with flowers, young fruits, and apparently also some detached ripe fruits and cupules. A year later (1871) he stated that the detached cupules and fruits on which he based his description of *Q. bancana*, did not belong to the species, and he replaced the original description with another one based on specimens collected by Teysmann (*HB. 76S9*) from Pangkal Pinang in Bangka. In the present study, however, I find that *Teysmann HB. 7639* is not conspecific with *Q. bancana*, but belongs to *L. urceolaris*.

Hance (1878), who never studied the type specimens of *Q. bancana* Scheff. (1870), described another species, *Q. rajah*, based on fruiting specimens collected from a tree cultivated in the Bogor Botanic Gardens, the seedlings or seeds of which were brought back by Teysmann from Bangka. In the last five years or so more fruiting specimens of *Q. bancana* from Bangka became available, and in my opinion they are definitely conspecific with those described by Hance as *Q. rajah*. Believing that Scheffer's identification made in 1871 was correct, King (1889) and most of the later authors who had never seen the type specimens of *Q. bancana*, referred all specimens of the true *Q. bancana* to *Q. rajah*, and those belonging to *Q. urceolaris* Jack to *Q. bancana*. In fact the last two mentioned species are completely different from one another by their leaves, cupules, and fruits. As a conclusion, therefore, it is obvious that *Q. bancana* is a perfectly distinct species and *Q. rajah* should be reduced to it, and all specimens which have been referred by previous authors to *Q. bancana*

(except for the type) should be included in *Q. urceolaris* (= *Lithocarpus urceolaris*).

Specimens from New Guinea attributed by Markgraf (1924) to *Pasania bancana*, belong to *L. megacarpus*.

LITHOCARPUS BECCARIANUS (Benth.) A. Camus

Lithocarpus beccariana (Benth.) A. Camus in Riviera Scientif. 18: 39, 1932. — *Quercus beccariana* Benth. in Hooker f., Icon. Pl. 14: 10, pl. 1315, 1880. — *Pasania beccariana* (Benth.) Prantl in Engler & Prantl, Nat. Pfl. fam. 3, 1: 55, 1894. — *Synaedrys beccariana* (Benth.) Koidzumi in Bot. Mag. Tokyo 30: 188, 1916. — Type: *Beccari P.B. 3310*, Marop, near Bt. Lupar, Sarawak, III-V-1867, ♂, ♀ fl., yfr. (A1, BM!, FI! holo, K!).

BORNEO. Sarawak: Marop, near Bt. Lupar, *Beccari P.B. 3269, 3310*. K a l i m a n t a n : Upper Mahakam, bb. 30637. S a b a h : Beaufort Distr., *SAN 34534, SAN 39858*, and several others; Tambunan Distr., Trusmi F.R., *SAN 41790*.

NOTE. The cupule and fruit of this species are rather similar to those of *L. maingayi* from Malaya, but the leaf is smaller and the number of lateral nerves is smaller. The cupule in *L. beccarianus* is longitudinally ridged, whilst that of *L. maingayi* is more or less smooth. Records from Penang (Hooker f., 1888, King, 1889) and from Singapore (Gamble, 1915) are not confirmed here. These authors may have had *L. burkillii*.

LITHOCARPUS BENNETTII (Miq.) Rehd.

Lithocarpus bennettii (Miq.) Rehd. in J. Arn. Arb. 1: 123, 1919. — *Quercus bennettii* Miq., Fl. Ind. Bat. 1(1): 857, 1856. — *Cyclobalanus bennettii* (Miq.) Oerst. in Kong. Danske Vid. Selsk. Skrift. 5(9): 375, 1871. — *Pasania bennettii* (Miq.) Gamble in J. Roy. As. Soc. Beng. 75(2): 433, 1915. — *Synaedrys bennettii* (Miq.) Koidzumi in Bot. Mag. Tokyo 30: 190, 1916. — Type: *Horsfield HB. 3402*, Bangka, Djeboes, ♂ fl., XI-1812 (CGE!, K!, U! holo).

SUMATRA. T a p a n u l i : Selindung, bb. 5680; Sibolga, Barus, bb. 29570, 31011; Pakanbaru, Tenajan River, *Soepadmo 21*; P a l e m b a n g : Banjuasin, *Grashoff 917*; Agam Ulu, *HB. 3727, Praetorius s.n.* L a m p o n g : Rantaujaja, bb. 2498. B a n g k a : Blinju, *Grashoff 94*; Djeboes, *HB. 3506*; Lobok Besar, *Kostermans & Anta 13, 575, 1150*; Gn. Mangkol, *Kostermans & Anta 669*; Batu Balai, Muntok, *Teysmann 7606*; Sg. Ila, *Teysmann 9607*; Pangkal Pinang, *Teysmann HB. 11451*.

MALAY PENINSULA. K e l a n t a n : Gn. Setong, *KEP 37682*; N e g e r i S e m b i l a n : Pasir Panjang, *KEP/CF 558*. J o h o r e : Sg. Sedili, *Burkill 2239*; Tg. Kapang, *Ridley 6446*; Mt. Austin, *Ridley 12515*. S i n g a p o r e : *Maingay 2700* (= *K.D. 1460*); *Ridley 3960*.

BORNEO. S a r a w a k : Mt. Mattang, *Moulton's Coll. 1688*; Serian Distr., Sg. Sabal Tapang, *SAR 15532*; Bintulu Distr., Pandan, *SAR 15812*; Nyabau F.R., *SAR 15878*; Marudi, Tinjar, *SAR 23425*; Bk. Iju, Ulu Arip, *SAR 23698, 23776*. Baram, Mt. Mulu, *Anderson & King K.5*. B r u n e i : Ulu Ropan, *BRUN 5236*. S a b a h : Ranau Distr., Bk. Ampuan, *SAN 29979*; Sipitang Distr., *SAN 27132*; Sandakan Distr., Sepilok F.R., *SAN 16306, 22576, SAN A 1974*; Tawau, *SAN 30104*. K a l i m a n t a n : Mantangai, *bb. 12246*; Tidung, *bb. 17850*; Berouw, *bb. 19057, Kostermans 21507*.

NOTE. Very near to *L. bancanus* but differs by its smaller and thinner leaf, glabrous fruit, and by its cupule which has denticulate lamellae or with distinct adpressed scales arranged in concentric lines. It is also very closely allied to *L. solerianus* from the Philippines, but may be distinguished by its smaller cupule and fruit with deeply concave scar, and by its leaf with obscure reticulation.

Records from the Philippines were based on specimens belonging either to *L. solerianus* or *L. sulitii*.

LITHOCARPUS BLUMEANUS (Korth.) Rehd.

Lithocarpus blumeana (Korth.) Rehd. in *J. Arn. Arb.* 10: 132. *Quercus blumeana* Korth., *Kruiddk.* 208, t. 44. 1844. — *Cyclobalanus blumeana* (Korth.) Oersted in *Vid. Medd. Naturh. For. Kjöbn.* 8: 1867. — *Synaedrys blumeana* (Korth.) Koidzumi in *Bot. Mag. Tokyo* 30: 186. 1916. — *Castanopsis blumeana* (Korth.) Rehd. in *J. Arn. Arb.* 1: 122. 1919. — Type: *Korthals s.n.*, S.E. Kalimantan, River Doesoen (Barito), ♀ fl. yfr. 20-VIII-1836 (A!, L! holo).

BORNEO. K a l i m a n t a n : S.E. part, Doesoen River, *Korthals s.n.*, ♀ fl., yfr. 20-VIII-1836; Tidung-lands, *bb. 17876, 17895, 18228*; Berouw, Tandjung Redeb, near Long Lanuk, *Kostermans 21468, 21650*, Long Wahan, *Schlechter 13377*. S a b a h : Kinabatangan, *Arsat 1150, Evangelista 927*, and several others; Tawau, Balung, *SAN 32468*.

NOTE. Record from Malaya are not confirmed here, King (1889), Gamble (1915) and others may have had specimens of *L. macphailii* or *neorobinsonii*. Specimens from Java attributed by Koorders & Valetton (1904) and others are excluded from this species and described as new (see *L. kostermansii*).

Lithocarpus brassii Soepadmo, *spec. nov.*

Arbor 15—35 m alta 30—45 cm diametro, cortice fumoso-grisea lenticellata. Ramuli ab initio pilis fulvis stellatis sparse denseve tomentosi mox glabrescentes fusci sparse lenticellati. Gemma terminali ovoideo ca 3 mm longo 2 mm diametro squamis ovatis acutis. Stipulae ovatae-acutae

1—2 longae 1 mm latae. Folia coriacea indice 2.2—2.6, 10—14 cm longa 4—6 cm lata, medio vel paulo infra latissima, faciebus discoloribus supra glabra opaca viride-cinerea vel fusce badia, infra pilis flaviscinereis adpressis minutis tenuiter oblecta, basi acuta apice obtuse acuta, costa nervisque tenuibus utrinque plus minusve appianatis, nervis lateralibus in latere unico 8—10 subparallelis ascendentibus angulo 45°—50° marginem versus arcuatis nec anastomosantibus, reticulo subtili subscalariformi ad fere regulari, utrinque obscura; petiolo glabro 6—10 mm longo supra appianato vel paulo sulcato. Inflorescentia mascula vel androgyna pilis fulvis lanuginosis dense pubescens, bracteis anguste ovatis 2—3 mm longa 1 mm lata bracteolis minoribus. Rachis mascula ca 5 cm longa 1½ mm crassa, floribus ♂ vulgo solitarii, perianthio campanulato profunde inciso lobis 6 acutis, dense lanuginoso, staminibus 12 filamentis 3—4 mm longo anthera 0.30—0.35 mm longa, pistillodio subgloboso ca 1 mm diametro. Rachis androgyna 5—6 cm longa 1—1½ mm crassa, floribus ♀ solitariis vel bini vel terni, perianthio regulariter 6-lobato, staminodiis 12 abortivis stylis 3—4 teretibus ca 1½ mm longis basi dense lanuginoso. Cupula matura sessilis vel 1—1½ mm pedunculata late poculiformis 1½—2 cm longa 4—4½ cm diametro fructus partem ⅓—½ infra obtegens, pariete lignoso 3—5 mm crasso, margine crassa paulo incurvata pilis fumoso cinereis adpressis stellatis dense tomentosa, squamis inconspicuis ovatis acutis adpressis imbricatis sed annulis concentricis obscuris depositis. Fructus maturus oblate ovoideo-globosus 2½—3 cm longus 3—4 cm diametro glaber apicem depressum umbonatum excepta, fusco-badius cicatrice valde convexa conoideave 2½—3 cm diametro, pariete lignoso 5—7 mm crasso; cotyledonibus planoconvexis.

TYPUS: *Brass 32372*, East New Guinea, Highlands Distr., Kassar, in *Castanopsis-Lithocarpus* forests, at 1370 m alt., fr. 2-XI-1959 (A!, L! holo, NY!).

NEW GUINEA. East New Guinea: Western Highlands Distr., Wabag Subdistr., near Lake Inim, ANU 2222, Ambun Valley, ANU 2671; Mile 15th. Wabag-Laigam Rd., NGF 15253; Central Div., Dieni, Brass 3301; Mafulu, Brass 3289; Eastern Highlands Distr., Mt. Dayman, Brass 33253; Boridi, Carr 13029, 13030.

NOTE. This new species is named after Mr. L.J. Brass, the well known plant collector, who collected a large number of plants during the Archbold expeditions in New Guinea.

Lithocarpus brassii is closely related to *L. lauterbachii* also from New Guinea, but differs from the latter by its thick cupule with adpressed scales, and acute leaves with obscure reticulation.

LITHOCARPUS BUDDII (Merr.) A. Cam.

Lithocarpus buddii (Merr.) A. Cam. in Bull. Soc. Bot. France 90: 85, 1943. — *Quercus robinsonii* Merr. in Philip. J. Sc. Bot. 10: 297, 1915; non Ridley 1914. — *Quercus buddii* Merr. in Philip. J. Sc. Bot. 35: 6, 1928. — *Synaedrys robinsonii* (Merr.)

Koidzumi in J. Arn. Arb. 1: 130, 1919. — Type: BS 17911 (Brown), Luzon, Mt. Maquiling, Laguna Prov., ♂, ♀ fl. V-1913 (BM!, K! L! NY! US! holo).

PHILIPPINES. Luzon: Laguna Prov., Mt. Maquiling, *Elmer 17515, BS 26666*, and many others; Mt. Banajao, *FB 30947*; Tayabas Prov., *FB 7848, Loher 14018*; Tarlac Prov., San Clemente, *FB 24972*. Samar: Mt. Mahagna, Oquendo, *PNH. 14461*. Leyte: Ormoc, Lake Danao, *PNH. 11903, Wenzel 759, 815, 1247, 1596, 1749*.

NOTE. Near to *L. celebiscus*, but differs by its smaller leaf with rufous indumentum, and by its smaller cupule set with recurved hook-shaped scales.

Lithocarpus bullatus Soepadmo, *spec. nov.* — Fig. 11

Arbor 9—25 m alta 15—40 cm diametro cortice fissurata vel squamosa obscure cinereo vel rubro-brunnea. Ramuli ab initio dense tomentosi pilis stellatis fulvis ad rubro-brunneis, subglabrescentes pallide fulvi vel obscure cinereo-brunnei, improfunde fissurati sparse lenticellati. Gemma terminali ovoideo 1—1½ mm longo 1 mm lato squamis anguste ovatis acutis ad lanceolatis 1 mm longis 0.3 mm latis. Stipulae lanceolatae acutae 1—1½ mm longae 0.3—0.5 mm latae. Folia rigida crasse coriacea valde bullata indice 1.3—2.8, (5—)7—9(—11) cm longa (3½—)3—4(—5) cm lata ad medium vel paulum infra latissima, supra glabra nitida olivacea infra tomentosa pilis pallide griseo-brunneis densis adpressis stellatis, basi acuta margine recurvata apice obtuse acuta ad ½—1 cm acuminata raro rotundata emarginataque, costa utrinque valde prominente, nervis in latere unico 9—10 infra valde prominentibus supra impressis parallelis angulo 60—80° marginem versus arcuatis sed non anastomosantibus, reticulo laxo subscalariformi utrinque obscuro; petiolo 3—5 mm longo 1—1½ mm crasso supra applanato. Inflorescentia mascula vel feminea vel mixta, tomentosa pilis brevibus fulvis stellatis. Rachis mascula 5—10 cm longa 1—1½ mm crassa bracteis bracteolisque 1 mm longis 0.5—0.7 mm latis ovatis acutis; floribus ♂ solitariis vel ternis perianthio campanulato 6-lobato lobis brevibus staminibus 12, filamento 2½—3½ mm longo anthera 0.5—0.7 mm longa pistillodio subgloboso 0.7—1 mm diametro dense lanuginoso. Rachis feminea vel mixta 5—10 cm longa 2 mm crassa; floribus ♀ solitariis perianthio profunde 6-lobato staminodiis 12 abortivis stylis 3—4 conoideis basi connatis 2—2½ mm longis dense pubescentibus partem stigma versus exceptam pilis simplicibus vel fasciculatis. Cupula juvenilis sessilis ovoideo-ellipsoidea fructum omnino obtegens perianthium stylosque exceptos, extus squamis numerosis minutis acutis annulis 5—6 concentricis. Cupula matura subsessilis solitaria poculiformis ½—1 cm longa 1.5—1.7 cm diametro fructus ¼—⅓ infra partem obtegens, intus dense tomentosa pilis simplicibus fulvo-brunneis vel argyraceis extus dense tomentosa pilis stellatis cinereo-brunneis brevibus stellatis, annulis 5—8 concentricis denticulis remotis. Fructus maturus ovoideo-conoideus ca 1½ cm magnitudine apice abrupte acutus basi rotundatus cicatrice applanato 8—10 mm diametro, pariete osseo ca 1 mm crasso glabro badio.

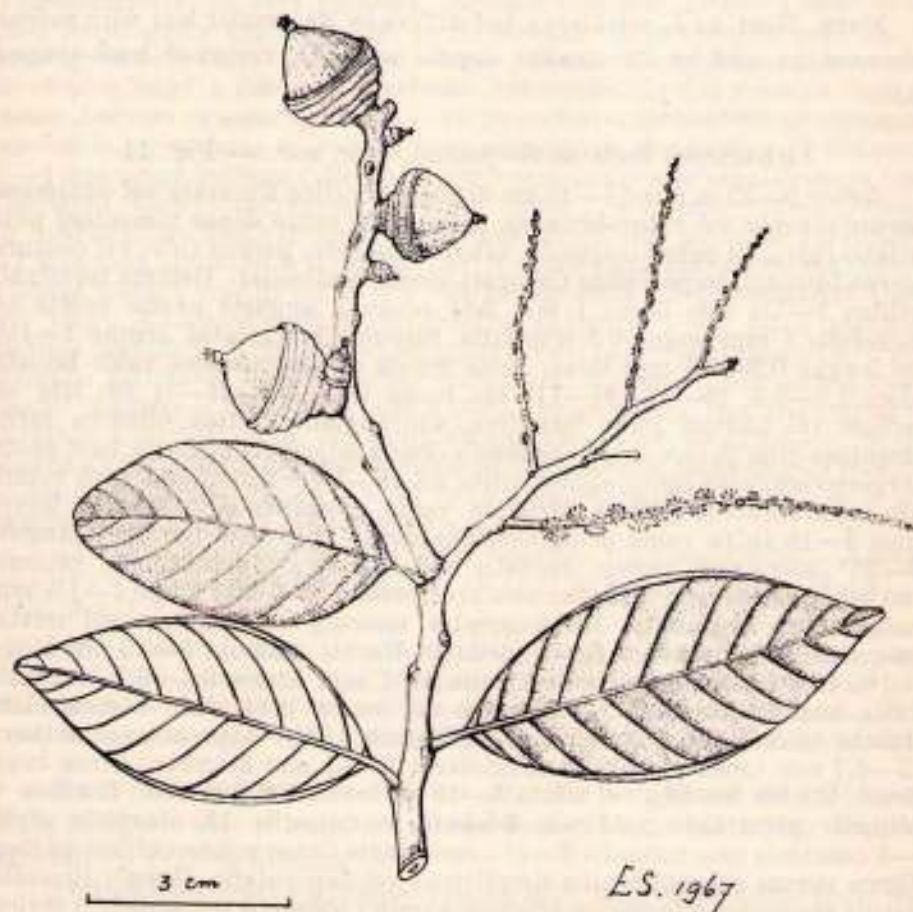


Fig. 11. *Lithocarpus bullatus* Soepadmo (after Clemens 23175).

TYPUS: *Clemens 32715*, North Borneo, Mt. Kinabalu, alt. 120—1500 m, ♂ fr. 15-IV-1933 (A! BM! BO! holo, K!, L!, NY, UC!).

BORNEO. North Borneo: Mt. Kinabalu, very common between alt. 1200—4000 m, *Clemens 29882, 30389, 30390, 32447, 32632, 32687, 32762, 33960*; Bembangan River, *RSNB. 4450, 4543*; Mesilau Cave, *RSNB. 4730, 4886*; Near Paka, *SAN 21957*; Sg. Lotong Tract, *SAN 24112*; Mt. Trusmadi, *SAN 31794, 41883*; Below Kambaranga, *SFN. 27526, 27676*. Kalimantan: W. Kutei, Mt. Palmasan, *Koetermans 13077*.

NOTE. In his MSS on Malesian Fagaceae, Hatusima (1942) had recognized this species as a new one. As he never published his work, the species is here reinterpreted and redescribed. It differs from any other species by its strongly bullate leaves. Its nearest ally is *L. ewyckii*, but in the latter species the leaves are not bullate and the fruits and cupules are much larger.

LITHOCARPUS BURKILLII A. Cam.

Lithocarpus burkillii A. Camus in Bull. Mus. Paris II, 5: 88, 1933. — Type: *Burkill & Holttum 7795*, in forest on East slopes of Fraser's Hill, Pahang, Malaya, 23-IX-1922, yfr (K! holo, KEP! SING!).

Pasania beccariana (non Prantl) Ridley, Fl. Mal. Pen. 3: 387, 1924.

MALAYA. Pahang, E. slope of Fraser's Hill, *Burkill & Holttum 7795*, *Corner s.n.*

NOTE. Though in his field note Prof. Corner indicated that this species is very common in Fraser's Hill, so far only two incomplete specimens represent this species. The fruit and cupule of *L. burkillii* resemble that of *L. hallieri* from Borneo, but the latter has a much larger leaf and the cupule is usually with spiral rings. Records of *Q. beccariana* from Penang (*King in Ann. Gard. Calc. 2: 23. 1889*) and from Singapore (*Gamble in J. As. Soc. Bengal 75, 2: 1915*) may belong here.

LITHOCARPUS CANTLEYANUS (King ex Hook.f.) Rehd.

Lithocarpus cantleyana (King ex Hook.f.) Rehd. in J. Arn. Arb. 10: 132, 1929. — *Quercus cantleyana* King ex Hook.f., Fl. Brit. Ind. 5: 613, 1888. — *Pasania cantleyana* (King ex Hook.f.) Gamble in J. Roy. As. Soc. Beng. 75, 2: 434, 1915. — *Synaedrys cantleyana* (King ex Hook.f.) Koidzumii in Bot. Mag. Tokyo 30: 190, 1916. — Lectotype: *King's Coll. 5623*, Malaya, Perak, Chandleriang, in open jungle on hilly locality, alt. 150—240 m, fr. III-1884 (BM!, K! holo, L!, P!, SING!).

MALAY PENINSULA. Perak: Taiping, *KEP/CF 237*; Parit F.R., *KEP/FMS 974*; Chikus F.R., *KEP 27214*; Bikam F.R., *KEP 21079*; Larut, *King's Coll. 5112, 5396, 5475, 5554*; Gopong, *King's Coll. 5814*. Kelantan: Sg. Sebir, *KEP/FRI 7058*; Sg. Tapah, *KEP/FRI 7174*; Rolai F.R., *KEP/FRI 7248, 7257, 7267, 7293, 7403, 7409, 7412*; Sg. Galas, *KEP/FRI 7443*. Johore: Mersing,

North of Gn. Arong F.R., *KEP 54246*; Bk. Paloh Estate, *Shah 364*. S i n g a - p o r e : *Hullett 654*; Seletar, *Ridley 5113*.

BORNEO. S a r a w a k : Lundu Distr., Sg. Merah, *SAR 9650*; Bintulu Distr., Segan F.R., *SAR 15559*; Miri, Batang Lambir, *SAR 21372*. S a b a h : Ranau Distr., Bk. Ampuan, *SAN 20977*; Lahad Datu Distr., Mt. Silam, *SAN 37927, 52805*; Lamag, Kinabatangan, *SAN 36402, 53265*; Sandakan, Sepilok F.R., *SAN 15359, 17219, 19708, 21535, 21738, 30989, 31006, 34275, 34315, 34348, 39473, 39498, 39656*; Tawau, Marutai, *SAN 26193, 29634*; Ulu Sg. Serudong, *SAN 31156*; Near Hot Spring, *SAN 47711*. K a l i m a n t a n : W. Kutei, near Hikam Batu Beng, *Enderl 2237*; W. of Samarinda, Lao Djanan, *Kostermans 6737*.

NOTE. Closely related to *L. ewyckii*, but differs by its thick-coriaceous, larger leaf, with a lax venation and reticulation.

LITHOCARPUS CASTELLARNAUIANUS (Vid.) A. Camus

Lithocarpus castellarauiana (Vid.) A. Camus in Bull. Soc. Bot. Fr. 92: 84. 1945. — *Quercus castellarauiana* Vid., Rev. Pl. Vasc. Filip.: 264. 1886. — *Synaedrya castellarauiana* (Vid.) Koidzumi in Bot. Mag. Tokyo 30: 190. 1916. — Type: *Vidal 1806*, Philippines, Marinduque Isl., Santa Cruz, fr. XI-1864 (A! K! holo).

Quercus merrittii Merr. in Philip. J. Sc. Bot. 3: 325. 1908. — *Synaedrya merrittii* (Merr.) Koidzumi, *Lc.* 192. — *Lithocarpus merrittii* (Merr.) Rehd. in J. Arn. Arb. 1: 128. 1919. — Type: *FB. 8647* (*Curran & Merritt*), Philippines, Luzon, Tayabas Prov., Mt. Banajao, fr. XI-1907 (US! holo).

Quercus obliquinervis Merr. in Philip J. Sc. Bot. 4: 250. 1909. — *Lithocarpus obliquinervis* (Merr.) A. Camus, *Riviera Scient.* 18: 41. 1932. — Type: *FB. 18380*, Philippines, Luzon, Benquet Prov., fr. I-1909 (K!, US! holo).

Quercus cagayanensis Merr. in Philip. J. Sc. Bot. 13: 6. 1918. — *Lithocarpus cagayanensis* (Merr.) A. Camus in Bull. Soc. Bot. Fr. 92: 256. 1945. — Type: *FB. 26973*, Philippines, Luzon, Cagayan Prov., st. VII-VIII-1917 (K!, US! holo).

Quercus pinatubensis Elmer in Leaf. Philip. Bot. 9: 3188. 1934. — *Lithocarpus pinatubensis* (Elmer) A. Camus, *Chênes, Atlas* 3: 117, t. 518. 1949. — Type: *Elmer 22272*, Philippines, Luzon, Pampanga Prov., Mt. Pinatubo, yfr. V-1927 (A!, K!, L!, UC! holo).

PHILIPPINES. L u z o n : Rizal Prov., *Ahern's Coll. 29*; Bosoboso, *BS. 2100*; Montalban, *Loker 6957*; Angilog, *Loker 6960*; Sumag, *Loker 14125*; Cagayan Prov., Penablanca, *BS. 76954*; Laguna Prov., *BS. 22894, FB. 25008, Loker 6965*; Bataan Prov., *FB. 12000*; Tayabas Prov., *FB. 30797*; Benquet Prov., *FB. 18380*; Pampanga Prov., *Elmer 22272*. M a r i n d u q u e : Santa Cruz, *Vidal 1806*. L e y t e : *FB. 12888*. S a m a r : Bagacay, *PNH 6324*. M i n d a n a o : Surigao, *Weuzel 3466*.

LITHOCARPUS CAUDATIFOLIUS (Merr.) Rehd.

Lithocarpus caudatifolia (Merr.) Rehd. in J. Arn. Arb. 1: 123. 1919. — *Quercus caudatifolia* Merr. in Philip. J. Sc. Bot. 3: 324. 1908. — *Synaedrya caudatifolia* (Merr.)

Koidzumi in Bot. Mag. Tokyo 30: 190, 1916. — Type: *FB. (Borden) 806*, Philippines, Luzon, Bataan Prov., Mt. Mariveles, Lamao River, fr. V-1904 (BM! holo).

Quercus minahassae Koord. ex Elmer in Leaflet, Philip. Bot. 3: 941, 1910. — *Lithocarpus minahassae* (Koord. ex Elmer) Rehd. in J. Arn. Arb. 10: 133, 1929. — Type: *Elmer 11942*, Philippines, Mindanao, Davao Distr., Todaya, Mt. Api, fr. X-1909 (A!, BM! holo, WRSL!).

Quercus bulusanensis Elmer in Leaflet, Philip. Bot. 10: 3736, 1939. — *Lithocarpus bulusanensis* (Elmer) A. Camus in Not. Syst. 13: 265, 1948. — Type: *Elmer 14537*, Philippines, Luzon, Sorsogon Prov., Mt. Bulusan, ♂, ♀ fl., X-1915 (A!, K!, L!, Pl!, UC! holo, US!).

BORNEO. S a b a h: Beaufort, *SAN 30230*; Tenom vicinity, *SAN 27264, 27440, 27445*; Mendolong, *SAN 31941*; Keningau, *SAN 42080, SAN A 4459*; Kota Belud, *SAN/BBFD 7120*; Kudat vicinity, *SAN 30880, 30909, 30913, 30927, SAN A 4344*; Ranau Distr., Bk. Kullimpisau, *SAN 18811, 18813*; Dolok Path, *SAN 20729, 20735*; Bk. Kalong, *SAN 21344, 28309, 28320*; Bk. Hampuan, *SAN 28330*; Hot Spring tracks, *SAN 28338*; 50th mile Potting-Ranau Road, *SAN 49151*; Trusmadi, *SAN 50404*; Tambunan, *SAN A 3624*; Sandakan, *SAN 32661, SAN A 1016, 1143, 1488, 3599, 4027, SFN 18658*; Lahad Datu, *SAN 37201, 47697*; Semporna, *SAN 26301*; Tawau, Sebatik Isl., *SAN A 1564, 2410, 4283*; Tumbun Mata Isl., *SAN 48183*. K a l i m a n t a n: S.E. parts, Tanah Grogot, *Hub. Winkler 3100*.

PHILIPPINES. M i n d o r o: *FB 8721, 12019*; Mt. Halcon, *Merrill 5695*. L u z o n: Benquet Prov., *BS 5592, Elmer 8556*; Tayabas Prov., *BS 9462, 25490*; Laguna Prov., *BS 22922*; Pangasianan Prov., *BS 29930*; Bataan Prov., *Elmer 6867*; Bulacan Prov., *Vidal 619*; Rizal Prov., *Bosoboso, Vidal 619b, 621*; Abra Prov., *Vidal 1813, 1816*. P o l i l l o Isl., Bigian, *PNH 3691*. Sibuyan Isl., Capiz Prov., *Elmer 12106*. Samar, Calarman, *FB 12649*. Bohol, *BS 42595*. N e g r o s: Mt. Marapara, *FB 13636*. M i n d a n a o: Surigao, *Ahern 527*; Davao Prov., Mt. Apo, *BS 15625, Elmer 10512, 11245, 11884, 11922, 11923, PNH 34608, 34618*; Bukidnon Prov., Mt. Katanglad, *BS 21406, PNH 9944, 9962, 10683*; Cotabato Prov., Mt. Matutum, *BS 85067*; Lake Lamao, *Clemens 1170*; Mt. Malindang, *FB 4568*.

NOTE. Most of the Bornean specimens differ slightly from those from the Philippines by their denser velutinous tomentum and laxer lateral nerves. Some intermediates are, however, present, so that the Bornean plants do not deserve to be regarded as a distinct species. Its nearest allies are *L. ewyckii* and *dasytachyus*. From *L. ewyckii* it differs by its densely velutinous branchlets and leaves, smaller cupules and fruits. From *L. dasytachyus* it may be distinguished by its velutinous indumentum, smaller and thinner leaves, and by its larger cupules and fruits.

LITHOCARPUS CELEBICUS (Miq.) Rehd.

Lithocarpus celebica (Miq.) Rehd. in J. Arn. Arb. 1: 123, 1919. — *Quercus celebica* Miq. in Ann. Mus. Lugd. Bat. 1: 110, 1863. — *Cyclobalanus celebica* (Miq.) Oerst. in Vid. Medd. Naturh. For. Kjöbn. 8: 81, 1867. — *Synaedrys celebica* (Miq.) Koidzumi

in Bot. Mag. Tokyo 30: 194. 1916. — Type: *De Vries s.n.*, Celebes, Menado, fr. IV-VI-1860 (BM!, BO!, K!, L! holo, U!).

Quercus llanosii A.D.C., Prod. 16(2): 97. 1864. — *Cyclobalanus llanosii* (A.D.C.) Oerst., Lc. 80. — *Synaedrys llanosii* (A.D.C.) Koidzumi, Lc.: 196. — *Lithocarpus llanosii* (A.D.C.) Rehd. in J. Arn. Arb. 1: 128. 1919. — Type: *Llanos s.n.*, Philippines (? lost).

Quercus campanoana Vidal, Sinopsis: 41. 1883. — *Pasania campanoana* (Vid.) Markg. in Bot. Jahrb. 59: 78. 1924. — Type: *Vidal 613*, Philippines, Luzon, Rizal Prov., San Mateo, fr. X-1883 (A!, K!, L! holo).

Quercus dalbertisii F.v.M. in Vict. Natural. 1: 124. 1884. — *Synaedrys dalbertisii* (F.v.M.) Koidzumi, Lc.: 194. — *Pasania dalbertisii* (F.v.M.) Markg., Lc.: 74. — *Lithocarpus dalbertisii* (F.v.M.) Rehd. in J. Arn. Arb. 10: 132. 1929. — Type: *D'albertis s.n.*, East New Guinea, Fly River, acorn only (MEL! holo).

Quercus gulliveri F.v.M., Lc.: 167. — *Synaedrys gulliveri* (F.v.M.) Koidzumi, Lc.: 189. — Type: *Edelfelt s.n.*, East New Guinea, Astrolobe Range, fallen acorns, & cupules only (MEL! holo).

Quercus pseudomoluccana var. *papuana* O. Warb. in Bot. Jahrb. 13: 286. 1891. — *Pasania papuana* (O. Warb.) Markg. in Bot. Jahrb. 59: 74. 1924. — *Lithocarpus papuana* (O. Warb.) Rehd. in J. Arn. Arb. 10: 132. 1929.

Quercus brachyclada v. *Seemen* in Bull. Dept. Agr. Ind. Neerl. 1: 7. 1906. — *Synaedrys brachyclada* (v. Seemen) Koidzumi, Lc.: 194. — *Lithocarpus brachyclada* (v. Seemen) A. Camus in Bull. Soc. Bot. Fr. 96: 201. 1943. — Type: *Teymann HB. 14095*, Celebes, Bonthain, Lanjienga, yfr. 28-X-1877 (BO!, L!).

Quercus lipacon Elmer in Leaflet Philip. Bot.: 1983. 1913. — *Lithocarpus lipacon* (Elmer) Rehd. in J. Arn. Arb. 1: 128. 1919. — Type: *Elmer 13735*, Philippines, Mindanao, Agusan Prov., Mt. Urdaneta, fr. IX-1912 (A!, K!, L!, UC! holo, US!).

Quercus mabesae Merr. in Philip. J. Sc. Bot. 13: 7. 1918. — *Lithocarpus mabesae* (Merr.) A. Camus in Bull. Soc. Bot. Fr. 92: 84. 1945. — Type: *FB. (Mabesa) 26915*, Philippines, Luzon, Laguna Prov., Los Banos, fr. IX-1917 (K!, US! holo).

Pasania aculeata Markg. in Bot. Jahrb. 59: 73. 1924. — *Lithocarpus aculeata* (Markg.) Rehd. in J. Arn. Arb. 10: 132. 1929. — Type: *Schlechter 17274*, East New Guinea, Kani highlands, fr. 14-II-1908 (A!, BM!, K! holo, L!).

PHILIPPINES. Mindoro: *FB. 11490*. Luzon: Bataan Prov., *FB. 2856*, Laguna Prov., Los Banos, *FB. 26915*; Mt. Banahaw, *FB. 30939, 30944*; C. Luzon, Limutan, *Lohr 4837, 4857*; Rizal Prov., Bosoboso, *Lohr 4863, Merrill 2684*; San Mateo, *Vidal 613*; Mt. Polis, *PNH 7958*. Polillo: *BS. 10402*. Negros: Mt. Cauloan, *FB. 17401*. Mindanao: Agusan Prov., Mt. Urdaneta, *Elmer 13735*.

CELEBES. Minnabassa: *Forman 264, Koorders 16618, 16622, 16624, 16625, 16626, 16628, 16630, 16631, 16635, 16636, 16638, 16639, 16640, 16957*; Menado, *De Vries s.n.*; Palu, *bb. 28262*; Gorontalo, *bb. 19421*; Palopo, *bb. 32801*; Lepo-lepo, *Beccari F. 9631*; Malili, *CEL/II-424, CEL/IV-151, 152, 153, 154*; Bonthain, *Teymann HB. 14095*; Mt. Ampoloh, *Rachmat 1011*; Baleh Angin, *Teymann HB. 12557, 12720*.
MOLUCCAS. Morotai: *Kostermans 998*. Ceram: Gn. Lon-loa, *Eyma 3215*; N.W. Ceram, Riring, *Rutten 1816*.

NEW GUINEA. West New Guinea: Manokwari vicinity, Inomi, *bb. 33548*; Arfak Mts., *Beccari PB. 858, BW 13827*; Sidei, *BW 6178*; Mt. Krabo,

BW 10761; Warmare Valley, BW 15692; Wandammen Pen., Mts. Wondiwoi, BW 10712; Job Isl., BW 14991; Hollandia, Berap, bb. 28996; Taminonding, BW 3804; Sidoarsi Mts., BW 9032; Cycloop Mts., van Royen 3781; Idenburg River, Bernhard's Camp, Brass & Versteegh 12589, 13556; Merauke, Kurkata Village, van Royen 4789; Pikipik, bb. 22238; Biak, BW 602; Andjai, Keba valley, BW 9502, 9521. E a s t N e w G u i n e a : Sepik Area, NGF 3696, Pullen 1598; Madang Distr., Finisterre Mts., Hoogland 5155; Morobe Distr., Bulolo, Brass 29148, Floyd 5220, NGF 4086, 7443, 8823, 9174, 10130, 10135, 14479, 15050, 15263, 17139; Oomsis Area, Brass 29343, NGF 8555, 11172, 14385, 16328, 17622; Sattelberg, Clemens 278, 413, 3276, 3062, 3234 A; Binatang Creek, Wau, Floyd & Morwood 5979, Kanekira 4082, NGF 5979, 10205; Northern Distr., Kokoda area, Floyd & Hoogland 4002, Carr 16343; Mambare River, NGF 3252; Gulf Distr., Kikori, NGF 7185; Central Distr., Kairuku, Darbyshire 325, Astrolobe Range, Edelfelt 57; Dieni, Brass 3839; Mafulu, Brass 5276; 5217; Milne Bay Distr., Stanley Range, Brass 1496; Waigani, NGF 1395; Sagarai Valley, NGF 19286; Goodenough Isl., Brass 24671, 25000; Fergusson Isl., Brass 26058.

LITHOCARPUS CLEMENTIANUS (King ex Hook.f.) A. Camus

Lithocarpus clementiana (King ex Hook.f.) A. Camus in Riviera Scient. 18: 40. 1932. — *Quercus clementiana* King ex Hook.f., Fl. Brit. Ind. 5: 614. 1888. — *Pasania clementiana* (King ex Hook.f.) Gamble in J. Roy. As. Soc. Beng. 75(2): 439. 1915. — *Sygnedryx clementiana* (King ex Hook.f.) Koidzumi in Bot. Mag. Tokyo 30: 191. 1916. — Lectotype: Maingay 1529, Penang, ♂, ♀, fr. (A!, K! holo, L!).

Quercus teysmannii (non Bl.) Heine in Fedde's Rep. 54: 225. 1951.

MALAY PENINSULA. P e n a n g : Govt. Hill, Curtis 3095. P e r a k : *Scortechini s.n.* P a h a n g : Cameron Highlands, KEP 11537, Poore 1308, Kasim b. Rajab 452.

BORNEO. S a r a w a k : Semengoh Arboretum, SAR 5384; Lundu Distr., Sg. Rengas, SAR 15413. S a b a h : Kota Belud, mile 14th Tenompok Road, SAN 22118; Mt. Kinabalu, Clemens 32488, 32997, 33672, 33687, RSNB 4147, 4456, 4674, SAN 33922, 56329.

NOTE. Specimens from Borneo have thicker leaves than those from the Malay Peninsula, but this is due to the fact that the Bornean materials were collected from a higher altitude than the Malayan ones.

Lithocarpus confertus Soepadmo, *spec. nov.*

Arbor 12—30 m alta 20—100 cm diametro anteridibus ad 0.9 m altis 1½ m latis 0.1 m crassis, cortice fumoso-grisea dense lenticellata interdum squamosa. Ramuli juveniles pilis fulvis adpressis stellatis dense muniti, sero glabrescentes fusci sparse vel dense lenticellati, gemma terminali ovoideo ellipsoideo 2—3 mm longo 1—2 mm lata squamis anguste ovatis. Stipulae anguste ovatae-acutae vel lanceolatae 2—3 mm longae 1 mm latae. Folia tenui-coriacea indice (1.5—)2—2.5(—3), (6—)9—10(—13) cm longa (3—)4—5(—7) cm lata ad vel infra medium latissima supra glabra

nitida vel opaca pallide cinereo-virescentia vel brunnea infra pilis cinereis vel fulvo-brunneis adpressis stellatis dense munita, basi rotundata et abrupte acuta decurrentia margine recurvata apice obtuse abrupteque acuta vel 1—1½ cm acuminata, costa utrinque prominente nervis in latere unico (8—)9—10(—11) infra prominentibus supra sulcatis subparallelis ascendentibus angulo 40°—50° arcuata et marginem versus anastomosantibus, reticulo dense scalariformi infra distincto; petiolo subglabro ½—1 cm longo 1—1½ mm crasso sulcato. Inflorescentia in glomeris densis paniculatis collectae. Infructescentia fructibus numerosis. Cupula juvenilis sessilis solitaria vel 2—3 in glomera ovoidea tomentosa fulva brevi stellato denso munita, squamis adpressis annulis concentricis 3—4. Cupula matura vulgo solitaria, discoidea basi attenuata, 2—5 mm longa 1½—1¾ cm diametro fructum basim tantum obtegens, lamellis 5—6 tenuibus minute denticulatis tomentosis pilis fumoso-cinereis vel fulvis adpressis stellatis munita. Fructus maturus depressus ovoideus 1.2—1.5 cm longus 1.4—2 cm diametro glabro badius vel purpureo-brunneus, apice abrupte acuminatus basi rotundatus cicatrice concava 1—1½ cm diametro, pariete osseo 1 mm vel tenuiore.

TYPUS: *Clemens 29265*, Sabah, Mt. Kinabalu, Tenompok.

BORNEO. S a r a w a k: Apau Plateau, *SAR 3967*. S a b a h: Mt. Kinabalu, Marat Parai, *Clemens 10875, 10950*; Penibukan, *Clemens 40449*; Mesilau River, *RSNB 4073*; Kundasan, *SAN 27485*; Tambunan Distr., Trusmadi Forest Reserves, *SAN 41814*; and many others.

NOTE. This species is close to *L. ewyckii* but differs by its smaller and thinner, saucer-shaped cupule, and by its smaller glabrous fruits. The species is easily recognized by its inflorescence and infructescences which are clustered in dense panicles.

LITHOCARPUS CONFRAGOSUS (King ex Hook.f.) A. Cam.

Lithocarpus confragosa (King ex Hook.f.) A. Camus in *Riviera Scientif.* 18: 40. 1932. — *Quercus confragosa* King ex Hook.f., *Fl. Brit. Ind.* 5: 616. 1888. — *Pasania confragosa* (King ex Hook.f.) Schottky in *Bot. Jahrb.* 47: 662. 1912. — Lectotype: *King's coll. 8123*, Malaya, Perak, Gopong Distr., alt. 60—90 m, fr. IX-1886 (A!, K! holo, L! SING!).

SUMATRA. Gajo-lands, Mt. Singantin, *Pringgo Atmodjo 164*.

MALAYA. P e r a k: Gopong Distr., *King's coll. 8188*.

BORNEO. S a r a w a k: Bintulu Distr., Nyabau F.R., *SAR 15895*. K a l i m a n t a n: Nunukan, *Kostermans 8678*. S a b a h: Mostyn Distr., Sapang Ayer F.R., *SAN 57026*; Sandakan Distr., mile 60th Labuk Road, *SAN 39238*, and few others; Ranau Distr., Mt. Kinabalu, *SAN 48105*, and few others; Tambunan Distr., Trusmadi F.R., *SAN 41840*.

LITHOCARPUS CONOCARPUS (Oudem.) Rehd.

Lithocarpus conocarpa (Oudem.) Rehd. in J. Arn. Arb. 1: 123, 1919. — *Quercus conocarpa* Oudem. in Versl. Med. Kon. Ak. Wet. Natuurk. 12: 206, 1861. — *Cyclobalanus conocarpa* (Oudem.) Oerst. in Vid. Medd. Naturh. For. Kjöbn. 8: 81, 1867. — *Pasania conocarpa* (Oudem.) Schottky in Bot. Jahrb. 49: 357, 1913. — *Synaedrya conocarpa* (Oudem.) Koidzumi in Bot. Mag. Tokyo 30: 191, 1916. — Type: *Jungkuhn s.n.* (1857), Java, Mt. Malabar, fl., fr. (BO! holo, L!).

SUMATRA. A t j e h: Gajo-lands, Goh Lembuh, Van Steenis 3209. C. S u - m a t r a: Mt. Sago, near Pajakumbuh, *Ichlas 91, Meijer 3985*; Riouw, Tenajan River, *Soepadmo 180*; W. Indragiri, *Amiruddin 15*. B e n g k a l i s: Sg. Misigit, *Beguin 591*.

MALAY PENINSULA. K e d a h: Kokmoi F.R., *KEP 47820*. P e r a k: Kledang Siang F.R., *KEP 28071*; Trolok F.R., *KEP 43464, 43492*; Goping, *King's Coll. 821, 5816, 5846*; Ulu Bubong, *King's Coll. 10519*; S e l a n g o r: Klang, *KEP 41706, Burhill 9160*. N e g e r i S e m b i l a n: near Seremban, *Shah 122*. S i n g a p o r e: *Cantley 183, King's Coll. 1249, Langlasse 105, Pierre 3130, Ridley 3387, 5115, 5989, SFN 32550, 34616, 34676, 36375*.

BORNEO. S a r a w a k: Lundu Distr., G. Berumput, *SAR 13177*; G. Gading, *SAR 15385*; Kuching & vicinity, *Beccari PB. 12, 1207, 1710, Haviland 1615, SAR, 0170*; Semengoh Arboretum, *SAR 5395*; Mt. Mattang, *Haviland 611*; Ulu Kelawit, III Div., *SAR 16470*; Bk. Raya, Kapit, *SAR 18921*; Bario, Kelabit Highlands, *SAR 20025*. S a b a h: Sipitang, *SAN 27174*; Beaufort, Padas Gorge, *SAN 27408, 39869*; Kota Belud, Bk. Matindok, *SAN 32165*; Mt. Kinabalu, *Clemens 27346, 29179, 31028, 31561, SAN 33897, 34514, 46707, SFN 26633*; Sandakan Distr., Elopura, *SAN/NBFD 10439*; Leila F.R., *SAN 29044, 26541, 27104*; Sepilok F.R., *SAN 27678, 31012, 34723*; Kebon China F.R., *SAN 26851, 32835, 34809, 39847, 39858, 40267, 41118*; Sg. Korong, *SAN 53233*. K a l i m a n t a n: W. Kutei, *bb. 15751, 19276, 26283, 16912, Endert 2232, 2217, 4822, 5024*; Mt. Klam, *Hallier 2518*; N.E. of Balikpapan, *Kostermans 4090, 4183*.

JAVA. W. J a v a: Tjigenteng, *Koorders 33744, 33755, 33765*; Mt. Malabar, *Jungkuhn s.n.* (type!).

LITHOCARPUS COOPERTUS (Blanco) Rehd.

Lithocarpus cooperta (Blanco) Rehder in J. Arn. Arb. 1: 124, 1919. — *Quercus cooperta* Blanco, Fl. Filip.: 503, 1845. — *Castanea cooperta* (Blanco) Oersted in Kong. Dansk. Vid. Selsk. Skrift. V, 3: 379, 1871. — *Synaedrya cooperta* (Blanco) Koidzumi in Bot. Mag. Tokyo 30: 186, 1916. — Neotype: *Elmer 14012*, Mindanao, Agusan Prov., Cahadbaran, fr. X-1912 (A!, BM!, L!, NY!, UC! holo).

Castanopsis costata (non A.D.C.) F-Vill., Nov. App. Fl. Filip. 3: 209, 1880.

Quercus fernandezii Vidal, Sinops.: 41, t. 92, f.E. 1883. — Type: *Vidal 617*, Luzon, Bulacan Prov., Angat, fr. (A!, K! holo, L!).

Quercus reflexa King in Ann. Roy. Bot. Gard. Calc. 2: 78, t. 72, 1889. — *Synaedrya reflexa* (King) Koidzumi Lc. 187. — *Castanopsis reflexa* (King) Rehder in J. Arn. Arb. 1: 122, 1919. — *Lithocarpus reflexa* (King) A. Camus in Riviera Scientif. 18: 41, 1932. — Lectotype: *Beccari PB 4056*, Borneo, Sarawak, fr. (F! holo, K!).

Quercus pruinosa (non Bl.) Elmer in Leaflet, Philip. Bot. 3: 940. 1910.

Quercus bohollensis Merr. in Philips, J. Sc. 29: 476. 1926. — *Lithocarpus bohollensis* (Merr.) Rehd. in J. Arn. Arb. 10: 132. 1929. — Type: BS, 43350, Philippines, Bohol, fr. VIII-X-1923 (A!, BM!, K!, US! holo).

MALAY PENINSULA. E. P a h a n g: Gn. Tapis, Ulu Sg. Kelui, KEP/ FRI 10873.

BORNEO. S a r a w a k: Ist. Div., Lundu District, Mt. Gading, SAR 15390; Mt. Santubong, SAR 2490; Mt. Penrissen, SAR 16355; Semengoh F.R., SAR 10419; Bako N.P., SAR 18701; and many others; Bintulu Distr., Segan F.R., SAR 15585, Baram Distr., Hose 322, Melianu Gorge, Anderson 4311; Gat, Upper Rejang, Clemens 21511; Anap, Bt. Mersing, SAR 22509; Balingian, Bk. Iju, SAR 23240. S a b a h: Tawau, SAN 22458; Sandakan Distr., Elopura, Kabilj F.R., SAN 10524; Mt. Kinabalu, Bongol, Clemens 51254; Beaufort Distr., Halogilat, SAN A. 3015, Beaufort Hill, SAN 36871, Jesselton Distr., Mt. Templer F.R., SAN 40310. B r u n e i: KEP 34556, yfr. (K!). P u l a u G a y a: SAN 37636.

PHILIPPINES. L u x o n: Bulacan Prov., Angat, Vidal 617, Albay Prov., Mt. Malinao, PNH 34538; Tayabas Prov., FB 25328, and few others. C a n t a d u a n e s, BS 75328. S a m a r: Mt. Cansayao, PNH 14358. L e y t e: Wenzel 710, 1079. B i l i r a n: N. slopes of Mt. Suiro, PNH 21676. B o h o l: BS 43350. M i n d a n a o: Mt. Apo, Elmer 10866, Mt. Katanglad, PNH 10089. S u r i g a o (or Siargao): Wenzel 2663, 2989.

NOTE. The leaves of the Bornean specimens are as a rule smaller than those from the Philippines, but the cupule, fruit, nervation, and the type of indumentum are so similar, so that no clear distinction could be drawn between *L. coopertus* and *reflexus*. In BS 43350 from Bohol (type of *Q. bohollensis*) the cupule is cup-shaped and enclosing $\frac{3}{4}$ part of the fruit, whilst in the others the fruit is completely covered by the cupule. Such variation is, however, not very uncommon among the species included in *enclisacarpus*-group. (For other examples see *L. enclisacarpus* and *macphailii*).

LITHOCARPUS CRASSINERVIUS (Bl.) Rehd.

Lithocarpus crassinervia (Bl.) Rehd. in J. Arn. Arb. 1: 124. 1919. — *Quercus crassinervia* Bl. in Mus. Bot. Lugd. Bat. 1: 2929. 1850. — *Quercus pseudomolucca* var. *crassinervia* (Bl.) Mig., Fl. Ind. Bat. 1(1): 849. 1856. — *Pasania crassinervia* (Bl.) Oerst. in Vid. Medd. Naturh. For. Kjöbn. 8: 84. 1867. — *Synaedrys crassinervia* (Bl.) Koidzumi in Bot. Mag. Tokyo 30: 194. 1916. — Type: Van Hasselt s.n., Java, Southern Bantam, Gn. Kendang, yfr. (L! holo, P!).

JAVA. W. J a v a: Tjianten, Bacher 25937; Pelabuhan Ratu, Koorders 1423, 1429, 11726, 15698, 34228. C. J a v a: Banjumas, Pringombo, Koorders 1360, 1520, 1534, 33807; Gn. Kidangan, Gobée 6642.

NOTE. Very near to *L. falconeri* and *kunstleri* from Malaya. It differs from *L. falconeri* by its stellate indumentum and its leaf with a fewer

nerves not anastomosing near the margin, and from *kuastleri* by its larger leaf, longer petiole, acute, or rarely rounded leaf-base, and by its nerves not anastomosing near the margins.

LITHOCARPUS CURTISII (King ex Hook.f.) A. Camus

Lithocarpus curtisii (King ex Hook.f.) A. Camus in *Riviera Scient.* 18: 40. 1932. — *Quercus curtisii* King ex Hook.f., *Fl. Brit. Ind.* 5: 612. 1888. — *Pasania curtisii* (King ex Hook.f.) Gamble in *J. Roy. As. Soc. Beng.* 75(2): 429. 1915. — *Synaedrya curtisii* (King ex Hook.f.) Koidzumi in *Bot. Mag. Tokyo* 30: 194. 1916. — Lectotype: *Curtis 1253*, Malaya, Penang, Water fall, fl., fr. (BM!, K! holo, P! US!).

SIAM. P a t t a n i: Betong, *Kerr 7435, 7635*.

MALAY PENINSULA. K e d a h: Sg. Patani, *KEP/FMS 10194*. K e l a n t a n: Sg. Lebir, Bk. Batupapan, *SFN 29512*, Gua Musang-Kuala Betis tracks, *SFN 29720*. P e r a k: Larut, *King's Coll. 3304*; Slim, *King's Coll. 10078*. S e l a n g o r: Kuala Lumpur, Weld Hill F.R., *KEP/CF 818, 4868, 8501, 10334*; mile 48th Gap, *Poore 385*; Rawang, *Ridley 13062*. P a h a n g: Sg. Iju, *Hardial Singh & Nor 47*; Chini F.R., *KEP/FRI 11088*; Gap, *Merton 5017*; Bentong, Sg. Perting, *SFN 16505*; Kemaman, Bk. Kajang, *SFN 30305, 30476*. P e n a n g: *King's Coll. 4834, 4836, 4854, 4962*.

LITHOCARPUS CYCLOPHORUS (Endl.) A. Camus

Lithocarpus cyclophora (Endl.) A. Camus in *Riviera Scient.* 18: 40. 1932. — *Quercus depressa* Roxb., *Fl. Ind.* 3: 640. 1832, non Humb. & Bonpl. (1809), nec Bl. (1825). — *Quercus cyclophora* Endl., *Gen. Pl., Suppl.* 4(2): 28. 1847. — *Quercus penangensis* Miq., *Fl. Ind. Bat.* 1: 859. 1856. — *Pasania cyclophora* (Endl.) Gamble in *J. Roy. As. Soc. Beng.* 75(2): 442. 1915. — *Synaedrya cyclophora* (Endl.) Koidzumi in *Bot. Mag. Tokyo* 30: 191. 1916. — Type: *Wallich 2779*, Malaya, Penang, ♂ fl., 1822 (BM!, CGE!, K! holo).

Quercus umbonata Hance in *J. Bot.* 12: 241. 1874. — Type: *Hance s.n.*, Malaya (BM! holo).

Lithocarpus pseudoplatycarpa A. Camus in *Bull. Mus. Hist. Nat. Paris* II, 4: 914. 1932. — Type: *KEP 24629*, Malaya, Perak, Tanjong Toh Alang F.R., fr. (KEP! holo).

SIAM. P e n. S i a m: Betong, Gn. Ma, *Kerr 7597*.

SUMATRA. W e s t C o a s t: Painan, *bb. 3111, S.W.K./I-6*; Tapanuli, Sepirok, *bb. 4176*; Selindung, *bb. 5251*; Mulak Ulu, *Grashoff 360*.

MALAY PENINSULA. P e r a k: Gn. Babu F.R., *KEP 98686, 98688*; Larut, *King's Coll. 6888*; Batu Puteh, *Wray 1207*. S e l a n g o r: Ginting Simpah, *Hume 3658*; mile 19th Gombak Road, *KEP/FD 11766*. P a h a n g: Cameron Highland, *SFN 23447*; Gn. Tapis, *KEP/FRI 10927*. M a l a c c a: *Maingay 1528*. P e n a n g: Govt. Hill, *Curtis 351*; Upper Tunnel Road, *KEP/FRI 0257*.

NOTE. *Lithocarpus pseudoplatycarpa* was described by A. Camus based on specimen consisting of five fallen leaves, one cupule and two fruits. Comparison with many specimens of *L. cyclophorus* recently collected from Malaya shows that the fruits cupule and leaves of *L. pseudoplatycarpa* represent a young stage of those of *cyclophora*.

LITHOCARPUS DAPHNOIDEUS (Bl.) A. Camus

Lithocarpus daphnoidea (Bl.) A. Camus in Riviera Scient. 18: 40. 1932. — *Quercus daphnoidea* Bl. Fl. Javae Cupul.: 28. 1829. — *Cyclobalanux daphnoidea* (Bl.) Oerst. in Vid. Medd. Naturh. For Kjöbn. 8: 81. 1867. — *Synaedrya daphnoidea* (Bl.) Koidzumi in Bot. Mag. Tokyo 30: 191. 1916. — *Pasania daphnoidea* (Bl.) S. Moore in J. Bot., Suppl.: 114. 1925. — Type: Van Hasselt s.n., W. Java, Mt. Pajung, fl., fr. (CGE!, K!, L! holo).

Quercus nitida Bl. Mus. Bot. Lugd. Bat. 1: 294. 1850, non Rafin., 1838, nec Mart. & Gal. 1843. — *Cyclobalanux nitida* (Bl.) Oerst., l.c.: 81. — *Lithocarpus nitida* (Bl.) A. Camus in Bull. Soc. Bot. Fr. 92: 255. 1945; Chênes 3: 1116. 1954. — Type: Praetorius s.n., Sumatra, ♂, ♀, yfr. (A!, L! holo).

Quercus pocaliformis V. Seemen in Bot. Jahrb. 27, Beibl. 64: 13. 1900. — *Synaedrya pocaliformis* (V. Seemen) Koidzumi, l.c.: 192. — *Lithocarpus pocaliformis* (V. Seemen) A. Camus in Riviera Scient. 18: 41. 1932. — Type: Teysmann HB. 11301, Borneo, Pontianak, Sg. Landak, fr. 18-VII-1874 (BO! holo, K!, L!).

Lithocarpus sarawakensis E.F. Warb. in Kew Bull.: 19. 1936. — Type: Richard's Coll. 1851, Borneo, Sarawak, Mt. Dulit, fr. 19-IX-1932 (K! holo, L!).

SUMATRA. West Coast: Tapanuli, Sepirok, bb. 5241, 15125, 15342, 15343, 29521; Lampong, Forbes Sam. 1499, 1668. Palembang: Lematang Ilir, N.I.F.S.T. 539, 962; Banjuasin, Endert 350. East Coast: Simelungan, bb. 5322.

MALAY PENINSULA. Perak: Slim Hill F.R., KEP/FRI 0703. Kelantan: Gn. Setong, KEP 37665. Pahang: Fraser's Hill, Poore 1335; Sg. Tahan, Ridley s.n.; Jerantut, SFN 29923.

BORNEO. Sarawak: Mt. Dulit, Richard's Coll. 1851. Kalimantan: Pontianak, Sg. Landak, Teysmann HB. 11301, 11502.

JAVA. West Java: Ujung Kulon, Mt. Pajung, Wirawan 113, 227, 289; Mt. Gede, Ja. 1913; Takoka, Koorders 1490, 15201, 33302, Wind 12; Tjemara Ujung, Bantam, Koorders 1595; Gn. Beser, Tjimerang, Kramer 5903.

LITHOCARPUS DASYSTACHYUS (Miq.) Rehd.

Lithocarpus dasystachya (Miq.) Rehd. in J. Arn. Arb. 1: 124. 1919. — *Quercus dasystachya* Miq., Ann. Mus. Bot. Lugd. Bat. 1: 221. 1863. — *Pasania dasystachya* (Miq.) Schottky in Bot. Jahrb. 49: 356. 1913. — *Synaedrya dasystachya* (Miq.) Koidzumi in Bot. Mag. Tokyo 30: 194. 1916. — Type: De Vries s.n. (1860), Borneo, Pontianak, ♂ fl. (BO!, L!, U!).

Pasania winkleriana Schottky, l.c.: 357. — *Quercus winkleriana* (Schottky) Merr., En. Born.: 216. 1921. — *Lithocarpus winkleriana* (Schottky) A. Camus in Riviera Scient. 18: 42. 1931. — Type: Foxworthy 176, Borneo, Sarawak (n.v.).

BORNEO. S a r a w a k: Kuching & vicinity, *Haviland & Hose 3324, 3700*; Unjam F.R., SAR 4435; Santubong, SAR 2493; Bako National Park, SAR 16237; Tg. Embang F.R., SAR 01341; Simanggang, Lingga, SAR 9814; Mt. Mattang, *Native Coll. Sar. Mus. 5153, 5156*; Loba Kabang, SAR 2730; Miri, Ulu Sg. Adang, SAR 4380, 8164; Bintulu, Bt. Urang, SAR 11997, 12027; Nyabau F.R., SAR 12047, 16252, 17406; Sg. Dalam F.R., SAR 4413. B r u n e i: mile 4th Labi Road, Ashton 955, 5550; Bk. Puan, Hotta 12341; Bk. Patoi, SAR 5820; Seria, SAR 5868. S a b a h: Beaufort, Pascual 2376, SAN A. 1317, SAN 24323, 27304, 33507, 44541; Bongawan, SAN/NBFD 2008, SAN 10610, Taka 3899; Paper, SAN 33621. K a l i m a n t a n: Sambas, bb. 16329; Pontianak, bb. 16469, Moudi 235; Sampit, Buwalda 7703; Mt. Kenepel, *Hollier 1486*; Bulungan, Sebakis River, *Koestermaus 9330*.

LITHOCARPUS ECHINIFER (Merr.) A. Camus

Lithocarpus echinifera (Merr.) A. Camus in Bull. Soc. Bot. France 81: 818. 1934. — *Quercus echinifera* Merr. in Univ. Calif. Publ. Bot. 15: 43. 1929. — Lectotype: *Elmer 21627*, Elphinstone Prov., near Tawau, N. Borneo, fr. X-III-1923 (A! holo, BM! BR! K! L! P!).

BORNEO. S a r a w a k: Miri Distr., S. 1216; Nanga Pelagos, SFN 36072. B r u n e i: mile 17 $\frac{1}{4}$ th Labi Road, Ashton BRUN 36; Sg. Wong, Ulu Temburong, Ashton BRUN 763. S a b a h: Tawau, *Elmer 20640*, and few others; Sandakan Bay, Sg. Semuda, SAN 20327, and many others; Mt. Kinabalu, SFN 26381; Temon Distr., Gn. Lumabu, SAN 49504; Kinabatangan Distr., Lamag, SAN 39382; Bk. Garam, SAN A. 4710.

NOTE. Near to *L. pulcher*, but the appendages of the cupule are softer and longer, and the leaf is larger and thinner.

Lithocarpus echinulatus Soepadmo, spec. nov.

Arbor 25—40 m alta 50—80 cm diametro anteridibus 1—2 m altis 1—2 m latis concavis, cortice laevi pallide fumoso-cinerei. Ramuli ab initio pilis fumoso-cinereis brevibus stellatis dense muniti, subglabrescentes, deinde opace fumoso-cinerei sparse lenticellati. Gemma terminali ovoideo 3—4 mm longo 2—3 mm lato squamis anguste ovatis. Folia tenue-coriacea indice 3—3.5, (9—)13—18(—12) cm longa (3—)4—6(—7) cm lata, ad medium latissima faciebus concoloribus opace cinereo-virentibus, supra glabra, infra, tomentosa pilis densis adpressis stellatis, basi attenuata apice acute 1— $\frac{1}{2}$ cm acuminata, costa infra prominente supra applanata, nervis lateralibus in latere unico 7—9, subtilibus infra prominentibus, supra impressis, subparallelis angulo 30°—45°, marginem versus arcuatis nec anastomosantibus, reticulo subtili, denso, scalariformi utrinque obscuro; petiolo $\frac{3}{4}$ —1 $\frac{1}{2}$ cm longo 1—2 mm crasso supra applanato. Cupula matura sessilis discoidea $\frac{1}{3}$ — $\frac{1}{2}$ cm longa 2—2 $\frac{1}{2}$ cm diametro, margine tenui undulata fructus partem basalem obtegens, intus tomentosa pilis densis sericeis flavescens ad brunnescentibus adpressis simplicibus, extus dense tomentosa pilis fulvis brevibus stellatis; squamis subulatis liberis

patentibus 1—2 mm longis dense sed irregulariter dispositis. Fructus maturus depressiter ovoideo-globosus, 1—1½ cm longus 1½—2⅓ cm diametro dense tomentosus pilis cinereis adpressis simplicibus glabrescentis apice abrupte apiculatus basi rotundatus cicatrice applanata ca 1¼ cm diametro pariete lignoso ca 1 mm crasso.

TYPUS: *Kostermans 13438*, Borneo, Kalimantan, Sangkulirang Distr., Mt. Medadam, alt. 250 m, fr. 10-VIII-1957 (BM!, BO! holo, K!, L!, SING!).

BORNEO. Kalimantan: Central Kutei, Mt. Kalopak, Belajan River, *Kostermans 10538*.

NOTE. Near to *L. luzoniensis* from the Philippines, but differing by the larger leaves, longer petiole, flatter cupule with irregularly placed subulate scales, and by its fruit which is broader than long and has a large scar up to 1½ cm in diameter.

LITHOCARPUS EICHLERI (Wenzig) A. Camus

Lithocarpus eichleri (Wenzig) A. Camus in *Riviera Scient.* 18: 40, 1932. — *Quercus eichleri* Wenzig in *Jahrb. Bot. Gart. Berl.* 4: 236, 1886. — *Pasania eichleri* (Wenzig) Gamble in *J. Roy. As. Soc. Beng.* 75(2): 438, 1915. — *Synaedrys eichleri* (Wenzig) Koidzumi in *Bot. Mag. Tokyo* 30: 191, 1916. — Type: *Forbes 3185*, Sumatra, Palembang, Muara Mengkulem, fr. (A!, BM!, K!, L! holo).

SUMATRA. East Coast: Labuan Batu, *bb, 5293*. Palembang: Muara Mengkulem, *Forbes 3035, 3180*.

MALAY PENINSULA. Perak: Larut, *King's Coll, 4045, 5290, 5570, 6630, 7289, 7384, 8485; Wray 2577, 2607*. Johore: mile 17th. Mawai-Jemalung Road, *SFN 21328; Sg. Kayu Ara, SFN 38990*.

Lithocarpus elegans (Bl.) Hatus. ex Soepadmo, *comb. nov.*

Quercus elegans Bl. in *Verh. Batav. Gen. K. & W.* 9: 208, 1823 (basionym). — *Lithocarpus spicata* var. *elegans* (Bl.) A. Camus, *Chênes. Atl.* 3: 102, t. 481, 1949. — Type: *Blume s.n.*, Java, Bantam Res., Sadjira, f., fr. (CGE!, K!, L! holo, P!).

Quercus spicata Smith in *Rees. Cyclop.: Quercus no. 12*, 1814, non Humb. & Bonpl. 1809. — *Quercus arcaula* Buch.-Ham. ex Sprengel, *Syst. Veg.* 3: 857, 1826. — *Arcula spicata* (Smith) Rafin., *Alsogr. Amer.*: 28, 1838. — *Pasania spicata* (Smith) Oerst. in *Vid. Medd. Naturh. For. Kjöbn.* 8: 1867. — *Synaedrys spicata* (Smith) Koidzumi in *Bot. Mag. Tokyo* 30: 198, 1916. — *Lithocarpus spicata* (Smith) Rehd. & Wils. in *Sargent's Pl. Wils.* 3: 207, 1917. — Type: *Buchanan s.n.*, India, Nepal, Suambu, fl., yfr. 5-V-1802 (BM! holo).

Quercus racemosa Jack, *Malay Misc.* 2: 86, 1822, non Lam. 1783; in *Hook. Comp. Bot. Mag.* 1: 255, 1836. — *Quercus arcaula* var. *racemosa* (Jack) Bl., *Mus. Bot. Lugd. Bat.* 1: 290, 1850. — *Quercus spicata* var. *racemosa* (Jack) Miq. in *Ann.* 1: 106, 1863. — Type: *Jack. s.n.*, Sumatra, ? Ujung Mamon (Lost!).

Quercus depressa Bl. in Verh. Batav. Gen. K. & W. 9: 209, t. 1, 1823, non Humb. & Bonpl. 1809. — *Quercus spicata* var. *depressa* (Bl.) King in Ann. Roy. Bot. Gard. Calc. 2: 48, t. 43. — Type: Blume s.n., Java, Mt. Gede, Kandang Badak, fr. IV-1823 (A!, L! holo, P!).

Quercus glaberrima Bl. in Verh. Batav. Gen. K. & W. 9: 210, t. 2, 1823. — *Quercus spicata* var. *glaberrima* (Bl.) Miq., Fl. Ind. Bat. 1(1): 848, 1856. — *Lithocarpus spicata* var. *glaberrima* (Bl.) A. Camus, Chênes, Alt. 3: 103, t. 482, 1949. — Type: Blume s.n., Java, Geger Bintang, Mt. Pangrango, fr. (CGE!, L! holo).

Quercus placentaria Bl., Bijdr.: 518, 1825. — *Quercus spicata* var. *placentaria* (Bl.) Schottky in Bot. Jahrb. 47: 664, 1912. — *Lithocarpus spicata* var. *placentaria* Vid. Medd. Naturh. For. Kjöbn. 8: 83, 1867. — *Pasania spicata* var. *placentaria* (Bl.) Schottky in Bot. Jahrb. 47: 664, 1912. — *Lithocarpus spicata* var. *placentaria* (Bl.) Rehd. in J. Arn. Arb. 10: 133, 1929. — Type: Blume s.n., Java, yfr. (CGE!, K! holo, P!).

Quercus glomerata Roxb., Fl. Ind. 3: 640, 1832. — *Pasania glomerata* (Roxb.) Oerst. in Kong. Danske Vid. Selsk. Skrift. V, 9: 379, 1891. — Type: Roxburgh s.n., Malaya, Penang yfr. (BR! holo).

Quercus anceps Korth. Kruidk. 204, 1844. — Type: Korthals s.n., Borneo, Pulau Lampe, fl., yfr. (L! holo).

Quercus microcalyx Korth., l.c. 206. — *Quercus arcaula* var. *microcalyx* (Korth.) Bl., Mus. Bot. Lugd., Bat. 1: 290, 1850. — *Quercus spicata* var. *microcalyx* (Korth.) Miq., Fl. Ind. Bat. 1(1): 848, 1856. — *Pasania spicata* var. *microcalyx* (Korth.) Gamble in J. Roy. As. Soc. Beng. 75(2): 421, 1915. — *Lithocarpus microcalyx* (Korth.) A. Camus in Bull. Soc. Bot. Fr. 92: 83, 1945. — Type: Korthals s.n., Borneo, Pulau Lampe, fl., fr. (A! L! holo).

Quercus pyrifolia Bl. in Mus. Bot. Lugd., Bat. 1: 304, 1850. — Type: Blume s.n., Java, st. (L! holo).

Quercus sphaeclata Bl. in Mus. Bot. Lugd., Bat. 1: 304, 1850. — Type: Waitz s.n., Java, Mts. Muria, st. (L! holo).

Quercus gracilipes Miq., Sumatra: 347, 1861. — *Quercus spicata* var. *gracilipes* (Miq.) Miq., Ann. 1: 106, 1863. — *Pasania spicata* var. *gracilipes* (Miq.) Schottky in Bot. Jahrb. 47: 664, 1912. — *Lithocarpus spicata* var. *gracilipes* (Korth.) Rehd. in J. Arn. Arb. 1: 131, 1919. — Type: Teysmann s.n., Sumatra, Lampong (K!).

Quercus spicata var. *latifolia* Scheff. in Nat. Tijd. Ned. Ind. 21: 359, 1870. — Type: Teysmann HB. 7641, Bangka, Sg. Liat, st. (BO!, L! holo).

Quercus rhoensis Hance in J. Bot. 16: 198, 1878. — *Lithocarpus rhoensis* (Hance) A. Camus in Riviera Scient. 18: 40, 1932. — Type: Teysmann HB. 11452, Sumatra, Riau, fr. (BO! BM!).

Quercus spicata var. *chittagonga* Hook.f., Fl. Brit. Ind. 5: 609, 1888. — *Pasania chittagonga* (Hook.f.) Hickel & A. Camus in Ann. Sc. Nat. II, 3: 390, 1921. — *Lithocarpus chittagonga* (Hook.f.) Merr. in Brittonia 4: 39, 1941. — Type: King's Coll. 480, India, Chittagong Hill, Kokoda, fr. V-1887 (K! holo, P!).

Pasania auriculata Hickel & A. Camus in Ann. Sc. Nat. X, 3: 397, 1921. — *Lithocarpus auriculata* (Hickel & A. Camus) Barnett in Trans. & Proc. Bot. Soc. Edinb. 34: 175, 1944, Alt. — Type: Poilane 2113, Laos, Sam-neua, fr. 18-X-1920 (P! holo).

Pasania bassacensis Hickel & A. Camus in Lecomte' Fl. Gen. Indo-Chine 5: 984.

1930. — *Lithocarpus bassacensis* (Hickel & A. Camus) Barnett in Trans. & Proc. Bot. Soc. Edinb. 34: 175. 1944. — Type: *Poilane 15830*, Laos, Nong Bok Kao plateau, Bassac Prov., fr. 6-X-1928 (P! holo).

Lithocarpus blaocensis A. Camus in Rev. Bot. Appl. Trop. 15: 24. 1935. — *Pasania blaocensis* (A. Camus) Hu in Bull. Fan. Mem. Inst. Biol. Peiping, Bot. X: 99. 1940. — Type: *Poilane 22750*, Annam, Blao Agriculture Station, Donai, fr. 25-VI-1933 (P! holo).

Lithocarpus syncarpa A. Camus in Bull. Soc. Bot. Fr. 85: 654. 1940. — Type: *Poilane 2560*, Indo-China, Gia-ray, Bien Hoa Prov., yfr. 31-I-1921 (P! holo).

INDIA. H i m a l a y a s : *Herb. Hance 11790*. N e p a l : Near Pakhapani, *Stainton es. 2807*; N. of Pokhara, *Stainton es. 5055*; Pargam, *Stainton es. 5934, 5935*; Silhet, Wallich. A s s a m : Sikkim, *Hooker & Thomson 71, Laccata 15536, Clarke 25205*. B h u t a n : *Cooper 1108, 1200, Griffith 2550, 2544, 4468*; Khasia Hill, *Mann 597, 600, Clarke 43731, Hooker & Thomson 1166*; Manipur, *Clarke 42059*; Shillong, *Clarke 44624, 43473*; Naga Hills, *Collet 151, Clarke 41226*. C h i t t a g o n g : *Hooker & Thomson 2, 72, 341, 324, King's Coll. 416, 478, 522, 582*.

BURMA. Danna Range, *Lace 4750*; May Myo Plateau, *Lace 5973, 6150*; Amherst, *Parkinson 5091*; Shan State, *Rock 2172, Scott A5*; Tenasserim, *Beddom 112, 7684, Helfer 4468*; Moulmein, *Griffith 148*; Mergui, *Griffith 4469, 19806*.

SIAM. N. p a r t s : Doi Chieng Dao, *Kerr 6622*; Chieng Mai, *Kerr s.n.*; Doi Sutep, Kao, *Garrett 686*; Kwae Noi Basin, *K. Suvathabandhu 171*; Kao Krading, *K. Suvathabandhu 189, 514, Kerr 20072*; Kao Keo Ngoi, *Kerr 5758*; Sukotai, Kao Luang, *Kerr 5928*. P e n. S i a m : Pattani, *Kerr 7311, 7841*; Satul, *Kerr 14209*; Songkla, *Kerr 14738, 15813*; Pang Nga, *Kerr 18553*; Trang, *Kerr 19013*; Patalung, *Kerr 19254*.

LAOS. Luang Prabang Prov., Long Nai-Nguen, *Poilane 26139, 26171*; Upper Mekong Prov., *Poilane 26344, 26448*; Pu Bia, *Kerr 21058*; Bassac Prov., Nong Bok Kao Plateau, *Poilane 15830*; Boloven Prov., Nang Met, *Poilane 15912*.

CAMBODIA. *Bejeaud 361*.

VIETNAM. Kontum Prov., Dak To, *Poilane 18382, 18377*; Than Hoa Prov., *Poilane 18908*; Donai, *Poilane 19893, 21023, 21215, 21236, 21927, 21934*, and many others; Bah Ma, near Hue, *Poilane 31108*; Bien Hoa, *Poilane 40836*; Dalat, *Squires 817*; Tonkin, *Balansa 2373, Petelot 4841, Poilane 17150*.

CHINA. S. Parts, Tibet, *Forest 24156, 24392, 27160*; Yunnan, *D. J. Anderson s.n., Wang 72028, 76124, 76631, 78232*.

SUMATRA. T a p a n u l i R e s. : Mt. Singgalang, *Schiffuer 1863*; Lae Pandan, *bb. 14469*; Siborongborong, *bb. 3833*. P a d a n g : Mt. Kerintji, *bb. 5941, Bännecker 8611, Jacobs 4536, Meijer 7511*; Lake Bento, *Meijer 6615*; Painan, *Meijer 6059*. L a m p o n g R e s. : *Teijsmann s.n.* Medan R e s. : *Lörzing 17434*; Labuan Batu, *Rachmat 3573*. P a l e m b a n g R e s. : Lematang Ulu, *Lambach s.n.*; Banjuasin, *bb. T. 734*; Kajuagung, *De Voogd 142*. B a n g k a : Blinju, *Grashoff 108*; Lobok Besar, *Kostermans & Anta 1237*; Sg. Liat, *Teijsmann HB. 7641*. R i o u w : *Teijsmann HB. 11452, 11453*.

MALAY PENINSULA. P e r l i s, Mata Ayer F.R., *KEP/FRI 451*. K e d a h : *KEP/17855*; Kp. Naka, *SFN 19803*, Wellesley Prov., Bk. Mertajam, *Curtis 2829*. P e r a k : Gopeng, *King's Coll. 6085, 6118, 8228*; Gn. Pondok, *SFN 23806*. S e l a n g o r : Ulu Langat, *KLU 1845*; Fraser's Hills, *SAN 48252*; 46th mile Kuala Lumpur-Gap Road, *Poore 1266, 1267*; Bk. Inung, *Umbai 1845*.

Negeri Sembilan: Bk. Kandong, *Alevis 1058*. Pahang: Kuala Lipis, Benchaah F.R., *KEP/CF 4018*; Temerlok, Kp. Belingo, *KEP/CF 4512*; Bentong, *KEP/CF 5067*; Rompin, *KEP 15705*; Near Raub, *SFN 10924*. Trengganu: Kuala Berang, *SFN 15315*. Kelantan: *SFN 29732*. Malacca: *Maingay 1456*. Johore: *Roxburgh s.n.* Singapore: Bk. Timah, *Ridley 4441*, *SFN 34627*; Mandai Road, *SFN 36545*.

BORNEO. Sarawak: Lundu Distr., Mt. Gading, *SAR 15377, 15380*. Sabah: Mt. Kinabalu, *SFN 27209, Clemens 36536, 29760, 29820, SAN 38562, KEP 80543*; Sandakan, Myrburgh Prov., *Elmer 20358*; Lahad Datu, *SAN 16131*. Kalimantan: Mt. Kenepel, *Hallier 1719*; Pulau Lampai, *Korthals s.n., C. Kutei, Belajan River, Kostermans 10293*.

CELEBES. Gowa Lembaja, *bb. 20917*.

JAVA. Jawa: Banten Res., Sadjira, *Blume s.n.*; Tjemara Udjuag, *Koorders 1504*; Gn. Karang, *Koorders 1506*; Depok, *Koorders 30955*; Geger Bintang, *den Berger 607*; Tjibodas, *Koorders 1453, 1456, 1459, 1460, 32208*, and many others; Takoka, *Kalkhoven 20*; *Koorders 15228, 15335*; Pelabuhan Ratu, *Koorders 1431, 1433, 1450*, and many others; Tjidadap, *Winkler 148*; Gn. Beser, *Winkel 153, 171, 280*; Pangentjongan, *Koorders 26508*; Pengalengan, *Forbes 1003*; Telaga Bodas, *Boerlage s.n.*; Gn. Malabar, *Forbes 950a, Kuntze 5449*; Tangkuban Prah, *Usteri 218*. C. Jawa: Pekalongan Res., Surdjo, *Koorders 11252*; Kedu Res., Mt. Sindoro, *Koorders 11281*; Semarang Res., Mt. Ungaran, *Koorders 1529, 1530, 1560*, and many others; Pati Res., Mt. Muria, *Kostermans 6213, 6340*; Banjumas Res., Pringombo, *Koorders 1521, 1536*, and many others; Nusakambangan, *Koorders 1542, 1544, 9302*, and many others. E. Jawa: Madiun Res., Lake Sarangan, *Coert 868*; Mt. Wilis, *Koorders 1528, 12451, 12454, 12455*; Gn. Telomojo, *Coert 1618*; Modjokerto, *bb. Ja 3027*; Gn. Ardjuno, *Koorders 38147, 38150*; Pantjur Idjen, *Koorders 1457*, *bb. Ja 2834*, and many others; Besuki, Tjuramanis, *Koorders 38489*; Probolinggo, *Kuntze 1102*; Banjuwangi, Gn. Lebuagung, *bb. Ja 2151, 2192*.

LITHOCARPUS ENCLEISACARPUS (Korth.) A. Cam.

Lithocarpus encleisocarpa (Korth.) A. Camus in *Riviera Scient.* 18: 40, 1932 — *Quercus encleisocarpa* Korth., *Kruidk.*: 209, t. 45, 1844. — *Cyclobalanus "encleisocarpa"* (Korth.) Oersted in *Vid. Medd. Naturh. For. Kjöbn.* 8: 81, 1867. — *Pasania encleisocarpa* (Korth.) Gamble in *J. As. Soc. Bengal* 75, 2: 449, 1915. — *Synacdryx encleisocarpa* (Korth.) Koidzumi in *Bot. Mag. Tokyo* 30: 186, 1916. — *Castanopsis encleisocarpa* (Korth.) Rehder in *J. Arn. Arb.* 1: 122, 1919. — Type: *Korthals s.n.*, Mt. Melintang, C. Sumatra, ♂ fl., fr. 8-IX-1835 (A! K! L! holo, P!).

SIAM. Pen. Siam: Songkla, *Kerr 15883*.

SUMATRA. West Coast: Kerintji, alt. 1400 m, *bb. 18759*. Central parts: Mt. Melintang, *Korthals s.n.*, ♂ fl., fr. 8-IX-1835; West Indragiri, Hutan Pulau Lawas, *Amiruddin et alia 42*. East Coast: Langkat, alt. 50 m, *bb. 16387*; Simelungan, Buntu Turunan, alt. 400 m, *bb. 31386*; Asahan, Masihi F.R., *Krukoff 4247*. Palembang: Semangus, *bb. 22263*; Sukaradja, Rupit River, *Forbes 2943*; Tjaban F.R., *Kostermans 12053*; and several others.

MALAYA. Perak: Larut, *King's Coll. 2828*; Chanderiang, *King's Coll. 5689*; and many others. Selangor: Sg. Buloh F.R., *KEP 2294*, Ginting Simpah, *KEP 11227*, and few others. Pahang: Fraser's Hill, alt. 1200 m, *Barkill &*

Holtum 8685; Cameron Highlands, *KEP 27263*; and many others. **Trengganu**: Kemaman, Bk. Kajang, *SFN 30301*; Mt. Padang, *SFN 33918*. **Malacca**: Bk. Sadanan, *Derry 1213*. **Johore**: Mersing, *KEP 5925*; Sg. Kayu, *SFN 32201*. **Penang**: *King's Coll. 1587*, and few others.

SINGAPORE. Bk. Mandai, *Ridley 3651*; Bk. Timah, *SFN 34678*; and few others.

BORNEO. **Sarawak**: Mt. Penrissen, alt. 900 m, *SAR 16313*; Ulu Mujong, Balleh, *SAR 19987*; Mt. Mulu, *SAR 15079*. **Sabah**: Tawau, Balong F.R., *SAN 30147*; Mt. Kinabalu, Ulu Liwagu, alt. 1300 m, *SAN 33721*, and few others.

NOTE. Specimens from a higher altitude than 800 m usually have the cupules not completely enclosing the fruits but cup-shaped, and usually in clusters of 2—3. These specimens were referred by King as var. *aperta*. There are however several intermediate forms so that no clear distinction can be drawn between the typical form and var. *aperta*. A similar variation may be observed in *L. macphailii* and *coopertus*.

LITHOCARPUS ERYTHROCARPUS (Ridley) A. Camus.

Lithocarpus erythrocarpa (Ridl.) A. Camus in *Riviera Scient.* 18: 40. 1932. — *Pasania erythrocarpa* Ridley in *J. Bot.* 42: 301. 1924. — Type: *SFN 11652*, Malaya, Negeri Sembilan, Gn. Angsi, fr. XI-1923 (K! holo, KEP! SING!).

MALAY PENINSULA. **Selangor**: Gn. Bunga Buah, *KEP/FRI 1130*; Ginting Simpah, *KEP 11198, 29826*. **Pahang**: Ulu Sg. Kellu, *KEP/FRI 10882*; Sg. Teku, *KEP/FRI 4793*. **Trengganu**: Ulu Sg. Loh, *KEP/FRI 12142*. **Negeri Sembilan**: Gn. Angsi, *SFN 11652* (Type!). Berembun F.R., near Bt. Tangga, *KEP 104881*.

NOTE. A very distinct species which can be recognized by its cylindrical fruit covered with rufous tomentum.

LITHOCARPUS EWYCKII (Korth.) Rehd.

Lithocarpus ewyckii (Korth.) Rehd. in *J. Arn. Arb.* 10: 132. 1929. — *Quercus ewyckii* Korth., *Kruidk.*: 212, 1844. — *Cyclobalanus ewyckii* (Korth.) Oerst. in *Vid. Medd. Naturh. For. Kjöbn.* 8: 80. 1867. — *Pasania ewyckii* (Korth.) Gamble in *J. Roy. As. Soc. Beng.* 75(2): 431. 1915. — *Synaedrys ewyckii* (Korth.) Koidzumi in *Bot. Mag. Tokyo* 30: 191. 1916. — Type: *Korthals s.n.*, C. Sumatra. Mt. Melintang, ♂ fl., fr. IV-V-1835 (A!, BM., L. holo, NY, P!).

Pasania lamponga var. *ewyckioides* Gamble, *Lc.* 425. — *Lithocarpus pseudo-lamponga* A. Camus, *Chènes Atl.* 3: 110, t. 504. — Type: *King s.n.*, Singapore (n.v.).

SUMATRA. **Atjeh**: Gajo-lands, V. *Steenis 10029*; Burni Geredong, V. *Steenis 6441*. **Tapanuli**: *Bangham 1117*, bb. 4161, 3275; Karo-lands, bb. 7171. **E. Coast**: Lower Langkat, bb. 16394; Asahan, *Rachmat 9558, 10800*.

MALAY PENINSULA. **Peraik**: Slim River F.R., *KEP/FRI 0702*; Babu F.R., *KEP 29929*. Gopeng, Kinta, *King's Coll. 4449*; Larut, *King's Coll. 6503, 7846*;

Batang Padang, *King's Coll.* 7777; Taiping, *King's Coll.* 8532; Gn. Batu Puteh, *Wray* 907; Tapa, *Wray* 1312. **Selangor**: Sg. Buloh F.R., *Burkill* 1035; Semenyih, *Hume* 8367; Ayer Hitam F.R., *KEP* 10530; Weld Hill, Kuala Lumpur, *KEP/CF* 861, 932, *KEP* 93475; Lake Garden, *KEP* 93478; Ulu Gombak F.R., *KEP* 79105; Ampang Catchment Area, *KEP* 10305. **Pahang**: Cameron Highlands, Sg. Parong, *KEP* 30953, *SFN* 32811; Lubok Paku, Pahang River, *SFN* 16115. **Negeri Sembilan**: *KEP/CF* 4212. **Malacca**: *Derry* 366, 400, *Goodenough* 1744. **Johore**: Sg. Sedili, *SFN* 36885; Tanjong Lembi, *Shah & Nur* 818. **Singapore**: Bk. Timah F.R., *Ridley* 6452, *SFN* 37950, 38801, 38802; McRitchie Reservoir, *SFN* 32790.

BORNEO. **Sarawak**: Bintulu, Merurong F.R., *SAR* 8820; Kebaun River, 2°38' N., 114°35' E., *SAR* 3514, Balleh, 3rd Div., *SAR* 12148, 19989; Bario, Ulu Baram, *SAR* 20122, 20123. **Brunei**: Ulu Ropan, Belalong, *BRUN* 5258. **Sabah**: Papar Distr., *SAN A.* 1427; Kudat Distr., *SAN A.* 1200, 3076, *Fraser* 144, *SAN* 30851; Mt. Kinabalu, *Clemens* 27675, 28378, 29825, *SAN* 29237, 36158, 38437, 38553, 42740, 49685, *RSNB* 4199, 4257, 4291, 4329, 4699, 4714, 4794; Sandakan, Sg. Manjong, *SAN* 34367; Lahad Datu Distr., Pulau Keruing, *SAN A.* 4793; Tawau, *Agalla* 1793, *SAN* 18304, 27216, 29952, 30128, 31226, 48871, *SAN A.* 1555. **Kalimantan**: W. Kutei, Marah, *Eudert* 5415; Long Ibut, *Eudert* 4786; Upper Mahakam, Lake Parei, *bb.* 20694; Berouw, *bb.* 18486, 19005; Mt. Liang Gagang, *Hallier* 3019; Amai Ambit, *Hallier* 3181, 3298; Karangan River, N.W. Sangkulirang, *Kostermans* 13616. **Nunukan Isl.**, *bb.* 26149.

LITHOCARPUS FALCONERI (Kurz) Rehd.

Lithocarpus falconeri (Kurz) Rehd. in *J. Arn. Arb.* 10: 133. 1929. — *Quercus falconeri* Kurz in *J. Roy. As. Soc. Beng.* 44(2): 197. 1875. — *Pasania falconeri* (Kurz) Schottky in *Bot. Jahrb.* 47: 679. 1912. — *Synaedrys falconeri* (Kurz) Koidzumi in *Bot. Mag. Tokyo* 30: 195. 1916. — Type: *Falconer* 458, Burma, Tenasserim Prov., Moulemin, fr. (K! holotype, L!).

Quercus minor Ridley in *J. Roy. As. Soc. Str. Br.* 57: 95. 1910, non Sargent 1889, *nee* Gandoger 1890. — Type: *Ridley* 14689. Malaya, Perak, Temengor, fl. VII-1909 (BM!, K! holotype).

BURMA. Tenasserim, Moulemin, *Falconer* 458; Mekuar Distr., *Lace* 4768.

SIAM. **Pen. Siam**: Trang, *Fox's Coll.* 3815, *Kerr* 19015; Kantang, *Haniff & Nur* 4299; Pattani, *Kerr* 7229, *Put* 3679; Surat, *Kerr* 13323, 13372; Satul, *Kerr* 13817, 14415, Songkla, *Kerr* 15815; Ranawang, *Kerr* 16431; Phuket, *Kerr* 17405; Tung Song, *Rabil* 82.

MALAY PENINSULA. **Perlis**: Mata Ayer, *SFN* 23038. **Kedah**: Bk. Bruang, *Derry* 14960; Tampoi F.R., *KEP/FRI* 436, *KEP* 64271; Mukim Suk, *KEP/CF* 21529; Alor Star, *Ridley* 14960; Burau Bay, *Ridley* 15791; Kp. Naka, *SFN* 19804, 19808; Kodiang, *SFN* 31558; Langkawi Isl., *Curtis* 1677, *Ridley* 15479, *SFN* 15494. **Perak**: Upper Perak, Kp. Temengor, *KEP* 98630; Sg. Keruing, *SFN* 23881; *Wray* 3410, 3776.

Lithocarpus ferrugineus Soepadmo, *spec. nov.*

Quercus kunstleri (non King ex Hook.f.) von Seemen in Bull. Dep. Agr. Ind. Neerl. 1: 4. 1906.

Arbor 16—24 m alta 20—30 cm diametro anteridibus 0.6 m altis 1—2 m latis 10 cm crassis, cortice cinereo laevi. Ramuli ab initio pilis simplicibus stellatisque fulvis dense tomentosi, deinde glabri cinerei subtiliter fissurati sparse lenticellati. Gemma terminali ovoideo-globo 2—4 mm longo 2—3 mm lato squamis ovatis. Folia tenui-coriacea indice 3—5, (13—)17—24(—26) cm longa (3—)4—5(—6) cm lata ad vel supra medium latissima faciebus concoloribus glabris pallide viridi-brunneis supra opaca infra nitida, basi attenuata acuta apice abrupte acuta vel 1—1½ cm acuminata; costa utrinque valde prominente, nervis (7—)9—10(—12) subparallelis angulo 30°—50° infra prominentibus supra impressis marginem versus arcuatis sed non anastomosantibus, reticulo laxo subtili irregulari vel subscalariformi infra distincto; petiolo (½—)1—1½(—1¾) cm longo 1½—2 mm crasso, supra appianato. Inflorescentia mascula vel androgyna vel mixta bracteis anguste ovatis 1½—2 mm longis ½—¾ mm latis bracteolis late ovatis acutis ¾—1½ mm longis ¾—1 mm latis. Rachis mascula ca 10 cm longa 1 mm crassa floribus ♂ solitariis perianthio 6-lobato staminibus 12 filamentis 3—4 mm longo anthera 0.3 mm longa pistillodio subglobo 1½—2 mm diametro. Rachis androgyna vel mixta 10—15 cm longa 2 mm floribus ♀ solitariis perianthio profunde 6-lobato staminodiis 12 bene evoluta perianthio superantibus stylis 3 teretibus 2—3 mm longis basi connatis. Cupula matura sessilis poculiformis ½—1 cm longa 1½—2 cm diametro margine tenui denticulata fructus partem ¼—⅓ infra obtegens, intus pilis simplicibus argenteo-fulvis dense munita extus dense fulvo-stellato-tomentosa squamis adpressis imbricatisque. Fructus maturus ovoideus magnitudine 1½—2 cm pilis adpressis simplicibus ferrugineis dense munitis apice rotundatus acutus basi rotundatus, cicatrice profunde concava ca 1 cm diametro, pariete lignoso ca 1 mm crasso.

TYPUS: *Ilias Paie S. 17030*, Borneo, Sarawak, Serian Distr., Sabal F.R., in primary forest on hill side, alt. 120 m, fr. 27-XII-1962 (A, BO!, K!, KEP, L!, holo, SAN, SAR!, SING!, P!).

BORNEO. Kalimantan: Amal Ambit, *Hollier 3583*. Sarawak: Semengoh F.R., *Muas S. 0171*; Balingian Distr., Bk. Iju, Ulu Sg. Arip, *S. 23702*. Sabah: Beaufort Distr., Beaufort Hill, *SAN 16972*, *SAN 25278*, *SAN 49292*; Ranau Distr., Bk. Kalong, *SAN 23319*; Tawau Distr., Ulu Balong F.R., *SAN 29628*; Mostyn Distr., Madai F.R., *SAN 57078*.

NOTE. *L. ferrugineus* is closely related to *L. falconeri* from Burma, Siam and the Malay Peninsula, but differs from that species by having a globose or subglobose fruit which is covered by a dense layer of reddish-brown tomentum, and by the rim of the cupule which is not recurved and

undulate when fully developed. From *L. kunstleri*, with which it has been confused, it differs by its larger leaves with fewer lateral nerves, and by its globose or subglobose fruit which is densely covered with reddish-brown tomentum. In *L. kunstleri* the fruit is cylindrical (longer than broad).

***Lithocarpus glutinosus* (Bl.) Soepadmo, comb. nov.**

Quercus glutinosus Bl., Mus. Bot. Lugd. Bat. 1: 304. 1850 (basonym). — Type: *Reinwardt 866*, Celebes, Tondano, st. X-1821 (L!).

Quercus koordersii V. Seem. in Bot. Jahrb. 27, Beibl. 64: 16. 1900. — *Lithocarpus koordersii* (V. Seem.) Markg. in Bot. Jahrb. 59: 66. 1924. — Lectotype: *Koorders 16629*, Celebes, Minahasa, ♂ fl., yfr. (BO! holo, L!).

Quercus zschokkei Elm. in Leaflet. Philip. Bot. 3: 944. 1910. — *Lithocarpus zschokkei* (Elm.) Rehd. in J. Arn. Arb. 1: 132. 1919. — Type: *Elmer 10846*, Philippines, Mindanao, Mt. Apo, alt. 900 m, fr. VI-1909 (A!, BM!, K!, L! holo, US!).

Quercus copelandii Elm. in Leaflet. Philip. Bot. 6: 1984. 1913. — *Lithocarpus copelandii* (Elm.) Rehd., l.c. 124. — Type: *Elmer 13935*, Philippines, Mindanao, Agusan Prov., Mt. Urdaneta, alt. 900 m, fr. X-1912 (A! K! L! P! UC! holo, US!).

BORNEO. S a b a h: Tawau, *Elmer 20971*.

CELEBES. Northern parts: Palu, *bb. 28255*; near Gorontalo, *bb. 194338*, and several others.

PHILIPPINES. Mindanao: Agusan Prov., *Stern 2114*; Zamboanga Prov., *FB 22019*.

***Lithocarpus gracilis* (Korth.) Soepadmo, comb. nov.**

Quercus gracilis Korth., Kruidk.: 207. 1844 (basonym). — *Cyclobalanus gracilis* (Korth.) Oerst. in Kong. Dansk. Vid. Selsk. Skrift. V, 9: 376. 1871. — Type: *Korthals s.n.*, Borneo, Balaran, ♂, ♀ fl. 19-XI-1836 (A!, L! holo, P!).

Quercus cyrtorhyncha Miq., Sumatra: 350. 1861. — *Pasania cyrtorhyncha* (Miq.) Gamble in J. Roy. As. Soc. Beng. 75(2): 432. 1915. — *Synaedrys cyrtorhyncha* (Miq.) Koidzumi in Bot. Mag. Tokyo 30: 191. 1916. — *Lithocarpus cyrtorhyncha* (Miq.) Rehd. in J. Arn. Arb. 1: 124. 1919. — Type: *Teymann HB. 3547*, Sumatra, Palembang, Muara Dua, st. 11-IV-1857 (BO! holo, K!, U!).

Quercus diepenhorstii Miq., Sumatra: 349. 1861. — *Cyclobalanus diepenhorstii* (Miq.) Oerst. in Vid. Medd. Naturh. For. Kjöbn. 8: 80. 1867. — *Synaedrys diepenhorstii* (Miq.) Koidzumi in Bot. Mag. Tokyo 30: 191. 1916. — *Lithocarpus diepenhorstii* (Miq.) Barnett in Trans. & Proc. Bot. Soc. Edinb. 34: 177. 1944. — Type: *Diepenhorst HB. 2340*, Sumatra, Priaman, Sipanuh, fr. 1855 (BO! U! holo!).

Lithocarpus cyathiformis A. Camus in Bull. Soc. Bot. Fr. 94: 4. 1947. — Type: *Langlasse 206*, Singapore, Bk. Timah, fr. 17-X-1894 (! holo).

SUMATRA. Priaman, Sipanuh, *Diepenhorst HB. 2340*; Palembang, *Grashoff 286*, *Teymann HB. 3547*. S i m a l u r Isl., *Achmad 1013, 1366, 1462, 1521, 1556*.

MALAY PENINSULA. P e r a k: Larut, *King's Coll. 4898*; Goping, *King's Coll. 5820*; Kinta, *King's Coll. 7117*; Ulu Bua, *King's College 10809*. S e l a n g o r: Gombak F.R., *Poore 1273*; Sg. Buloh, *KEP/FD 9602*. P a h a n g: Tembeling,

SN 24801; Sg. Tekai, SN 24843; Kemaman, Ulu Kajang, SN 30444. Negeri Sembilan: Petasih, KEP/FMS 605; Bk. Angoi, KEP/CF 1965. Johore: Mersing F.R., KEP 77862. Singapore: Bk. Timah, Langlasse 206.

BORNEO. S a r a w a k: Beccari PB 2880, 4031; Mt. Mattang, Clemens 20970; Gat, Upper Rejang River, Clemens 21512; Belaga, Haviland 2188; Baram Distr., Sg. Melinau Ruloh, SAR 15094, Hose 447, 662; Bintulu Distr., Sg. Latai, Hirano & Hotta 829; Segan F.R., SAR 15588; Lahang F.R., SAR 15830, 18142; Mt. Dulit, Ulu Tinjar, Richards 1293, 2400; Kapit Distr., Bt. Raya, SAR 22205; Bt. Mersing, SAR 22435. B r u n e i: Lumpas, KEP 37224. S a b a h: Sipitang Distr., Ulu Moyah, SAN 16594; Tenom Distr., SAN 42496; Beaufort Distr., SAN 25840, 32020, 39862, 39874, 39882; Kota Belud Distr., SAN 37616, 26763; Kudat Distr., SAN/NBFD 4059, SAN 40763; Mt. Kinabalu, Clemens 26196, 26716, SAN 21345, 22089; Sandakan, Lamag Distr., Kinabatangan, SAN 30722; Segaliud F.R., SAN 19293; Sapagaya F.R., SAN A, 3115; Kabili-Sepirok F.R., SAN 21790, 39468, 39678, 39682, and many others; Elopura F.R., SAN 10558, SAN A, 795, 2242, 2314; Mostyn Distr., Kalumpanggan F.R., SAN 46137, 46282; Tawau Distr., Elmer 21766, SAN 19406, 30351, 30637, 32654, 39214; Banguay Isl., Castro & Melegrito 1659. K a l i m a n t a n: Pontianak, Sanggau, Hallier 806; Balaran, Korthals s.n.; W. Kutai, bb. 15757, 15760, 15852, 16571, Schat K.5, 20, and many others; Tidung, bb. 18156; Bt. Tengkujung, Melawai, bb. 26425; Tandjung Bako, Mahakam River, Kostermans 7056, 7147; Loa Djanan, W. of Samarinda, Kostermans 6409; Balikpapan Sub-distr., bb. 34259; Sg. Wain, Kostermans 4255; Sg. Mentawir, Kostermans 10053; Sangkulirang Distr., Kostermans 13274, 13610; Berouw Distr., Mt. Ila Bungaian, Kostermans 13743; Mt. Njapa, Kostermans 21322. N u n u k a n I s l.: Kostermans 3761, Paymans 285. P u l a u L a u t: bb. 12906, 12908.

LITHOCARPUS HALLIERI (Von Seemen) A. Camus

Lithocarpus hallieri (V. Seemen) A. Camus in Riviera Scient. 18: 40. 1932. — *Quercus hallieri* Von Seemen in Bull. Dept. Agr. Ind. Neerl. 1: 11. 1906. — *Synaedrya hallieri* (V. Seemen) Koidzumi in Bot. Mag. Tokyo 30: 189. 1916. — Type: Hallier 2655, Mt. Lianggagang, Borneo, III-IV-1894, yfr. (BO! holo, L!).

BORNEO. S a r a w a k: Mt. Penrissen, alt. 800 m, SAR 16334; Distr. Ulu Tuban, SAR 18187; Bario Distr., Ulu Baram, alt. 1050 m, SAR 20004; 3rd Div., E. of Kapit, Ulu Sebatang, SAR 21113. K a l i m a n t a n: Mt. Lianggagang, Hallier 2655. S a b a h: Tenom Distr., Crocker Ranges, SAN 42677; Ranau Distr., Mt. Kinabalu, SAN 26467, 42460; and few others; Tawau, Elmer 21892, SAN 19435.

NOTE. Close to *L. burkillii* from Malaya, but differs by its much larger leaves and cupule.

Lithocarpus hatusimae Soepadmo, spec. nov.

Arbor 13—18 m alta ca 30 cm diametro cortice laevi. Ramuli initio dense tomentosi pilis flavo-brunneis adpressis stellatis deinde subglabrescentes, obscure fumosi sparse lenticellati. Gemma terminali ovoidea 2—3 mm magnitudine squamis ovatis acutis. Stipulae crasse coriaceae ovatae

acutae 2—3 mm longae 1 mm latae. Folia rigida crasse coriacea indice 2—3, (8—)11—14(—16) cm longa (3—)4—6(—7) cm lata faciebus plus minusve concoloribus glabris nitidis pallide chokolatinis infra tenuiter tomentosa pilis pallide flavo-brunneis adpressis stellatis, basi acuta raro rotundata margine recurvata apice acuta ad acute 1—2 cm caudata, costa utrinque valde prominente nervis infra valde prominentibus supra impressis utrinque (9—)11—12(—13) parallelis angulo 60°—70° marginem versus arcuatis sed non anastomosantibus, reticulatione laxa subscalariforme infra distincta; petiolo 1—1½ cm longo 1—3 mm crasso sulcato. Inflorescentia mascula vel feminea vel androgyna vel mixta, dense tomentosa pilis fulvo-brunneis brevibus stellatis, bracteis bracteolisque ovatis acutis 1—1½ mm longis 0.7 mm latis. Rachis mascula ca 10 cm longa 1—1½ mm crassa; floribus ♂ solitariis vel ternis perianthio 5—6-lobato staminibus 10—12 filamentis 3—4 mm anthera 0.3—0.4 mm longa pistillodio subglobo 1—1½ mm diametro dense pilis flavo-brunneis lanuginoso. Rachis feminea vel androgyna vel mixta 5—10 cm longa 1—2 mm crassa, floribus ♀ solitariis vel ternis perianthio dimidio 6-lobato staminodiis 12 valde abortivis stylis 3 conoideis 1½—2 mm longis basi connatis et dense lanuginosis. Cupula matura sessilis poculiformis ca ½ cm longa 1.2—1.7 cm diametro margine tenui, intus dense tomentosa pilis pallide cinereo-brunneis brevibus stellatis, annulis 5—8 concentricis minute denticulatis, fructus partem ⅓—¼ obtegens. Fructus maturus ovoideo-conoideus 1—1½ cm magnitudine apice abrupte acutus basi cordatus cicatrice concava ca 1 cm diametro, pariete osseo 1 mm vel tenuiore chokolatino nitido glabro.

TYPUS: *Clemens 29206*, Borneo, Sabah, Mt. Kinabalu, alt. ca 1800 m, fr. 26-III-1932 (A!, BM!, K!, L! holo, NY!, UC!).

BORNEO. Sarawak: Baram Distr., IV Div., Mt. Mulu, SAR 4263, 4509, 15088, Hotta 14803. North Borneo: Mt. Kinabalu, rather common between alt. 1000—2000 m, *Clemens 29888, 31781, 31819, 32038, 32492, 32533, 40235*; Mesilau River, *RSNB 4145, 4197, 4803*; Bk. Ampuan, *SAN 20968*; Ranau Distr., *SAN 33588, 34634, 46568, 49806*.

NOTE. This new species is named after Dr. S. Hatusima, a Japanese botanist (now Professor at Kagoshima University) who during the period between 1943—1945, already worked out the Fagaceae specimens at the Herbarium Bogoriense, and who had recognized some of the new species described in this paper. *L. hatusimae* is closely related to *L. ewyckii*, but differing from the latter by its smaller cupule and fruit, and by its rigid, thick-coriaceous leaves with a lax reticulation.

LITHOCARPUS HAVILANDII (Stapf) Barnett

Lithocarpus havilandii (Stapf) Barnett in Trans. & Proc. Bot. Soc. Edinb. 33: 176. 1942. — *Quercus havilandii* Stapf in Trans. Linn. Soc. London II, Bot. 4: 231, & 18. 1894, excl. Vidal 1864. — Type: *Haviland 1069*, Borneo, Mt. Kinabalu, at alt. 3000 m, ♂, ♀ fl., fr. 1892 (BM!, K! holo, SING!).

Quercus abendanonii Valet. in Icon. Bog. 4: 179, t. 354. 1914. — *Lithocarpus abendanonii* (Valet.) A. Camus in Bull. Bot. Soc. Fr. 92: 84. 1945. — Type: *Abendanon s.n.*, S.W. Celebes, Mt. Latimodjong, alt. 3000 m, fr. (BO! holo).

BORNEO. S a b a h : Kota Belud Distr., SAN 20414, 22101; Mt. Kinabalu, Clemens 27687, 29883, 30393, 31782, 32518, 32913, 33942, 50799, 50831, Gibba 4264; Mesilau River, RSNB 4201, 4292, 4319; Mesilau Cave, RSNB 4740, 4760; Ulu Bembangan River, RSNB 5932; Ranau Distr., SAN 26750, 27478, 28013, 28585, 28904, 28923, 28999, 29156; Tenompok, SFN 27880; Mt. Tambuyokan, SAN 25235.

CELEBES. Menado, Gn. Lumut, Eyma 3672; Enrekang, Rante Lemo, bb. 22358; Rante Mario, Eyma 577, 734; Mt. Bonthain, Bünnemeijer 11935, 12183, 12226, Everett 40, Taxopens 15, Warburg 16842.

NOTE. In Mt. Kinabalu, *L. havilandii* is the only species which survives up to about 3000 m alt., where it becomes a shrub of not more than 5 m tall. At this altitude this species is found scattered within vegetation dominated by *Leptospermum flavescens*, *Dacrydium beccarii* and *Phyllocladus hypophyllus*.

LITHOCARPUS HENDERSONIANUS A. Camus

Lithocarpus hendersoniana A. Camus in Bull. Mus. Paris II, 6: 92. 1934. — Type: *Henderson SFN 33431*, Cameron Highlands, Pahang, Malaya, alt. ca 1350 m, 5-IV-1930, fr. (A!, K! holo, NY!, SING!).

SIAM. S i a m P e n : Rawang, Lam Lieng, Kerr 16430.

MALAYA. P a h a n g : Cameron Highlands, KEP 34030, Poore 1280.

NOTE. The leaf of this species is rather similar to that of *L. beccarianus* from Borneo, but the cupule is much smaller and it lacks of longitudinal ridges and terminal umbo. Though the female flowers are in cluster of 2—5, the mature cupule is always solitary.

LITHOCARPUS HYSTRIX (Korth.) Rehd.

Lithocarpus hystrix (Korth.) Rehd. in J. Arn. Arb. 1: 127. 1919. — *Quercus hystrix* Korth., Kruidk.: 201, t. 43. 1844. — *Quercus korthalsii* var. *hystrix* (Korth.) Bl., Mus. Bot. 1: 293. 1850. — *Quercus mappacea* var. *hystrix* (Korth.) Miq., Fl. Ind. Bat. 1(1): 869. 1856. — *Cyclobalanus hystrix* (Korth.) Oerst. in Vid. Medd. Naturh. For. Kjöbn. 8: 81. 1867. — *Pasania hystrix* (Korth.) Gamble in J. Roy. As. Soc. Beng. 75(2): 428. 1915. — *Synaedrys hystrix* (Korth.) Koidzumi in Bot. Mag. Tokyo 30: 195. 1916. — Type: *Korthals s.n.*, Sumatra, yfr. (A!, K!, L! holo, P!).

Quercus cyrtopoda Miq., Fl. Ind. Bat. 1(1): 869. 1858. — *Cyclobalanus cyrtopoda* (Miq.) Oerst., l.c. 80. — *Lithocarpus cyrtopoda* (Miq.) A. Camus, Chênes Alt. 3: 74. 1949. — Type: *Diepenhorst HB. 2228*, Sumatra Briaman, st. (U! holo).

Castanea furfurella Miq., Sumatra: 352. 1861. — Type: *Teysmann HB. 4270*, Sumatra, Lampong, ♂ fl. (BM!, K!, U! holo).

Quercus brevipetiolata Scheff. in Nat. Tijd. Ned. Ind. 31: 359. 1870. — Type: *Teysmann s.n.*, Bangka, Djeboes, yfr. (BM!, BO! holo, K!, U!).

SUMATRA. A t j e h R e s.: Burni Lintang, V. Steenis 6286; Takegeun, *Banham 701, 858*. T a p a n u l i R e s.: Angkola-Sepirok, bb. 4172; Mandailing, bb. 6177; Sibolga, bb. 19387; P a d a n g R e s.: Pajakumbuh & vicinity, bb. 6612, *Maradjo 331*; Mt. Sago, *Ichlas 40, Meijer 3249, 4000, 7509, 7659*; Mt. Kerintji, bb. 5931; Lake Bento, *Meijer 6648; Jacobs 4532*; L a m p o n g R e s.: Redjang, bb. 2257, 3004, *De Voogd 49*. P a l e m b a n g R e s.: Rawas, *Dumas 1538*; Lematang Ulu, *Lambach 1324*; Banjuasin, *D.J. For. Serv. T. 722*. D j a m b i R e s.: *Posthumus 566, 690, 830*. R i o u w R e s.: Indragiri, Muara Pedjangki, bb. 27479. M e d a n R e s.: Asahan, Masihi F.R., *Krukoff 4236*; Gurah Batu, *Yates 1757*; Bunut, *Yates 1813*; Pematangsiantar, *Alston 15222*; Brastagi, *Burkill s.n.*; Sibolangit, *Lörzing 4536, 4686, 12618*. S i m a l u r I s l.: Achmad 24, 384, 602, 1014, 1064, 1204. B a n g k a: Djeboes, *Teysmann s.n.*

MALAY PENINSULA. P e r a k: Larut, *King's Coll. 3681, 7371*; Ulu Bubong, *King's Coll. 10636*. S e l a n g o r: Klang, *KEP/CF 3466*; Sg. Buloh, *KEP/CF 9601*; Ulu Gombak, *KEP 42996*, *Poore 711*; Ginting Simpah, *KEP 99070*; Rantua Panjang F.R., *Mahmud 790*; P a h a n g: Temerloh, *KEP/CF 4780*. N e g e r i S e m b i l a n: Segenting, *KEP/CF 570*; Setul, *KEP/CF 1996*; Cave Rachado, *KEP 76339*; Bk. Tangga, *Ridley s.n.* M a l a c c a: Bk. Beruang, *Curtis 3645*; Ayer Panas, *Ridley 10789*. J o h o r e: Sg. Mas, *KEP/FD 5910*; Mersing F.R., *KEP 77861*. S i n g a p o r e: *King's Coll. 1252, Langlasse 325, Ridley 3383, 6299, SFN 26176, 34614*. P e n a n g: *Ridley 10765*.

BORNEO. K a l i m a n t a n: Tidung-landa, bb. 18250; W. Kutai, bb. 29412; Loa Haur, W. of Samarinda, *Kostermans 6964*.

NOTE. Young leaves of *L. sundaiicus* are very similar in form and type of indumentum with those of *L. hystrix*. The indumentum of *L. hystrix*, however, persist even in the old leaves, whereas that of *L. sundaiicus* is caducous, so that old leaves of the later species are usually glabrous. In fruiting specimens there will be no difficulty in distinguishing these two species, as in *L. hystrix* the cupule is set with recurved, linear scales while that of *sundaiicus* is covered with adpressed ovate scales arranged in concentric lines.

LITHOCARPUS INDUTUS (Bl.) Rehd.

Lithocarpus induta (Bl.) Rehd. in J. Arn. Arb. 1: 127. 1919. — *Quercus induta* Bl. in Verh. Batav. Gen. K. & W. 9: 220. 1823. — *Cyclobalanus induta* (Bl.) Oerst. in Vid. Medd. Naturh. For. Kjöbn. 8: 80. 1867. — *Synaedrys induta* (Bl.) Koidzumi in Bot. Mag. Tokyo 30: 195. 1916. — *Pasania induta* (Bl.) S. Moore in J. Bot. 63, Suppl.: 144. 1925. — Type: *Blume s.n.*, W. Java, Mt. Gede, fr. (A!, CGE!, K!, L! holo, NY!, P!).

JAVA. W e s t J a v a: Mt. Gede, Tjibunar, *Junghuhn 22*; Tjibodas, *Koorders 1446, 15577, 32229, Nurta & Hasan 84, Palmer & Bryand 821*; Gn. Beser,

bb. Ja. 5902, Winkel 279; Gn. Malabar, Kuntze 5450, Montere 1; Tjigenteng, Koorders 37279; Pengalengan, Jungkuhn 34; Sukabumi, bb. Ja. 2651. C e n t r a l J a v a : Gn. Slamet, Den Berger s.n., Tegal, Koorders 1510.

NOTE. Its nearest ally is *L. urceolaris* from Sumatra, Malaya, and Borneo, but may be distinguished by its leaves with more lateral nerves and distinct reticulation, and by its broadly cup-shaped cupule and hemispherical fruit with a flat scar.

Lithocarpus jacobsii Soepadmo, spec. nov.

Arbor 9—36 m alta 10—35 cm diametro interdum radicibus gralliformibus, cortice pallide brunnea laevi, lenticellata. Ramuli ab initio paulo tomentoso pilis cinerescentibus adpressis stellatis interdum squamis(?) minutis porphyreis intermixtis mox glabrescentes, deinde opace fumoso-griseis sparse lenticellatis. Gemma terminali ovoidea 5—6 mm longa 3—4 mm lata squamis anguste ovatis pilis rufis stellatis dense munitis. Folia crasse coriacea rigida indice 3—4, (18—)24—40(—56) cm longa (5—)9—11(—16) cm lata paulo supra medium latissima, faciebus = discoloribus glabris cinereo-viridibus infra pallidioribus, basi cordata vel auriculata margine recurvata apice obtuse acuta ad abrupte acute 1 cm acuminata, costa infra valde prominente supra applanata, nervis lateralibus utrinque (13—)14—17(—19) infra valde prominentibus supra impressis, subparallelis angulo 60° marginem versus arcuatis anastomosantibusque, reticulatione laxa subscalariforme ad irregulare infra distincta; petiolo ½—1½ cm longo 3—6 mm crasso terete vel supra applanato. Inflorescentia mascula femineave, pilis fulvis stellatis dense munita, bracteis bracteolisque lineribus-acutis 2—3 mm longis ½—1 mm latis. Rachis mascula (partem evoluta) ca 5 cm longa 2 mm crassa, floribus ♂ ternis. Rachis feminea ca 25 cm longa 2½ mm crassa, floribus ♀ ternis perianthio lobis 6 recurvatis, staminodiis 12 bene evoluta et perianthium excedentibus, stylis 3 conoideis 2—3 mm longis. Cupula juvenilis squamis imbricatis. Cupula matura ½—1 cm pedunculata discoidea ½—½ cm longa 2—2½ cm diametro, margine tenue, fructus partem basalem obtgens, intus extusque tomentosa pilis opace fumosis stellatis, squamis obscuris seriebus concentricis dispositae. Fructus maturus ovoideus-globosus glaber opace chocolatinus ad fuscus, 1½—2 cm longus 2—2½ cm diametro apice abrupte acutus basi truncatus cicatrice profunde concava ca 1½ cm diametro, pariete osseo ca 1 mm crasso; cotyledonibus plano-convexus.

Typus: *Jacobs* 5398, Borneo, Sarawak, III Div., Kapit Distr., Sg. Rejang, 2°40' N, 113°50' E, in primary forest at 500 m alt., fr. 2-IX-1958 (K!, L! holo).

BORNEO. S a r a w a k : Sepilok F.R., *Puasa* 7015; Segan F.R., *SAR* 15574. S a b a h : Meraba, *Wood's collector* 2363; Sandakan Distr., *SAN* 39278, 39690.

NOTE. This new species is named after Dr. M. Jacobs (Leiden) to whom I am very much indebted for his cooperation during the preparation of the present work.

L. jacobsii is closed to *L. lampadarius* from Mt. Kinabalu and the Malay Peninsula, but differing from the latter by the large leaves with cordate to auriculate base, shorter petiole, and by its glabrous fruit.

LITHOCARPUS JAVENSIS BL.

Lithocarpus javensis Bl., Bijdr.: 527. 1825. — *Quercus javensis* (Bl.) Miq. in Ann. Mus. Bot. Lugd. Bat. 1: 177. 1863. — *Cyclobalanus javensis* (Bl.) Oerst. in Vid. Medd. Naturh. For. Kjöbn. 8: 81. 1867. — *Pasania javensis* (Bl.) Prantl in Engler & Prantl Nat. Pfl.-fam. 3, 1: 55. 1894. — *Synaedrys javensis* (Bl.) Koidzumi in Bot. Mag. Tokyo 30: 189. 1916. — Type: Blume s.n., Mt. Salak, W. Java, fl. & fr. (L!).

Quercus costata Bl., Bijdr.: 522. 1825. — *Cyclobalanus costata* (Bl.) Oerst. in Vid. Medd. Naturh. For. Kjöbn. 8: 81, t. I-II, f. 14. 1867. — *Synaedrys costata* (Bl.) Koidzumi in Bot. Mag. Tokyo 30: 188. 1916. — *Lithocarpus costata* (Bl.) Rehder in J. Arn. Arb. 1: 124. 1919. — Type: Blume s.n., Mt. Salak, W. Java, fl., fr. - X (L!).

Lithocarpus scutigera Oudemans, Annot. circ. Cupul. Jav.: 20, t. 12, f. 1-7. 1865. — Type: Junghuhn s.n., Mt. Malabar, W. Java, fr. (L.).

SUMATRA. Tapanuli Res.: N.W. side of Lake Toba, alt. 1200—1300 m, *Bangham 1118*. Medan Res.: Asahan, Masihi F.R., *Krukoff 4171*. Padang Res.: Mt. Singalang, near Bk. Tinggi, alt. 1800 m, *Meijer 5178*; N. Kerintji District, 1° 45' S, 101° 20' E, alt. 1400—1500 m, *Jacobs 4564*. Riau Res.: Mengkuang Lake, *bb, 27501*. Bengkulu Res.: Redjang, *bb, 2275*. Palembang Res.: Lematang Ilir, Semangus, *bb, 32052*.

MALAY PENINSULA. Selangor: Ulu Sg. Tamir, *KEP 56653*.

JAVA. West Java: *Forbes 584, Junghuhn 65*; Tjiwidei, *Kalshoven 38*; Takoka, *Koorders 15213, 26754, 27715, 33311, 37272*; Sanggrawa, *Koorders 1469*. Central Java: Mt. Ungaran, *Koorders 27715*.

NOTE. In the previous works, *L. costata* was distinguished from *L. javensis* by its cupule with apical aperture wider than 0.5 cm in diameter. In *Junghuhn s.n.* from Mt. Malabar (described by Oudemans as *L. scutigera*) and *Jacobs 4564* (from Mt. Kerintji, Central Sumatra), however, the cupule is intermediate between that of *javensis* and *costata*. Furthermore the leaves of these three species are exactly the same. In 1825, and also in 1829, Blume recognized two varieties under *Quercus costata*, differing from each other by the fruit. In the typical variety the upper free part of the fruit is flat to concave, while in the other it is convex. A. de Candolle (1864) named the later variety as var. *convexa*. The type specimens in Leiden show that no sharp boundary between these two

varieties can be drawn. In 1888, Hooker f. attributed several specimens from Malaya to *Quercus costata*, apparently without examining the original specimen of Blume. King (1889) followed Hooker, and on account of the convex fruit included the Malayan specimens in var. *convexa*. Gamble (1914) working on the Malayan specimens only, included *Quercus costata* in the genus *Pasania*, and placed them in the subgenus *Cyclobalanus*. In 1954, A. Camus disagreed with Hooker, King and Gamble, and transferred *Quercus costata* to the genus *Lithocarpus*, recognizing four distinct varieties, viz. var. *typica*, *convexa*, *scutigera* (all from Java) and var. *kingii* for the Malayan specimens. I consider *L. costata* (Bl.) Rehd. var. *kingii* A. Camus as a separate species, differing from *L. javensis* (incl. *costata* and its varieties and *scutigera*) by its cupule enclosing the lower part of the fruit only. To avoid any confusion in the future with the existing *L. kingianus* (Gamble) A. Camus, I propose a new name, i.e. *L. perakensis*, for *L. costata* var. *kingii*.

LITHOCARPUS JORDANAE (Laguna) Rehd.

Lithocarpus jordanae (Laguna) Rehd. in J. Arn. Arb. 1: 127. 1919. — *Quercus jordanae* Laguna, Apuntes Sobre Nuev. Roble Filip.: 7. 1875. — *Synaedrys jordanae* (Laguna) Koidzumi in Bot. Mag. Tokyo 30: 196. 1916. — Type: *Jordana s.n.*, fr. 1874, Luzon, Mt. Caraballo (n.v.).

PHILIPPINES. Luzon: Benquet Prov., Panai, BS 4507, and several others; Mt. Data, Clemens 16337, Merrill 4550, and several others; Mt. Santo Thomas, Sinclair & Edano 9815, Williams 1321, 1365; Mt. Pulog, Steiner 2014; Mt. Sisipitan, Santos 5531; Mt. Polis, PNH 7983; Mt. Nangaoto, PNH 7716, 7725; Abra Prov., FB 15585.

NOTE. Unable to find the type of *Q. caraballoana*, Merrill (1923) and A. Camus (1954) reduced the species to the synonymy of *Q. jordanae*. The type of *Q. caraballoana* found in Leiden (*Vidal 618 bis*), however agrees better with *L. philippinensis*.

LITHOCARPUS KINGIANUS (Gamble) A. Camus

Lithocarpus kingiana (Gamble) A. Camus in Riviera Scient. 18: 41. 1932. — *Pasania kingiana* Gamble in Kew Bull.: 117. 1914. — *Synaedrys kingiana* (Gamble) Koidzumi in Bot. Mag. Tokyo 30: 196. 1916. — Type: Wray 4155, Malaya, Perak, Gn. Inas, fr. (K! holotype).

MALAY PENINSULA. Perak: Larut, Gn. Bubu, Wray 3910; Gn. Inas, Wray 4155. Pahang: Cameron Highlands, Sg. Bertam, KEP 35254, Poore 1282, Rajab & Sidek 606, SFN 23498. Trengganu: Gn. Mandi Angin, KEP/FRI 10821. Johore: Mawai, Ngadiman s.n.

NOTE. An easily recognized species by its glabrous concolorous leaves with areolate or subscalariform reticulation and by its cupule which is covered by spirally arranged long subulate scales.

Lithocarpus korthalsii (Endl.) Soepadmo, *comb. nov.*

Quercus annulata Korth., *Kruiddk.*: 213, t. 46, 1844, non Smith 1819. — *Quercus korthalsii* Endl., *Gen. Pl. Suppl.* 4(2): 28, 1847 (basonym), non Bl. 1850. — *Quercus pseudoannulata* Bl., *Mus. Bot. Lugd., Bat.* 1: 299. — Type: *Korthals s.n.*, Sumatra, Mt. Melintang, ♂ fl., yfr. IV-1833 (A!, L! holo, NY!).

Quercus teysmannii Bl., *Lc.*: 300. — *Cyclobalanus teysmannii* (Bl.) Oerst. in Vid. Medd. Naturh. For. Kjöbn. 8: 1867. — *Pasania teysmannii* (Bl.) Prantl in E. & P., *Nat. Pfl. Fam.* 3(1): 55, 1889. — *Synaedrys teysmannii* (Bl.) Koidzumi in Bot. Mag. Tokyo 30: 193, 1916. — *Lithocarpus teysmannii* (Bl.) Rehd. in J. Arn. Arb. 1: 131, 1919. — Type: *Blume s.n.*, Java, ♂ fl., yfr. (A!, L! holo).

Quercus pseudomolucca var. *incrassata* Bl., *Lc.* 291. — Type: *Reinwardt s.n.*, W. Java, Randja Tjitarum (L! holo).

Quercus laurifolia Miq., *Pl. Jungh.* 1: 11, 1851, non Michx. 1801. — Type: *Jungkuhn s.n.*, Java, Mt. Gede, ♂ fl., fr. (L!, U! holo).

Quercus hypoleuca Miq., *Fl. Ind. Bat.* 1(1): 869, 1858. — Type: *Teymann HB.* 679, Sumatra, yfr. (U! holo).

Quercus heliciformis V. Seemen in Bot. Jahrb. 27, Beibl. 64: 15, 1900. — *Synaedrys heliciformis* (V. Seemen) Koidzumi, *Lc.*: 191. — *Lithocarpus heliciformis* (V. Seemen) Rehd. — Type: *Koorders 1527*, E. Java, Mt. Wills, ♂ fl., yfr. (BO!, K!, L! holo).

SUMATRA. A t j e h R e s.: Laut Pupandji, *V. Steenis 6552*; Takingeun, *Bangham 846*. P a d a n g R e s.: Mt. Melintang, *Korthals s.n.*; Mt. Kerintji, *bb. 5928*, *Jacobs 4585*; Mt. Singalang, *Beccari PS. 302*. L a m p o n g R e s.: Pananggung, *Forbes 1660, 1663*. M e d a n R e s.: Serdang, Linting, *bb. 29496*.

JAVA. W e s t J a v a: Mt. Malabar, *Van Gorkom HB. 7507, 7645*; Mt. Gede, *Hasskarl 348, UH 5802*; Tjibodus, *Koorders 32230, Meijer 1741*; Gn. Beser, *Winckel 214, 420*; Tjigenteng, *Koorders 1482*; Tjinjiuran, *Koorders 1484*; Takoka, *Koorders 15336, 25067, 33289, 33309, 33310, 37264, 37281, 37292*; Pangentjongan, *Koorders 13920, 14205*; Pelabuhan Ratu, *Koorders 1424, 1428, 11725*. C e n t r a l J a v a: Gn. Slamet, *Den Berger s.n.* E a s t J a v a: Madiun, Ngebel, *Koorders 38740*; Pasuruan, *bb. Ja. 30228*; Besuki, Tjuramanis, *Koorders 1550, 1552, 1553, 1554, 21131, 21137, 21140, 21136*; Mt. Idjen, *Koorders 32281*.

Lithocarpus kostermansii Soepadmo, *spec. nov.*

Quercus blumeana (non Korth.) Koord. & Val., *Bjdr. Booms. Java* 10: 57, 1904. — *Lithocarpus blumeana* (non Rehd.) A. Camus, *Chênes* 3, 2: 773, t. 1-11, 1952, p.p. quoad specim. ex Java.

Arbor 18—30 m alta 30—60 cm diametro. Ramuli ad initio pilis fulvis adpressis stellatis dense tomentosi, deinde subglabri fumosi lenticellatis magnis sparse muniti. Folia crasse coriacea indice (1.6—)3—3.5(—4),

(12½—)16—22(—31) cm longa (4—)6—8(—10) cm lata, circa medium latissima, supra opaca glabra, infra pilis cinerascentibus adpressis stellatis dense tomentosa, basi acuta ad cuneata rario rotundata, margine undulata, apice acuta ad 1—3 cm acuminata vel cuspidata, costa infra valde prominente supra applanata vel paulo prominente, nervis lateralibus utrinque (8—)10—11(—13), parallelis angulo 45°—60° marginem versus arcuatis nec anastomosantibus infra prominentibus supra obscuris, reticulatione subscalariformi utrinque obscura, petiolo 5—10 mm longo 2 mm crasso subglabrescente rugoso basi incrassato supra applanato. Cupula juvenilis (sub-)sessilis ovoidea-globosa extus squamis verticillatis brevibus acutis depressis munita. Cupula matura subsessilis (depressa) ovoidca-globosa, 2—2½ cm longa 2.8—3 cm diametro, pariete circiter ¼ mm crasso fructum omnino includens, extus basi annulis concentricis 3—4 munita, parte superiore squamis obscuris brevibus adpressis ad fere laevis, pilis fulvis brevibus dense tomentosa, maturitate irregulariter dehiscens. Fructus maturus depresso-ovoideus-globosus circiter 2 cm longus 3 cm diametro basi rotundato-truncatus circatrace concava, apice abrupte acutus apiculatus, cum pilis fulvis brevibus dense tomentosus, pariete lignoso 1—2 mm crasso.

TYPUS: *Kostermans 21877*, W. Java, Ujung Kulon Nature Reserves, W. slopes of Mt. Pajung, alt. ca 200 m, fr. 2-XII-1964 (BO! holo, K!, L!).

JAVA. W. J a v a : Mt. Gede, near Tjimerang, *Deu Berger 5*; Hadjere, near Djasinga, *Wasijat Ja. 6404*, and several others; Depok, *Koorders 30949*, and several others; Ujung Kulon Nature Reserves, Mt. Pajung, *Kostermans 21845*.

NOTE. Close to *L. neorobinsonii* but differs by its cupule which is set with adpressed ovate scales on the upper part and with 3—4 concentric rings on the basal part, and by its larger leaves with lax nervation and obscure reticulation. This new species differs from *L. blumeanus* with which it used to be confused, by its larger cupule, fruit and leaves.

This new species is dedicated to Dr. A.J.G.H. Kostermans (Bogor), to whom I am very grateful for his continuous advices and encouragements during the preparation of this work.

LITHOCARPUS KUNSTLERI (King ex Hook.f.) A. Camus

Lithocarpus kunstleri (King ex Hook.f.) A. Camus in *Riviera Scient.* 18: 40. 1932. — *Quercus kunstleri* King ex Hook.f., *Fl. Brit. Ind.* 5: 606. 1888. — *Pasania kunstleri* (King ex Hook.f.) Gamble in *J. Roy. As. Soc. Beng* 75(2): 419. 1915. — *Synaedrya kunstleri* (King ex Hook.f.) Koidzumi in *Bot. Mag. Tokyo* 30: 196. 1916. — Type: *King's Coll. 3054*, Malaya, Perak, Larut, fr. (K! holo, P!).

MALAY PENINSULA. P e r a k : Pondok Tanjong, *KEP/CF 9773*; Kroh F.R., *KEP 31057*; Keladang, Saiong, *KEP 33639*; Larut, *King's Coll. 2482, 2621, 2742, 3608, 5128, 5556*, and many others; Chanderiang, *King's Coll. 5655, 5699*;

Gn. Batu Puteh, *Wray 1038*. Selangor: Sg. Buloh F.R., *Burkill 1052*; Kanching, *KEP/CF 3042, 6561*; Sg. Lalang, *KEP 22729*; Gading F.R., *KEP 98221*. Negeri Sembilan: *KEP 26619*. Malacca: *Beccari Herb. Firenze 2726*. Johore: Mersing, *KEP 77864*; mile 14th Mawai - Jemaluang Road, *SFN 29035*; Sg. Kayu, *SFN 32411*.

LITHOCARPUS LAMPADARIUS (Gamble) A. Camus

Lithocarpus lampadaria (Gamble) A. Camus in *Riviera Scient.* 18: 41. 1932. — *Pasania lampadaria* Gamble in *Kew Bull.*: 177. 1914. — *Synaedrys lampadaria* (Gamble) Koidzumi in *Bot. Mag. Tokyo* 30: 192. 1916. — *Quercus lampadaria* (Gamble) Burkill in *Kew Bull.*: 318. 1935. — Type: *Wray 1174*, Malaya, Perak, Gn. Batu Puteh, yfr. (K! holo, SING!).

MALAY PENINSULA. Perak: Gn. Korbu, *KEP 31436*, *Robinson s.n.*, Gn. Batu Puteh, *Wray 1174*; Ulu Batang Padang, *Wray 1514*. Pahang: Cameron Highlands, *KEP 11158, 27025, 30937, 31002, 36145, Rajab 446, 497, SFN 23499*; Gn. Tapis, *SFN 28838*. Trengganu: Gn. Lawit Besut, *KEP/FRI 8218, 8234*.

BORNEO. Sabah: Tambunan, Trusmadi F.R., *SAN 41796*; Mt. Kinabalu, *Clemens 27396, 27935, 29166, 29553, 29864, 29983, 30660, RSNB 4098, 4173, SAN 22115, 22125, 22126, 27481, 28994*, and many others, *SFN 27107*.

LITHOCARPUS LAUTERBACHII (V. Seem.) Markg.

Lithocarpus lauterbachii (V. Seemen) Markg. in *Bot. Jahrb.* 59: 69. 1924. — *Quercus lauterbachii* V. Seem. in *Bot. Jahrb.* 23, *Beibl.* 57: 54. 1897. — *Synaedrys lauterbachii* (V. Seemen) Koidzumi in *Bot. Mag. Tokyo* 30: 196. 1916. — Type: *Lauterbach 493*, Sattelberg, E. New Guinea, alt. 900 m, fr. VII-1890 (L!, UC! holo, WRSL!).

Lithocarpus solanicaarpa Markg., *Lc.*: 67. — Type: *Schlechter 16644*, Kani Ranges, alt. 1000 m, fr. 7-X-1907.

NEW GUINEA. West Irian: 4 km S.W. of Bernhard camp, Idenburg River, alt. 850 m, *Brass & Versteegh 13120*. East New Guinea: Western Highlands, Kubor Ranges, Sg. Minj., alt. 2400 m, *Pullen 5414*; Mt. Hagen, alt. 1600 m, *Robbins 505, Vink 16561*; Eastern Highlands, 2 miles W. of Omaura, alt. 1650 m, 6° 23' S, 145° 58' E, *Hartley 11971*; Morobe Distr., Sattelberg, *Clemens 470, Weiland 318*; Matap, between 1500—1800 m, *Clemens 11183*; Garagos, alt. 300 m, 6° 45' S, 147° E, *NGF 10175*; Patep Creek, alt. 700 m, 7° S, 146° 35' E, *NGF 12205*; Bulolo, alt. 1000 m, 7° 12' S, 146° 39' E, *NGF 17112*; Kani Ranges, alt. 1000 m, *Schlechter 16644*; Sepik Distr., Torricelli Mts., near Miwaute village, alt. 870 m, *Darbyshire 195*.

NOTE. This species might be conspecific with *Q. gulliveri* F.v.M., but as the type of the latter (MEL) consists only of young cupules and fruits, and apparently mixed up with other species, the name *lauterbachii* is here accepted, and *Q. gulliveri* is considered as a doubtful species.

Lithocarpus leptogyne (Korth.) Soepadmo, *comb. nov.*

Quercus leptogyne Korth., *Kruidk.*: 206. 1844 (basionym). — *Cyclobalanus leptogyne* (Korth.) Oerst. in *Kong. Danske Vid. Selsk. Skrift.* V. 9: 376. 1871. — Type: *Korthals s.n.*, Borneo, Kalimantan, Gn. Sakumbang, fl. (A!, L! holo, P!).

Quercus lamponga (non Miq.) Hook.f., *Fl. Brit. Ind.* 5: 611. 1888.

Quercus conocarpa (non Oudem.) Merr., *Pl. Elm. Born.*: 43. 1929.

MALAY PENINSULA. Wellesley Prov.: *Curtis 3471*. Perak: Larut, *King's Coll.* 3373, 5413, 6455, 6479, 6490, 6573, 6756, 6910, 7278; Taiping, *Wray 2699*. Pahang: Bk. Kamunting, *Burkill 2858*. Johore: Layang Layang, *Hassan & Kadim 64, 66, 77*, Sg. Berasu, Mawai-Jemaluang Road, *SFN 28959*.

BORNEO. Sarawak: Div. III, Kapit Distr., Bk. Raya, *SAR 33919*; Div. IV, Miri Distr., *SAR 1217, 8165, 21407*; Bintulu Distr., *Fuchs 21359, SAR 15844*; Ulu Majeng, Kakus, *SAR 21786*; Limbang Distr., *SAR (Brunig) 1151*. Brunei: Kuala Belalong, *Bruce 466*. Sabah: Beaufort Distr., *SAN 25277, 27416, 32021, 43265, SAN A. 1323*; Tenom Distr., *SAN 43076, 43199, 50483*; Keningau Distr., *SAN 49509*; Jesselton Distr., *SAN 28869*; Tuaran Distr., *SAN A. 1286*; Ranau Distr., *SAN 20659, 25313, 26469, 28762, 44732*; Kinabatangan, *SAN 16877*; Bongawan, *SAN A. 3315*; Sandakan Distr., Kabili-Sepilok F.R., *SAN 10570, 21243, 21439, 34271, 34666, 39626*, and many others; Lahad Datu Distr., *SAN 15437, 39902, 52858*; Mostyn, *SAN 53110*; Tawau, *Elmer 20533, 20800, 20910, 21261, 21836, SAN 19545, 19630, 22859, 24470, 29816, 34005, 37001*, and many others. Kalimantan: Sampit, *Alston 13133*; E. Kutei, Sangkulirang Distr., *bb. 34755, Kostermans 5498, 13445*; Berouw, Teluk Bajur, *Kostermans 21569*; Balikpapan, *bb. 13912, Kostermans 4294*; Bandjarmasin, *Polak 497*; Nunukan Isl., *Meijer 2204*.

LITHOCARPUS LONGISPINUS Barn.

Lithocarpus longispinus Barn. in *Kew Bull.*: 100. 1938. — Type: *Kerr 7755*, Kao Kalakiri, Pattani, Siam, at 300 m, fr. 9-IX-1923 (K!).

SIAM: Nakawan Tai, alt. 200 m, *Kerr 5834*; Kiat, Baw Rai, alt. 50 m, *Kerr 9449*. Pen. Siam: Ranawang, at sea level, *Kerr 11697*; Nakawan Sritamarat, *Kerr 15634*, and many others.

MALAYA. Selangor: mile 20th Bentong Rd., *Abdullah 167*; Ginting Simpah, alt. 600 m, *Rajah 505, 523, 548, 585*.

NOTE. Near *L. wrayi* and *coopertus*, but differs from both by its glabrous branchlets and leaves, long styles, and by its cupule which is densely set with long (1—1.5 cm) but soft spine-like appendages.

LITHOCARPUS LUCIDUS (Roxb.) Rehd.

Lithocarpus lucida (Roxb.) Rehd. in *J. Arn. Arb.* 1: 128. 1919. — *Quercus lucida* Roxb., *Fl. Ind.* 3: 635. 1832. — *Quercus cuneata* A.D.C., *Prod.* 16(2): 108. 1864 (later superfluous name). — *Pasania lucida* (Roxb.) Gamble in *J. Roy. As. Soc. Beng.* 75(2): 440. 1915. — *Synaedrys lucida* (Roxb.) Koidzumi in *Bot. Mag. Tokyo* 30: 192. 1916. — Type: *Roxburgh s.n.*, Penang, ♂, ♀. (BM!, BR! holo).

Quercus omalokos Korth., Kruidk.: 214. 1844. — *Cyclobalanus omalokos* (Korth.) Oerst. in Vid. Medd. Naturh. For. Kjöbn. 8: 80. 1867. — *Pasania omalokos* (Korth.) Schottky in Bot. Jahrb. 47: 676. 1912. — *Synaedrya omalokos* (Korth.) Koidzumi in Bot. Mag. Tokyo 30: 192. 1916. — *Lithocarpus omalokos* (Korth.) Rehd. in J. Arn. Arb. 1: 129. 1919. — Type: Korkals s.n., Sumatra, ♀, yfr. (A!, BM!, K!, L! holo).

SUMATRA. Padang Res.: Sidjundjung, bb. 2960, 5209; Painan, Barungbarungbelantai, bb. S.W.K./1-13. Medan Res.: Sibolangit, Lörzing 5369, 12621; Asahan, bb. 10429. Riau Res.: Indragiri areas, Amiruddin 6, 59; Lower Langkat, bb. 16389, 25206, 30017.

MALAY PENINSULA. Kedah: KEP 32988, SFN 35094. Perak: Larut, King's Coll. 3990, 5086, 5279, 5307, 5325, 5351, 5429, and many others; Chandering, King's Coll. 5975; Gopeng, King's Coll. 5950, 8194; Taiping, King's Coll. 8447; Ulu Sapetang, Burn-Murdoch 251; Kuala Kangsar, SFN 14950; Gn. Batu Puteh, Wray 1190. Selangor: Sg. Buloh, Burkill 1043, KEP 79017, 94443; Ulu Gombak F.R., KEP 98893, Poore 1259, Strugnell 12629. Negeri Sembilan: KEP/CF 610; Semawang F.R., KEP/CF 1971. Malacca: Bk. Kayu Arang, Alvins s.n.; Sg. Udang, Derry 583, 1227, Goodenough 1227, 1377. Johore: Mersing, KEP/CF 5895, KEP 77853, 77876, 99057; Bk. Paloh Est., Shah & Kadim 426. Kelantan: Kerilla Est., Shah & Kadim 470. Trengganu: Kuala Trengganu, SFN 40476. Pahang: Cameron Highlands, KEP/FD 37522, Poore 1309; Ginting Simpah, KEP/CF 3902; Ulu Sg. Kelu, KEP/FRI 10950; Sg. Kerla, SFN 24015, 31229. Penang: Curtis 436, 930. Singapore: Ridley 3381, 3414, SFN 35780, 36274, 39604.

BORNEO. Sarawak: Lundu Distr., Gn. Pueh F.R., SAR 15680; Semengoh Arb., SAR 4400; Div. III, Kapit Distr., Belaga, Jacobs 5417; Baram Distr., Melinau Gorge, SAR (Anderson) 4316. Brunei: Temburong, BRUN 475; Ulu Ropan, BRUN 5259. Sabah: Beaufort Distr., SAN 40542; Sandakan Distr., Sepilok F.R., SAN 17720, 21740, 22533, 24777, 34732; Lahad Datu Distr., Silabukan F.R., SAN 52955; Tawau Distr., SAN 29611, 30059, 30503, 32995, 40590, 47508, 48469. Kalimantan: Berouw, bb. 18026; W. Kutei, bb. 16087, 16550; C. Kutei, Belajan River, Koetermans 10230, 10351. Nunukan Isl., bb. 26203, Koetermans 9224.

Lithocarpus luteus Soepadmo, spec. nov.

Arbor 18—36 m alta 30—100 cm diametro anteridibus numerosis ad 2 m altis latisque, cortice profunde fissurata squamosa prophyreaca. Ramuli ab initio pilis flavo-brunneis ad fulvis adpressis stellatis dense muniti, fuscis ad nigri dense verrucosi lenticellati. Gemma terminalis ovoidea 3 mm longa 2 mm diametro, squamis anguste ovatis acutis. Stipulae lineariacutae 4—6 mm longae 1 mm latae. Folia crasse coriacea indice 2.5—3, (7—)9—12(—15) cm longa (2½—)3½—5(—6) cm lata ad medium vel paulo infra latissima, basi acuta cuneata, decurrentia, margine recurvata, apice ad 1 cm acuminata, faciebus plus minusve concoloribus flavo-brunneis, supra glabra nitida, infra pilis adpressis stellatis dilute obiecta; costa nervisque flavo-brunneis infra subtiliter prominen-

tibus supra applanatis, nervis lateralibus utrinque 9—12, densis parallelis angulo 45°—50° marginem versus arcuatis nec anastomosantibus, reticulatione subtili dense scalariformi infra distincta; petiolo 8—13 mm longo 2 mm crasso supra applanato. Inflorescentia mascula vel androgyna pilis brunneis stellatis dense munita, bracteis bracteolatisque anguste ovatis vel linearibus 2—2½ mm longis 1 mm latis. Rachis mascula 10—15 mm longa 1½ mm crassa floribus ♂ cum 3—7 fasciculatis, perianthio profunde inciso lobis 6 circiter 1 mm longis, staminibus 10—12 filamentis 2½—3½ mm longo anthera ½ mm longa, pistillodia subglobosa ca 1 mm diametro. Rachis androgyna 5—10 cm longa 2—3 mm crasse, floribus ♀ ternis vel solitariis, perianthio 6-lobato, staminodii 12 bene evoluta et perianthium superantibus, stylis 3 conoideis 1 mm longis recurvatis basi pilis simplicibus dense munitis. Cupulae nondum maturae sessilia, solitariae vel vulgo binae vel ternae, poculiformes 1—1½ cm longae 2½—3 cm diametro, margine crasso interdum incurvato, pariete lignoso, fusco-badio, fructus partem ¼ obtegentes, lamellis obscuris vulgo undulatis pilis adpressis stellatis dense munitis. Fructus ovoideus vel subhemisphaericus 1—1½ cm longus 2—2½ cm diametro pilis flavescensibus-griseis adpressis simplicibus dense tomentosus, apice acutus vel rotundatus-umbonatus basi truncatus cicatrice plana ca 2 cm diametro, pariete lignoso 2—3 mm crasso.

TYPUS: *Clemens 32817*, Borneo, Sabah, Mt. Kinabalu, Mt. Nuntok Ridges, alt. 1500 m, fr. 15-IV-1933 (A!, BM!, K!, L! holo, NY!, UC!).

BORNEO. S a r a w a k: Baram Distr., Mt. Mulu, *Anderson 4257, 4563*. S a b a h: Mt. Kinabalu, Tenompok, *Clemens 27763, 28311, 29314, 29373*; Penibukan, *Clemens 30975, 31577, 40621*; Colombon River, *Clemens 32494, 32604, 34103, 34389*; Gurulau Spur, *Clemens 50526, 50568*; Mesilau River, *Fuchs & Collette 21493*; *RSNB 4286*; Bembangan River, *RSNB 4935*; Crocker Range, *SAN 31926*; Tambunan, Trusmi, *SAN 32083*; Kamaranga, *SAN 33938*; Pinosok Plateau, *SAN 49702*. K a l i m a n t a n: W. Kutel, Mt. Kemul, *Endert 4124, 4274*.

NOTE. *Lithocarpus luteus* is quite near to *L. cyclophorus* from Sumatra, Malaya, and Borneo, but differs from the latter by its smaller leaves with a fewer and thin lateral nerves, smaller cupule and fruit, and by the present of yellowish tinge on the branches, leaves, nerves and cupule in dried specimens.

LITHOCARPUS LUZONIENSIS (Merr.) Rehd.

Lithocarpus luzoniensis (Merr.) Rehd. in *J. Arn. Arb.* 10: 133. 1929. — *Quercus luzoniensis* Merr. in *Philip. J. Sc. Bot.* 3: 323. 1908. — *Synaedrys luzoniensis* (Merr.) Koidzumi in *Bot. Mag. Tokyo* 30: 197. 1916. — Type: *FB 5040* (Curran), Philippines, Luzon, Benquet Prov., Mt. Tenglon, yfr. VIII-1906 (US! holo).

PHILIPPINES. L u z o n: Benquet, Mt. Pauai, *BS 8346, 31974, 32381, 32401*. Mt. Data, *Clemens 16338, 17784*; Mt. Pulog, *FB 18063, 18079, 18087, PNH 4305, Steiner 1949*; Mt. Nangaoto, *BS 82456, PNH 7783, 7756, 7764, 7775*; Mt. Osdung,

PNH 7787; Tayabas Prov., Mt. Alzapan, BS 45663; Neuva Vizcaya Prov., Mt. Caraballo, BS 45620, Loher 13641, 13649, 13709.

LITHOCARPUS MACPHAILII (Hend.) Barn.

Lithocarpus macphailii (Hend.) Barnett in Trans. & Proc. Bot. Soc. Edinb. 33, 3: 178. 1942. — *Pasania macphailii* Henderson in Gard. Bull. S.S. 5: 76. 1930. — Type: SFN 19621 (Henderson), Malaya, Kelantan, Sg. Ketch, near Gua Ninik, ♀ fl., yfr. 24-X-1929 (K! holo, SING! UC!).

SIAM. Pen. Siam: Pattani, Betawang, alt. ca 400 m, Kerr s.n., fr. 1-VIII-1923; Betong, Kerr 7464; Tung Song, Ban Pa Prek, Rabil 178.

SUMATRA. Atjeh Res.: Burni Lintang, Van Steenis 6253. Medan Res.: Sibolangit Nature Reserve, alt. 400 m, Lörsing 12619, 12620. Padang Res.: N. slopes of Mt. Sago, alt. 1000 m, Meijer 3987; Kerintji Lake, alt. 890 m, Bännemeyer 8343. East Coast: Simelungan, alt. 1200 m, Srait & Nasution 35318.

MALAYA. Kelantan: Sg. Ketch, near Gua Ninik, SFN 19621. Perak: Slim Hill F.R., KEP/FRI 0824. Selangor: Bt. Kali F.R., KEP 51674; Ginting Simpah, Rajah 362, and several others. Trengganu: Kemaman, Bk. Kajang, alt. 150 m, SFN 30241.

NOTE. Records of *L. blumeanus* from Malaya (Hooker f. 1888, King 1889) may belong here. In SFN 23955 and 30241 the cupule (detached) matches very well with that of *L. encleisocarpa*, but the leaves and inflorescence are similar to those of *macphailii*.

LITHOCARPUS MAINGAYI (Benth.) Rehd.

Lithocarpus maingayi (Benth.) Rehd. in J. Arn. Arb. 1: 128. 1919. — *Quercus maingayi* Benth. in Hooker f., Icon. Pl. 14: 9, pl. 1314. 1880. — *Pasania maingayi* (Benth.) Schottky in Bot. Jahrb. 47: 627. 1912. — *Synaedrys maingayi* (Benth.) Koidzumi in Bot. Mag. Tokyo 30: 189. 1916. — Type: *Maingayi* 1464, 1 mile from the top of Penang Hill, Malaya, yfr. (A!, BM!, K! holo, L!).

L. subnucifera A. Camus in Bull. Mus. Paris II, 4: 123. 1932. — Type: *Symington* KEP 24398, ca 22 mile from Gombak, Selangor, Malaya, 13-IX-1930, yfr. (K! holo, KEP!, SING!).

MALAYA. Perak: Gn. Batu Puteh, Wray 1142. Selangor: 20 mile from Gombak, KEP 11194, 24388; between Gap and Fraser Hill, Poore 1375; Ginting Simpah, SFN 34291. Negeri Sembilan: Semawang F.R., KEP/CF 520; Bk. Ophir, Ridley s.n. Johore: 19th mile Mawai-Jemaluang Road, SFN 32925. Penang: Curtis 267, yfr. VI-1892 (K!).

NOTE. The cupule and fruit of this species are rather similar to those of *L. beccariana* from Borneo, but the leaf is much larger with more lateral nerves and the cupule is lacking of longitudinal ridges. A. Camus

distinguished *L. subnucifera* from *L. maingayi* by its cupule which is not completely covering the fruit and by its leaf with more than 20 lateral nerves on either side. After looking at the types and other specimens more carefully, I found that in *L. subnucifera* the cupule is also completely covering the fruit as in *L. maingayi*, and that the number of the lateral nerves in *L. maingayi* is also about 20. A. Camus apparently examined a specimen with a broken cupule!

***Lithocarpus mariae* Soepadmo, spec. nov.**

Arbor 15—33 m alta 50—60 cm diametro anteridibus ca $2\frac{1}{3}$ m altis cortice laevi lenticellata flavo-cinerea. Ramuli ad initio pilis fulvis ad rufis stellatis dense tomentosi mox glabrescentes, fumosi laevi vel sparse lenticellati, gemma terminalis ovoidea $1\frac{1}{2}$ —2 mm longa diametro squamis ovatis. Folia tenuiter coriacea indice 2—3, (8—)10—12(—13) cm longa 4—5 cm lata medio vel infra latissima, faciebus paulo discoloribus, supra glabra nitida virescentia ad chokolatina, infra glauca pilis adpressis minutis stellatis dense tomentosa, basi rotundata acuta apice abrupte acuta ad 1 — $1\frac{1}{2}$ cm acuminata, costa infra prominente supra applanata, nervis lateralibus utrinque 10—12 tenuibus infra prominentibus supra applanatis ad impressis, parallelis angulo 50—60° marginem versus arcuatis nec anastomosantibus, reticulatione subtili dense scalariforme infra distincta; petiolo $1\frac{1}{2}$ — $2\frac{1}{2}$ cm longo 1 — $1\frac{1}{2}$ mm crasso supra applanato vel paulo sulcato. Inflorescentia mascula vel androgyna, simplex, pilis fulvis adpressis stellatis dense tomentosa, bracteis bracteolisque ovatis acutis $\frac{2}{3}$ —1 mm longis $\frac{1}{2}$ — $\frac{2}{3}$ mm latis. Rachis mascula c. 10 cm longa 2 mm crassa, floribus δ solitariis vel bini vel terni, perianthio 6-lobato, staminibus 12 filamentis 3—4 mm longo anthera 0.35 mm longa, pistillodio globoso 1 — $1\frac{1}{2}$ mm diametro pilis albescentibus dense tomentoso. Rachis androgyna ca 10 cm longa 2 mm crassa, floribus φ solitariis, perianthio 6-lobato staminidiis 12 abortivis, stylis 3—5 conoideis 1 — $1\frac{1}{2}$ mm longis connatis. Cupula juvenilia pedunculo 1 — $1\frac{1}{2}$ cm longo, globoso pilis adpressis stellatis rufis dense tomentosa. Cupula matura pedunculo 1 —2 cm longo, circiter 1 cm diametro, ovoidea basi apiceque rotundata acuta 2 — $2\frac{1}{2}$ cm longa $2\frac{1}{2}$ —3 cm diametro fructum includens aperturam 3 mm diametro exceptum, pariete tenuiore quam 1 mm, intus pilis fulvis adpressis simplicibus dense tomentosa, extus laevis vel longitudinaliter obscure striata, pilis glaucis adpressis stellatis dense tomentosa. Fructus maturus ovoideus 2 — $2\frac{1}{2}$ cm longus $2\frac{1}{2}$ — $2\frac{3}{4}$ cm diametro pilis fulvis adpressis simplicibus dense tomentosus, apice rotundatus acutus basi rotundatus cicatrice profunde concava ca 2 cm diametro, pariete lignoso ca 1 mm crasso.

TYPUS: SAR 15404, Borneo, Sarawak, Lundu Distr., Mt. Lundu, in primary submontane forests, alt. 600 m, δ , φ , fr. 7-X-1961 (A, K!, L! holo, SING!).

BORNEO. Sarawak: Kapit Distr., Sg. Lajang, SAR 13194. Sabah: Kota Belud Distr., SAN 26754.

NOTE. This new species is named in honour of Mrs. M. J. Van Steenis-Kruseman (Leiden) whose invaluable service to our Flora Malesiana Projects is here very highly appreciated. It is near to *L. enclisacarpus* from Sumatra, Malaya and Borneo, but may be distinguished by its leaf which has more lateral nerves and scalariform reticulation, and by its conical cupule without distinct longitudinal streaks.

Lithocarpus megacarpus Soepadmo, *spec. nov.*

Arbor 9—30 m alta 10—50 cm diametro, Ramuli validi glabri fumosi sparse denseve lenticellati, gemma terminali ovoidea 2—3 mm magnitudine, squamis anguste ovatis-acutis, pilis rufis adpressis stellatis dilute oblecta. Stipulae anguste ovatae-acutae 1—1½ cm longae ½—1 mm latae. Folia crassa rigide coriacea indice (2—)2.2—2.6(—3.2), (9—)11—14 (—16) cm longa (3½—)5—6(—8) cm lata, medio vel raro infra latissima, faciebus concoloribus fumosis, supra glabra opaca nitidave, infra pilis minutis adpressis stellatis dilute oblecta mox glabrescentia, basi attenuata-acuta vel rotundata abrupteque acuta breviter decurrente, apice acuta acuminatave acumine ½—1 cm obtuso-acutove, costa nervisque infra prominentibus supra applanatis, nervis lateralibus utrinque (7—)8—10(—11) subparallelis ascendentibus angulo 45—50° marginem versus arcuatis nec anastomosantibus, reticulatione grossa subscalariforme infra distincta; petiolo glabro 6—10 mm longo 2—2½ mm crasso paulo sulcato. Inflorescentia mascula vel androgyna, pilis griseis adpressis stellatis dilute oblecta, bracteis bracteolatisque ovatis acutis 0.7—1 mm longis 0.7 mm latis. Rachis mascula ca 10 cm longa 2 mm crassa, floribus ♂ ternis, perianthio campanulato 6-lobato staminibus 12 filamentis 3—4 mm longo anthera ca 3 mm longa, pistillodio globoso 1—1½ mm diametro. Rachis androgyna ca 5 cm longa 2 mm crassa, floribus ♀ solitariis vel bini vel terni perianthio 6-lobato staminodiis 12 abortivis stylis 3 conoideis ca 1 mm longis. Cupulae juveniles binae vel ternae vel raro cupula solitaria, squamis crassis ovatis acutis adpressis pilis cinerascentis adpressis stellatis dense tomentosus. Cupula matura sessile vel raro pedunculo breve, latae discoidea 1—1½ cm longa 4—5½ cm diametro, fructus partem basalem tantum obtegens, margine crassa rotundata, pariete lignoso pilis fumosis adpressis stellatis dense tomentoso, squamis crassis alternantibus, annulis concentricis dispositis. Fructus maturus depressus-subglobosus raro ovoideus-globosus, glaber, chokolatinus, 2—3½ cm longus 4—5 cm diametro, basi truncatus cicatrice concava sed centro convexa, 2½—4 cm diametro, apice rotundatus apiculatus vel depressus-umbonatus, pariete lignoso 5—8 mm crasso, cotyledonibus plano-convexis.

TYPUS: *Hoogland & Pullen 6216*, East New Guinea, Western Highlands Distr., ca 6 km South of Mt. Hagen, in montane forest on fairly steep slopes, alt. 1900 m, ♂ fl., fr. 14-IX-1956 (L! holo).

NEW GUINEA. West New Guinea: Idenburg River, 6 km South-West of Bernhard Camp, *Brass & Versteegh 12521, 12569*. East New

G u i n e a : Milne Bay Distr., North slopes of Mt. Dayman, Brass 23252, 23341; Boridi, Carr 13266; Sepik Areas, Ledermann 10325, 12784; Morobe Distr., 7° 10' S, 147° E., NGF 8725; Wagau, 6° 45' S, 146° 50' E., NGF 17913; Eastern Highlands Distr., Arau, Brass 32256.

NOTE. Closed to *L. lauterbachii*, also from New Guinea, but differs by its thick rigid coriaceous leaves and sessile, broadly saucer-shaped cupule, and by its broader but shorter fruits. Schlechter 19841, formerly identified by Markgraf (1924) as *Pasania spicata* var. *placentaria*, belong to this new species. Record of *Pasania bancana* from New Guinea (Markgraf 1924) based on Ledermann 10325 & 12784 is not confirmed, and these two specimens are included in this new species.

Lithocarpus meijeri Soepadmo, spec. nov.

Arbor 12—42 m alta 20—100 cm diametro anteridibus patentibus obtusis, cortice laevi profunde fissurata vel squamosa, cinereo-ferruginea. Innovationes pilis fulvis stellatis dense munitae. Ramuli subglabri, griseo-picei, sparse lenticellati. Gemma terminalis ovoidea ca 3 mm longa 2 mm lata squamis anguste ovatis-acutis. Stipulae lineares acutae vel subulatae 3—4 mm longae $\frac{1}{2}$ —1 mm latae. Folia coriacea indice 2—3, (11—)13—16(—15) cm longa (4—)5—7(—11) cm lata medio vel supra medium latissima, basi cuneata breve decurrente margine recurvata apice obtuse acuta ad $\frac{1}{2}$ cm acuminata, faciebus discoloria supra glabra nitida infra dense pilis fulvo-griseis adpressis stellatis minuta, costa infra prominente supra applanata, nervis infra distinctis roseo-brunneis utrinque 11—13 subparallelis angulo ca 45° marginem versus arcuatus nec anastomosantibus, reticulatione densa subtili subscalariforme utrinque obscura; petiolo 1—1 $\frac{1}{2}$ cm longo 1 $\frac{1}{2}$ —2 $\frac{1}{2}$ mm crasso subglabro basi incrassato rugosoque vix sulcato.

Cupula matura sessilis plus minusve obconoidea basim versus contracta 1—1 $\frac{1}{2}$ cm longa 2—2 $\frac{1}{2}$ cm diametro tantum basim fructus obtegens, intus dense fumose tomentosa extus pilis stellatis fulvis dense munita, lamellis 6—8 integris undulatis interdum obscuris, margine tenui. Fructus maturus ovoideus-conoideus, depressus 0.6—1.5 cm longus 2—3 cm diametro pilis simplicibus albo griseis argenteis dense munitus, basi truncatus cicatrice profunde concava 1 $\frac{1}{2}$ —2 cm diametro, apice abrupte acuminato vel depresso apiculatoque, pariete lignoso ca 2 mm crasso; cotyledones plano-convexo.

TYPUS: SAN 39608 (*Meijer*), Borneo, Sandakan, Sepilok Forest Reserves, in primary Dipterocarps forest on sandy loamy soil, alt. ca 90 m, Fr. 23-IX-1963 (K!, L! holo, SAN!, SING!).

BORNEO. S a r a w a k : Mt. Penrissen, SAR 16400 (*Ilias Paie*); Ulu Mujong, Balleh, SAR 19791 (*Askton*); 3rd Division, Kapit Distr., 2° 40' N., 113° 50' E., Jacobs 5368. B r u n e i : Bt. Lebadak, KEP 80174. S a b a h : Jesselton vicinity,

KEP 71663, Ranau Distr., SAN 21346, 26470, 26714; Beaufort Distr., SAN 28073 and many others; Sandakan Distr., Sepilok, Leila, and Kebon China Forest Reserves, SAN 27471 and many others.

NOTE. This new species is named after Dr. W. Meijer, formerly (1959—1968) forest botanist in Sandakan, North Borneo, whose collections have tremendously increased our knowledge of the Flora of North Borneo in the last five years or so. Its nearest allies are *L. cantleyanus* and *L. daphnoideus*. It differs from *L. cantleyanus* by its sessile cupule, fewer lateral nerves, obscure reticulation, and by its fruit which is densely covered with silvery tomentum, and from *L. daphnoideus* by its leaves and fruits.

LITHOCARPUS MINDANAENSIS (Elmer) Rehd.

Lithocarpus mindanaensis (Elmer) Rehd. in J. Arn. Arb. 1: 128. 1919. — *Quereus acuminatissima* Merr. in Philip. J. Sc, Bot. 3: 326. 1908, non A.DC. 1864. — *Quereus mindanaensis* Elmer, in Leaf. Philip. Bot. 3: 942. 1900, quoad nomen. — *Synaedryx acuminatissima* (Merr.) Koidzumi in Bot. Mag. Tokyo 30: 190. 1916. — Type: *Ahem* 432, Philippines, Mindanao, Surigao, fr. 1902 (K!, NY!, UC! holo).

Quereus philippinensis (non A.DC.) Merr. in Bull. Bur. For. Philip. 1: 16. 1903.

Quereus celebica (non Miq.) V. Seemen in Perkins' Fragm. Fl. Philip.: 41. 1904.

Quereus "dasystaehya" (non Miq.) in Elmer, Leaf. Philip. Bot. 3: 942. 1910.

PHILIPPINES. L e y t e : *FB* 12792, *Wenzel* 932. B a s i l a n : *Vidal* 3915. M i n d a n a o : Bukidnon Prov., *Britton* 423; Todaya, Mt. Apo, *Elmer* 11841; Zamboanga Prov., *FB* 9143, 22011, 22938, 24151; Davao Prov., *FB* 27623; Lanao Prov., *Zwicky* 242; Butuan, *FB* 20762.

LITHOCARPUS NEOROBINSONII A. Camus

Lithocarpus neorobinsonii A. Camus, Chênes, Alt. 3, Expl. Pl.: 77. 1948. — *Quereus robinsonii* Ridley in J. Fed. Mai. States 5: 46. 1914. — *Pasania robinsonii* Gamble in J. As. Soc. Bengal 75, 2: 450. 1915. — Type: *Robinson s.n.*, Malaya, Selangor, Mt. Mengkuang Lebah, alt. c. 1500 m, d¹ fl., fr. 20-1-1913 (BM!, K! holo).

SI AM. Pen. Siara: Setul, Kao Keo Ranges, alt. 700 m, *Kerr* 1455; Rana-wang, Kao Panta Luang, alt. c. 1000 m, *Kerr* 16976; and few others.

MALAYA. P e r a k : Larut, *King's Coll.* 3232, and several others. S e l a n g o r : the Gap, *KEP* 32856. P a h a n g : Cameron Highlands, *KEP* 45420; *Poore* 1283; Fraser's Hill, *Poore* 1346, and few others.

NOTE. The name *neorobinsonii* was coined by A. Camus (1948), as by then the specific epithet *robinsonii* was already preoccupied by *L. robinsonii* Rehder (1919) based on *Q. robinsonii* Merrill (1915), a species from the Philippines. Merrill (1928) knowing that his specific

name was a later homonym, renamed his species as *Q. buddii* which in 1943 was transferred by A. Camus to the genus *Lithocarpus*.

LITHOCARPUS NIEUWENHUISII (V. Seemen) A. Camus

Lithocarpus nieuwenhuisii (V. Seemen) A. Camus in Bull. Soc. Bot. Fr. 92: 255. 1945. — *Quercus nieuwenhuisii* V. Seemen in Bull. Dept. Agr. Ind. Neerl. 1: 6. 1906. — *Synaedrys "nieuwenhuisii"* (V. Seemen) Koidzumi in Bat. Mag. Tokyo 30: 197. 1916. — Type: *Jaheri 1546*, Borneo, Sg. Salut, fr. (BO! holo).

Quercus dementis Merr. in Philip. J. Sc. Bot. 3: 321. 1908. — *Pasarfia dementis* (Merr.) Sehottky in Bot. Jahrb. 49: 358. 1913. — *Synaedrys "dementi"* (Merr.) Koidzumi, *l.e.* 194. — *Lithocarpus dementis* (Merr.) A. Camus in Riviera Scient. 18: 39. 1932. — Type: *M. S. Clemens 906*, Philippines, Mindanao, Lake Lanao, ? fl., fr. 1907 (US! holo).

Pasania ochraeea Sehottky in Bot. Jahrb. 49: 357. 1913. — *Quercus ochracea* (Sehottky) Merr., En. Born.: 214. 1921. — *Lithocarpus ochracea* (Sehottky) A. Camus in Riviera Scient. 18: 41. 1932. — Type: *Foxworthy 258*, Borneo, Sarawak, fr. 1908 (K! holo, US!).

Quercus borneensis Merr. in Philip. J. Sc., Bot. 21: 516. 1922. — *Lithocarpus bomeensis* (Merr.) Rehd. in J. Arn. Arb. 10: Borneo, Tawau, fr. 1918 (A! holo, K!, US!).

Lithocarpus crateriformis Merr. ex A. Camus, Chénes, Alt. 3: 97. 1949. — Type: *Foxworthy 259*, Borneo, Sarawak (BM!, K! holo).

BORNEO. S a r a w a k : Semengoh Arb., SAR 5393; Mt. Mattang, SAR 12625; Div. III, Balingian, Ulu Sg. Arip, SAR 23787; Baram Distr., *Hose 209*; Div. IV, Mt. Dulit, *Richards' Coil. 1123*; Miri Distr., Lambir Hill F.R., SAR 3005; Bt. Mersing, SAR 17657, 21962; Bk. Gebong, SAR 15U0. B r u n e i : Bk. Puan, BRUN 7886; Bt. Bangan, *Hotta 13118*; Bt. Meriong, KEP 80182; Sg. Ingei, SAR (*Brunig*) U05. S a b a h : Beaufort Distr., Pangi, SAN 15216; Tenom Distr., Halogilait, SAN 31837; Paal Trail, SAN 43248; Keningau, SAN 32192; Kota Belud, Bk. Monindok, SAN 32192; Mt. Kinabalu, *Clemens 51255*; Ranau Distr., SAN 21029, 21338, 25308, 26706; Kinabatangan, SAN A. 4652; Sandakan Distr., Sepilok-Kabili F.R., SAN 34336; Tumundong camp, SAN 19011; Bk. Dodi, SAN 28939; Labuk Road, SAN 37890, 39273; Lahad Datu, SAN 29689, 40950; Tawau, *Elmer 20601, 21626, 21810, SAN 16481, 17262, 21495, 26256, 29417*, and many others. K a l i m a n t a n : W. Kutei, near Lake Ibut, *Endert 2710*; Nunukan Isl., *Kostermans 9049, Meijer 2192*.

PHILIPPINES. B a s i l a n : BS 16122, 18909. M i n d a n a o : Lake Lanao, *Clemens 906, 1138*; Agusan Prov., *PNH 41837*.

Lithocarpus nodosus Soepadmo, *spec. nov.*

Arbor 10—20 m alta 20 cm diametro cortice brunnescente laevi. Ramuli glabri nodis crassis fusci sparse lenticellati gemma terminali ovoidea 1—3 mm longa \vee - \rightarrow —1 mm lata squamis anguste ovatis initio dense rufo-lepidotis glabrescentes. Stipulae lineares acutae ca 2 mm longae $y\%$ mm latae. Folia crasse coriacea rigida indice (1.6—)2(—3), (6—)8—10(—12) cm Jonga (3—)4—5(—8) cm lata medio latissima, faciebus

leviter discoloribus supra glabra nitida chocolatina infra dense tomentosa pilis adpressis minutis stellatis fulvis, basi acuta apice abrupte acuta vel 1—IV2 cm acuminata, costa lata supra prominente infra applanata nervis utrinque 8—10 infra subtiliter prominentibus supra applanatis, subparallelis angulo 30—50° marginem versus arcuatis sed non anastomosantibus, reticulazione subtili subscalariforme utrinque obscure; petiolo glabro 8—12 mm longo 2—3 mm crasso supra appaflato. Inflorescentia mascula vel androgyna, solitaria vel glomeris densis paniculatis collecta pilis stellatis dense vel sparse tomentosa bracteis anguste ovatis 1—2 mm longis V2—% mm latis bracteolis ovatis ca 1/2 mm longis latisque. Rachis mascula 3—10 cm longa 1—2 mm crassa floribus § ternis perianthio 6-lobato staminibus 12 filamentis 2—3 mm longo anthera 0.25 mm longa pistillodis subgloboso %—1 mm diametro. Rachis androgyna ca 5 cm longa 2 mm crassa floribus 2 solitariis vel raro 2—3 in glomero perianthio 6-lobato staminodiis 12 abortivis stylis 3 conoideis 1—2 mm longis connatis. Cupula juvenilia solitaria vel glomera cum 2—3, squamis adpressis minutis concentricis. Cupula matura sessilis solitaria poculiformis %—1 cm longa 2—2 1/2 cm diametro margine tenui fructus partem 14—VA obtegens intus dense tomentosa pilis adpressis simplicibus cinereis extus dense tomentosa pilis brevis stellatis fulvis, lamellis 4—6, obscuris tenuibus minute denticulatis. Fructus maturus ovoideo-globosus 1—IV2 cm longus 1%—2 1/2 cm diametro glaber pallide chokolatinus apice rotundatus acutus basi rotundatus cicatrice profunde concava ca 1 cm diametro, pariete lignoso ca 1 mm crasso.

TYPUS: SAN 21980 (*Meijer*), Borneo, Sabah, Mt. Kinabalu, above Kundasan, alt. 1500—2100 m, fr. 19-VII-1961 (K!, L! holo).

BORNEO. Sarawak: Mt. Mulu, *Hotta* H889, H793. North Borneo (Sabah): Mt. Kinabalu, *Clemens* 29163, 29890, 30392, SAN 29U7, *SFN* (*Carr*) 27526 A; Mt. Trusmadi, SAN 31855.

NOTE. This new species can be easily recognized by its swollen nodes.

***Lithocarpus obtusifolius* Soepadmo, nom. nov.**

Quercus rufa V. Seemen in Bull. Dept. Agr. Ind. Neerl. 1: 4. 1906, non Vukot. 1889. — *Synaedrys rufa* (V. Seemen) Koidzumi in Bot. Mag. Tokyo 30: 193. 1916. — *Lithocarpus rufa* (V. Seemen) A. Camus in Riviera Scient. 18: 41. 1932. — Type: *Hallier* 2i81, Borneo, Mt. Klam, fr. (K! holo).

BORNEO. Kalimantan: Mt. Klam, *Hallier* 2i81.

NOTE. SO far only known from the type specimen. A distinct species recognizable by its thick leathery leaf with obtuse-rounded tip, dense rufous tomentum underneath and a short petiole.

Lithocarpus orbicularis Soepadmo, *spec. nov.*

Fructex 1—3 m alta. Ramuli initio pilis fulvis adpressis stellatis sparse muniti mox glabrescentes, fumosi, gemma terminali ovoidea ca 1 mm longa $\frac{1}{2}$ — $\frac{3}{4}$ mm diametro, squamis ovatis. Stipulae lineares ca 2 mm longae $\frac{1}{2}$ — $\frac{3}{4}$ mm latae. Folia crasse coriacea rigida indice 1—1.5, (2—) 3—3VJ>(—4I/2) cm longa (2—)2VH—3) cm lata, circa medium latissima, faciebus plus minusve concoloribus chocolatinis, supra glabra nitida glandulis minutis sparse munita, infra pilis adpressis stellatis dilute obiecta subglabrescentia, basi rotundata ad subcordata apice rotundata emarginata, costa utrinque subtiliter prominente, nervis lateralibus utrinque 8—10 utrinque obscuris parallelis angulo ca 60° marginem versus arcuatis nee anastomosantibus, reticulatione subtili areolata utrinque obscura; petiolo 3 mm longo 2 mm crasso glabro supra applanato. Infructescentia juvenilis ca 3 cm longa $\sqrt{2}$ mm crassa, cupulo juvenili subgloboso sessile, poculiforme ca 8 mm longo 2 cm diametro, intus pilis adpressis simplicibus dense tomentosus, extus pilis fulvis adpressis stellatis dense tomentosus, margine tenui, fructus partem ca $\sqrt{3}$ obtegens, lamellis tenuibus 5—6 concentricis. Fructus (nondum maturus) depressus ovoideus 1 cm longus $\frac{1}{2}$ — $\frac{3}{4}$ cm diametro glaber fusco-badius, pariete-lignoso ca 1 mm crasso.

TYPUS: *Van Steenis* 8977, Sumatra, Gajo & Alas Lands, top of Goh Lembuh, alt. 2800 m, $\frac{1}{2}$ fl., fr. 19-11-1937 (BO!, K!, L! holo).

NOTE. This new species is so far known only from the type specimen. It is vegetatively distinct from the rest of the species, and can be recognized by its typically thick coriaceous orbicular leaf with a rounded-emarginate tip, strongly areolate reticulation, and short petiole.

Lithocarpus oreophilus Soepadmo, *nom. nov.*

Quercus monticola King in Ann. Roy. Bot. Gard. Calc. 2: 44, t. 37. 1889, non Petzold & Kirchner 1864. — *Synaedrys monticola* (King) Koidzumi in Bot. Mag. Tokyo 30: 197. 1916. — *Lithocarpus monticola* (King) Rehd. in J. Arn. Arb. 1: 129. 1919. — Type: *Bccari* PS 275, Sumatra, Mt. Singalang, fr. 1878. (FI! holo, K!, L!).

SUMATRA. A t j e h Res.: Gajo & Alas Lands, *Van Steenis* 9687. P a d a n g Res.: Mt. Kerintji, *Jacobs* 4357, *Meijer* 6132, *H. C. Robinson & Kloss s.n.*

NOTE. Records from the Philippines (Elmer in Leaflet Philip. Bot. 3: 942. 1910) and Borneo (King, *I.e.*) are not confirmed here. Specimens collected by Elmer from Mindanao Isl. are included in *L. sttbmonticolus* and according to Stapf (in Trans. Linn. Soc. Lond. II, Bot. 4: 231. 1894) King's records from Borneo belong to *Myrica*.

LITHOCARPUS OVALIS (Blanco) Rehd.

Lithocarpus ovalis (Blanco) Rehd. in J. Arn. Arb. 1: 129. 1919. — *Quercus glabra* Blanco, Fl. Filip.: 727. 1837, non Thunb. 1784. — *Quercus ovalis* Blanco, Fl.

Filip. Ed. 2: 502. 1845. — *Quercus blancoi* A. DC, Prod. 16(2): 97. 1864. (*superfluous name*). — *Cyclobalanus ovalis* (Blanco) Oerst. in Vid. Medd. Naturh. For. Kjöbn. 8: 81. 1867. — *Cyclobalanus blancoi* (A. DC.) Oerst. in Kong. Danske Vid. Selsk. Skrift. V, 9: 376. 1871. — *Synaedrys ovalis* (Blanco) Koidzumi in Bot. Mag. Tokyo 30: 192. 1916. — Neotype: *Merrill Sp. Blanc. 70k*, Philippines, Luzon, Bulacan Prov., Angat, £? fl. (A!, BO!, K!, L! holo, NY!).

PHILIPPINES. L u z o n : Ilocos Norte Prov., *BS 33113*; Cagayan Prov., *BS 7701b*, *FB 27073*, *PNH U0621*; Zambales Prov., *FB 5817*; Bataan Prov., *FB 23225*, *Vidal 620*; Bulacan Prov., *FB 3255*, *Merrill Sp. Blanc. 70b*; Rizal Prov., *Vidal 615*, *616*, *1808*; Laguna Prov., *PNH 6927*, *40623*, *kIS05*, *Sulit 17*; Camarines Prov., *FB 18738*.

LITHOCAKPLUS PALLIDUS (Bl.) Rehd.

Lithocarpus pallidus (Bl.) Rehd. in J. Arn. Arb. 1: 129. 1919. — *Quercus pallida* BL, Bijdr. 10: 524. 1825. — *Quercus pseudomolucca* Bl. var. *paltida* Miq. in Ann. Mus. Bot. Lugd. Bat. 1: 108. 1863. — *Pasania pallida* (Bl.) Oerst. in Vid. Medd. Naturh. For. Kjöbn. 8: 1867. — *Synaedrys pallida* (Bl.) Koidzumi in Bot. Mag. Tokyo 30: 197. 1916. — Type: *Blume s.n.*, <\$ fl. VI-1823, W. Java, Mt. Gede, Tjibeureum River (L!).

Quercus pseudomolucca Bl. var. *rostrata* BL, Mus. Bot. Lugd. Bat. 1: 292., 1850. — Type: *Blume s.n.*, St., W. Java (L!).

SUMATRA. S. p a r t s : Mt. Dempo, *Forbes s.n.*

JAVA. W. J a v a : Mt. Gede, *Blum.be s.n.*, *\$ fl. VI-1823; Mt. Burangrang, *Blume s.n.* (1420), yfr.; Mt. Malabar, *Monterie 2U*; Bandung vicinity,)». *1316*; Tjidadatar, near Garut, *Jm b6b2*. C. J a v a : Mt. Slamet, above Simpar, *den Berger s.n.*, yfr. XI-1918. — E. J a v a : Mt. Wilis, *Ja. 3035*, *Koorders 29203*.

Lithocarpus papillifer Soepadmo, *spec. nov.*

Arbor 15—25 m alta 30—40 cm diametro, certive laevi fumosa. Ramuli ad initio pilis fulvis ad rufis adpressis stellptis dense rouniti mox glabrescentes deinde cinerei lenticellati minutis pallidis dense muniti; gemma terminali ovoidea 2 mm longa et lata squamis anguste ovatis. Stipulae ovatae deltoideave 1—2 mm longae $\frac{1}{2}$ —1^m mm latae. Folia crasse coriacea indice 1.5—2.5, (4—)6—10 (—12) cm longa (2—) 3—4 (—5%) cm lata, ad medium vel infra latissima, basi acuta apice acuta vel rotunda-emarginata faciebus plus minusve discoloribus, supra fusee chocolatina opaca nitidave, pilis stellatis adpressis atque papillis nigrescentibus glandulosis paulo munita, infra flavescencia ad porphyrea, pilis adpressis stellatis dense munita, costa infra prominente paulo supra, nervis laterilibus utrinque (5—)6—7(—8), infra prominentibus supra impressis, parallelis angulo 45—50°, marginem versus arcuata nee anastomosantibus, reticulatione subtili densa scalariforme utrinque, obscura vel raro infra distincta; petiolo $y \pm$ —1 cm longo 1—3 mm crasso paulo sulcato. Inflorescentia mascula vel androgyna, fascicula terminali paniculata dense disposita, pilis fulvis ad rufis adpressis stellatis dense muniti, bracteis bracteolisque anguste ovatis 1—IVa mm longis $\frac{1}{2}$ —1 mm latis. Rachis

mascula ca 5 cm longa 1—1/2 mm crassa, floribus δ bini ternive raro solitariis, perianthio 6-lobato staminibus 12 filamentis 1 1/2—2 mm longo anthera 0.25 mm longa, pistillodio globoso 1 mm diametro. Raehis androgyna 4—5 cm longa 2 mm crassa, floribus 2 solitariis vel raro bini perianthio 6-lobato staminodiis 12 abortivis, stylis 3 conoideis 1—IV2^{mm} longis recurvatis. Cupula nondum matura sessiles improfunde poculif ormis, 1/2 cm longa 1—1 1/4 cm diametro, tenuis, pilis fulvis stellatis dense munita, fructus partem basalem obtegens, margine tenui, squamis minutis adpressis alternantibus sed concentricis dispositis. Fructus nondum maturus ovoideus-conoideus, glaber, badius, nitidus, ca 1 cm longus IV3 cm diametro apice acuminatus basi rotundatus cicatrice concava ca V₂, cm diametro, pariete osseo tenuiore quam V2^{mm}.

TYPUS: *Clemens* 32A93, Borneo, Sabah, Mt. Kinabalu, Colombon River, alt. 1800 m, fr. 8-VI-1933 (A!, BM!, BO!, K!, L! holo, NY!, UC!).

BORNEO. S a r a w a k : Mt. Kalulong, 3° 14'N, 114° 41'E., SAR 3753; Mt. Mulu, SAR 15078; Ulu Baram, SAR 20035. S a b a h : Mt. Kinabalu, *Clemens* S2998, 40845, 50038, 50506, 50764, 51038; Mesilau River, RSNB 4304; Tenompok, Kota Belud, SAN 20409; Pinosok Plateau, SAN 4831. K a l i m a n t a n : W. Kutei, *Endert* 3148.

NOTE. *L. papillifer* is close to *L. buddii* from the Philippines, but differs by its smaller leaves and cupule, type of indumentum, and its adpressed cupule-scales.

In SAN 29006 from Mt. Kinabalu, the staminodes in the female flower are missing, and the number of styles is up to 15.

LITHOCARPUS PATTANIENSIS Barnett

Lithocarpus pattaniensis Barnett in Kew Bull.: 104. 1938. — Type: *Kerr* 7583, Pen. Siam. Betong, Gn. Ma, fr. 12-VIII-1923 (BM! holo).

PEN. SIAM. Kao Pado, *Kerr* 6071; Gn. Ma, Betong, *Kerr* 7583.

MALAY PENINSULA. P e r a k : Slim Hill F.R., *KEP/FRI* 705. P a h a n g : Cameron Highlands, *Poore* 1331, 1351, *Rajab* U8, U67; Fraser's Hills, *KEP/FRI* 10663, 10664, *KEP* 29477, *Poore* 1381; Gn. Mandi Angin, *KEP/FRI* 10795. J o h o r e : Labis F.R., *KEP/FRI* 7922, 8006.

Lithocarpus perakensis Soepadmo, *stat. et nom. nov.*

Quercus costata (non Bl.) Hook.f., Fl. Brit. Ind. 5: 617. 1888. — *Quercus costata* var. *convexa* (non Bl.) King in Ann. Roy. Bot. Gard. Calc. 2: 82, t. 76A. 1889. — *Pasania costata* (Bl.) Gamble J. Roy. As. Soc. Beng. 75(2): 443. 1915, *quoad specim. ex Malaya*. — *Lithocarpus costata* var. *Mngii* A. Camus in Bull. Soc. Bot. Fr. 92: 254. 1945. — Lectotype: *King's Coll.* 7277, Malaya, Perak, Larut, fr. 11-1885 (K! holo, SING!).

MALAY PENINSULA. P e r a k : Larut, *King's Coll.* 4891, 5166, 5584, 7277, *Scortechini s.n.*, *Wray* 1097. P a h a n g : Kemaman, *Corner s.n.*; near Ulu Kahang, *SFN* 10782; Sg. Kayu, *SFN* 32348.

NOTE. The basionym on this species is *L. costata* var. *Jcingii* A. Camus. The name *perakensis* is proposed to avoid any future confusion with *L. kingianus* (Gamble) A. Camus also from Malaya. It differs from *L. javensis* (incl. *costata*) from Sumatra and Java, by its larger leaf with a longer petiole and its cup- to saucer-shaped cupule which is not enclosing the fruit.

LITHOCARPUS PHILIPPINENSIS (A. DC.) Rehd.

Lithocarjms philippinensis (A. DC.) Rehd. in J. Am. Arb. 1: 129. 1919. — *Quercus philippinensis* A. DC., Prod. 16(2): 97. 1864. — *Cyclobalanus "philippensis"* (A. DC.) Oerst. in Vid. Medd. Naturh. For. Kjobn. 8: 81. 1867. — *Synaedrys philippinensis* (A. DC.) Koidzumi in Bot. Mag. Tokyo 30: 192. 1916. — Type: *Cuming 809*, Philippines, Luzon, Albay Prov., fr. 1841 (BM!, CGE!, K! holo, L!). *

Quercus caraballoana F.-Villar, Novis. App. Fl. Filip. 3: 209. 1880. — Type: *Vidal 618 bis*, Philippines, Luzon, Mt. Caraballo, \$ fl. (L! holo), *syn. nov.*

Quercus wenzelii Merr. in Philip. J. Sc., Bot. 10: 267. 1915. — *Synaedrys wenzelii* (Merr.) Koidzumi, *I.e.*: 193. — *Lithocarpus wenzelii* (Merr.) Rehd. in J. Arn. Arb. 1: 132. 1919. — Type: *Wenzel 1157*, Philippines, Leyte, fr. 1-X-1914 (A!, L!, US! holo), *syn. nov.*

Quercus rizalensis Merr. in Philip. J. Sc., Bot. 3: 272. 1918. — *Lithocarpus rizalensis* (Merr.) Rehd. in J. Arn. Arb. 10: 133. 1929. — Type: *BS (Ramos & Edano) 20587*, Philippines, Luzon, Rizal Prov., yfr. VII-1917 (US! holo), *syn. nov.*

Lithocarpus oligocarpa A. Camus in Bull. Soc. Bot. Fr. 81: 816. 1934. — Type: *Vidal 3897*, Philippines, Luzon, Neuva Ecija Prov., Mt. Caraballo, yfr. III-1886 (K! holo), *syn. nov.*

PHILIPPINES. L u z o n : Cagayan Prov., Mt. Tabuan, *BS 77090*; Isabela Prov., Mt. Moises, *Clemens 16890*; Quezon Prov., *PNH 2),51*; Neuva Ecija Prov., Mt. Caraballo, *Vidal 618 bis, 3897*; Bataan Prov., Mt. Mariveles, *Whitford 1178*; Rizal Prov., *BS 29587, Loher 6958, 12796, 13102*; Laguna Prov., *BS 27919, FB 7910*; Bataangas Prov., *FB 280U6*; Tayabas Prov., *BS 9U5, 28818, Cuming 809, Elmer 8185*; Camarines Sur, *BS 762U0, FB 27827*. S a m a r : Mt. Calbica, *PNH 6bll*. L e y ' t e : *Wenzel 1008, 1157*. M i n d a n a o : Mt. Apo, *Elmer 119 US*.

NOTE. Merrill (1908, p. 322) and A. Camus (1954) who never saw the type of *Q. caraballoana* (L!) reduced the species to the synonymy of *Q.(L.) jordanae*, a completely different species. Though the type of the former is in flower, except for the shorter acument, the venation and indumentum of the leaf are exactly the same with that of *Cuming 809*. Specimens formerly known as *Q.(L.) wenzelii* are here regarded as the lowland form and those previously included in *Q.(L.) rizalensis* as the montane form of *L. philippinensis*. Its nearest ally is *L. solerianus*, also from which it differs by its long caudate-acuminate leaf with strongly ascending nerves and by its densely whitish-grey to fulvous simple-tomentose fruit with strongly convex or flat scar.

LITHOCARPUS PLATYCARPUS (Bl.) Rehd.

Lithocarpus platycarpa (Bl.) Rehd. in J. Arn. Arb. 1: 130. 1919. — *Quercus platycarpa* Bl., Fl. Javae, Cupul.: 27, t. 15. 1829. — *Cyclobalanus platycarpa*: (Bl.) Oerst. in Vid. Medd. Naturh. For. Kjöbn. 8: 80. 1867. — *Synaedrys platycarpa* (Bl.) Koidzumi in Bot. Mag. Tokyo 30: 192. 1916. — Type: *Van Hasselt s.n.*, W. Java, S.W. Banten, between Sudimanik and Binuangeun, yfr. VIII-1823 (L! holo).

JAVA. West Java: Banten, between Sudimanik and Binuangeun, *Van Hasselt s.n.*, cultivated in Bog. Botanic Gardens, *RasDini 195*, *Teysmann HB. 7508*, *76U*. Central Java: Nusakambangan Isl., *Koorders 2U732*, *34135*, *3413:2*, *39277*.

Lithocarpus porcatus Soepadmo, *spec. nov.*

Arbor 10—45 m alta 20—50 cm diametro. Ramuli ad initio pilis adpressis stellatis dense tomentosi, deinde subglabri verrucosi lenticellati. Folia crasse coriacea indice 1.8—2.5, (15—)20—22 (—26) cm longa, (7—) 9—10 (—13) cm lata, medio vel supra latissima, supra glabra nitida infra pilis adpressis stellatis dense tomentosa glabrescentia, basi abrupte rotundata-acuta ad cuneata decurrentia marg-ine undulata apice obtuse acuta, costa nervisque infra valde prominentibus supra applanatis angulo 45—60° marginem versus arcuatis nee anastomosantibus, reticulatione subtili dense scalariforme utrinque obscura; petiolo subglabro 5—15 mm longo 2—2½ mm crasso basi rugoso incrassatique supra applanato.

Cupula (incomplete evoluta?) ½—1 cm pedunculata, depresso ovoidea-globosa, basi abrupte constricta, 2—3 mm longa, 3—4 cm diametro, apice applanata, extus porcis 5—10 concentricis vel spiralibus prominentibus interdum basim versus placatis, pilis flavo-brunneis brevibus dense tomentosa, fructum includens aperturam 1—5 mm diametro exceptam. Fructus depressus subglobosus 1—IV2 cm longus 1½—2 cm diametro, pariete lignoso 1—2 mm crasso, basi rotundato cicatrice partem majorem occupante, apicem applanatum umbonatum et pilis flavo-brunneis brevibus dense tomentosum exceptum.

TYPUS: *SFN 26677* (*Carr*), Borneo, Sabah, Mt. Kinabalu, Menctudok Gorge, alt. 900 m, fr. 21-111-1933 (SING! holo).

BORNEO. Sarawak: Mt. Penrissen, alt. 900 m, *SAB 16339*. Sabah: Kota Belud Distr., Tabilong Hill, *SAN A U339*; Tambunan Distr., near Kaingaran River, *SAN 31753*; Mt. Kinabalu Menetudok Gorge, *SFN 26677*; Tenompok, *Clemens 28562*.

NOTE. The leaves of this species are very similar to those of *L. hallieri*, but the cupule is much smaller and set with strong ridges, and provided with a small aperture at its top.

LITHOCARPUS PSEUDOKUNSTLERI A. Camus

Lithocarpus pseudokunstleri A. Camus in Bull. Soc. Bot. Fr. 92: 10. 1945. — Type: *Beccari PB 3328*, Borneo, Sarawak, Marop, yfr. (FI! holo, K!).

BORNEO. S a r a w a k : Marop, *Beccari PB 3281, 3330*; Lundu Distr., Gn. Berumpot, *SAR 13172*; *Kuching*, Sg. Sekrang, *SAR 9824*; Sg. Entulang, *SAR 13112*; Sibul Distr., Sg. Assam, Naman F.R., *SAR 3361, 5507*; Loba Kabang, *SAR 519, 878*; Kapit Distr., Bk. Raya, *SAR 14742*; Ulu Mujong, *SAR 19936, 21160*; Mt. Mulu, *SAR 150S8*. S a b a h : Beaufort Distr., Halogilat, *SAN 33751, 39885*; mile 9th Sipitang Road, *SAN 35153*. K a l i m a n t a n : Pontianak, Kp. Andjongan, *Mondi 272*; W. Kutei, Tundjung Plateau, *Kostermans 12567*.

LITHOCARPUS PSEUDOMOLUCCUS (Bl.) Rehd.

Lithocarpus pseudomolucca (Bl.) Rehd. in J. Arn. Arb. 1: 130. 1919. — *Quercus pseudomolucca* Bl. in Verh. Batav. Gen. K. & W. 9: 214, t. 4. 1823. — *Pasania pseudomolucca* (Bl.) Oerst. in Vid. Medd. Naturh. For. Kjöbn. 8: 83. 1867. — *Synaedrys pseudomolucca* (Bl.) Koidzumi in Bot. Mag. Tokyo 30: 197. 1916. — Type: *Blume s.n.*, W. Java, Mt. Gede, ♂, 2 fl., yfr., fr. VI-1823 (A!, CGE!, L! holo, NY!).

Quercus pseudomolucca var. *incrassata* BL, Mus. Bot. Lugd. Bat. 1: 291. 1850. — Types: *Blume s.n.*, W. Java, Mt. Salak, fr. 1823 (K!, L! holo).

Quercus angustata Bl. in Verh. Batav. Gen. K. & W. 9: 212, t. 3. 1823. — *Quercus pseudomolucca* var. *angustata* (Bl.) Bl., Mus. Bot. Lugd. Bat. 1: 292. 1850. — *Quercus thelecarpa* var. *angustata* (Bl.) Miq. PI. Jungh.: 9. 1851. — Type: *Blume s.n.*, W. Java, Mt. Gede, Ulu Tjibeureum, ♂, ? fl., fr. VI-1823 (K!, L! holo, NY!, P!).

Quercus thelecarpa Miq., PI. Jungh.: 9. 1851. — Type: *Junghuhn 3*, W. Java, Pengalengan, fr. V-1847 (L!, U! holo).

Quercus neurophylla Miq., Sumatra: 351, 1861. — *Pasania neurophylla* (Miq.) Oerst. in Kong. Danske Vid. Selsk. Skrift. V, 9: 379. 1871. — Type: *Diepenhorst HB 2495*, Sumatra, st. (U! holo).

SUMATRA. A t j e h Res.: Ssulimun, 66. 5877. T a p a n u l i Res.: Lake Toba, near Peso-Peso, *Bangham 1169*; Djulu, 66. 5663; Karo, 66. 7196. P a d a n g Res.: Mt. Singalan, *Beccari PS 74*. B e n g k u l e n Res.: Lebong, *Oliver 21*. I n d r a g i r i Res.: *Buwalda 7094*; P a l e m b a n g Res.: Pasemah-lands, 66. T.B. 623.

JAVA. W e s t J a v a : Mt. Salak, *Hochreuner 755*; Tjibodas, *Koorders 1.8473, 12475, 13017, 25864, 32206, 32210, 32227, Nurta & Hasan 18, 165, 188*; Takoka, *Koorders 33305, 33307 372S2, 37294, 39648*; Tjidadap, Tjibeber, *Bakhuizen Sr. 2420, Winckel 298*; Tjigenteng, *Koorders 33749, 33760*; Tjadas Malang, *Winckel 3*; Gn. Tangkuban Perahu, *Junghuhn s.n.* C e n t r a l J a v a : Pekalongan Res., Surdjo, *Koorders 1541*; Semarang Res., Telomojo, *Koorders 27717*. E a s t e r n J a v a : Madiun Res., Ngebel, *Koorders 38703*; Besuki Res., Yang Plateau, *Van Steenis 10901*.

NOTE. Specimens from Malaya attributed to this species belong to *L. rassa*, and those from New Guinea to *L. megacarpus*.

LITHOOAEPUS PULCHER (King) Markg.

Lithocarpus pulchra (King) Markg. in Bot. Jahrb. 59: 67. 1924. — *Quercus pulchra* King in Ann. Roy. Bot. Gard. Calc. 2: 85, pi. 81. 1889. — *Synaedrys pulchra*

(King) Koidzumi in Bot. Mag. Tokyo 30: 189. 1916. — Leetype: *Beccari P.B. 312*, yfr., Sg. Sioel, Sarawak (FI! holo, K!, NY!, P!).

BORNEO. S a r a w a k : near Kuching, *BeccarH. P.B. 2100*; Mt. Matang, *Moulton's coll. 260*; Mt. Poi, *Jantan s.n.*; Semengoh Arboretum, *SAR 51U5*; Sabal F.R., *SAR 13395*; Bario, Ulu Baram, *SAR 20119*. K a l i m a n t a n : Mt. Lianggang, *Hallier 2885*; W. Kutei, near Mt. Kemul, *Endert 3679*; Tarakan, *Meijer 2583*. S a b a h : Tawau, Ulu Serudong, *SAN 31166*; Ranau, Distr., Sosopodon, *SAN UH60*.

NOTE. King's original description of the inflorescence and flowers was based on *Beccari P.B. 3269* from Sarawak which is here excluded from this species and included in *L. beccarianus*. This species is close to *L. echinifer*, but differs by its rigid-coriaceous leaves with strongly prominent midrib and lateral nerves beneath and by its cupule with short, thick, pointed tubercles.

***Lithocarpus pusillus* Soepadmo, spec. nov. — Fig. 11**

Arbor 7—25 m alta 10—80 cm diametro, interdum radicibus grilliformibus ad 1.2 m altis, cortice minute squamosa cinereo-brunnea. Ramuli initio dense tomentosi pilis adpressis stellatis cinereo-brunneis, interdum excretis resinosis obtecti, deinde fumosi ad nigricantes, sparse lenticellati vel minute fissurati, gemma terminalis ovoidea ca 1 mm magnitudinis, squamis ovatis. Folia rigida, tenue-coriacea, indice (1.6—)2—3(—3.6), (4)6_10(—121/2) cm longa (1.7—)2i/2—4(—5) cm lata, infra raro supra medium latissima; basi rotundata-acuta apice obtuse 1—3 cm acuminata-caudata, supra glabra, opaca vel nitida pallide cinereo-viridia ad chocolatina, infra pilis fumosis adpressis stellatis dense munita costa tcepta, costa tenue utrinque prominente, n-ervis lateralibus utrinque (6—)8—10(—11), obscuris vel infra distinctis, parallelis angulo 50—60° marginem versus arcuatis et paulo anastomosantibus, reticulatione subtili, obscura, irregulare vel areolata; petiolo 5—10 mm longo 1—IV2 mm crasso glabro supra piano vel paulo sulcato. Inflorescentia mascula vel androgyna vel mixta pili fumosis adpressis stellatis dense munita, *subglabrescens, bracteis ovatis 0.5—0.7 mm magnitudine bracteolis late ovata-acuta 0.35—0.5 mm longa, 0.7—1 mm lata. Rachis mascula 7—20 cm longa 1—iy> mm crassa vulgo axillaris simplexque, floribus \$ solitariis perianthio campanulato 5—6-lobato staminibus 10—12 filamento 2i/2—&A mm longo anthera 0.25—0.30 mm longa pistillodio globoso ca 1 mm diametro pilis albescentibus lanuginosis simplicibus dense munito. Rachis androgyna vel mixta 8—15 cm longa IV2^{mm} crassa floribus \$ solitariis perianthio 6-lobato staminodiis 12 abortivis stylis 3 conoideis recurvatis 1—2 mm longis basi dense tomentosis pilis simplicibus. Cupula juvenilis sessilis globosa squamis ovatis adpressisque seriebus concentricis 4—5 dispositis. Cupula matura sessilis ad 2—3 mm pedunculata discoidea ca 3 mm longa 8—12 mm diametro margine tenue fructus partem basalem obtecta, lamellis 4—5 tenuibus denticulatis integrisve intus pilis adpressis simpli-

cibus dense munita, extus dense tomentosa pilis adpressis cinereis stellatis. Fructus maturus ovoideus-conoideus, giaber, pallide badius, 8—13 mm magnitudine, apice rotundato-acuto basi rotundato cicatrice 3—7 mm diametro, pariete osseo J/o—1 nun crasso.

TYPUS: *Anderson U560*. Borneo, Sarawak, Baram Distr., Mt. Mulu, in submontane forest, at 1140 m alt., fr. 29-VI-1961 (A!, K!, L! holo).

BORNEO. S a r a w a k : *Beccari P.B. 1208, 1876*; near Kuching, *Haviland 928, Haviland & Hose 3701 E, Omar 358*; Loba Kabang peat-swamp forest, III Div., *Wood S 0444, Anderson S 0515*; Bario Distr., Ulu Baram, *S(AR) 20028, 20110, 20153*; Sibuluan Distr., Bt. Lassa peat-swamp forest, *S(AR) 15954.*; BLntulu Distr., Bt. Urang, *S(AR) 11996, 12029, 12042*, Nyabau area, *S(AR) 12046*. S a b a h : Mt. Kinabalu, Mesilau River, *RSNB 4273, 4295, 4890', 7130*; Ranau Distr., *SAN 20966, 56306*. S a b a h : Muara Tewe, *bb. 27767*; Mt. Klam, *Hallier 2382*; Berouw, Mt. Iias Mapulu, *Kostervians 14029*.

NOTE. From the field notes given by the collectors, this new species seems to be confined either to peat-swamp forest or heath forest (both at low or high altitudes). This new species is closely related to *L. bennetii* from which it differs by its smaller cupule and fruit, smaller leaves with 1—3 cm acuminate-caudate apex, and by its simple (not branched) axillary inflorescence.

LITHOCARPUS EASSA (Miq.) Behd.

Lithocarpus rassa (Miq.) Rehd. in *J. Arn. Arb.* 1: 130. 1919. — *Quercus rassa* Miq., *Sumatra*: 350. 1861. — *Cyclobalanus rassa* (Miq.) Oerst. in *Kong. Danske Vid. Selsk. Skrift.* V, 9: 376. 1871. — *Pasania rassa* (Miq.) Gamble in *J. Roy. As. Soc. Beng.* 75(2): 436. 1915. — *Synaedrys rassa* (Miq.) Koidzumi in *Bot. Mag. Tokyo* 30: 192. 1916. — Type: *Teysmann HB. 675*, Sumatra, Padang Res., Pajakumbuh, yfr. (BO! holo, K!, U!).

Quercus rassa var. *montana* King ex Hook.f., *Pl. Brit. Ind.* 5: 613. 1888. — Type: *King's Coll. 6957*, Malaya, Perak, Larut, Gn. Iju, fr. XII-1884 (BM!, K! holo).

Quercus wenzigiana King ex Hook.f., *Pl. Brit. Ind.* 5: 613. 1888. — *Pasania wenzigiana* (King ex Hook.f.) Gamble, *l.e.* 435. — *Synaedrys wenzigiana* (King ex Hook.f.) Koidzumi, *l.c.* 193. — *Lithocarpus ioenzigiana* (King ex Hook.f.) A. Camus in *Riviera Scient.* 18: 42. 1932. — Type: *Maingay 1527*, Malaya, Malacca, <? fl., fr. (A!, BM!, CGE!, K! holo, L!).

Quercus rassa var. *lanuginosa* Ridley in *J. Str. Br. Roy. As. Soc.* 61: 37. 1912. — Type: *Ridley 15576*, Malaya, Selangor, Semangkok Hill, <? fl. IV-1911 (BM!, K! holo).

Lithocarpus rangeriana A. Camus in *Bull. Mus. Hist. Nat. Paris* II, 4: 912. 1932. — Type: *KEP/FD 5912* (Yeob), Malaya, Johore, Ulu Endau, fr. 20-VII-1923 (K! holo, KEP!).

Lithocarpus ridleyana A. Camus in *Bull. Mus. Hist. Nat. Paris* II, 4: 913. 1932. — Type: *KEP/FMS. 8916*, Malaya, Kedah, Gn. Inas F.R., fr. 10-VIII-1928 (KEP! holo).

Lithocarpus syntingtonia A. Camus in Bull. Mus. Hist. Nat. Paris II, 4: 913. 1932. — Type: *KEP 25961 (Symington)*, Malaya, Pahang, Cameron Highlands, fr. 25-V-1931 (K! holo, *KEP!*).

SUMATRA. *Tapanuli Res.*: Lae Pondon, E. of Sidikalang, *Alston 14945*. *Padang Res.*: Pajakumbuh, *Teysmann HB. 675*. *Medan Res.*: Asahan, Hutan Padang, *Krukoff 259, 4278, 3227*; *Langkat, Honing s.n.*, *Riau Res.*: *Forbes 2560*.

MALAYA. *Kedah*: Koh Mai F.R., *SFN 35187*. *Peraak*: *Scortechini 329a*; Goping, *King's Coll. 5783, 5955*; Larut, *King's Coll. 6957, 6983*; Gn. Korbu, *KEP S2132, 45864*. *Selangor*: Gn. Nuang, Ulu Langat, *KEP 51769*; Ulu Gombak F.R., *KEP 94394*; Semangkok Hill, *Ridley 15576*. *Pahang*: Cameron Highlands, *KEP 27308, 30967, 31027, Rajah 466*; Praser's Hills, *KEP 22359, SFN 11311, Sidek 4812*; Gn. Tahan, *Wray & Robinson 5UO*; Bk. Raka, Bentong, *KEP 380U*; Sg. Teku, *SFN 31785*; Kemaman, *SFN 30477*. *Malacca*: *Maingay 1527*. *Johore*: Ulu Endau, *KEPJFD\ 5912*; Gn. Belunmti, *SFN 10775*. *Penang*: *Curtis 360, 362, 368, 2479, KEP 99667, King's Coll. 1689, Ridley 7214,, 9369*.

BORNEO. *Sarawak*: Semengoh F.R., *SAR 5385, 10040, 15604*; Bako N.P., Bk. Gondot, *SAR 17905*; Kuala Serait, *SAR 1803(t)*. *Sabah*: Tawau, Sg. Serudong, *SAN S6163*.

NOTE. In 1954, A. Camus carelessly designated *Griffith 4482* also from Malacca, as the type of *L. ivenzigiana*. King (1889), however, clearly stated that his description of *Q. wenzigiana* was based on *Maingay's* specimen (*Maingay 1527*).

Three rather distinct forms may be recognized in this species. The typical form is found in the submontane forests at altitude between 600 and 1500 m, and has small, narrowly ovate to linear-lanceolate leaves and small fruits and cupules with 5—6 distinct lamellae. The lowland form which was recognized by King and others as a separate species (*Q. wenzigiana*) has larger leaves, cupules and fruits. This lowland form is united with the submontane one by several intermediate specimens such as *KEP 94349 & SFN 10775* from Malaya, *Honing s.n.* from Sumatra, and by *SAN 26163 and SAR 5385 & 18030* from Borneo. The third form represented by several specimens collected from the upper montane forests in Malaya (1500-1800 m alt.) and which has been recognized as a distinct species (*L. syntingtonia*) by A. Camus, has much smaller leaves, cupules and fruits than those of the lowland and submontane forms. Several intermediates linking the upper montane and the other two forms are also present.

LITHOCARPUS REINWAKDTII (Korth.) A. Camus

Lithocarpus reinwardtii (Korth.) A. Camus in *Riviera Scient.* 18: 41. 1932. — *Quercus reinwardtii* Korth., *Kruidk.*: 211. 1844. — *Cyclobalanus reinwardtii* (Korth.)

Oerst. in Vid. Medd. Naturh. For. Kjobn. 8: 81. 1871. — *Pasania reinwardtii* (Korth.) Prantl in E. & P., Nat. Pfl. Pam. 3(1): 55. 1889. — *Synaedrys reinwardtii* (Korth.) Koidzumi in Bot. Mag. Tokyo 30: 192. 1916. — Type: *Korthals s.n.*, Sumatra, Mt. Malintang, <?, \$ fl., fr. 1835 (A!, BM! K!, L! holo).

SUMATRA. P a d a n g R e s.: Lubuk Perahu, 66. 5779; Sindjundjung, 66. 605i; Mt. Sago, *Meijer 3419, 3575*.

JAVA. W. J a v a: Banten, Pasir Orai, *Forbes 329, 334*.

NOTE. Records from Indo-China, Malay Peninsula and Borneo are not confirmed here.

Lithocarpus revolutus Hatus. ex Soepadmo, *spec. nov.* — Fig. 12

Arbor 12 m alta 30 cm diametro, cortice molli eburnea. Ramuli initio pilis rigidis stellatis fulvis dense pubescentes, mox glabrescentes fumosi sparse lenticellati; gemma terminali ovoidea 4—5 mm longa 3—4 mm lata squamis anguste ovatis 2—2% mm latae. Folia crasse coriacea rigida indice 2—3, 8%—14 cm longa 3—5 cm lata, medio vel supra latissima faciebus concoloribus pilis rigidis stellatis sparse pubescentibus glabrescentibus; basi acuta margine valde revoluta apice rotundata ad abtuse acuta acumine emarginato, costa nervisque infra valde prominentibus supra applanatis ad impressis, nervis lateralibus utrinque 6—8 subparallelis angulo 45—60° marginem versus arcuatis nee anastomosantibus, reticulatione subscalariforme subtili utrinque obscura vel infra subdistincta; petiolo 5—6 mm longo 3—4 mm crasso supra applanato. Rachis mascula 10—15 cm longa 3 mm crassa pilis fulvis rigidis stellatis dense munita, bracteis anguste ovatis 2—214 mm longis 1—IV2^{mm} latis bracteolis ovatis 1 mm longis latisque, floribus \$ ternis, perianthio 6-lobato, staminibus 12 filamentis 3y₂—5 mm longo anthera 0.3—0.35 mm longa, pistillodio subgloboso IV2—2 mm diametro. Floribus 2 (in fructu juvenile visi) solitarii bini vel terni, perianthio 6-lobato staminodiis 12 bene evolutis superato, stylis 3 teretibus 3—4 mm longis recurvatis. Cupula matura sessilis lignosa poculiformis IV2—2 cm longa 3%—41/2 cm diametro margine tenui sed rigida, fructus partem %—V3 obtegens, intus pilis argenteo-brunneis sericeis simplicibus dense munita, extus pilis fulvis stellatis dense tomentosa, squamis ovatis adpressis imbricatis. Fructus maturus depressus ovoideo-conoideus 2—2i/\$ cm longus 3—4 cm diametro glaber fusco-badius, apice rotundatus acutus basi rotundatus cicatrice concava 2—214 cm diametro, pariete lignoso ad 1 cm crasso.

TYPUS: *RSNB U71*, Borneo, Sabah, Mt. Kinabalu, Mesilau River, alt. 1500 m, \$, fr. 30-1-1964 (K!, L! holo).

BORNEO. S a r a w a k: Headwater of Balleh River, Kapit Distr., 1° 35'N, 114° 30' E, in primary forest, SAR 28737. S a b a h: Mt. Kinabalu, Tenompok, *Clemens 29526, 30388*; Pinosok Plateau, *RSNB s.n.*; Mesilau, *SAN 41299*.



Fig. 12. *Lilhocarpus revolutus* Soepadmo,

NOTE. This new species is near to *L. schlechteri* from New Guinea and *L. pallidus* from Java and Sumatra. It differs from *L. schlechteri* by its broadly saucer-shaped cupule and thick-coriaceous, short-petioled leaves with strongly revolute margin, and from *L. pallidus* by its rigid, thick-coriaceous, concolorous leaves, shorter petiole, strongly recurved margin, and by the concave fruit-scar.

***Lithocarpus rigidus* Soepadmo, spec. nov.**

Arbor 6—18 m alta 30 cm diametro. Ramuli validi internodiis brevibus nodis crassis, glabri fusci sparse lenticellati, gemma terminalis ovoideo-ellipsoidea 7—10 mm longa 3—5 mm lata squamis anguste-ovatis 5—7 mm longis 2—3 mm latis initio pilis minutis stellatis sparse munitis mox glabrescentibus. Stipulae ovatae-acutae ad lanceolatae 6—8 mm longae 3—4 mm latae. Folia crasse coriacea rigide indice 1.5—2, (8—) 14—16 (—18) cm longa (5—)6—8(—10) cm lata medio vel supra latissima, concoloria pallide flavo-brunnea supra glabra nitida infra laxe tomentosa pilis minutis adpressis stellatis, basi acuta vel rotundata apice obtuse rotundato-acuta vel rotundata, costa lata utrinque prominente, nervis utrinque 8—11 infra prominentibus supra appianatis ad impressis subparallis angulo 50—80° marginem versus arcuatis sed non anastomosantibus, reticulatione tenui subscalariforme ad irregulare utrinque obscura; petiolo 7—10 mm longo 5—6 mm crasso glabro supra appianato. Rachis mascula (partim evoluta) ca 5 cm longa 3—4 mm crassa sparse tomentosa pilis stellatis bracteis linearibus 5—7 mm longis 1—2 mm latis bracteolis ovatis 3—4 mm longis 2 mm latis; floribus σ ternis. Flores 2 (in cupula juvenile observati) perianthio 6-lobato staminibus 12 abortivis stylis 3 conoideis 1—2 mm longis apicem versus recurvatis glabrisque. Rachis fructifera (partim evoluta) 15—20 cm longa σ —1 cm crassa sparse tomentosa pilis fulvis stellatis. Cupula juvenilis sessilis vulgo terna, dense tomentosa pilis fulvis stellatis, squamis minutis adpressis concentricis. Fructus juvenilis ovoideus glaber chokolatinus apice rotundatus-acuminatus.

TYPUS : *RSNB V/89*, Borneo, Sabah, Mt. Kinabalu, Mesilau Cave, alt. 1800 m, yfr. I-IV-1964 (K!, L! holo, SING!).

BORNEO. S a b a h : Mt. Kinabalu, Mesilau Cave, *Clemens 32725*, *RSNB iC8S*, 4767, 4780; Mt. Tambuyokan, *SAN 28802*.

NOTE.. This new species can be easily distinguished from any other species by its extremely rigid thick-coriaceous leaves with long-decurrent base, and by its sturdy branchlets, inflorescence and infructescence.

LITHOCARPUS ROTUNDATUS (Bl.) A. Camus

Lithocarpus rotundata (Bl.) A. Camus in *Riviera Scientif.* 18: 41. 1931. — *Quernis rotundata* Bl. hi *Verh. Bat. Genootsch.* 9: 219. 1823. — *Pasania rotundata*

(Bl.) Oerst. in Vid. Medd. Naturh. For. Kjobn. 8: 83. 1867. — *Synaedrys rohmdata* (Bl.) Koidzumi in Bot. Mag. Tokyo 30: 189. 1916. ("*rotunda*"). — Type: *Blume s.n.*, Mt. Salak, Java, Aug. fr. (L!).

Quercus clathrata V. Seemen in Bot. Jahrb. 27, Suppl. 64: 15. 1900. — *Synaedrys clathrata* (V. Seemen) Koidzumi in Bot. Mag. Tokyo 30: 190. 1916. — *L. clathrata* (V. Seemen) Render in J. Arn. Arb. 1: 123. 1919. — Type: *Koorders 11176*, Mt. Kapal, Pringombo, Banjumas, Central Java, yfr. (BO! holo, L!).

Quercus pyriformis V. Seemen in Bot. Jahrb. 27, Suppl. 64: 17. 1900. — *Synaedrys pyriformis* (V. Seemen) Koidzumi in Bot. Mag. Tokyo 30: 189. 1916. — *L. pyriformis* (V. Seemen) Render in J. Arn. Arb. 1: 130. 1919. — Type: *Koorders 15340*, Takoka, W. Java, 24-11-1894, yfr. (BO! holo, L!).

Quercus curranii Merr. in Philip. J. Sc. 3: Bot. 329. 1908. — *Synaedrys curranii* (Merr.) Koidzumi in Bot. Mag. Tokyo 30: 189. 1916. — *L. curranii* (Merr.) Rehder in J. Arn. Arb. 1: 127. 1919. — Type: *Curran & Merritt FB 7918*, Luzon, Laguna Prov., Mt. Banajao, st. XI-1907 (K!).

JAVA. West Java: Takoka, *Koorders 1489*, and several others; Tjibodas, *Koorders 25781*. Central Java: Banjumas R.s., Pringombo, Mt. Kapal, *Koorders 11176*.

BORNEO. Sabah: Sandakan Distr., Sapagaya, *NBFD 4943 (Clemente)*.

PHILIPPINES. Luzon: Rizal Prov., Mt. Susong Dalaga, *BS 29316*; Montalban, *Loher 12021*.

NOTE. The type of *Quercus curranii* Merr. which was apparently collected from a young plant (a basal shoot) differs slightly from that of *L. rotundatus* by its thicker indumentum on the leaf and branchlets. In *Loher 12021* and *BS 29316* also from the Philippines, the leaf and branchlets are subglabrous, similar to those of *L. rotundatus* from Java and Borneo. Further the cupule and fruit of *L. curranii* are very much the same with those of *L. rotundatus*, except for the narrower opening at the top.

LITHOCARPUS RUFOVILLOSUS (Markg.) Rehd.

Lithocarpus rufovillosa (Markg.) Rehd. in J. Arn. Arb. 10: 133. 1929. — *Pasania rufovillosa* Markg. in Bot. Jahrb. 59: 74, l. 3, 4B-C. 1924. — Type: *Schlechter 18242*, N.E. New Guinea, Finisterre Ranges, ♂, 2 fl. 8-IX-1908 (A!, BM!, K! holo, L!, US!).

NEW GUINEA. West New Guinea: Warsamson Valley, E. of Sorong, *BW 5736, 5901, 5932, 1161b*; S. of Lake Ajamaru, *BW 7368, 15206*; Kebar Valley, *BW 7722, 7747, 7754, 779k, 7981, Van Royen 5020, 5052, Van Roy em, & Sleumer 7330*; Warmare Valley, *BW 15658*; Arfak Mts., Anggi Gigi Lake, *BW 257, 2024, 2037, 2039, 14283, Kanehira & Hatusima 13963*; Anggi Gigi Lake, *BW 2004, Kostermans 2350, 2405*; Sidei, *BW 1767*; Andai, *BW 11956*; Ransiki, *BW 2261*; Aifat Valley, *BW 12825, Van Royen & Sleumer 7058*; Fakfak, 66. 32700, *BW 5139, 12168*; Wandammen Pen., *BW 13471*; Wissel Lake, *BW 3267, 3272, 8710, 8779*; Bele River, 18 km. N.E. of Lake Habbema, *Brass 11353, 11477, Brass & Versteegh 11150, 11152*, Balin Ewer,

Brass & Versteegh 11177; Bernhard Camp, Idenburg River, *Brass & Versteegh 11981, 1385*, Along Digul River, *BW 4849*, J a p e n I s l . : *BW 10526, bb. 30512*. E a s t New Guinea: Alola, *Carr 14136, 14137*; „Boridi, *Carr 13044, 14319, 14475, 14581, 14589, 14698, 14699*; Western Highlands Distr., near Wabag, *ANU 2044, NGF 15254, 15255, 15256*; Mt. Hagen Station, *Hoogland & Pullen 5833, 6217, Pullen 196, Robbins 2, 179*; Eastern Highlands Distr., Mt. Michael, *Brass 31150, 31761, 32238, 32419, 32422, Hartley 12046, 12926*; Near Goroka, *Hoogland & Pullen 5435, Saunders 880*; Aiyura[^]. *NGF 1073*; Kiburu, *Sohodde 1324, 1404*; Western Distr., Fly River, *Brass 6740*; Gulf Distr., Konewu, *Cameron s.n.*; Morobe Distr., *Clemens 5204, 8624, 11264, 41281, Hartley 10400, 11521, NGF 7310*; Finisterre Range, *NGF 11878, Pullen 6184, Schlechter 18242*; Near Wagau, *NGF 17895, 19314*; Waria Valley, *NGF 26388*; S.E. of Boana, *Van Roy en & Millar 17548*; Northern Distr., Kokoda, *Carr 16457, Hoogland 5923*.

***Lithocarpus ruminatus* Soepadmo, spec. nov.**

Arbor 10—20 m alta 20—30 cm diametro, Ramuli initio pilis fulvis adpressis stellatis dense tomentosi, deinde subglabrescentes cinerascentes lenticellis obscuris sparse muniti. Stipulae lineares acutae 2—3 mm longa 0.2 mm lata. Folia crasse coriacea indice 2—3, (6—)9—12 (—16) cm longa (3—)4—5(—8) cm lata, medio vel infra latissima, faciebus plus minusve discoloribus, supra glabra opaca ad nitida cinereo-viridia, infra pilis cinerascentibus adpressis stellatis dense tomentosa, basi rotundata et abrupte acuta ad cuneata breviter decurrentia, apice acuta interdum obtusata, costa infra prominente supra subprominente, nervis lateralibus utrinque 6—8 subparallelis ascendentibus angulo 45—50° marginem versus arcuatis nee anastomosantibus, reticulatione subtili laxa subscalariforme utrinque obscura; petiolo 5—10 mm longo 2 mm crasso subglabrescente rugoso basi incrassato supra applanato. Cupula matura subsessilis subhemispherica ad depresso ovoidea-globosa, 3—4/2 cm longa 5—6 cm diametro, basi attenuata ad rotundata apice truncata, fructum includens aperturam 2—3 cm diametro exceptam, pariete lignoso circiter 5 mm crasso extus 8—10 annulis concentricis quarum 5—6 in apice truncato dispositis, pilis fumosis brevibus stellatis dense tomentosa, glabrescens. Fructus maturus subhemisphericus 3—4 cm longus 4—5 cm diametro pariete lignoso ruminato 1/2—1/2 cm crasso parte libera convexa, centro depressus umbonatus, pilis ferrugineis brevibus dense tomentosus, basi rotundatus cicatrice fructus partem circiter 1/5—4/5 occupante.

TYPUS: *Clemens 2916h*, Sabah, Mt. Kinabalu, alt. 2000 m, fr. I-VI-1932 (A! BM! BO! K! L! holo, NY! UC!).

BORNEO. S a b a h : Beaufort Distr., *SAN 35171*; Mt. Kinabalu, *Clemens 28997*; Sandakan Distr., Leila F.R., *SAN 26542, 27502*.

NOTE. This new species is very closely allied to *L. turbinatus* (also from Mt. Kinabalu), but it may be distinguished from the latter by its subglobose cupule with an apical aperture of 2—3 cm in diameter, and by its fruit-wall ruminant in cross-section.

LITHOCARPUS SCHLECHTERI Markg.

Lithocarpus schlechteri Markg. in Bot. Jahrb. 59: 69, l. 2. 1924. — Type: *Schlechter 19100*, East New Guinea, Finisterre Ranges, fr. 15-1-1909 (A!, BM!, K!, L! holo, US!).

Lithocarpus pcrclusa Markg., l.e. 68. — Type: *Schlechter 1884.8*, East New Guinea, Bismarck Ranges, yfr. 18-XI-1908 (A!, BM!, K!, L! holo, US!).

NEW GUINEA. West New Guinea: Arfak Mts., Minjambau, *BW 13945*; Anggi Gigi Lake, *BW 264*; Wissel Lake, *BW 3269, 8699, 8774*; Bele River, 18 km N.E. of Habbema Lake, *Brass 11396*; Idenburg River, 15 km S.W. of Bernhard Camp, *Brass & Versteegh 11971*. East New Guinea: Sepik Area, *Ledermann 10103*; Western Highlands Distr., near Wabag, *ANU 2561*; Central Highlands Distr., Aiyura, *NGF 3388*; Eastern Highlands Distr., Arau, *Brass 32255*; Bismarck Ranges, *Schlechter 18848*; Finisterre Ranges, *Schlechter 19100*; Kani Ranges, *Schlechter 17483*; Morobe Distr., Mt. Kanidi, *Brass 29737*; Sattleberg, *Clemens 3049*; Boana, *Clemens 8376*; Edi Creek, S.W. of Wau, *Hartley 11753*; S.E. of Garaina, *Hartley 12873*; Wagau, *NGF 21578*; Southern Highlands Distr., Mubi River, *Pullen 2795*.

NOTE. *Quercus imperialis* Von Seemen (1901) might belong here. This species was described based on a single cupule which was lost during the World War II. Since it cannot be recognized with certainty from the existing description, the later specific name (*schlechteri*) is accepted.

LITHOCARPUS SCORTECHINH (King ex Hook.f.) A. Camus

Lithocarpus seortechinii (King ex Hook.f.) A. Camus in Riviera Scient. 18: 42. 1932. — *Quercus seortechinii* King ex Hook.f., Fl. Brit. Ind. 5: 608. 1888. — *Pasania seortechinii* (King ex Hook.f.) Schottky in Bot. Jahrb. 47: 676. 1912. — *Synaedryx seortechinii* (King ex Hook.f.) Koidzumi in Bot. Mag. Tokyo 30: 198. 1916. — Type: *King's Coll. 2188*, Malaya, Perak, Larut, fr. VIII-1881 (A!, K! holo).

Pasania touranensis Hick. & A. Camus in Bull. Mus. Hist. Nat. Paris 34: 365. 1928. — *Lithocarpus touranensis* (Hick. & A. Camus) A. Camus in Riviera Scient. 18: 42. 1932. — Type: *Poilane 7095*, Indo-China, Annam, Ba Na, yfr. 12-VII-1923 (P! holo).

Lithocarpus campylolepis A. Camus in Bull. Mus. Hist. Nat. Paris II, 14: 357. 1942. — Type: *Poilane 18023*, Indo-China, Annam, Nan-Giang, fr. 19-VIII-1930 (P! holo).

Lithocarpus smithinandiana A. Camus in Not. Syst. 14: 257. 1952. — Type: *Smithinand 822*, Pen. Siam, Khao Luang, Nakorn Sritamarat, fr. (K!, P! holo).

INDO-CHINA. Annam: *Poilane 7093, 18023, 24089*.

SIAM. N. of Rachasani, *Phengkhlai 423, 526*; Pen. Siam, Khao Luang, *Smithinand 822*; Pattani, Kao Kala Kiri, *Kerr. 7777, 14983*.

MALAY PENINSULA. Kelantan: Gn. Setong, *KEP 37687*. Perak: Larut, *King's Coll. 2188*. Pahang: Cameron Highlands, *SFN 32824*; Fraser's Hills, *Corner s.n., Poore 1268*; Gn. Tapis, *KEP/FRI 10917*.

LITHOCARPUS SERICOBALANUS E.F. Warb.)

Lithocarpus sericobalanus E.F. Warb. in Kew Bull.: 20. 1936. — Type: *Richards' 1241*, Borneo, Sarawak, Mt. Dulit, Ulu Tinjar, near Long Kapa, <? fl., yfr. 13-VIII-1932 (A!, K! holo, L!).

BORNEO. S a r a w a k : Lundu Distr., Gn. Gading, *SAR 12603, 13578*; Gn. Lundu, *SAR 15407*; Serian Distr., Gn. Gaharu, *SAR 15536*; Carapa Pila Ulu Pila, Rejang, *SAR 19637*; Mt. Dulit, Ulu Tinjar, near Long Kapa, *Richards 1241*. S a b a h : Beaufort Distr., *SAN 25869, 36832*; Sipitang Distr., Ulu Moyah, *SAN 16672*; Tawau, *SAN 24473, 29450, 30094, 47731*. K a l i m a n t a n : Mt. Liang Gagang, *HalUer 2886*; C. Kutei, Belajan River, *Kostermans M. 29*; W. of Samarinda, Loa Djanan, *Kostermans 6734*; Tandjung Banko, near Mahakam Estuary, *Kostermans 7125*. N u n u k a n I s l . : *Kostermans 8730, Meyer 2442*.

LITHOCARPUS SOGERENSIS (S. Moore) Markg. ex A. Camus

Lithocarpus sogerensis (S. Moore) Markg. ex A. Camus, *Chenes 3: 795, t. 415: 12-14*. 1954. — *Pasania sogerensis* S. Moore in J. Bot. 61, Suppl. 54. 1923. — Type: *Forbes 300*, E. New Guinea, Sogeri Area, 9° 29' 45" S, 147° 31' 37" E, alt. ±, 960 m, fr. 28-X-1885 (BM! holo, K! L!).

NEW GUINEA. S o g e r i A r e a : *Forbes 300*. W. H i g h l a n d s D i s t r . : Kassam, *Brass 32272*. M o r o b e D i s t r . : Zenag, 6° 55' S, 146° 35' E, *Hartley 9998*; Bulolo, 7° 12' S, 146° 39' E, *NGF 17112*.

LITHOCARPUS SOLERIANUS (Vid.) Rehd.

Lithocarpus soleriana (Vid.) Rehd. in J. Arn. Arb. 1: 131. 1919. — *Quercus soleriana* Vid., Rev. PL Vase. Filip.: 261. 1886. — *Synaedrys soleriana* (Vid.) Koidzumi in Bot. Mag. Tokyo 30: 193. 1916. — Type: *Vidal 612*, Philippines, Luzon, Bataan Prov., Mt. Abucay, <?, ? fl., fr. 5-V-1880 (A!, K!, L! holo).

Quercus bicolorata Elmer in Leaflet. Philip. Bot. 1985. 1913. — *Lithocarpus bicolorata* (Elmer) A. Camus in Riviera Scient. 18: 39. 1932. — Type: *Elmer 13810*, Philippines, Mindanao, Agusan Prov., Cabadbaran, yfr. IX-1912 (A!, BM!, K!, L! holo, UC!, US!).

PHILIPPINES. L u z o n : Ilocos Norte Prov., *Vidal 612d*; Abra Prov., Mt. Mabaniit, *FB 30414, Vidal 1810*; Ilocos Sur Prov., *FB 25487*; Neuva Vizcaya Prov., *FB 28503, 29297*; Neuva Ecija, Mt. Caraballo, *Vidal 614*; Benquet Prov., *Elmer 6443, Loher 4864*; Zambales Prov., Santa Cruz, *Vidal 612b*; Bataan Prov., Mt. Mariveles, *Elmer 6898, FB 685, 822, Whitford 295, 1180*; Mt. Abucay, *Vidal 612*; Rizal Prov., Bosoboso, *BS 4659, FB 1148, Loher 4858*; Tanay, *Merrill 2296*; near Antipolo., *BS 29541, Merrill Sjy. Blanc. 538, Merrill 1709, Vidal 1807*; Montalban, *Vidal 612c*; San Mateo, *Vidal 623*; Laguna Prov., Mt. Maquiling, *Elmer 17839, PNH 40624*; Batangaa Prov., *Curran 7664*; Tayabas Prov., *FB 1824, 1825*; Quezon Prov., *PNH 40617, 40619, 81922*. M i n d o r o : *FB 8749*. M i n d a n a o : Davo Distr., Mt. Apo, *Elmer 11248, Williams 2608, 3035*; Agusan Prov., Cabadbaran, *Elmer 13810, 13868, FB 24487, PNH 42168*; Surigao Prov., *FB 23031*.

LITHOCARPUS SUBMONTICOLUS (Elmer) Rehd.

Lithocarpus submonticola (Elmer) Rehd. in J. Arn. Arb. 1: 131. 1919. — *Quercus submonticola* Elmer in Leaflet. Philip. Bot. 3: 943. 1910. — Type: *Elmer 11428*, Philippines, Mindanao, Davao Distr., Mt. Apo, <?, ? fl., fr. IX-1909 (A!, BM!, K!, L! holo, US!).

PHILIPPINES. Luzon: Abra Prov., *Vidal 1812*; Bontoc Subprov., *Vanoverbergh 1065*; Ifugao Subprov., *PNH 80589*; Benquet Prov., *Loher 5868*; near Baguio, *Williams IS63, 136A*; Pampanga Prov., Mt. Pinatubo, *Elmer 22069*; Rizal Prov., *FB 23958, Loher 12377*. Mindanao: Davao Distr., Todaya, Mt. Apo, *Elmer 1U28, 11894*; Agusan Prov., Cabadbaran, Mt. Urdaneta, *Elmer 14164*.

NOTE. Record of *Q. monticola* King, non Petz. & Kirchn., from Mindanao (Elmer 1910) belong to this species.

Lithocarpus suffruticosus (Ridley) Soepadmo, *stat. nov.* — Fig. 13

Pasania rassa var. *suffruticosa* Ridley, Fl. Mai. Pen. 3: 382. 1924 (basonym). — *Lithocarpus rassa* var. *suffruticosa* (Ridley) A. Camus, *Chenes* 3: 741. 1954. — Type: *Ridley 12061*, Malaya, Selangor, top of Gn. Semangkok, <? fl., yfr. IV-1894 (K! holo, SING!).

SUMATRA. Atjeh Res.: Gajo & Alas lands, Mt. Kemiri, *Van Steenis 9662*; Gn. Talamau, *Bunnemeyer 897*.

MALAY PENINSULA. Perak: *Scortechini 329*; Gn. Mas, *Wray 4095, 4105, 4126*. Selangor: Top of Gn. Semangkok, *Ridley 12061*. Pahang: Cameron Highlands, *KEP 27560, \$6255, Poore 1310, 1323, Rajab 447, SFN 23560, 23652*; Fraser's Hills, *Burkill 2381, KEP 6517, Poore 1379, Purseglove 4241*; Telom, *SFN 31230*; Gn. Mandi Angin, *KEP/FRI 10820*. Trengganu: Gn. Padang, *SFN 31074, 31837*.

NOTE. Separated from *L. rassa* from which it differs by its thick-coriaceous, ovate acuminate-caudate leaves with strongly recurved margin, constricted cupule with thick, entire lamellae, and by its ovoid-conical fruit.

Lithocarpus sultii Soepadmo, *spec. nov.*

Arbor 15—20 m alta 25—80 cm diametro. Ramuli pilis fulvis adpressis stellatis sparse tomentosi mox glabrescentes fumosi lenticellatis paucis minutis muniti, gemma terminalis ovoidea ca 2 mm longa latisque, squamis ovatis. Folia tenuiter chartacea indice (2—) 2.2 (—2.3), (6—) 9—11 (—13) cm longa, (2V—) 4—5 (—6) cm lata, circa medium latissima, faciebus discoloribus, supra glabra opaca fusee fumosa, infra pallide chocolatina pilis adpressis minutis stellatis dense tomentosa, subglabrescentis, basi rotundata-acuta, apice acuta vel vulgo V-j.—1 cm acuminata acumine rotun-



Fig. 13. *Lithocarpus suffruticosus* (Ridley) Soepadmo (after Rajab H?),

data, costa nervisque utrinque tenuibus, nervis lateralibus utrinque (8—) 9—10(—13) obscuris, subparallelis angulo (45° — 60° — 70°) margine versus arcuatis nee anastomosantibus, reticulatione subtili areolata utrinque obscura; petiolo 7—12 mm longo 1—1½ mm crasso glabro supra applanato. Inflorescentia mascula vel androgyna vel mixta, simplex solitariaque vel fasciculata paniculis densis, pilis dnerascentibus adpressis stellatis sparse tomentosa, bracteis bracteolisque ovatis acutis c. $\frac{1}{2}$ mm longis $\frac{1}{2}$ mm latis. Rachis mascula 8—20 cm longa $\frac{1}{2}$ mm crassa, floribus $\frac{1}{2}$ terni, perianthio 6-lobato, staminibus 12 filamentis 2—2½ mm longo anthera 0.25—0.30 mm longa, pistillodio globoso $\frac{1}{2}$ —1 mm diametro. Rachis androgyna vel mixta 10—15 cm longa 2 mm crassa, floribus 5 solitariis perianthio 6-lobato staminodiis 12 abortivis, stylis 3 conoideis 1—½ mm longis plus minusve connatis. Cupula juvenilis subsessilis obconoidea lamellis tenuibus 3—4, pilis glaucis adpressis stellatis dense tomentosa. Cupula matura sessilis discoidea 5—6 mm longa 2—2½ cm diametro, intus pilis fulvis adpressis simplicibus dense tomento; a, extus pilis adpressis stellatis dense tomentosa, marginem tenuem, fructus partem basalem tantum obtegens, lamellis 4—5 spiralibus tenuibus. Fructus maturus ovoideus 2½ cm longus 2—2¼ cm diametro pilis cinerascentibus adpressis simplicibus dense tomentosus, apice rotundatus acutus basi rotundatus cicatrice profunde concava ca 1 cm diametro, pariete lignoso ca 1 mm crasso, cotyledonibus planoconvexis.

TYPUS: PNH (*Sulit & Conklin*) 176U6, Philippines, Mindoro, East slopes of Mt. Yagaw, alt. 600 m, fr. MV-1953 (A!, BM!, L! holo).

PHILIPPINES. Luzon: Cagayan Prov., *Adduru* 247; Bataan Prov., *Borden* 167, *FB* 53, 759, 781, 12925, 12934, 17559, *Whitford* 365, *Williams* 705; Pangasinan Prov., *BS* 29874; Ilocos Norte Prov., *BS* 32958; Laguna Prov., *FB* 13149, 23120, PNH 34081, *Villamil* 27; Isabela Prov., *FB* 17919; Camarines Prov., *FB* 23504. B a ^ i - I a n : Zamboanga Prov., *Santos* 4328. M i n d a n a o : Naga Naga, *FB* 27401.

NOTE. This new species is named after Mr. M.D. Sulit of the Philippines National Herbarium, Manila, who collected the type specimens. Its nearest allies are *L. bennettii* and *L. solerianus*. It differs from *L. bennettii* by its much thinner leaf with areolate reticulation and rounded tip, and by its larger cupule and tomentose fruit. From *L. solerianus*, also from the Philippines, it may be distinguished by its smaller leaf with obscure lateral nerves, areolate reticulation, and by its densely tomentose fruit.

LITHOCARPUS SUNDAICUS (Bl.) Rehd.

Lithocarpus sundaica (Bl.) Rehd. in *J. Arn. Arb.* 1: 131. 1919. — *Quercus sundaica* Bl. in *Verh. Batav. Gen. K. & W.* 9: 216. 1823. — *Pasania sundaica* (Bl.) Oerst. in *Vid. Medd. Naturh. For. Kjobn.* 8: 83. 1867. — *Quercus pseudomolucca* var. *sundaica* (Bl.) Wenzig in *Jahrb. Bot. Gart. Berl.* 4: 227. 1886. — *Synaedrys sundaica* (Bl.) Koidzumi in *Bot. Mag. Tokyo* 30: 198. — Type: *Blume s.n.*, W. Java, Banten Res.,

Sadjira, near Rangkas Bitung, yfr. (CGE!, L! holo).

Quercus pruinosa Bl. in Verh. Batav. Gen. K. & W. 9: 217, t. 5. 1823. — *Pasania pruinosa* (Bl.) Oerst., *I.e.* 83. — *Quercus pseudomolucca* var. *pruinosa* (Bl.) Wenzig in Jahrb. Bot. Gart. Berl. 4: 227. 1886. — *Synaedrys pruinosa* (Bl.) Koidzumi, *I.e.* 197. — *Lithocarpus pruinosa* (Bl.) Rehd., *I.e.* 130. — Type: *Blume s.n.*, Java, <? fl., fr. (CGE!, K!, L! holo).

Castanaea latifolia Bl., Bijdr.: 526. 1826. — Type: *Blume s.n.*, W. Java, Mt. Tjeremai, st. (L! holo).

Quercus muricata Roxb., Fl. Ind. 3: 635. 1832. — *Cyclobalanopsis muricata* (Roxb.) Oerst. in Kong. Danske Vid. Selsk. Skrift. V, 9: 379. 1871. — Type: *Roxburgh (12559)*, Malaya, yfr. (BM! holo).

Quercus mappacea Korth., Kruidk.: 202. 1844. — *Quercus korthalsii* var. *mappacea* (Korth.) BL, Mus. Bot. Lugd. Bat. 1: 293. 1850. — *Quercus hystrix* var. *mappacea* (Korth.) Merr., En. Born.: 213. 1921. — Type: *Korthals s.n.*, Borneo, Pulau Lampei, c? fl., yfr. (A!, L! holo, NY!).

Quercus korthalsii BL, Mus. Bot. Lugd. Bat 1: 292. 1850, non Endl. 1847. — *Pasania korthalsii* (Bl.) Oerst. in Vid. Medd. Naturh. For. Kjobbn. 8: 83. 1867. — *Quercus pseudomolucca* var. *korthalsii* (Bl.) Wenzig, *I.e.* 227. — Type: *Blume s.n.*, Java, Mt. Seribu, fr. (A!, L! holo).

Quercus lamponga Miq., Sumatra: 348. 1861. — *Cyclobalanus lamponga* (Miq.) Oerst. in Vid. Medd. Naturh. For. Kjobbn. 8: 81. 1867. — *Pasania lamponga* (Miq.) Gamble in J. Roy. As. Soc. Beng. 75(2): 423, excl. var. — *Synaedrys lamponga* (Miq.) Koidzumi, *I.e.* 196. — *Lithocarpus lamponga* (Miq.) Rehd., *I.e.* 128. — Type: *Teysmann HB. 4452*, Sumatra, Lampong, fr. (BO!, U! holo).

Quercus grandifrons King ex Hook.f., Fl. Brit. Ind. 5: 610. 1888. — *Pasania grandifrons* ("King ex Hook.f.) Gamble, *I.e.* 421. — *Synaedrys grandifrons* (King¹ ex Hook.f.) Koidzumi, *I.e.* 195. — *Lithocarpus grandifrons*- (King ex Hook.f.) A. Camus in Riviera Scient. 18: 40. 1932. — Type: *King's Coll. 7259*, Malaya, Perak, Larut, fr. 11-1885 (K! holo, L!, US!).

SI AM. Pen. S i a m : Pattani, *Kerr 7678, 7774, Lakshnakara 616*; Songkla, *Kerr 15887*; Krabi, Kao Panom, *Kerr 18829*.

SUMATRA. T a p a n u l i Res.: N.W. of Lake Toba, *Bangham 1167*. P a d a n g Res.: Agam, *bb. 29U, 2942, 2948, 3091, 3093, 5514, 5228*; Mt. Kerintji, 66. 5932; Painan, 66. *SWK/I-16*; L a m p o n g : *Hoet 417, Teysmann HB. 4452, De Wit 15*. P a l e m b a n g Res.: *Dorst 36, T. IP. 41*.

MALAY PENINSULA. K e d a h : Sungap F.R., *KEP 73793*; Gn. Lang, *SFN 35018*. P e r a k : Kledang Saiong F.R., *KEP 33628*; Larut, *King's Coll. 2232, 3272, 3502, 3681, 3766, 3866, 3944*, and many others. S e l a n g o r : mile 12th. Ulu Gombak Road, *KEP 12107*; Kajang, *KEP 22737*; and several others. P a h a n g : Cameron Highlands, *Burkill 724, Poore 1314, 1320*, *R'ajab 490, SFN 23556, 23576*; Fraser's Hills, *Poore 1358*; Kuantan, *KEP/CF 2791, 3714*; Temerloh, *KEP/FD 6327, 10890*; Tembeling, *SFN 21858, 21995*. T r e n g g a n u : mile 18th. Kuala Trengganu-Besut Road, *SFN 40749, 40751*. N e g e r i S e m b i l a n : Sg. Udang, *Alvins 49*; Ulu Petasih, *KEP/CF 619*. M a l a c c a : *Alvins 315*. J o h o r e : Mersing, *Burkill 3220*; Sg. Sedili, *SFN 25958*; Mawai-Jemaluang Road, *SFN 28968, 29457, 29751*. P e n a n g : *Curtis 442, 3042, King's Coll. 1622, 1627, 1692*, and many others.

JAVA. **W e s t J a v a** : Banten Res., Ujungkulon **N.R.**, *Wirawan* 126, 151, 169; Mt. Gede, Tjibodas **N.R.**, *Koorders* 1378, 32211, *Meyer* 1727, *Nurta*, & *Hasan 4-1*; Gn. Kendeng, *Backer* 25880; Gn. Tjiputih, near Puraseda, *Bakhrizen Sr.* 7727; Depok, *Blumee* 5666, 6100, and several others; Gn. Malabar, *Forbes* 940; Gn. Papandajan, *Holstvoogd* 564; Hadjere, near Janlappa, *Ja* 6184, and several others; Pelabuhan Ratu, *Koorders* 14.32; Takoka, *Koorders* 1491, 15337, and several others; Gn. Salak, *Koorders* 24188; Tjidadap, *Winckel* 309; Tjadas Malang, *Winckel* 425; Pengalengan Plateau, *Junghuhn* 241. **C e n t r a l J a v a** : Banjumas Res., Pringombo, *Koorders* 1537, 24099, 33953, 37792, 39018, 39019; Kedu Res., Gn. Dieng, *Koorders* 11231; ISigasinan, *Koorders* 27711. **E a s t J a v a** : Madiun Res., Gn. Lawu, *Elbert* 61, 153; Ngebel, *Koorders* 12452, 12456, and many others; Gn. Ardjuno, *Burger* 6660, *Koorders* 38149; Gn. Kawi, *V. Leeuwen* 12390; Besuki. Res., Gn. Tengger, *Soejatmi* 35, *Koorders* 37377, 37378; Pantjur Idjen, *Koorders* 14389* 32460; Ijuramanis, *Koorders* 21133, 21143, 38331; Tangkil, *Koorders* 23814, 23955.

BORNEO. S a r a w a k : *Beccari* **PB.** 3012; Lundu Distr., **SAR** 9557, 9646; Baram, Ulu Sg. Melinau, **SAR** 4045; Kapit Distr., **SAR** 14701, 19920, 24805; Bintulu Distr., **SAR** 15599. **B r u n e i** : Ulu Belait, **SAR** 1184. **K a l i m a n t a n** : Sangkulirang, *Aet* 665; Balikpapan, *bb.* 13870. **S a b a h** : Keningau, **SAN** 49573; Tawau, **SAN** 17185, 21457, 48475.

PHILIPPINES. L u z o n : Bataan Prov., **FB** 27145. **M i n d a n a o** : Mt. Apo, **BS** 15604, *Elmer* 10624, 11679, 11810, 11949, **PNH** 1433.

LITHOCARPUS TURBINATUS (Stapf) Forman

Lithocarpus turbinata (Stapf) Forman in *Kew Bull.* 18(3) : 423. 1966. — *Castanopsis turbinala* Stapf in *Trans. Linn. Soc. London, Bot.* 4: 232. 1894, — Type: *Haviland* 1102, Mt. Kinabalu, N. Borneo, yfr. (K!).

BORNEO. S a r a w a k : Mt. Mulu, 4th. Div., *Hotta* 14789; Bario, Ulu Baram, alt. c. 1000 m, **SAR** 20209. **S a b a h** : Kota Belud Distr., N. of Lumulumu, **SAN** A. 4472; above Kamaranga, **SAN** 20389, 29053; Tambunan Distr., Trusmi F.R., **SAN** 31786; Mt. Kinabalu, *Holtum s.n.*; eastern shoulder, Mentaki Ridges, **RSNB** 7141 and many others.

NOTE. This species is closely allied to *L. beccarianus* and *L. maingayi*, but differs from both by its rigid, thick-coriaceous leaf. From *L. beccarianus* it differs further by its cupule which is not longitudinally ridged and without terminal umbo, and from *L. maingayi* by its smaller leaf with a fewer lateral nerves. Though in the early stage the female flowers are in cluster of 3—7, at maturity only one or two fruits are fully developed, the others abortive and sometimes may be seen at base of the well developed cupule.

In Mt. Kinabalu this species is very common at about 1800—2100 m altitude.

LITHOCARPUS URCEOLARIS (Jack) Merr.

Lithocarpus urceolaris (Jack) Merr. in J. Arn. Arb. 33: 241. 1952, excl. syn. *Q. eichleri*. — *Quercus urceolaris* Jack in Mai. Misc. 2(7): 86. 1822; in Hook., Comp. Bot. Mag. 1: 256. 1836. — *Pasania urceolaris* (Jack) Oerst. in Vid. Medd. Naturh. For. Kjöbn. 8: 83. 1867. — Neotype: *Grashoff 951*, Sumatra, Palembang, Banjuasin, c? fl., fr. (BO!, L! holo).

Quercus oligoneura Korth., Kruidk.: 203. 1844. — *Pasania oligoneura* (Korth.) Oerst., l.e. 84. — Type: *Korthals s.n.*, Sumatra, yfr. (L! holo).

Pasania craterophora Fischer in Kew Bull.: 319. 1932. — *Lithocarpus "cratephora"* (Fischer) A. Camus in Not. Syst. 5: 75. 1935. — Type: *Riching s.n.*, Malaya, Pahang, Ulu Pahang-, <?, 5 fl. 1931 (A!, CANB!, K! holo, KEP!, L!, SING!).

SUMATRA. A t j e h Res.: Mt. Agosan, 66. 22425. R i a u Res.: Upper Indragiri, Muara Serangege, 66. 30057; Pakanbaru, Tenajan River, *Soepadmo U. 77, 118*. P a l e m b a n g Res.: Banjuasin, *Grushoff 856, 876, 937, 951*. B a n g k a I s l.: Lobok Besar, 66. 34154, *Kostermans & Anta 2, Kostermans & Anta 56, 522, 1023, 102k, 1107*; Sg. Selan, *Biinemeyer 2028*; Pangkalpinang, *Teysmann 7639*.

MALAY PENINSULA. K e l a n t a n: *KEP/FRI 93618*. P a h a n g: Selborne Plantation, *KEP 20549, 23875, 38017*. J o h o r e: Mawai, *SFN 28170, 28737, 28738, 32279*; Sg. Kayu, *SFN 32343*.

BORNEO. S a r a w a k: Lundu Distr., Gn. Lundu, *SAR 15U0*; Miri Distr., *Ismail 1216*; Bintulu Distr., Nyabar F.R., *SAR 17401*; Bt. Mersing, *SAR 22455*. B r u n e i: Muara Sg. Lumut, *BRUN 5132*; Bt. Bangar, *Hotta 13096*. S a b a h: Beaufort Distr., Lumat Estate, *SAN 50078*; Jesselton, Pulau Gaya, *SAN 21330*; Gn. Templer F.R., *SAN 40337*; Ranau Distr., mile 37th. Ranau-Tamparuli Road, *SAN 26778*; Kinabatangan Distr., Bk. Garam, *SAN A. 4727*; Sandakan Distr., Sepilok F.R., *SAN 15362, 15419, 34278, 47284, SAN A. 1970, 4214*; Mostyn, *SAN 53149*; Semporna, *SAN 46322*; Tawau, Kalabakan F.R., *SAN 18733, 30019, 30421*, and several others. K a l i m a n t a n: Kuala Kapuas, 66. 2167; Ulu Kapuas, 66. 35086; W. Kutei, 66. 26065, *Endert 1808*; E. Kutei, Sangkulirang, *Kostermans 4880*; Menubar Region, *Kostermans 5110*; Balikpapan Area, Sg. Wain, *Kostermans 4034, 4391*; Gn. Beratus, *Kostermans 7355*; Sg. Mentawir, *Kostermans 10016*; Tikung, *Amdjah 868*; Pembilingan, *Amdjah 896, 899*; Semenggaris, *Amdjah 986*; Muara Teweh, 66. 23467; Martapura, *Labohn 1135*; Bandjarmasin, *Motley 464, 1168*.

LITHOCARPUS VIDALII (Fern.-Vill.) Rehd.

Lithocarpus vidalii (Fern.-Vill.) Rehd. in J. Arn. Arb. 10: 134. 1929. — *Quercus vidalii* Fern.-Vill., Nov. App.: 209. 1880. — Type: *Vidal 617b*, Philippines, Luzon, Neuva Ecija Prov., Mt. Caraballo, <?, ? fl. (A!, K! holo, L!).

PHILIPPINES. L u z o n: Ifugau Subprov., Mt. Polis, *BS 19647*; Baguio, *FB 27953*; Neuva Ecija Prov., Mt. Caraballo, *Vidal 617b, 3898*; Bataan Prov., Mt. Mariveles, *FB 1353, Whitford 1186*; Rizal Prov., *Loher 13018*; Laguna Prov., Mt. Banajao, *FB 7912, 30941, 30945, 30946*; Tayabas Prov., Mt. Dingalan, *BS 26626, Elmer 7903*. M i n d a n a o: Agusan Prov., Mt. Urdanelita, *Elmer 14096*. P a l a w a n I s l.: *FB 3863*.

NOTE. Its closest ally is *L. jordanae* to which Merrill (1908) reduced the species, but differs by its larger and narrower leaves and by its cupule with the scales being adpressed and set on rather prominent belts in 5—8 concentric lines.

***Lithocarpus vinkii* Soepadmo, spec. nov.**

Arbor 15—30 m alta 15—50 cm diametro anteridibus interdum presentibus ad 2V2 m altis latisque 10 cm crassis, cortice cinereo-brunnei laevi ad improfunde fissurata. Ramuli ad initio tomento denso pilis fulvis adpressis stellatis mox glabrescentes, cinereo-brunneis subtiliter fissurati minute lenticellosi, gemma terminal! ovoidea ca 3 mm longa 2 mm lata squamis ovatis. Stipulae ovatae 1—2 mm longae 1 mm latae. Folia coriacea indice (1.7—)2—2.5 (—3.5), (7—)8—14 (—18) cm longa (3—)4—5 (—7) cm lata medio vel raro infra latissima faciebus plus minusve discoloribus supra glabra nitida opacare pallide ad obscure cinereo-brunnea infra flavo-brunnea ad glauca tomentosa pilis adpressis stellatis minutis, basi acuta raro rotundata apice abrupte acuta ad $\frac{y}{\%}$ —1 cm acuminata apiculo obtuso acutore interdum obliquo, costa nervisque tenuibus utrinque applanatis ad supra impressis, nervis utrinque (8—)10—12 subparallelis angulo 45—50° marginem versus areuatis sed non anastomosantibus, reticulaciona tenui irregulare utrinque obscura; petiolo 7—10 mm longo $\frac{V}{2}$ —2 mm crasso supra applanato. Inflorescentia maseula vel androgyna vulgo simplex axillarisque, dense tomentosa pilis brevibus fulvis stellatis, bracteis bracteolisque angustis ovatis $\frac{\%}{\%}$ —1 mm longis $\frac{V}{2}$ — $\frac{\%}{\%}$ mm latis. Rachis maseula 10—20 cm longa IV2 mm crassa, floribus \$ ternis perianthio 6-lobato staminibus 12 filamento ca 2 mm longo anthera 0.25 mm longa pistillodia subgloboso $\frac{\%}{\%}$ —1 mm diametro. Rachis androgyna 10—15 cm longa $\frac{1\%}{\%}$ —2 mm crassa, floribus 2 solitariis vel raro bini perianthio 6-lobato staminodiis 12 fere bene evoluta sed perianthium non superantibus stylis 3 (—4) conoideis ca 1 mm longis recurvatis. Cupula matura solitaria vel raro binata, subsessilis discoidea V3—V2^{cm} longa IV->—2 cm diametro intus tomento denso pilis adpressis stellatis fulvis ad glaucis margine tenui involuta fructus partem basalem obtegens, lamellis 4—6 tenuibus denticulatis. Fructus maturus conoideus glaber pallide chocolatinus $\frac{1\frac{3}{4}}{i}$ — $\frac{2\frac{1}{2}}{y_2}$ cm longus $\frac{1\frac{1}{2}}{2}$ cm diametro apice acutus basi truncato rotundatore cicatrice concava $\frac{\%}{\%}$ —1 cm diametro, pariete lignoso ca 1 mm crasso, cotyledones plano-convexae.

TYPUS: *BW (Vink) 15237*, New Guinea, Ajamaru, Vogelkop Peninsula, in primary forests on limestone with a thin clay cover, alt. 240 m, fr 7-III-1962 (L! holo, SING!).

NEW GUINEA. West New Guinea: Jappen, *Aet & Idjan 673*; Digul, 66. *U526*; Hollandia, *BW 1187*; Cycloop Mts., *BW 1196, 2655*; Vogelkop, Penjnsula, Aitinju, *BW 7b36*, near Andai, *BW 11791*; Warmare Valley, *BW 13980*; Wissel Lake Area, *Eyma 4871, 5bb8*; Angigita Lake Area, *Kostermans 23bl*; Sorong Disitr., *Pleyte 732, Van Roy en 3077, 4003*; Aifat River, *Van Roy en & Sleumer 7121*, Kebar

Valley, *Van Royen & Sleumer 7305*. East New Guinea: Palmer River, Brass 70i2, Modewa Bay, Brass 28875, Sepik Area, *Ledermann 9417, 10251*, Milne Bay Areas, *NGF 1358*, Wau Morobe Distr., *NGF 2534*; Normanby Isl., *By-ass 25770*, *NGF 8689*; Misima Isl., Brass 27451; Sudest Isl., Brass 28194; Rossel Isl., Brass 28367.

NOTE. This new species is named after Mr. W. Vink, (of Leiden), who collected the type specimen. During his brief stay in W. New Guinea, he collected many specimens of Fagaceae from the area. *Lithocarpus vinkii* is closely related to *L. rassa*, but differs from the latter by its obconical cupule with fewer lamellae, the fruit which is longer than broad, shorter petiole and by its broader but thinner leaves.

LITHOCARPUS WALUCHIANUS (Lindl. ex Hance) Rehd.

Lithocarpus wallichiana (Lindl. ex Hance) Rehd. in J. Arn. Arb. 1: 132. 1919. — *Quercus wallichiana* Lindl. ex Hance in J. Bot. 8: 4. 1870. — *Pasania wallichiana* (Lindl. ex Hance) Gamble in J. Roy. As. Soc. Beng. 75(2): 425. 1915. — *Synaedrys wallichiana* ("Lindl. in Wall.") Koidzumi in Bot. Mag. Tokyo 30: 199. 1916. — Type: *Wallich Cat. 2778*, Penang, Penang Hill (BM!, CGE!, K! holo).

Quercus hystrix var. *longispica* Gamble, l.e. 429. — Type: *Scortechini s.n.*, Malaya, Perak, yfr. (K! holo).

SIAM. Pen. S i a m : Songkla, *Kerr 15875*.

SUMATRA. A t j e h Res.: Perupuh, 66. 9694; Gn. Rangutl Galang, 66. 22398. T a p a n u l i Res.: Pausurmatolu, 66. 5678. P a d a n g Res.: Agam, 66. 20314. R i a u Res.: Tandjung Pauh, near Pakanbaru, *Meyer 4609*; near Bangkinang, 66. 23392. S i n g k e p Isl.: 66. 2041.

MALAY PENINSULA. K e d a h : Kedah Peak, *Burkill 3346, KEP 94419*. P e r a k : Lumut F.R., *KEP 76727*; Larut, *King's Coll. 2279, 5195*; Ulu Bubong, *King's Coll. 10832*; Taiping Hills, *SFN 13178, 13224*. S e l a n g o r : mile 15th. Kuala Lumpur-Ginting Simpah Road, *KEP 99078*; Gombak F.R., *Poore 1277, 2850*. P a h a n g : Cameron Highlands, *SFN 32828*; Fraser's Hills, *Burkill 4213, KEP/FRI 0240, SAN 48253*. K e l a n t a n : Ulu Kelantan, *KEP 98815*; Sg. Kelantan F.R., *KEP 98817*. T r e n g g a n u : Jambu Bongkok F.R., *Kassim 3877*; Ulu Sg. Loh, *KEPIFRI 10858*. N e g e r i S e m b i l a n : Semawang F.R., *KEP/CF 524, SFN 9946*; Kuala Pedar, *Ridley 10071*. M a l a c c a : Sg. Udang, *Goodenough 1362*. J o h o r e : Endau, *Kadim & Noor 348*; Bk. Paloh Estate, *Shah 402*. S i n g a p o r e : *Main gay 1460/2, Ridley 4683, 5114, Wallich 2779B*. P u l a u U b i n : *Ridley 7479*. P e n a n g : *Burkill 817, Curtis 120], 253, 364, 365, S/Br, Haniff 163, KEP 99672, King's Coll. 1515, 1573, 1795, 4853, 5199, SFN S1304*. T i o m a n I s l . : Bk. Kerung, *KEP 7722*.

BORNEO. K a l i m a n t a n : Melawai, 66. 26031.

LITHOCARPUS WOODII (Hance) A. Camus

Lithocarpus woodii (Hance) A. Camus in Riviera Scient. 18: 42. 1932. — *Quercus woodii* Hance in J. Bot. 12: 240. 1874. — *Synaedrys woodii* (Hance) Koidzumi

in Bot. Mag. Tokyo 30: 193. 1916. — Type: *Wood s.n.* (*Herb. Hance 17797*), Philippines, Luzon, fr. (BM!).

Lithocarpus loheri A. Camus, *Chênes Alt.* 3: 111. 1949. — Type: *Loher i860*, Philippines, Luzon, Benquet Prov., yfr. (K!, US! holo).

PHILIPPINES. L u z o n : Benquet Prov., *BS 5576, 82512, Clemens 5071, 5847, 51899, 51901, Elmer 5900, 8733, FB 21288, 31370, Loher i860, 4.886, Williams 949, 980*; Mountains Prov., Mt. Santo Thomas, *PNH 2199, Mearns 81*; Mt. Nangaoto, *PNH 7715, 7721*; Bontoc, *PNH 81926*; Tayabas Prov., Infanta, *BS 9431*. S a m a r : *Ramos 1643*. M i n d a n a o : Davao Prov., Mt. Apo, *Copeland 1145, Elmer 10511, 11831, 11460, 11789, 11856, PNH 1554*; Bukidnon Prov., *BS 385S7*; Mt. Katanglad, *PNH 9989, 10084, 10111*.

LITHOCARPUS WRAYI (King) A. Camus

Lithocarpus wrayi (King) A. Camus in Bot. Syst. 18: 42. 1932. — *Quercus wrayi* King in Ann. Roy. Bot. Gard. Calc. 2: 77, t. 104. 1889. — *Pasania wrayi* (King) Gamble in J. Roy. As. Soc. Beng. 75(2): 446. 1915. — *Synaedrys wrayi* (King) Koidzumi in Bot. Mag. Tokyo 30: 187. 1916. — Type: *Wray Jr. 2854*, Malaya, Perak, Larut yfr. VIII-1888 (A!, BM!, K! holo, SING!).

Quercus lappacea (non Roxb.) Hook.f., Fl. Brit. Ind. 5: 607, 1999, p.p. *quoad specim. ex Perak*. — *Pasania lappacea* (non Oerst.) Gamble, l.e. 416., p.p. *quoad specim., ex Perak*. — *Lithocarpus lappacea* var. *perakensis* A. Camus in Bull. (3oc. Bot. Fr. 92: 254. 1945.

Quercus hystrix (non Korth.) Merr. in Contr. Arn. Arb. 8: 43. 1934, p.p. *quoad specim. Bangham 1097*.

SIAM. P e n . S i a m : Trang Nhao Chang, *BKF 2131*.

SUMATRA. E a s t C o a s t : Kaban Djahe, *Bangham 1097*.

MALAY PENINSULA. K e d a h : Kota Star, *KEP 17590*; Changlon, *KEP 17519*. P e r a k : Larut, *King's Coll. 3919*; Kuala Kangsar, *SFN 14948*, and few others; Gn. Bubu, *KEP/FRI 10967*. P a h a n g : Cameron Highlands, Sg. Paransr, *KEP 36154*; between Brinchang and Tringkap, *Poore 1312*; Fraser's Hills, *KEPI FBI 2154*; Gn. Benom, *KEP 99126, KEP/FRI 3159*; and several others. T r e n g g a n u : Bk. Bank F.R., *KEPi 68598*. K e l a n t a n : Sg. Nenggiri, *KEP/FRI 4096*; Ulu Sg. Arirg-, *KEP/FRI 7184*. J o h o r e : Gn. Panti, *KEP/FRI 7826*. P e n a n g : Penara, *Curtis s.n.*

NOTE. Its nearest ally is *L. cooperatus* from which it differs by its leaves with more lateral nerves, simple pubescence, and by its depressed subglobose cupule with spine-like appendages.

DOUBTFUL SPECIES

1. *Lithocarpus angustifolia* Miq., Fl. Ind. Bat. 1(1): 865. 1858. — Type: *Teysmann s.n.*, Sumatra (*n.v.*).

NOTE. This species was apparently described by Miquel based on a sterile specimen. King (1889) who examined the specimen, suggested that it might belong to Lauraceae.

2. *Lithocarpus argyrocarpa* A. Camus in Bull. Soc. Bot. Fr. 94: 4. 1947. — Type: *KEP 21712*, Malay Peninsula, on the border between Kedah and Thailand yfr., 25-III-Z930 (K! holo, KEP!).

NOTE. This species was described by A Camus based on a single collection (*KEP 21712*) from the border area between Thailand and Kedah (Malay Peninsula). In this specimen, except for the smaller size, the leaves, cupules and fruits are very similar to those of *L. sootepensis* from Doi Angka and Doi Sootep in Thailand. From the limited number of specimens of these two species which I have seen it is impossible to draw a definite conclusion. In this paper, therefore, *L. argyrocarpa* is considered as an incompletely known species of a doubtful status.

3. *Lithocarpus debaryana* (Warb.) Markg. in Bot. Jahrb. 59: 69. 1924. — *Quercus debaryana* Warb. in Bot. Jahrb. 13: 286. 1891. — Type: *Warburg 20584*, N.E. New Guinea, Sattelberg, detached fruit and leaves (*n.v.*).

NEW GUINEA. N. E. p a r t s : Morobe Distr., between Ewot-Wonimbu, alt. 1350 m, *Clemens 11360*, fr. 23-IV-1940 (A!, MICH! UC!).

NOTE. In the original description, Warburg did not mention any particular specimen on which he based his new species. Later Markgraf, who apparently had seen the type, cited *Warburg 20584*, and stated that the specimen consists only of loose fruit and leaves; he also mentioned *Hellwig 515* as an additional specimen. Of these two specimens I have seen none in any of the Herbaria consulted.

Warburg described the leaf as 18 by 9 cm, the cupule as covering the greater part of the fruit and the fruit with conical base. In *Clemens 11360* the fruit and cupule agree very well with Warburg's description, but the leaves, which unfortunately were collected from a basal shoot of a young tree, are much smaller, the largest being 12 by 4% cm.

4. *Lithocarpus dolichocarpa*, (V. Seemen) Rehd. in J. Arn. Arb. 1: 125. 1919. — *Quercus dolichocarpa* V. Seemen in Bot. Jahrb. 27, Beibl. 64: 14. 1900. — *Synaedrys dolichocarpa* (V. Seemen) Koidzumi in Bot. Mag. Tokyo 30: 191. 1916. — Lectotype: *Koorders 21094*, Java, Besuki Res., Idjen Fr. 13-XI-1895 (BO!, L! holo).

NOTE. From the few specimens I have seen (Koorders' collection from Java) it is difficult to make a definite conclusion whether this species is sufficiently different from *L. daphnoideus*. Except for the smaller size, the cupule, fruit and leaves are, suggestive of *daphnoideus*.

5. **Lithocarpus menadoensis** (Koord.) Soepadmo, *comb. nov.* — *Quercus menadoensis* Koord. in Koord.-Schum., Syst. Verz. 3: 28. 1914, *nomen.* — Type: Koorders 16632, Celebes, Minahassa (L!).

NOTE. The type mentioned above and several other collections from Malili area and Buton Isl. are, except for the glabrous branches and leaves, suggestive of *L. caudatifolius* from Borneo* and Philippines. More flowering and fruiting specimens are, however, required before any conclusion can be drawn.

6. **Lithocarpus mohiccus** (Rumph. ex L.) Soepadmo, *comb. nov.* — *Quercus molucca* Rumph. ex L., Sp. Pl.: 1199. 1753. — *Balanaulax molucca* (Rumph. ex L.) Raf. ex Jack in Kew Bull.: 265. 1893. — *Balanaulax rumphi* Raf. ex Jack, *l.e.* — *Pasania molucca* (Rumph. ex L.) Oerst. in Kong. Danske Vid. Selsk. Skrift. V, 9: 373. 1871.

NOTE. This species may be conspecific with *L. glutinosus* from the Philippines and Celebes, but as the original specimen was lost and the original description and figure are not recognizable, it is treated as a doubtful species.

7. *Lithocarpus "nymanniana"* (Markg.) Rehd. in J. Arn. Arb. 10: 133. 1929. — *Pasania nymanniana* Markg. in Bot. Jahrb. 59: 77. 1924. — Type: Nyman 692, E. New Guinea (Lost!).

NOTE. The type of this species was lost during World War II, and from the original description it is difficult to recognize the identity of the species.

8. *Lithocarpus oogyne* (Miq.) A. Camus in Bull. Soc. Bot. Fr. 92: 255. 1945. — *Quercus oogyne* Miq., Sumatra: 351. 1861. — *Cyclobalanus oogyne* (Miq.) Oerst. in Vid. Medd. Naturh. For. Kjøbn. 8: 81. 1867. — Type: Diepenhorst HB 1315, Sumatra, Priaman, yfr. (U! holo).

NOTE. This species is suggestive of *L. sundaicus*, but since the type is incomplete it is treated as doubtful.

9. *Lithocarpus plumbea* (Bl.) Soepadmo, *comb. nov.* — *Quercus plumbed* BL, Mus. Bot. Lugd. Bat. 1: 293. 1850. — *Pasania plumbea* (Bl.) Oerst. in Vid. Medd. Naturh. For. Kjöbn. 8: 84. 1867. — Type: *Herb. Blume s.n.*, Sumatra, s f., yfr. (L! holo).

NOTE. Except for the smaller size, the leaves and the young cupules are suggestive of *L. sundaicus*.

10. *Lithocarpus scyphigera* (Hance) A. Camus in Riviera Scient. 18: 42. 1932. — *Quercus scyphigera* Hance in J. Bot. 16: 199. 1878, *excl. var.* — *Synaedrys scyphigera* (Hance) Koidzumi in Bot. Mag. Tokyo 30: 198. 1916. — Type: *Teysmann HB IU03*, Bangka (BM!).

NOTE. The leaves of the type are rather similar to those of *L. sundaicus*, but, except for its smaller size, the cupule is suggestive of *L. vrceolaris*. As the cupule is detached from the branch a possibility of mixed specimen should not be ruled out. The species is here regarded as doubtful.

EXCLUDED SPECIES

Quercus littoralis BL, Mus. Bot. Lugd. Bat. 1: 303. 1850. — *Pasania littoralis* (Bl.) Oerst. in Kong. Danske Vid. Selsk. Skrift. V, 9: 379. 1871. — Type: *Blume s.n.*, W. Java (L! holo).

The type now preserved at Leiden has been identified by Dr. Kostermans as *Atuna scabra* (Hassk.) Kosterm. (Rosaceae).

APPENDIX:

INDEX TO FAGACEAE ON RECORD FROM MALESIA

Nothofagus excluded

(Compiled by M. JACOBS, Rijksherbarium, Leiden, 30-XII-1967)

C. standing for *Castanopsis*, L. for *Lithocarpus*, Q. for *Quercus*. Authors have been correctly cited; original (mis)spellings have been retained; for accepted names in *Lithocarpus* the masculine gender has been **adopted**. **Misinterpretations of names have** not been accounted for.

- Arcuala spicata* (Sni.) Raf. = *L. elegans*
Balanaulax molucca (L.) Raf. ex Jacks. = *L. moluccus*
rumphii Raf. ex Jack. = *L. moluccus*
Callaeocarpus rhamnifolia (Miq.) Miq. = *C. rhamnifolia*
sumatrana Miq. = *C. inermis*
Castanea acuminatissima Bl. = *C. acuminatissima*
argentea Bl. = *C. argentea*
 var. *rigida* Bl. = *C. argentea*
brevicuspis Miq. = *C. costata*
buruana (Miq.) Oerst. = *C. buruana*
cooperta (Blanco) Oerst. = *L. coopertus*
costata Bl. = *C. castata*
furfurella Miq. = *L. sundaicus*
glomericiita Bl. = *C. inermis*
inermis Lindl. ex Wall. = *C. inermis*
javanica, Bl. = *C. Javanica*
 var. *fuscescens* Bl. = *C. javanica*
 var. *montana* (Bl.) Bl. = *C. javanica*
icLitifoliai Bl. = *L. sundaicus*
montana Bl. = *C. javanica*
rhamnifolia (Miq.) Oerst. = *C. rhamnifolia*
sessilifolm Bl. = *C. acuminatissima*
spectabilis Miq. = *C. costata*
sumatrana (Miq.) Oerst. = *C. inermis*
tungurrut Bl. = *C. tungurrut*
 f. *sumatrana* Miq. = *C. tungurrut*
Castanopsis acuminatissima (Bl.) A.DC.
andersotki Gamble = *C. schefferiana*
argentea (Bl.) A.DC.
blumeana (Korth.) Rehd. = *L. blumeanus*
borneensis King
brevicuspis (Miq.) A.DC. = *C. costata*
brevispina Schottky, non **Hayata** = *C. psilophylla*
buruana Miq.

Cestanopsis

f. *grandifolia* Miq. = *C. buruana*

catappaefolia King ex Hook.f.

clemensii Soepadmo

conspersispina Merr. = *C. tungurrut*

costata (Bl.) Miq.

f. *bancana* Scheff. = *C. costata*

curtisii King

densinervia Soepadmo

discocarpa (Hance) Hance = *C. javanica*

dispersispina Merr. = *C. hypophoenicea*

elmeri Merr. = *C. evansii*

enclisocarpa (Korth.) Rehd. = *L. enclisacarpus*

endertii Hatus. ex Soepadmo

evansii Elmer

foxworthyi Schottky

fulva Gamble

glabra Merr. = *C. philipensis*

hulletii King ex Hook.f. = *C. lucida*

hypophoenicea (V. Seemen) Soepadmo

inermis (Lindl.) Benth. & Hook.f.

javanica (Bl.) A.D.C.

var. *montana* (Bl.) A.D.C. = *C. javanica*

junghuhnii (Miq.) Markg. = *C. acuminatissima*

kinabaluensis A.Cam. = *C. forworthyi*

lentiginosa E.P. Warb. = *C. javanica*

lucida (Nees) Soepadmo

malaccensis Gamble

megacarpa Gamble

microphylla Soepadmo

mitifica Hance = *C. inermis*

mot-tleyaria King — corrected to *motleyana*

nepelioides King ex Hook.f.

oligoneura Soepadmo ' •

oviformis Soepadmo

paehycarpa A. Cam. = *C. rhamnifolia*

paucispina Soepadmo ' •

pearsonii Merr. = *C. motleyana*

pedunculata Soepadmo

penangensis A. Cam. = *C. Javanica*

philipensis (Blanco) Vidal

philippinensis Vidal — corrected to *philipensis*

psilophylla Soepadmo

reflexa (King) Rehd. = *L. coopertus*

rhamnifolia (Miq.) A.D.C.

tfidleyi Gamble = *C. tungurrut*

schefferiana Hance

Castanopsis

- echlenkeræ* Bailey = *C. acuminatissima*
scortechinii Gamble
selangorensis A. Cam. — doubtful
spectabilis (Miq.) A.DC. = *C. costata*
swmatrwna (Miq.) A.DC. = *C. inermis*
trispemm Scheff. = *C. costata*
tungurrut (Bl.) A.DC.
turbinata Stapf = *L. turbinatus*
wallichii King *ex* Hook.f.
woodii Merr. = *C. evansii*
Corylopanasia reflexa (King) Nakai = *L. coopertus* •
Cyclobalanopsis argentata (Korth.) Oerst. = *Q. argentata*
gerne Hiflora (Bl.) Oerst. = *Q. gemelliflora* •
horsfieldii (Miq.) Oerst. = *Q. gemelliflora*
lineata (Bl.) Oerst. = *Q. lineata*
lowii (King) Schottky = *Q. lowii*
merkusii (Endl.) Oerst. = *gemelliflora*
merrillii (V. Seemen) Schottky = *Q. merrillii*
muricata (Roxb.) Oerst. = *L. sundaicus* •
oidocarpa (Korth.) Oerst. = *Q. oidocarpa*
sericea (Schoff.) Schottky = *subsericea*
treubiana (V. Seemen) Schottky = *Q. treubiana*
turbinata (Bl.) Schottky = *Q. gemelliflora*
Cyclobalamis bennettii (Miq.) Oerst. = *L. bennettii*
blancoi (A.DC.) Oerst. = *L. ovalis*
blumeana (Korth.) Oerst. = *L. blumeanus*
celebica (Miq.) Oerst. = *L. celebicus*
conocarpa (Oudem.) Oerst. = *L. conocarpus*
costata (Bl.) Oerst. = *L. javansis*
cyrtopoda (Miq.) Oerst. = *L. hystrix*
daphnoidea (Bl.) Oerst. = *L. daphnoideus*
diepenhorstii (Miq.) Oerst. = *L. gTacilis*
enclleistocarpa (Korth.) Oerst. = *L. enclleacarpus*
ewyckii (Korth.) Oerst. = *L. ewyckii*
gracilis (Korth.) Oerst. = *L. gracilis*
hystrix (Korth.) OeraJ. = *L. hystrix*
induta (Bl.) Oerst. = *L. indutus*
javansis (Bl.) Oerst. = *L. javansis*
lamponga (Miq.) Oerst. = *L. sundaicus*
leptogyne (Korth.) Oerst. = *L. leptogyne*
llanosi (A.DC.) Oerst. = *L. celebicus*
merrillii (V. Seemen) Schottky = *Q. merrillii*
nitida (Bl.) Oerst. = *L. daphnoideus*
omalokos (Korth.) Oerst. = *L. lucidus*
oogyne (Miq.) Oerst. — doubtful
ovalis (Blanco) Oerst. = *L. ovalis*

Cyclobalanus

- philippensis* (A.DC.) Oerst. = *L. philippinensis*
platycarpa (Bl.) Oerst. = *L. platycarpus*
rassa (Miq.) Oerst. = *L. rassa*
reinwardtii (Korth.) Oerst. = *L. reinwardtii*
teysmanii (Bl.) Oerst. = *L. korthalsii*
Fagus argentea Bl. = *C. argentea*
javanica, Bl. = *C. javanica*
philipensis Blanco = *C. philipensis*
sylvatica L. = introduced
Lithocarpus abendanonii (Valeton) A.Cam. = *L. havilandii*
aculeata (Markg.) Rehd. = *L. celebicus*
acuminata (Roxb.) Rehd. — non-Malesian
amherstianus (Wall.) A. Cam.
andersonii Soepadmo
angustifolia Miq. — doubtful
apoensis (Elmer) Rehd.
argentata (Korth.) Merr. = *Q. argentata*
argyrocarpa A.Cam. = ? *sootepensis* (Craib) A.Cam
aspericupula (Markg.) Rehd.
atjehensis Ratus. *ex* Soepadmo
bancanus (Seheff.) Rehd.
beccarianus (Benth.) A.Cam.
benetii (Miq.) Rehd.
bicolorata (Elmer) A.Cam. = *L. solerianus*
blumeanus (Korth.) Rehd.
boholensis (Merr.) Rehd. = *L. coopertus*
borneensis (Merr.) Rehd. = *L. nieuwenhuisii*
brachyclada (V. Seemen) A.Cam. = *L. celebicus*
brassii Soepadmo
buddii (Merr.) A.Cam.
bullatus Hatus. *ex* Soepadmo
bulusanensis (Elmer) A.Cam. =: *L. caudatifolius*
burkillii A.Cam.
cagayanensis (Merr.) A.Cam. = *L. castellarnauianus*
cantleyanus (King *ex* Hook.f.) Rehd.
castellarnauianus (Vidal) A.Cam.
caudatifolius (Merr.) Rehd..
clathratus (V. Seemen) Rehd. = *L. rotundatus*
clementianus (King *ex* Hook.f.) A.Cam.
dementis (Merr.) A.Cam. = *L. nieuwenhuisii*.
confertus Soepadmo
conocarpus (Oudem.) Rehd.
sp. mataccensis A.Cam. = *L. conocarpus*
coopertus (Blanco) Rehd.
copelandii (Elmer) Rehd. = *L. glutinosus*
costatus (Bl.) Rehd. = *L. javensis*

Lithoearpus

- var. *convexa* (Bl.) A.Cam. := *L. javensis*
 var. *kingii* AlCam. = *L. perakensis*
 var. *scutigera* (Oudem.) A.Cam. = *L. javensis*
 var. *typica* A.Cam. = *L. javensis*
crassinervius (Bl.) Rehd.
eratephora (Fischer) A.Cam. = *L. ureeolaris*
crateriformis Merr. ex A.Cam. = *L. nieuwenhuisii*
curranii (Merr.) Rehd. = *L. rotundatus*
curtisii (King ex Hook.f.) A.Cam.
cyathiformis A.Cam. = *L. gracilis*
cyclophorus (Endl.) A.Cam.
cyrtopoda (Miq.) A.Cam. = *L. hystrix*
cyrtorhyncha (Miq.) Rehd. = *L. gracilis*
d'albertisii (F.v.M.) Rehd. = *L. celebicus*
daphnoideus (Bl.) A.Cam.
dasystachyus (Miq.) Rehd.
debaryana (Warb.) Markg. — doubtful
diepenhorstii (Miq.) Barnett = *L. gracilis*
dolichocarpa (V. Seemen) Rehd. — doubtful
echinifer (Merr.) A.Cam.
echinulatus Soepadmo
eichleri (Wenzig) A.Cam.
elegans (Bl.) Hatus ex Soepadmo
encleisacarpus (Korth.) A.Cam.
 var. *aperta* (King ex Hook.f.) A.Cam. = *L. encleisacarpus*
 var. *perakensis* A.Cam. = *L. encleisacarpus*
erythrocarpus (Ridl.) A.Cam.
ewyckii (Korth.) Rehd.
falconeri (Kurz) Rehd.
fenestrata (Roxb.) Rehd. — non-Malesian
ferrugineus Soepadmo
glutinosus (Bl.) Soepadmo
gracilis (Korth.) Soepadmo
grandifrons (King ex Hook.f.) A.Cam. = *L. sundaicus*
hallieri (V. Seemen) A.Cam.
hatusimae Soepadmo
havilandii (Stapf) Barnett
heliciformis (V. Seemen) Rehd. = *L. korthalsii*
hendersonianus A.Cam.
hypophoeniceus (V. Seemen) Barnett = *C. hypophoenicea*
hystrix (Korth.) Rehd.
imperialis (V. Seemen) Markg. = *L. schlechteri*?
indutus (Bl.) Rehd.
 var. *microcarpa* (A.DC.) A.Cam. = *L. indutus*
jacobsii Soepadmo
javensis Bl.

Lithocarpus

- jordanae* (Laguna) Rehd.
kingianus (Gamble) A.Cam.
koordersii (V. Seemen) Markg. = *L. glutinosus*
korthalsii (Endl.) Soepadmo
kostermansii Soepadmo
kunstleri (King *ex* Hook-f) A.Cam.
lampadarius (Gamble) A.Cam,
lamongw (Miq.) Rehd. = *L. sundaicus*
lappacect (Roxb.) Rehd. = *L. wrayi* (Malesian specimens only!)
 var. *perakensis* A.Cam. = *L. wrayi*
lauterbachii (V. Seemen) Markg.
leptogyne (Korth.) Soepadmo
lipaon (Elmer) Rehd. = *L. eelebicus*
llanosii (A.DC.) Rehd. = *L. eelebicus*
lohori A.Cam. = *L. woodii*
longispinus Barnett
lucidus (Roxb.) Rehd.
luteus Soepadmo
luzonensis (Merr.) Rehd.
mabesae (Merr.) A.Cam. = *L. eelebicus*
macphailii (Henders) Barnett
maingayi (Benth.) Rehd.
mariae Soepadmo
megacarpus Soepadmo
meijeri Soepadmo
merrittii (Merr.) Rehd. = *L. castellarnauianus*
microcalyx (Korth.) A.Cam. = *L. elegans*
minahossae (Koord. *ex* Elmer) Rehd. = *L. caudatifolius*
mindanaensis (Elmer) Rehd.
monticola (King) Rehd. = *L. oreophilus*
neorobinsonii (Ridl.) A.Cam.
nieuwenhuisii (V. Seemen) A.Cam.
nitida (Bl.) A.Cam. = *L. dahnoideus*
nodosus Soepadmo
nymaniana (Markg.) Rehd. — doubtful
obKquinervia (Merr.) A.Cam. = *L. castellarnauianus*
obtusifolius Soepadmo
ochracea (Schottky) A.Cam. = *L. nieuwenhuisii*
oligocarpa A.Cam. = *L. philippinensis*
omalokos (Korth.) Rehd. = *L. lucidus*
oogyne (Miq.) A.Cam. — doubtful
orbicularis Soepadmo
oreophilus Soepadmo
ovalis (Blanco) Rehd.
pallidus (Bl.) Rehd.
papillifer Hatus. *ex* Soepadmo

Lithocarpus

- papuanai* (Warb.) Rehd. = *L. celebicus*
pattaniensis Barnett
perakensis Soepadmo
perclusa Markg. = *L. schlechteri*
philippinensis (A.DC.) Rehd.
pinatubensis (Elmer) A.Cam. = *L. castellarnauianus*
platycarpus (Bl.) Rehd.
poculiformis (V. Seemen) A.Cam. = *L. daphnoideus*
porcatus Soepadmo
pruinosa (Bl.) Rehd. = *L. sundaicus*
pseudokunsteri A.Cam.
pseudolampona A.Cam. = *L. ewyckii*
pseudomoluccus (Bl.) Rehd.
pseudoplatycarpus A.Cam. = *L. cyclophorus*
pulcher (King) Markg.
pusillus Soepadmo
pyriformis (V. Seemen) Rehd. = *L. rotundatus*
rajah (Hance) A.Cam. = *L. bancanus*
rangeriana A.Cam. = *L. rassa*
rassa (Miq.) Rehd.
 var. *lamiginosa* (Ridl. ex Gamble) A.Cam. = *L. rassa*
 var. *suffruticosus* (Ridl.) A.Cam. = *L. suffruticosus*
reflexa (King) A.Cam. = *L. eoopertus*
reinwardtii (Korth.) A.Cam.
revolutus Hatus. ex Soepadmo
rhioensis (Hance) A.Cam. = *L. elegans*
ridleyana A.Cam. = *L. rassa*
rigidus Soepadmo
rizalevisis (Merr.) Rehd. =: *L. philippinensis*
robinsonii (Merr.) Rehd. = *L. buddii*
rotundatus (Bl.) A.Cam.
rufa (V. Seemen) A.Cam. = *L. obtusifolius*
rufovillosus (Markg.) Rehd.
ruminatus Soepadmo
sarawakensis E.F. Warb. = *L. daphnoideus*
schlechteri Markg.
scortechinii (King ex Hook.f.) A.Cam.
scutigera Oudem. = *L. javensis*
scyphigera (Hance) A.Cam. — doubtful
 var. *riedelii* (King) A.Cam. = *L. bancanus*
sericobalanos E.F. Warb.
smitinandiana A.Cam. = *L. scortechinii*
sogerensis (S. Moore) Markg. ex A.Cam.
solanicarpa Markg. = *L. lauterbachii*
solerianus (Vidal) Rehd.
spicata (Sm.) Rehd. & Wils. = *L. elegans*

Lithocarpus

- var. *elegans* (Bl.) A.Cam. = *L. elegans*
 var. *glaberrima* (Bl.) A.Cam. = *L. elegans*
 var. *gracilipes* (MIQ.) REHD. = *L. elegans*
 var. *placentaria* (Bl.) Rehd. = *L. elegans*
submonticolus (Elmer) Rehd.
subnucifera, A.Cam. = *L. maingayi*
suffruticosus (Ridl.) Soepadmo
sulitii Soepadmo
sundaicus (Bl.) Rehd.
symingtoniana A.Cam. = *L. rassa*
teysmanii (Bl.) Rehd. = *L. korthalsii*
truncata Rehd. & Wils — non-Malesian
turbinatus (Stapf) Forman
urceolaris (Jack) Merr.
vidalii (F.-Vill.) Rehd.
vinkii Soepadmo
wallichianus (Lindl. ex Hance) Rehd.
wenzelii (Merr.) Rehd. = *L. philippinensis*
wenzigiana (King ex Hook.f.) A.Cam. = *L. rassa*
winkleriana (Schottky) A.Cam. = *L. dasystahyus*
woodii (Hance) A.Cam.
wrayi (King) A.Cam.
zschokkei (Elmer) Rehd. = *L. glutinosus*
Pasania aculeuta Markg. = *L. celebicus*
acuminatissima (Bl.) Oerst. = *C. acuminatissima*
aspericupula Markg. = *L. aspericupula*
bancana (Scheff.) Markg. = *L. bancamis* (as for name)
beccariana (Benth.) Prantl. = *beccarianus*
bennetii (Miq.) Gamble = *L. bennettii*
blumtana (Korth.) Gamble = *L. blumeanus*
cantleyana (King ex Hook.f.) Gamble = *L. contleyanus*
dementis (Merr.) Schottky = *L. nieuwenhuisii*
clementiana (King ex Hook.f.) Gamble = *L. clementianus*
companoana (Vidal) Markg. = *L. celebicus*
confragosa (King ex Hook.f.) Schottky = *L. confragosus*
conocarpa (Oudem.) Gamble = *L. conocarpus*
cosMa (Bl.) Gamble = *L. perakensis*
cratsinervia (Bl.) Oerst. = *L. crassinervius*
eraterophora Fischer = *L. urceolaris*
curvisii (King ex Hook.f.) Gamble = *L. curtisii*
cfidophora (Endl.) Gamble = *L. cyclophorus*
cyttophyneha (Miq.) Gamble = *L. gracilis*
d'albertisii (F.v.M.) Markg. = *L. celebicus*
daphnoidea (Bl.) S. Moore = *L. daphnoideus*
dasystachya (Miq.) Schottky = *L. dasystachyus*
discocarpa (Hance) Gamble = *C. javanica*

Pasania

- eichleri* (Wenzig) Gamble = *L. eichleri*
enclisacarpa (Korth.) Gamble = *L. enclisacarpus*
 var. *aperta* (King; *ex* Hook.f.) Gamble = *L. enclisacarpus*
erythrocarpa Ridl. = *L. erythrocarpus*
ewyckii (Korth.) Gamble = *L. ewyckii*
 var. *latifoKa* (King *ex* Hook.f.) Gamble = *L. ewyckii*
falconeri (Kurz) Gamble = *L. falconeri*
glomerate/, (Roxb.) Oerst. = *L. elegans*
glutinosa (Bl.) Oerst. = *L. glutinosus*
grandifrons (King¹ *ex* Hook.f.) Gamble = *L. sundaicus*
hystrix (Korth.) Gamble = *L. hystrix*
 var. *longispica* Gamble = *L. wallichianus*
induta (Bl.) S. Moore = *L. indutus*
javensis (Bl.) Prantl. = *L. javensis*
kingiana Gamble = *L. kingianus*
korthalsii (Bl.) Oerst. = *L. sundaicus*
kunstleri (King *ex* Hook.f.) Gamble = *L. kunstleri*
lampadai'ia Gamble = *L. lampadarius*
lamponga (Miq.) Gamble = *L. sundaicus*
 var. *ewyckioides* Gamble = *L. ewyckii*
lappacea (Roxb.) Oerst. = *L. wrayi* (Malesian record only!)
lucida (Roxb.) Gamble = *L. lucidus*
macphailii Henders. = *L. macphailii*
maingayi (Benth.) Schottky = *L. maingayi*
molucca- (Rumph.) Oerst. — doubtful species of *Lithocarpus*
neurophylla (Miq.) Oerst. = *L. pseudomoluccus*
nymaiiana Markg. — doubtful species of *Lithocarpus*
ochracea Schottky = *L. nieuwenhuisii*
oligoneura (Korth.) Oerst. = *L. urceolaris*
omalokos (Korth.) Schottky = *L. lucidus*
pallida (Bl.) Oerst. = *L. pallidus*
papuana (Warb.) Markg. = *L. celebicus*
pinanga (Bl.) Oerst. = *Q. argentata*
placentaria (Bl.) Oerst. = *L. elegans*
plumbed (Bl.) Oerst. — doubtful species of *Lithocarpus*
pi-uinosa (Bl.) Oerst. = *L. sundaicus*
pseudomolucca (Bl.) Oerst. = *L. pseudomoluccus*
rajah (Hance) S. Moore = *L. bancanus*
rassa (Miq.) Gamble = *L. rassa*
 var. *lanuginosa* Ridl. *ex* Gamble = *L. rassa*
 var. *suffruticosa* Ridl. = *L. suffruticosus*
reinwardtii (Korth.) Prantl. = *L. reinwardtii*
robinsonii (Ridl.) Gamble = *L. neorobinsonii*
rotundata (Bl.) OersS. = *L. rotundatus*
rufovillosa Markg. = *L. rufovillosus*
scortechinii (King *ex* Hook.f.) Schottky = *L. scortechinii*

Pasania

- sogerensis* S. Moore = *L. sogerensis*
spicata (Sm.) Oerst. = *L. elegans*
 var. *gracilipes* (Miq.) Schottky = *L. elegans*
 var. *microcalyx* (Korth.) Gamble = *L. elegans*
 var. *placentaria* (Bl.) Schottky = *L. elegans*
sundaica (Bl.) Oerst. = *L. sundaicus*
teysmanni (Bl.) Prantl. = *L. korthalsii*
urceolaris (Jack) Oerst. = *L. urceolaris*
wallichiana (Lind. ex Hance) Gamble = *L. wallichianus*
wenzigiana (King ex Hook.f.) Gamble = *L. rassa*
winkleriana Schottky = *L. dasystachyus*
wrayii (King) Gamble = *L. wrayi*
- Quercus abendanonii* Valetton = *L. havilandii*
acuminatissima Merr. = *L. mindanaensis*
acuminatissima (Bl.) A.D.C. = *C. acuminatissima*
anceps Korth. = *L. elegans*
angustata Bl. = *L. pseudomoluccus*
annulata Korth. non Sm. = *L. korthalsii*
apoensis Elmer = *L. apoensis*
 var. *ulayan* Elmer = *L. apoensis*
arcaula Ham. ex Spreng. = *L. elegans*
 var. *microcalyx* (Korth.) Bl. = *L. elegans*
 var. *racemosa* (Jack) Bl. = *L. elegans*
argentata Korth. -
 var. *concolor* Bl. = *Q. argentata*
bancana Scheff. = *L. bancanus*
beccariana Benth. = *L. beccarianus*
bennettii Miq. = *L. bennettii*
bicolorata Elmer = *L. solerianus*
blancoi A.D.C. = *L. ovalis*
blumeana Korth. = *L. blumeanus*
boffoleasIs Metr. ^ !_. coopextua
borneensis Merr. = *L. nieuwenhuisii*
brachyclada V. Seemen = *L. celebicus*
brevipetiolata Scheff. = *L. hystrix*
brevistyla A.Cam. = *Q. oidocarpa*
buddii Merr. = *L. buddii*
bulusanensis Elmer = *L. caudatifolius*
burkillii (A.Cam.) Corner (valid?) = *L. burkillii*
cagayanensis Merr. = *L. castellarnauianus*
cantleyana King ex Hook.f. = *L. cantleyanus*
- celebiea* Miq. = *L. celebicus*
cerris (non L.) Blanco — doubtful
chrysotricha A.Cam.

Quercus

- clathrata* V. Seemen = *L. rotundatus*
clementiana King ex Hook.f. = *L. clementianus*
dementis Merr. = *L. nieuwenhuisii*
companoana Vidal = *L. celebicus*
concentrica (non Lour.) Blanco = *L. solerianus*
confragosa King ex Hook.f. = *L. confragosus*
conocarpa Oudem. = *L. conocarpus*
cooperta Blanco = *L. coopertus*
copelandi Elmer = *L. glutinosus*
cornea Lour. — non-Malesian
costata Bl. = *L. javensis*
 var. *convexa* Bl. = *L. javensis*
 var. *subrecurvata* Bl. = *L. javensis*
crassilamellata (Gamble) A.Cam. = *Q. gemelliflora*
crassinervia Bl. = *L. crassinervius*
craterophora (Fischer) Corner (valid ?) = *L. urceolaris*
curranvi Merr. = *L. rotundatus*
ourtsii King ex Hook.f. = *L. curtsii*
cyclophora Endl. = *L. cyclophorus*
cyrtopoda Miq. = *L. hystrix*
cyrtorhyncha Miq. = *L. gracilis*
dalbertisii F.v.M. = *L. celebicus*
daphnoidea Bl. = *L. daphnoideus*
dasystachya Miq. = *L. dasystachyus*
debaryana Warb. — doubtful species of *Lithocarpus*
depressa Bl. non Humb. & Bonpl. = *L. elegans*
depressa Roxb. non Humb. & Bonpl. = *L. cyclophorus*
depenhorstii Miq. = *L. gracilis*
discocarpa Hance = *C. javanica*
dolichocarpa V. Seemen — doubtful species of *Lithocarpus*
echinifera Merr. = *L. echinifer*
eichleri Wenzig = *L. eichleri*
elegans Bl. = *L. elegans*
elmeri Merr.
enclisaearpa Korth. = *L. enclisacarpus*
 var. *aperta* King ex Hook.f. = *L. enclisacarpus*
 var. *divergens* Bl. = *L. enclisacarpus*
ewyckii Korth. = *L. ewyckii*
 var. *latifolia* King ex Hook.f. = *L. ewyckii*
fagiformis Jungh. = *C. acuminatissima*
falconeri Kurz = *L. falconeri*
fenestrata Roxb. — non-Malesian
fernandezii Vidal = *L. coopertus*
gaharuensis Soepadmo
gemelliflora Bl.
glaberrima Bl. = *L. elegans*

Quercus

- glabra* Blanco, non Thunb. = *L. ovalls*
glomerata Roxb. = *L. elegans*
glutinosa Bl. = *L. glutinosus*
gracilipes Miq. = *L. elegans*
gracilis Korth. = *L. gracilis*
grandifrons King ex Hook.f. = *L. sundaicus*
gulliveri P.v.M. = *L. celebicus*
guppyi F.v.M. — excluded: *Litsea guppyi* (Lauraceae)
hallierii V. Seemen = *L. hallierii*
havilandii Stapf = *L. havilandii*
heliciformis V. Seemen = *L. korthalsii*
hendersoniana A.Cam. = *Q. lineata*
horsfieldii Miq. = *L. gemelliflora*
 var. *longifolia* Miq. = *L. gemelliflora*
hypoleuca Miq. = *L. korthalsii*
hypophoenicea V. Seemen = *C. hypophoenicea*
hystrix Korth. = *L. hystrix*
 var. *longispica* Gamble = *L. wallichianus*
 var. *mappacea* (Korth.) Merr. = *L. sundaicus*
 var. *microcarpa* Wenzig = *L. hystrix*
iavensis (Bl.) Miq. = *L. javensis*
ilicifolia K. & V. — doubtful record
imperialis V. Seemen ex K.Sch. & Laut. = *L. schlechteri*?
induta Bl. =; *L. indutus*
 var. *microcarpa* A.DC. = *L. indutus*
javanica (Bl.) Drake = *C. javanica*
jordanae Laguna = *L. jordanae*
junghuhnii Miq. = *C. acuminatissima*
kerangassensis Soepadmo
kinabaluensis Soepadmo
koordersii V. Seemen = *L. glutinosus*
korthalsii Bl. = *L. sundaicus*
 var. *hystrix* (Korth.) Bl. = *L. hystrix*
 var. *kajan* Bl. = *L. sundaicus*
 var. *mappacea* (Korth.) Bl. = *L. sundaicus*
 var. *paehyphylla* Bl. = *L. sundaicus*
korthalsii Endl. = *L. korthalsii*
kunstleri King ex Hook.f. =; *L. kunstleri*
lamellata Roxb. — misspelling for non-Malesian species
lampadaria (Gamble) Burk. = *L. lampadarius*
laniponga Miq. = *L. sundaicus*
lanceaefolia Roxb. — non-Malesian (= *C. lanceaefolia*)
laurifolia Miq. = *L. korthalsii*
lauterbachii V. Seemen = *L. lauterbachii*
leptogyne Korth. = *L. leptogyne*
lineata Bl.

Quercus

- var. *heterochroa* Miq. = *Q. lineata*
 var. *merkusii* (Endl.) Wenzig = *Q. gemelliflora*
 var. *oxyrhyncha* (Miq.) V. Seemen = *Q. lineata*
lipacon Elmer = *L. celebicus*
litoralis Bl. — excluded: *Atuna scabra* (Hassk.) Kosterm, (Rosaceae)
llanosii A.DC. = *L. celebicus*
lowii King
lucida Roxb. = *L. lucidus*
hizoniensis Merr. = *L. luzoniensis*
mabesae Merr. = *L. celebicus*
maingayi Benth. = *L. maingayi*
mappacea Korth. = *L. sundaicus*
 var. *hystrix* (Korth.) Miq. = *L. hystrix*
menadoensis Koord. — doubtful species of *Lithocarpus*
merkusii Endl. = *Q. gemelliflora*
merrillii V. Seemen
merrittii Merr. = *L. castellarnaujanus*
mespilifolia Wall. var. *borneensis* Heine = *Q. valdinervosa*
microcalyx Korth. — *L. elegans*
minahassae Koord. = *L. caudatifolia*
mindanaensis Elmer = *L. mindanaensis*
minor Ridl. = *L. falconeri*
miqueliana Scheff. = *L. bennettii*
moluccoi Rumph. ex L. — doubtful species of *Lithocarpus*
monticola King, non Petz. & Kirchn. = *L. oreophilus*
muricata Roxb. = *L. sundaicus*
neurophylla Miq. = *L. pseudomoluccus*
nieuwenhuisii V. Seemen = *L. nieuwenhuisii*
nitida Bl. non Rafin. nee Mart. & Gal. — *L. daphnoideus*
 var. *grisea* Bl. = *L. daphnoideus*
nivea King
obliquinervia Merr. = *L. castellarnauianus*
ochracea Merr. = *L. nieuwenhuisii*
oidocarpa Korth.
oligoneura Korth. = *L. urceolaris*
omalokos Korth. = *L. lucidus*
oogyne Miq. — doubtful species of *Lithocarpus*
ovalis Blanco = *L. ovalis*
oxyrhyncha Miq. = *Q. lineata*
pallida Bl. = *L. pallidus*
penangensis Miq. = *L. cyclophorus*
percoriacea Soepadmo
philippinensis A.DC. = *L. philippinensis*
pinanga Bl. = *Q. argentata* Korth.
pinatubensis Elmer = *L. castellarnauianus*
placentaria Bl. = *L. elegans*

Quercus

- platycarpa* Bl. = L. platycarpus
plumbea Bl. — doubtful species of *Lithocarpus*
poculifonnis V. Seemen = L. daphnoideus
polyneura Miq. = Q. lineata
pruinosa Bl. = L. sundaicus
 var. *alpina* Jungh. = L. sundaicus
pseudoannulata Bl. = L. korthalsii
pseudomolucca Bl. = L. pseudomoluceus
 var. *angustata* (Bl.) Bl. = L. pseudomoluccus
 var. *crassinervia* (Bl.) Miq. = L. crassinervius
 var. *incrassata* Bl. = L. korthalsii
 var. *korthalsii* (Bl.) Wenzig = L. sundaicus
 var. *pallida* (Bl.) Miq. = L. pallidus
 var. *papuana* Warb. = L. celebicus
 var. *pruinosa* (Bl.) Wenzig = L. sundaicus
 var. *rostrata* Bl. = L. pallidus
 var. *sundaica* (Bl.) Wenzig = L. sundaicus
pseudoverticillata Soepadmo
pulchra King = L. pulcher
pyrifolia Bl. = L. elegans
pyriformis V. Seemen = L. rotundatus
racemosa Jack = L. elegans
rajah Hance = L. bancanus
rassa Miq. = L. rassa
 var. *lanuginosa* Ridl. = L. rassa
 var. *montana* King ex Hook.f. = L. rassa
reflexa King¹ = L. coopertus
reinwardtii Korth. = L. reinwardtii
rhamnifolia Miq. = C. rhamnifolia
rhioensis Hance = L. elegans
rizalensis Merr. = L. philippinensis
robinsonii Merr. = L. buddii
robinsonii Ridl. = L. neorobinsonii
robur L. — cultivated
rotundata Bl. = L. rotundatus
rufa V. Seemen, non Vukot. = L. obtusifolius
scortechinii King ex Hook.f. = L. scortechinii
seypigera Hance — doubtful species of *Lithocarpus*
 var. *riedelii* King = L. bancanus
sericea Scheff., non Willd. = Q. subsericea
soleriana Vidal = L. colerianus
sphacelata Bl. = L. elegans
spicata Sm. = L. elegans
 var. *depressa* (Bl.) King = L. elegans
 var. *genuina* Koord. = L. elegans
 var. *glaberrima* (Bl.) Miq. = L. elegans

Quercus

- var. *gracilipes* (Miq.) Miq. =: L. *elegans*
 var. *latifolia* Scheff. = L. *elegans*
 var. *microcalyx* (Korth.) Miq. = L. *elegans*
 var. *placentaria* (Bl.) Miq. = L. *elegans*
 var. *racemosa* (Jack) Miq. = L. *elegans*
steenisi Soepadmo
submonticola Elmer = L. *submonticolus*
subsericea A.Cam.
sumatrana Soepadmo
sundaica Bl. = L. *sundaicus*
teysmannii, misspelling for *tysmannii* = L. *korthalsii*
thelecarpa Miq. = L. *pseudomoluccus*
 var. *aigustata* (Bl.) Miq. = L. *pseudomoluccus*
treubiana V. Seemen
turbinata Bl. = Q. *gemelliflora*
 var. *crassilamellata* Gamble = Q. *gemelliflora*
tysmannii Bl. = L. *korthalsii*
umbonata Hance = L. *cyclophorus*
urceolaris Jack = L. *urceolaris*
valdinervosa Soepadmo
varingaefolia Miq. = C. *acuminatissima*
vidalii F.-Vill. = L. *vidalii*
wallichiana Lindl. ex Hance = L. "wallichianus
wenzelii Merr. = L. *philippinensis*
wenzigiana King ex Hook.f. = L. *rassa*
wilhelminae V. Seemen = Q. *argentata*
winkleriana (Schottky) Merr. = L. *dasystachyus*
woodii Hance = L. *woodii*
wrayii King = L. *wrayi*
eschokkei Elmer = L. *glutinosus*
Synaedrys acuminatissima (Merr.) Koidz. = L. *mindanaensis*
bancana (Scheff.) Koidz. = L. *bancanus*
beccariana (Benth.) Koidz. = L. *beccarianus*
bennettii (Miq.) Koidz. = L. *bennettii*
blumeana (Korth.) Koidz. = L. *blumeanus*
brachyclada (V. Seemen) Koidz. = L. *celebicus*
cantleyana (King ex Hook.f.) Koidz. =: L. *cantleyanus*
castellamauiana (Vidal) Koidz. = L. *castellarnauianus*
candatifolia (Merr.) Koidz. = L. *caudatifolius*
celebica (Miq.) Koidz. = L. *celebicus*
clathrata (V. Seemen) Koidz. = L. *rotundatus*
dementi (Merr.) Koidz. =; L. *nieuwenhuisii*
conocarpa (Oudem.) Koidz. = L. *conocarpus*
cooperta (Blanco) Koidz. = L. *coopertus*
costata (Bl.) Koidz. = L. *javensis*
crassinervia (Bl.) Koidz. = L. *crassinervius*

Synaedrys

- curranii* (Merr.) Koidz. = *L. rotundatus*
curtisii (King ex Hook.f.) Koidz. = *L. curtisii*
cyclophora (Endl.) Koidz. = *L. cyclophorus*
eyrtorhyncha (Miq.) Koidz. = *L. gracilis*
d'albertiski (F.v.M.) Koidz. = *L. celebicus*
daphnoidea (Bl.) Koidz. = *L. daphnoideus*
dasystachyn (Miq.) Koidz. = *L. dasystahyus*
debaryana (Warb.) Koidz. — doubtful species of *Lithocarpus*
diepenhorstii (Miq.) Koidz. = *L. gracilis*
discocarpa (Hance) Koidz. = *C. javanica*
dolichocarpa (V. Seemen) Koidz. — doubtful species of *Lithocarpus*
eichleri (Wenzig) Koidz. = *L. eichleri*
enclisocarpa (Korth.) Koidz. = *L. enclisacarpus*
ewyckii (Korth.) Koidz. = *L. ewyckii*
fagiformis (Jungh.) Koidz. = *C. acuminatissima*
falconeri (Kurz) Koidz. = *L. falconeri*
grandifrons (King ex Hook.f.) Koidz. = *L. sundaicus*
gulliveri (F.v.M.) Koidz. = *L. celebicus*
hallierii (V. Seemen) Koidz. = *L. hallieri*
heliciformis (V. Seemen) Koidz. = *L. korthalsii*
hystric (Korth.) Koidz. = *L. hystrix*
imperialis (V. Seemen) Koidz. = *L. schlechteri* ?
induta (Bl.) Koidz. = *L. indutus*
javensis (Bl.) Koidz. = *L. javensis*
jordanae (Laguna) Koidz. = *L. jordanae*
kingiana (Gamble) Koidz. = *L. kingianus*
kunstleri (King ex Hook.f.) Koidz. = *L. kunstleri*
lampadarius (Gamble) Koidz. = *L. lampadarius*
lamponga (Miq.) Koidz. = *L. sundaicus*
lauterbachii (V. Seemen) Koidz. = *L. lauterbachii*
llanosii (A.DC.) = *L. celebicus*
lucida (Roxb.) Koidz. = *L. lucidus*
luzonensis (Merr.) Koidz. = *L. luzoniensis*
maingayii (Benth.) Koidz. = *L. maingayi*
merrittii (Merr.) Koidz. =: *L. castellarnauianus*
monticola (King) Koidz. = *L. oreophilus*
nieuwenhuisii (V. Seemen) Koidz. = *L. nieuwenhuisii*
omalkos (Korth.) Koidz. = *L. lucidus*
ovalis (Blanco) Koidz. = *L. ovalis*
pallida (Bl.) Koidz. = *L. pallidus*
philippinensis (A.DC.) Koidz. = *L. philippinensis*
platycarpa (Bl.) Koidz. = *L. platycarpus*
poculiformis (V. Seemen) Koidz. =: *L. daphnoideus*
pruinosa (Bl.) Koidz. = *L. sundaicus*
pseudomolucca (Bl.) Koidz. = *L. pseudomoluccus*
pulchra (King) Koidz. = *L. pulcher*

Synaedrys

- pyriformis* (V. Seemen) Koidz. = *L. rotundatus*
rajah (Hance) Koidz. = *L. bancanus*
rassa (Miq.)¹ Koidz. = *L. rassa*
reflexa (King) Koidz. = *L. coopertus*
reinwardtii (Korth.) Koidz. = *L. reinwardtii*
robinsonii (Miq.) Koidz. = *L. buddii*
rotunda (Bl.) Koidz. = *L. rotundatus*
rufa (V. Seemen) Koidz. = *L. obtusifolius*
scortechinii (King ex Hook.f.) Koidz. = *L. scortechinii*
scyphigera (Hance) Koidz. — doubtful species of *Lithocarpus*
sericea (Scheff.) Koidz. = *Q. subsericea*
soleriana (Vidal) Koidz. = *L. solerianus*
spicata (Sin.) Koidz. = *L. elegans*
sundaica (Bl.) Koidz. = *L. sundaicus*
teysmanni (Bl.) Koidz. = *korthalsii*
truncwta (King) Koidz. — non-Malesian
wallichiana (Lindl. ex Hance) Koidz. = *L. walliehanus*
wenzelii (Merr.) Koidz. = *L. philippinensis*
wenzigiana (King ex Hook.f.) Koidz. = *L. rassa*
wilhelminae (V. Seemen) Koidz. = *Q. argentata*
woodii (Hance) Koidz. = *L. woodii*
wrayii (King) Koidz. = *L. wrayi*
- Trigonobalanus verticillata* Forman
-

NOTE TO CONTRIBUTORS

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