

Fig. S. — *Acioou percoria-cea* Kosterm.

NEW AND CRITICAL MALESIAN PLANTS VII *)

by

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SUMMARY

1. Anacardiaceae: *Mangifera caesia* Jack is combined with *M. kemanga* Bl. and 3 varieties are recognized: *caesia*, *kemanga* and *wanji*.
2. Newly described are: *M. pajang* and *M. torquenda*.
3. *Lepidadenia seloang* Miquel represents: *Phoebe declinwta* Bl.
4. New Lauraceae: *Beilschmiedia glabra*, *B. dictyoneura*, *B. bangkae*, *B. raontanoides*, *B. rivularis*; *Endiandra ochracea*, *E. magnilimba*.
5. In Meliaceae are newly described: *Aphanamixis reticulosa*, *Lansium pedicellatum* and *L. sepalinum*.
6. *Sterculia minahassae* Kds. is referred to *Firmiana*. *F. philippinensis* Kosterm. is reduced to synonymy.

ANACARDIACEAE

1. MANGIFERA CAESIA Jack

Jack's type specimen is apparently not extant any more. His description of the fruit points to the variety *wanji* as described below.

The inflorescence of the wild form of *M. caesia* is more condensed than that of the cultivated varieties; its fruit is very acid; when young it is green and partly dirty red.

The two varieties *kemanga* and *wanji* differ only by the more elongate and open inflorescences and by the fruit, which are sweet acid and agreeable in taste, when they are fully ripe (fallen from the tree and left to ripen for another one or two days; the pulp becomes then very soft and juicy).

Mangifera kemanga Blume is only grown in West Java as far as I know and perhaps in S. Sumatra and the Malay Peninsula. It has pear shaped fruit, that are pale brown in colour and dull, whereas those of the variety

*) The first and second part of this series appeared in *Reinwardtia* 2: 357—66. 1953 and 3: 1—25. 1954; part III and IV were issued separately by the Planning Division of the Forestry Service of Indonesia in Febr. and Oct. 1955; part IV appeared in *Reinwardtia* 4: 1—40. 1956; part V in *Garden's Bull.*, Singapore 17: 1—10. 1958; part VI in *Reinwardtia* 5: 341—69. 1961.

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wanji has fruit of the same shape, same texture and same taste, but they are glossy greenish white with partly a red coloration.

The wani (Bali) or wanji (East Indonesian Borneo) or beluno (Sabah) is not grown in West Java. Rumphius' Wani (*Mangifera foetida* II) was perhaps from Bali.

The leaves of *Mangifera caesia* (with its 2 varieties) have a decurrent leaf base. The flowers of the var. *kemanga* and *wanji* are certainly not smaller than those of the wild *M. caesia*.

The size of the fruit in all three varieties is the same and varies considerably.

Mangifera caesia Jack

- a. var. *caesia*
 b. var. *kemanga* (Bl.) Kosterm., *comb. nov.*; cultivar. *Fructus pyriformis subrugosis pallide brunneis* (basonym: *Mangifera kemanga* Blume).
 c. var. **wanji** Kosterm., *var. nov.* *Fructus pyriformis, nitidis, albo-viridis, rubescentibus*. Typus: *Kostermans s.n.* (BO).

2. *Mangifera pajang* Kosterm. *spec. nov.*—Fig. 1a et b.

Arbor magna foliis glabris, magnis, rigide coriaceis oblongo-ovatis basi sensum, attenuatis apice perobscure acuminatis, supra nitida nervo mediano costisque prominulis subtus pallidiora nervo mediano magna prominentibus costis utrinque ca 20—25 patentibus prominulis ad marginem arcuatis; petiolis longis basi incrassatis; inflorescentiis apicalibus multifloribus, magnis, sepalibus elongato-ovatis, petalibus elongato-ovatis magnis, staminibus fertilibus 5, ovario albo, stylo longo; fructus globosus magnus.

Large tree, 33 and more m tall with a tall clear bole of 50 cm and more in diam. Bark grey, superficially, broadly cracked, rather smooth; sap of the living bark causing skin-eruptions when touched. Buttresses none. Crown rather open, round. Leaves crowded at the end of the thick branchlets, glabrous, rigidly coriaceous, oblong-obovate, 8 x 28 to 15 x 40 cm (and x 45 cm) (leaves of a sapling are narrower (10 x 40 cm) with up to 12 cm long petioles), base gradually tapering, contracted into the petiole, apex rounded with a short broad acumen; upper surface smooth, glossy darkgreen (fresh), midrib and lateral nerves prominent; lower surface smooth, somewhat paler, the very strong midrib prominent; lateral nerves 20—25 pairs, patent, prominent, strongly arcuate at margin. Petioles stout, 5—7 cm long, grooved, swollen at base.

Inflorescences apical, appearing with the new flush, dark brick red, glabrous, paniculate, many-flowered, ca 30 cm long, consisting of a very stout main rachis and patent branches; bracts and bracteoles partly present at anthesis. Calyx lobes dark purple, oblong-ovate, 2—2.5 mm long, rather fleshy. Petals oblong-ovate, 5—6 mm long, inside purple, outside pinkish white. Fertile stamens consisting of one very long one (5 mm), two somewhat smaller ones (3—4 mm) and 2 short ones; filaments broad, purple; ovary ellipsoid to ovoid, white; style white, ca 5 mm with a small capitate stigma.

Fruit ca 15 cm in diam. (often more), globose, roughish, brownish; rind very thick (10 mm) (when eaten peeled off like a banana); pulp yellowish white, sweet acid. Stone rather flattened.

TYPUS: *Kostermans 12534* (BO).

The species is a well known cultivated and wild one, related to *Mangifera foetida*.

It is easily recognized by the dark brickred inflorescences with the purple flowers and the white ovary. The fruit are the largest of the genus *Mangifera* and may reach dimensions of a small coconut. The local name in Sabah and Indonesian East Borneo is everywhere Asem (= manggo) pajang.

East Kalimantan (Indones. Borneo), West Kutei, Tundjung Plateau Padang Luwai, July, fl., *Kostermans 12534*. (A, BO, CANB, K, L, NY, SING). Sabah (N. Borneo): Sipitang, Ulu Mendalong, 6 miles S.S.E. of Malaman, alt. 500 m, Sept., fr., *Wood, San 16783* (BO).

3. *Mangifera torquenda* Kosterm., *spec. nov.*—Fig. 2

Arbor magna foliis longe petiolatis rigide coriaceis glabris, ellipticis usque ad subobovato oblongis, inflorescentiis apicalibus parce minute tomentellis, floribus parvis, staminibus fertilibus unicus, discus distinctis.

Large tree, up to 30 m tall and 40 cm in diam. Bark smooth, light brownred; sap not itching. Leaves rigidly coriaceous, concave (fresh), glabrous, aggregate near the end of the branchlets, obovate-oblong to elliptic, 5 x 12 to 9 x 21 cm, base gradually attenuate, apex obscurely acuminate, above glossy green, smooth, midrib and lateral nerves prominent; lower surface paler, midrib strongly prominent, lateral nerves patent, ca 20 pairs, at margin arcuate, prominent; secondary nerves rather obscure. Petioles 3—6 cm long, rather slender, thickened and black-green (fresh) at base. Inflorescences white, terminal, dense, paniculate, up to 15 cm long (the tops of the side branches often almost in the same level); the thick main peduncle slightly, sparsely, minutely pilose towards apex, bearing slender, short branchlets; flowers sweetly fragrant, greenish white

on a short pedicel, articulate with a slender up to 8 mm long branchlet, with a bract at its base. Flowers small; sepals elongate-ovate, 2—2.5 mm long; petals elongate ovate, 4 mm long. Fertile stamen one, 4—5 mm long; ovary ovoid on a disk. Fruit globular, smooth, yellowish green, about 10 cm diam. with a rather thin rind; pulp pale yellowish, sweet acid. It is consumed by making a transverse cut through the rind and pulp and twisting the two halves which then loosen completely from the seed. Seed biconvex, about 4 cm thick.

TYPUS: *Kostermans 12533* (BO).

East Kalimantan (Indones. Borneo), West Kutei, Tundjung Plateau, Padang Luwai, July, fl. *Kostermans 12533* (A, BM, BO, BRI, CAL, CANB, K, L, LAE, NY, P, SING). Also cultivated.

L A U R A C E A E

LEPIDAOENIA SELOANG Miq.

Lepidadenia seloang Miquel, Fl. Ind. bat., Suppl. Sumatra 145. 1860 et 361. 1861; Meissner in DC, Prodr. 15(1): 515. 1864; van Eeden, Catal. Houtsoorten Ned. O. Ind. 43. 1872; Hasselt & Boerlage, Bijdr. Fl. Midden Sumatra 19. 1884; Filet, Plantk. Woordenb. Ned. Ind., ed. 2: 206. 1888; Kostermans, Bibliogr. Laur. 722. 1964. — *Cylicodaphne seloang* (Miq.) Meissner in DC, l.e.; Kostermans, l.e.

This species is represented in the Bogor Herbarium by two iso-type sheets (numbered 3573 *H.B.* and 3905 *H.B.*), collected by Teijsmann near Muara Dua (Moeara Doewa) near Palembang; the label bears the local name: Medang selowang.

These sterile specimens represent: *Phoebe declinata* Bl.

1. *Beilschmiedia glabra* Kosterm., spec. nov.—Fig. 3

Arbor in omnibus partibus (fioribus exceptis) glabris foliis oppositis coriaceis ellipticis vel subovato-ellipticis basi cuneatis in petiolum subdecurrentibus apice acuminatis, gemmis ovatis acuminatis, paniculis parvis paudfloris, fioribus longe pedicellatis tepalibus ovato-lanceolatis staminibus gracilibus filamentis longis parce pilosis antheris elongatis glandulis stipitatis staminodiis longis gracilis; fructus brunneis scabrusculis magnis.

Tree up to 35 m high and 80 cm in diam.; buttresses none or small (up to 50 cm high), thin. Bark dark redbrown, rather smooth, cracked or peeling off in papery pieces. Living bark 3—10 mm thick, light brown to orange brown. Wood moderately hard, white. Branchlets glossy dark green, drying brown. Leaves coriaceous, very glossy, glabrous, subobovate-elliptic, (2 x 5.5) 3.5 x 10 to 6 x 15 cm (in saplings 10 x 30 cm), base cuneate,

slightly decurrent, apex with a blunt or sharp acumen, both surfaces with a lax, prominent reticulation, upper surface glossy dark green (pale grey brown, when dried), midrib broad, flat, usually impressed or at least impressed along its centre, lateral nerves slender, 8—9 pairs, arcuate, prominent on both surfaces, lower surface drying dark chocolate brown. Leaf buds ovate, acuminate, glabrous, 5—9 mm long. Petiole glabrous, superficially sulcate on its upper surface, 2—3 (—4) cm long.

Panicles axillary in the new flush, glabrous, few-flowered, hardly branched, 1—2 cm long; pedicel slender, up to 10 mm long, sparsely, minutely pilose. Flowers pale green to greenish white; tepals lanceolate, acute, 3 mm long, inside sparsely, minutely pilose. Stamens slightly shorter than the tepals with slender, slightly pilose filaments; anthers narrow, elongate; cells of the outer ones introrse, of the inner ones lateral; glands globose, shortly stipitate. Staminodes cordate, acute.

Fruit ellipsoid, up to 2.5 X 3.5 cm; chocolate brown, roughish (scaly), pointed at apex, base with a conspicuous neck of 5—10 mm long.

TYPUS: *Kostermans 7313* (BO).

DISTRIBUTION: Malay Peninsula, Sumatra, Borneo.

The leaves vary considerably in size; those near the inflorescence are 3 x 6 cm, others 10 x 25 cm. The tree prefers wet places, but remains small in periodically for long times inundated areas; on better drained soils they become much taller.

The Sumatran and Malayan material matches the Bornean perfectly, except for the specimens *Kiah S.F.N. 32424* and *Burkill & Holttum 8694*, which have a fruit of 3 x 4.5 cm of yellowish brown colour with a very conspicuous neck at the base; the leaves have a slightly different texture. The species has leaves similar to those of *B. gigantocarpa* Kosterm.

Malay Peninsula: Pahang, Fraser Hill upon the Selangor Border, alt. 1200 m, Sept., fr., *Burkill & Holttum 86U* (K, SING); Perak, Mt. Batu Patah, fr., *Wray 1067* (K, SING); Johore, Sg. Sedili, March, young fr., *Corner s.n.* (SING); Sg. Kayu, March, fr., *Kiah, S.F.N. 32UU* (K, SING); Sumatra: Djambi, Simpang, alt. 45 m, ster., *bb. 13123* (BO); Borneo: Sarawak, fl., *Beccari P.B. 1156* (BM, BO, G, K, LE); Kuching, Sg. Mohon, Dec, fl., *Beccari P.B. 3971* (F1); West Kalimantan (Indones. Borneo), Landak, young fr., *Teijsmann H.B. 1124.0* (BO, F1); East Kalimantan, Nunukan Isl., S. part, Simengkadu, marshy, alt. 2 m, Jan., young fr., *Kostermans 9194* (A, BO, K, L, SING); *ibid.*, alt. 25 m, ster., *bb. 3U560* (A, BO, K, L); E. Kutei, Mt. Medadem, N.W. of Sangkulirang, alt. 100 m, Aug., buds, *Kostermans 13288* (A, BO, K, L, SING); Menubar R., N.E. of Sangkulirang, June, young fr., *Kostermans 5U38* (A, BO, K, L, PNH, SING); *ibid.*, sapling of 6 m on ridge, alt. 20 m, *Kostermans 5195* (A, BO, K, L, PNH, SING); *ibid.*, Mt. Tepianlobang on Menubar R., alt. 100 m, limestone, Aug., fl., *Kostermans 6012* (A, BISH, BO, K, KEP, L, LAE, P, SING, SYD); *ibid.*, Tokot on Menubar R., ster.,

66. 14749 (BO, K, L); Pelawan R., N.W. of Sangkulirang, alt. 50 m, Sept., fl., fr., 66. 11861 (BO); W. Kutei, Belajan R., Mt. Kelopok near Tabang, alt. 50 m, April, fl., *Kostermans* 10433 (A, B, BO, CANB, P, SING) (leaves of 2 x 5.5 cm!); Loa Djana'n, near Samarinda, ster., *Kostermans* 6509 (BO, K, L); Tdg. Bangko, Mouth of Mahakam R., ster., *Kostermans* 7227 (A, BO, K, L, PNH, SING); Balikpapan Distr., Sg. Wain, alt. 40 raster., *Kostermans* 4426 (BO, K, L); *ibid.*, Oct., young fr., *Kostermans* 4234 (A, BO, K, L, SING) et 4214 (A, BO, BRI, K, L, PNH, SING); *ibid.*, Aug., young fr., *Kostermans* 4.020 (BO, L); *ibid.*, Sept., ster., *Kostermans* 4445 (BO, K, L); Peak of Balikpapan (Mt. Beratus), Beul, alt. 600 m, July, fl., *Kostermans* 7313 (A, BO, BRI, K, L, LAE, NY, P, PNH, SING); *ibid.*, July, fl., *Kostermans* 7421 (A, BISH, BM, BO, BRI, CAL, CANB, K, L, LAE, MEL, P, PNH, SING); *ibid.*, July, young fr., *Kostermans* 7505 (BO).

2. *Beilschmiedia dietyoneura* Kosterm., *spec. nov.*—Fig. 4.

Arbor gemmis adpresse pilosis foliis coriaceis glabris lanceolatis conspicue reticulatis, costis utrinque 6—10 petiolis glabris gracilibus profunde sulcatis, paniculis gracilibus multifloris, tepalibus late ovatis pilosis, filamentis latis brevis pilosis, antheris triangularibus cellulis introrsis, staminodiis sessilis triangularibus, ovario glabro stylo aequilongo, stigmatibus inconspicuo.

Tree up to 34 m high and 57 cm in diam., buttresses none or very small. Bark darkbrown, roughish, 0.5 mm, smooth or peeling off in irregular pieces; living bark darkbrown, "timer layer dark yellow, 5—10 mm thick. Wood white. Branchlets slender, glabrous. Leafbuds conical, densely, minutely, grey adpressed pilose, small. Leaves coriaceous, glabrous, lanceolate to broadly or narrowly lanceolate, 1 x 7 to 5.5 x 20 cm, base cuneate, apex gradually acuminate, sharp; both surfaces laxly prominulously, conspicuously reticulate; upper surface glossy, darkgreen (fresh), midrib slender, prominulous, lateral nerves very slender, slightly prominulous; lower surface pale green (fresh), dull, midrib rather slender, prominent, lateral nerves 6—10 pairs, slender, arcuate, prominulous, often arcuately anastomosing at some distance from the margin. Petiole glabrous, slender, 5—20 mm long, deeply and narrowly sulcate above.

Panicles axillary, narrow, 2—8 cm long, minutely pilose. Flowers greenish white, rather flat, 1.5—2 mm in diam., 1 mm high; tepals fleshy, ovate, acute, broader than long, pressed together, the tips recurved, pilose on both surfaces; anthers protruding beyond the perianth, 0.5—0.75 mm long, ovate, acute with introrse cells; filaments broad, very short, pilose; staminodes triangular or sagittate, flat, sessile, 0.25 mm; ovary globose, glabrous, 1—1.5 mm long with 1 mm long style with inconspicuous stigma. Flower tube shallow, infundibuliformous, wide.

Fruit ellipsoid, obtuse, up to 12 x 15 mm, glossy green, smooth (fresh), covered with small warts (dried), pericarp soft, green, 2 mm, acid and biting on the tongue; cotyledons white, flat-convex.

TYPUS: *Kostermans* 4464 (BO).

DISTRIBUTION: Fairly common but scattered in the Malay Peninsula, Sumatra and Borneo from 20—850 m. altitude.

The leaves show some resemblance with those of *Micropora curtisii*. The warts on the fruit appear after drying and are very characteristic.

Malay Peninsula: Kemaman, Hulu Bendung, alt. 200 m, Oct., ster., *Corner, S.F.N. 30037* (SING); Malacca, Bukit Sidenan, alt. 200 m, Febr., buds, *Pun Bebas (Derry) 128* (SING); Sumatra: East Coast, Lower Langkat, Sg. Sedapan, alt. 20 m, ster., 66. 9367 (BO); West Coast, Lubuk Sikabing, Sawah Mudoh, ster., 66. 3960 (BO, L); Palembang Distr., Lematang hilir, Gunungmegang, alt. 75 m, Dec, ster., *T. 3P. 851* (BO); *ibid.*, Nov., fr., *T. 851* (BO, L); *ibid.*, Semangus, ster., 66. 32023 (BO, K, L, NY); Bencoolen, Redjang, Kepahiang, alt. 650 m, Oct., ster., 66. 15951 (BO); West Kalimantan (Indon. Borneo), Melawi, Tjatit, alt. 410 m, ster., 66. 264.60 (A, BO, K, L, NY, SING); East Kalimantan, Tdg. Bangko, Mouth of Mahakam R., alt. 40 m, June, fr., *Kostermans* 7266 (A, BO, BRI, CAL, K, L, NY, P, PNH, SING); Balikpapan Distr., Sg. Wain, alt. 40 m, ster., *Kostermans* 4.570 (A, BO, K, L) et 1,075 (A, BO, K, L); *ibid.*, Oct., fl., *Kostermans* 4524 (A, BISH, BM, BO, BRI, K, L, NY, P, PNH); *ibid.*, alt. 90 m, Oct., buds, *Kostermans* 4048 (A, BM, BO, BRI, K, L, LAE, P, PNH, SING); *ibid.*, Sept., fl., *Kostermans* 4464 (A, BISH, BM, BO, BRI, CANB, K, KEP, L, LE, NY, P, PNH, SAN); *ibid.*, Maridan, Jan., fl., 66. 14985 (BO, K, L, SING); South Kalimantan, Puruktjahu, Biha, alt. 90 m, ster., 66. 10602 (BO, L).

3. *Beilschmiedia bangkae* Kosterm., *spec. nov.*—Fig. 5

Arbor foliis coriaceis suboblanceolatis usque ad late ellipticis, pauci gradatim attenuatis apice breve acuminatis supra nitida reticulatio prominentibus laxis subtus glabrescentia costis utrinque 6—8, petiolis 5—8 mm; paniculis parvis minute tomentellis paucifloris bracteis ad anthesis persistentibus, tepalis oblongis pilosis, antheris exterioribus ovatis acutis cellulis introrsis filamentis distinctis perparce pilosis, antheris interioribus oblongis cellulis extrorso-lateralibus, glandulis basalibus magnis sessilis, staminodiis parvis ovatis acutis sessilis, ovario glabro, stylo staminibus aequilongo. Fructus ellipsoideus glabris.

Tree 8—26 m tall, 15—40 cm in diam. Bark smooth, brownish. Branchlets and young flush densely pulverulently grey pilose. Leaves coriaceous, suboblanceolate to broadly elliptical, 2 x 5 to 4 x 7.5 (to 5 x 10) cm, base gradually narrowed, apex shortly or distinctly, broadly acuminate; margin thickened; upper surface glossy with lax prominent reticulation, midrib prominulous (impressed near the base), lateral nerves slender, prominulous; lower surface with adpressed very tiny hairs, glabrescent, midrib promi-

ment, lateral nerves 6—8 pairs, slender, slightly arcuate, prominent; reticulation lax, prominulous. Petiole 5—8 mm long, flat or slightly concave above.

Panicles axillary, short, 0.5—3 cm long with few, short branches, densely pulverulently pilose. Bracts and bracteoles ovate or lanceolate, acute, persistent at anthesis, up to 1 cm long. Pedicel ca 1 mm long. Flowers yellowish green, 2 mm in diam. Tepals elliptic, acutish, densely pilose, 1.5—2 mm long; stamens 1—1.5 mm long; outer anthers ovate, acute, cells introrse, filaments as long as the anthers, rather slender, very sparsely, minutely pilose; inner anthers oblong, cells extrorse-lateral; basal glands large, sessile; staminodes ovate, acute, sessile, 0.4 mm long; ovary glabrous, globose, with a style as long as the stamens; stigma inconspicuous, truncate. Fruit (immature) ellipsoid, acute, glossy, up to 5 x 10 mm with slightly curved, slender notch at the apex.

TYPUS: *Grashoff 69* (L).

The species is closely related to *B. rivularis* Kosterm., from which it differs by the coriaceous leaves with lax reticulation, the shorter petioles, the glabrous ovary and the differently shaped, glossy fruit. The local name in Bangka is medang bakul.

S u m a t r a : Isl. Bangka, Lobok Besar, alt. 20 m, Aug., fr., *Kostermans & Anta 71* (A, BO, K, L); *ibid.*, Aug., fr., *Kostermans & Anta 135* (A, BO, CANB, K, KEP, L, P, PNH, SING, SYD); *ibid.*, Sept., fl., *Kostermans & Anta 421* (A, BO, K, L, LAE, P, PNH, SING), 849 (A, BO, K, L, LAE, PNH, SING), 272 (A, BISH, BM, BO, CANB, K, KEP, L, LAE, P, PNH, SING, SYD); *ibid.*, Oct., young fr., *Kostermans & Anta 1043* (A, BO, K, L, P, PNH); *ibid.*, Oct., ster., *Kostermans & Anta 1317* (A, BO, K, KEP, L, LAE, P, PNH, SING, SYD); locality not indicated, fl., *Grashoff 69* (L); Blinju, ster., *Teijsmann s.n.* (BO); Djambi, Simpang, alt. 45 m, ster., 66. 13152 (BO).

4. *Beilschmiedia montanoides* Kosterm., spec. nov.—Fig. 6

Arbor mediocris gemmis minute dense adpresse pilosis, foliis rigide coriaceis glabris lanceolatis sensim acuminatis reticulatio laxa prominulo, petiolis gracilis distinctis, paniculis paucifloris subglabris axillaribus parvis, floribus subplanis, antheris triangularibus, filamentis brevis latis, staminodiis cordatis acutis sessilibus, ovario basin versus pilosis stylo aequilongo, stigmate inconspicuo; fructus ellipsoideus acutis.

Tree 12 m high with 8 m clear bole of 15 cm diam. Bark scaly, reddish brown, lenticellate, thin; living bark 2—4 mm, dark reddish; sapwood pale ochre yellow. Branchlets glabrous. Leafbuds densely grey adpressed pilose. Leaves rigidly coriaceous, glabrous, lanceolate, 1.5 x 5.5 to 3 x 10.5 cm, base acute, apex gradually acuminate; upper surface glossy smooth, midrib

and primary nerves hardly prominulous, lower surface paler, midrib prominulous, lateral nerves 6—7 pairs, very slender, rather obscure, arcuate; reticulation lax, rather obscure. Petiole slender, glabrous, 5—10 mm long, flat or shallowly sulcate above.

Panicles axillary, few-flowered, narrow, almost glabrous (except for tiny, scattered adpressed hairs on the base of the main peduncle), 1—3 cm long, with few, short, stiff, erect-patent ramifications. Pedicels 1—2 mm long, slender. Flowers rather flat, 1.5—2 mm diam.; tube shallow, broad; tepals ovate, acute, 1.5 mm long, rather fleshy. Anthers elongate triangular, 0.75 mm long on 0.25—0.5 mm long, slightly pilose, broad filaments; cells of the outer anthers introrse, of the inner extrorse; basal glands small. Staminodes sessile, heart shaped, acute, 0.25 mm long. Ovary globose, pilose at base; style as long as the stamens; stigma truncate, inconspicuous.

Fruit ellipsoid or ovoid, pointed, apiculate, smooth, up to 1.5 x 2.5 cm.

TYPUS: *Singh, San 28273* (BO); para-typus: *Singh, San 24203* (BO).

The alliance of this species is with *B. dictyoneura* Kosterm., from which it differs by its non-reticulate, narrow, stiff leaves, different flowers and smooth, acute fruit.

S a b a h (N. Borneo): Distr. Ranau, Sg. Letong, Kundasang, Kinabalu, alt. 1800 m, March, fl., *Singh, San 24203* (BO); *ibid.*, Corner's Path, E. of Kundasang, alt. 1400 m, Nov., fr., *Singh, San 28273* (BO).

5. *Beilschmiedia rivularis* Kosterm., spec. nov.—Fig. 7

Ryparosa borneensis (nee van Slooten) Boerlage ex Hallier in *Beih. bot. Centralbl.* 39(1): 161. 1921. — *Korthals s.n.* (L).

Arbor gemmis gracilis acutis ferruginis pulverulente pilosis, foliis chartaceis glabris ellipticis usque ad suboblanceolatis vel lanceolatis basi acutis apice obscure acuminatis reticulatio laxa prominulo, costis utrinque 6—8, petiolis gracilis longis, subsulcatis; paniculis axillaribus dense pulverulente pilosis bracteis bracteolisque mox caducis, pedicellis conspicuis; antheris late ovatis acutis, cellulis antheris exterioribus magnis introrsis, interioribus minoribus extrorsis, filamentis parvis, glandulis magnis sessilibus, staminodiis ovatis acutis minutis sessilibus; fructus globosus rugosis apiculatis, endospermum ruminatus.

Tree, up to 30 m high, with 15 m free bole and 50 cm in diam. Bark smooth, soft, pale redbrown, slightly cracked, 0.5 mm thick; living bark 6—10 mm, redbrown with a sweet taste and a little clear sap when cut. Wood white with a faint sweetish smell. Branchlets at apex and the slender, acute leafbuds minutely rusty, pulverulently pilose. Branches slender, glabrous. Leaves glabrous, chartaceous, elliptical to subobovate-elliptical and lanceolate (3.5 x 11 cm) to suboblanceolate, 2.5 x 8 to 6 x 13.5 cm,

base acute, apex rather obscurely acuminate (in seedlings long and gradually acuminate), rather laxly, prominulously reticulate on both surfaces; upper surface dark glossy green (fresh), drying rather dull with flat or slightly raised midrib and lateral nerves; lower surface paler, somewhat glaucous (fresh), drying dull brown with 6—8 pairs of erect-patent, somewhat arcuate, slender, prominulous lateral nerves. Petiole slender, 8—12 mm long, shallowly sulcate above.

Panicles axillary near the new flush, lax, many-flowered, up to 13 cm long, densely, pulverulently pilose; bracts minute, ovate-acute, pilose, caducous before anthesis. Pedicels slender, 2—5 mm long, pilose. Flowers greenish white; tube very shallow; tepals orbicular-ovate, acutish, 1.5 mm long, densely minutely pilose; anthers 0.5 mm long, broadly ovate with acute protruding connective, the outer row with very large, introrse cells and 0.25 mm long, slightly pilose filaments; the inner row with broadly oblong, obtuse anthers with smaller, extrorse cells and slightly longer, pilose, rather broad filaments; glands large, sessile; staminodes ovate, acute, sessile. Ovary glabrous, 0.75 mm; style 0.5 mm long, truncate.

Fruit globose, up to 29 mm in diam., apiculate or with an up to 1.5 mm long notch at apex, brown, roughish. Pedicel cylindrical, 3 mm in diam. Endosperm ruminant.

TYPUS: *Kostermans 8005* (BO).

DISTRIBUTION: Usely along rivers and rivulets from 20—800 m alt., locally common.

The species is outstanding by its globose, rough, brown fruit with ruminant endosperm. The latter characteristic is so unusual in Lauraceae, that the species might be considered to represent a separate genus. The specimen *Endert 3665* differs by its slightly, minutely pilose, lower leaf-surface.

E. Kalimantan (Indon. Borneo): W. Kutei, Belajan R., fl., *Kostermans 1024-5 et 10317* (A, BO, G, K, L, MEL, SYD); *ibid.*, near Kembang Djangut, May, fl. and young fr., *Kostermans 10688* (A, BO, GAL, CANB, K, L, NY, SING); *ibid.*, Muara Antjalong, July, fl., fr., *Endert 2128* (A, BO, K, L); Telen R., Batu Bong falls, Aug., fr., *Endert 23U* (A, BO, K, L); *ibid.*, Aug., buds, *Endert 3635* (A, BO, K, L); Peak of Balikpapan (Mt. Beratus), Sambuni, alt. 650 m, July, fr., *Kostermans 7639* (A, BO, K, L, SING); *ibid.*, July, buds, *Kostermans 7641* (A, BISH, BO, BRI, CAL, K, L, LAE, NY, P, PNH); *ibid.*, alt. 600 m, July, young fr. and fl., *Kostermans 763J_f* (A, B, BRI, CAL, K, L, P, PNH, SING); *ibid.*, 800 m alt., July, young fr., *Kostermans 7493* (A, BO, BRI, CAL, K, L, LAE, PNH, SING); *ibid.*, 1000 m alt., July, fl., *Kostermans 7682* (A, BISH, BO, BRI, CAL, K, L, LAE, NY, P, PNH); *ibid.*, 800 m alt., seedling, *Kostermans s.n.* (BO); S.E. Kalimantan: Sampit Distr., Kuala Kuajan, July, fl., fr., *Kostermans 8005* (BO, BRI, CAL, G, K, KEP, L, LAE, P, PNH); locality not indicated, ster., *Korthals s.n.* (L, 3 sheets), type of *Ryparosa borneensis* Boerl.

6. *Endiandra ochracea* Kosterm., *spec. nov.*—Fig. 8

Arbor ramulis sulcatis gemmis minute sericeis, foliis chartaceis glabris oblongis vel lanceolatis acuminatis petiolis longis sulcatis, infructescentibus parvis unifructus, fructus ellipsoideus.

Tree up to 30 m high and 55 cm in diam. Bark rather smooth, light red-brown, paperthin; living bark 5—10 mm thick, outside green, inside light reddish brown, without smell. Wood white, soft, without smell. Branchlets furrowed, minutely, laxly pilose. Leafbuds minutely sericeous. Branches smooth, stout, sulcate, glabrous. Young leaves pinkish. Leaves chartaceous, glabrous, oblong to lanceolate, 3.5 x 11 to 6 x 18 cm with a usually long acuminate apex, base acute; both surfaces densely, finely, prominently reticulate (areoles ca 0.5 mm in diam); midrib flat on upper surface, prominent on lower one; lateral nerves 8—10 pairs, filiformous, prominulous on both surfaces, strongly arcuate near the margin. Petiole slender, up to 2 cm long, glabrous, deeply sulcate above.

Infructescence axillary, 0.5—3 cm long, very minutely, densely pilose unbranched, bearing one ellipsoid, smooth, up to 2 x 5 cm long, obtuse, glossy fruit; pedicel cylindrical or somewhat obconical, 2—3 mm long and broad.

TYPUS: *Kostermans 9572* (BO).

The species is related to *E. rubescens* from which it differs by its unbranched short infructescence and by the leaves which dry a yellowish colour (ochre on the lower surface).

E. Kalimantan (Indon. Borneo): Sangkulirang Distr., Mt. Tepianlobang on Manubar R., alt. 40 m, ster., *bb. 12565* (BO); W. Kutei, Kelindjau R., Segoi, alt. 20 m, June, fr., *Kostermans 9572* (A, BO, K, KEP, L, LAE, P, PNH, SING); Balikpapan Distr., Sg. Wain, along rivulet, alt. 5 m, Aug., young fr., *Kostermans 4031* (BO); *ibid.*, alt. 10 m, Sept., fr., *Kostermans 4H79* (BO); S. East Kalimantan, Puruktjahu, Muara Djaen, alt. 100 m, ster., *bb. 10505* (BO).

7. *Endiandra magnilimba* Kosterm., *spec. nov.*—Fig. 9a et b.

Arbor ramulis crassis gemmis minutis acutis minute sericeis, foliis permagnis glabris late ellipticis chartaceis glabris basi rotundatis apice obscure acuminatis perdense reticulatis (areolis 1 mm diam.), petiolis longis crassis late sulcatis, fructus ellipsoideus permagnis.

Tree up to 17 m high and 20 cm in diam. Bark brown, smooth; living bark light pink. Sapwood brown-creamy, heartwood pink. Branchlets stout, glabrous. Leaf buds small, slender, acute, laterally flattened, finally, densely, minutely sericeous. Leaves stiffly chartaceous, glabrous, broadly elliptical,

up to 16 x 30 cm, base rounded, contracted into the petiole; apex obscurely, shortly acuminate; both surfaces densely prominently reticulate; areoles ca 1 mm in diam.; midrib prominulous, broad on upper surface, prominent on lower one; lateral nerves slender, about 9 pairs, erect-patent to rather patent, slightly arcuate, prominulous on upper, prominent on lower surface. Petiole up to 3 cm long, stout, glabrous, widely sulcate above. Fruit ellipsoid, up to 5 x 10 cm, smooth.

TYPUS: *White, N.G.F. 10270* (BO).

Except for *E. eusideroxylocarya* Kosterm. this is the largest-fruited *Endiandra* species known. It is related to *E. macrophylla* Teschn. by the shape and size of its leaves.

Territory of New Guinea: Madang Distr., Josephstal, alt. 80 m, lat. 4.45 S., long. 145.00 E., Sept., fr., *White, N.G.F. 10283 et 20270* (BO).

MELIACEAE

1. *Aphanamixis reticulosa* Kosterm., *spec. nov.*—Fig. 10.

Arbor ramulis glabris striatis foliis 5-foliolatis, foliolis lanceolato-ellipticis membranaceis glabris utrinque nitidis et prominule reticulatis, basi acutis apice conspicue acuminatis, costis 10—12 paribus, petiolulis gracilibus, spicis glabris, fructus globosus, lignosus, glabris, sub-costatis.

Tree 25 m high with 8 m free bole. Bark smooth, greyish green; outer bark thin; cork cambium green; inner bark pale yellow. Branchlets grey, striate, glabrous. Leaves with 5 (rarely 3) glabrous, membranaceous, alternate or sub-opposite leaflets; rachis slender, up to 20 cm long, glabrous; petiolar part ca 8 cm, thickened at base; folioles lanceolate-elliptic, 6.5 x 20 (top leaflet) to 3.5 x 10 cm (basal leaflet), base gradually tapering, acute, apex conspicuously acuminate; both surfaces glossy and prominulously reticulate; upper surface darkgreen, midrib impressed, lower surface paler (drying pale brown), midrib prominent, lateral nerves 10—12 pairs, prominent, arcuate; petiolule slender, 5—10 mm long, deeply sulcate above, not or hardly thickened at base. Spikes glabrous, 11 cm long, solitary behind the leaves; fruit globular, pulverulently pilose, ca 25 mm in diam., pale grey brown, woody with slender, protruding longitudinal ribs; pedicel 3 mm long and 3 mm in diam.; sepals (under the fruit) triangular, acute, 1 mm long seated on a narrow rim. Seeds 3, the size and shape of coffee-beans surrounded by a thick arillus.

TYPUS: *San 24030* (BO).

The species is outstanding by its ribbed, glabrous, woody fruit and the typical leaf venation; the Jaheri specimen has a fruit without ribs.

Borneo: Sabah (N. Borneo), Ranau Distr., above Hot Springs, alt. 800 m, Febr., fr., *J. Singh, San 24030* (BO); Kalimantan: Bukit Batu milir, fr., *Jaheri 37 S* (BO, L).

2. *Lansium pedicellatum* Kosterm., *spec. nov.*—Fig. 11

Frutex ramulis juvenilis dense tomentellis, mox glabris, foliis 5-vel 7-foliolis; foliolis membranaceo-chartaceis glabris subobovato-lanceolatis basi acutis apice acuminatis, utrinque 7—8, petiolulis gracilis conspicuis basi pulvinatis; racemis gracilis glabris, pedicellis floribus conspicuis gracilis.

Shrub, ca 4 m tall; youngest branchlets densely, minutely brown-tomentellous, soon glabrous. Leaves glabrous (base of rachis in young leaves somewhat pilose), rachis up to 10 cm long, petiolar part up to 4 cm long, slender, thickened at base. Folioles 5 or 10, glabrous, subobovate-lanceolate (apical leaflet) to sub-ovate (basal ones), up to 4.5 x 14 cm (top leaflet) to 2.5 x 6 cm (basal one), base gradually acute, often asymmetric, apex distinctly acuminate; upper surface glossy, midrib slender, impressed; lower surface paler, duller, midrib prominent; lateral nerves 7—8 pairs, prominent, arcuate. Petioles slender, 3—4 mm long, pulvinate at base, slightly sulcate or flat on their upper surface.

Racemes in fascicles on old wood, glabrous, slender, up to 11 cm long. Flower 2 mm. Pedicel 1 mm, slender, subtended by a minute, pilose bract. Sepals ca 1 mm in diam., rounded, fringed at margin. Petals 2 mm, ovate-orbicular. Stamens in one row, the anthers protruding beyond the rim. Ovary angular, pilose; stigma truncate.

TYPUS: *Van Steenis 3444* (BO).

The species is related to *Lansium humile* Hassk., which is, however, a large tree. It differs from *L. humile* by the fewer lateral nerves, the thinner and narrower leaves and the pedicelled flowers.

South Sumatra: N. Slope of Mt. Pakiwang, N.W. of lake Ranau, alt. ca 600 m, Oct., fl., *Van Steenis HU* (A, BO, K, L, U).

3. *Lansium sepalinum* Kosterm., *spec. nov.*—Fig. 12

Arbor humilis ramulis dense minute tomentellis, foliolis 9, chartaceis glabris lanceolatis vel lanceolate-ellipticis basi acutis vel in petiolulum contractis apice obscure acuminatis utrinque prominulo-reticulatis costis utrinque 10—12, spicis dense minutissime pilosis, sepalibus magnis dense pilosis; fructus dense pilosis.

Treelet 4 m tall, branchlets rather stout, densely, minutely palebrown tomentellous. Rachis of leaves up to 17 cm long, densely, minutely pilose;

petiolar part ca 5 cm. Foliioles 9, chartaceous to chartaceous-membranaceous, lanceolate to narrowly elliptical or subobovate-lanceolate (apical leaflet), 5 x 17 (apical leaflet) to 3 x 8 cm (basal leaflet), base acute or rounded, often oblique, apex rather inconspicuously acuminate; both surfaces glossy, prominulously reticulate; upper surface glabrous, midrib pilose, slightly impressed; lower surface soon glabrous, midrib prominent, lateral nerves 10—12 pairs, prominent, arcuate. Petiolule 3—5 mm, pulvinate at base. Spikes densely, minutely pale-brown pilose, up to 16 cm long, on old wood. Sepals depressed orbicular 4 mm long, densely pilose. Fruit globular, 2—2.5 cm in diam., densely, velvety tomentellous, one-seeded.

TYPUS: *Jacobs 4456* (BO).

The species is related to *L. aqueum* Miq., from which it differs by its narrow, glabrous folioles, the much larger sepals with a more dense indumentum.

CENTRAL SUMATRA: W. side of Mt. Tadjuh Complex, 1° 40'S, 101° 20'E, alt. 1400—1600 m, Aug., fr., *Jacobs U56* (A, K, L, SING).

STERCULIACEAE

Firmiana minahassae (Kds.) Kostermans., *comb. nov.*

Dr. W. Soengeng pointed out to me that *Sterculia wiinahassae* Koorders (basionym) (Suppl. Fl. N.O. Celebes 2:-33, t. 8. 1922) might belong to *Firmiana*.

It belongs indeed in that genus and is conspecific with *F. philippinensis* Kosterm.

The type specimen (*Koorders 18070*) is represented in the Bogor Herbarium by two loose leaves, a flowering branch with immature flowers and a branch with young fruit. After this specimen Koorders' drawing was made. It may consequently be considered to represent the holo-type.



Fig. 1a. — *Mangifera pajang* Kosterm.

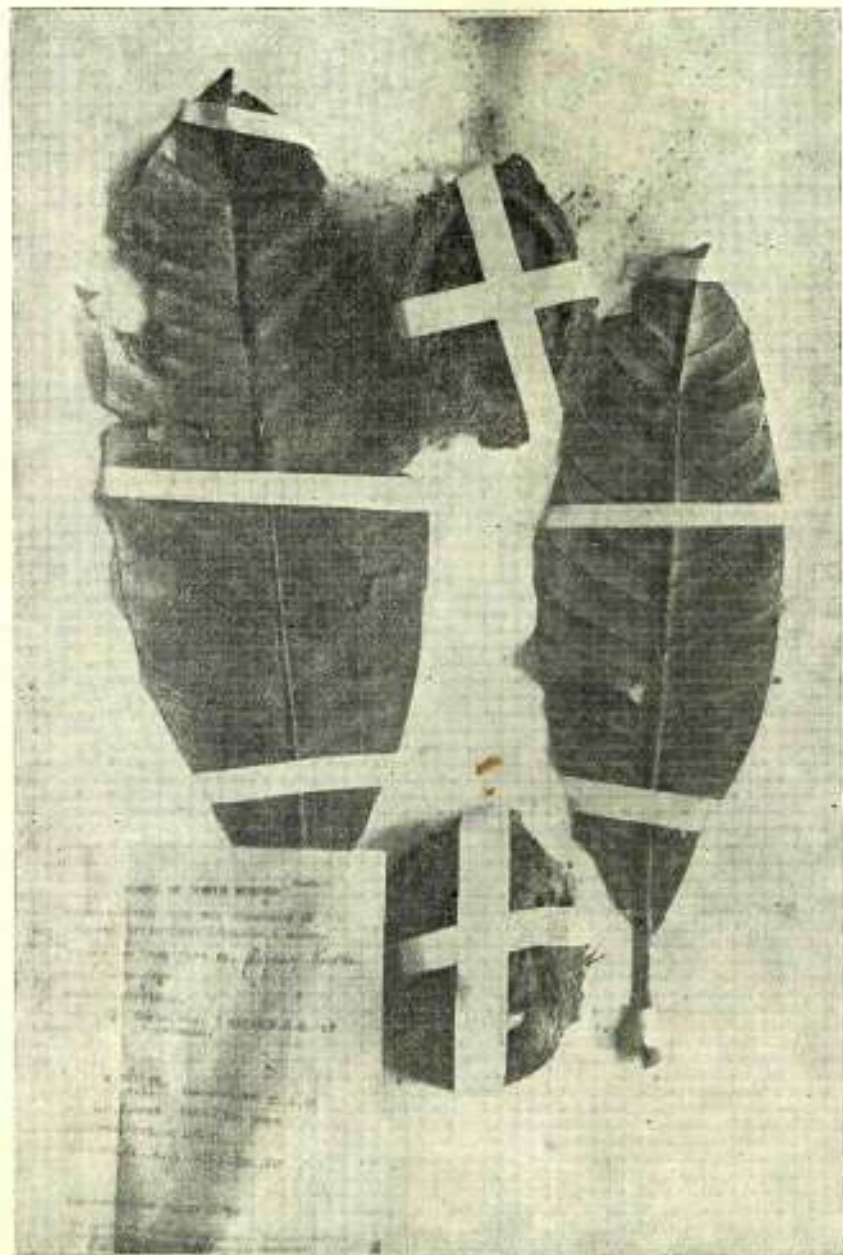


Fig. 1 b. — *Mangifera pajang* Kosterm.

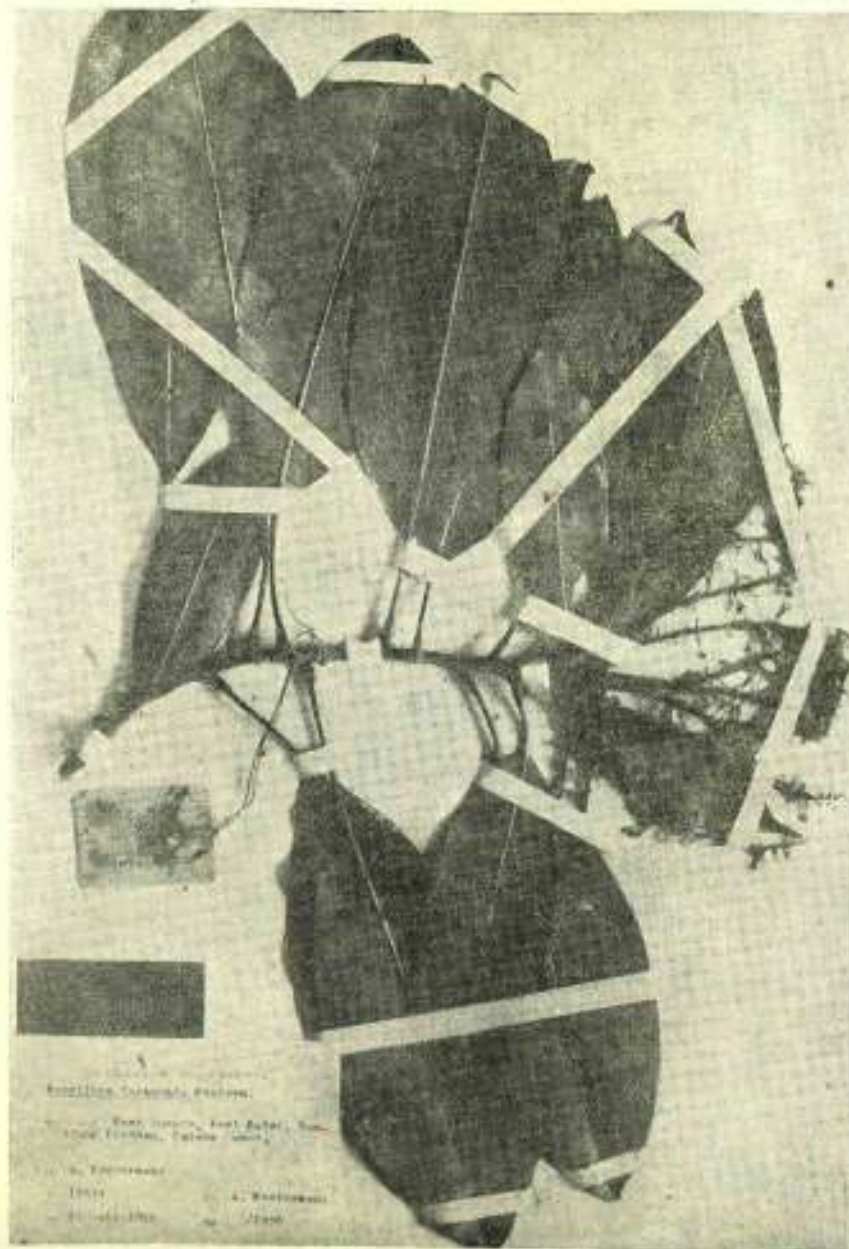


Fig. 2. — *Mangifera torquenda* Kosterm.



Fig. 3. — *Beilschmiedia glabra* Kosterm.; after *Kostermans 7313*; flowering-branch; flower (X 10); inner stamen, staminode, ovary (x 20).



Fig. 4. — *Beilschmiedia dictyoneura* Kosterm.

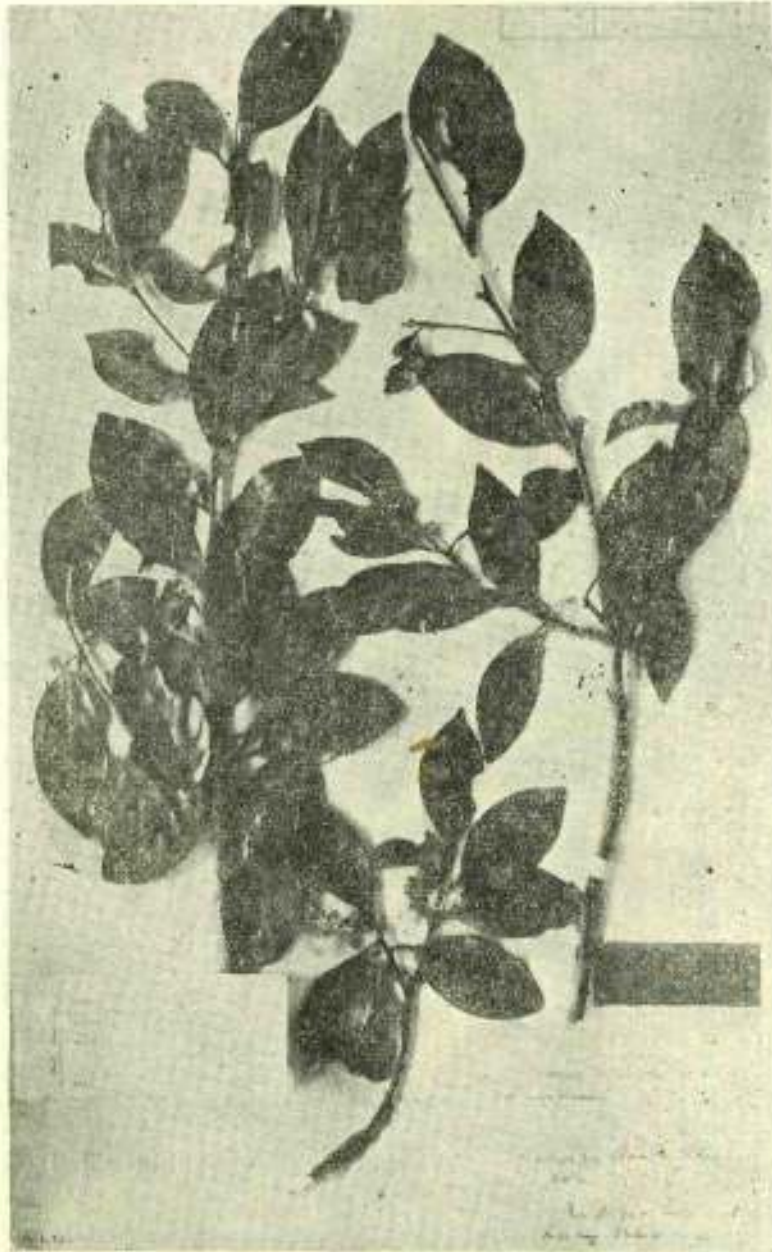


Fig. 5. — *Beilschmiedia bangkai* Kosterm.

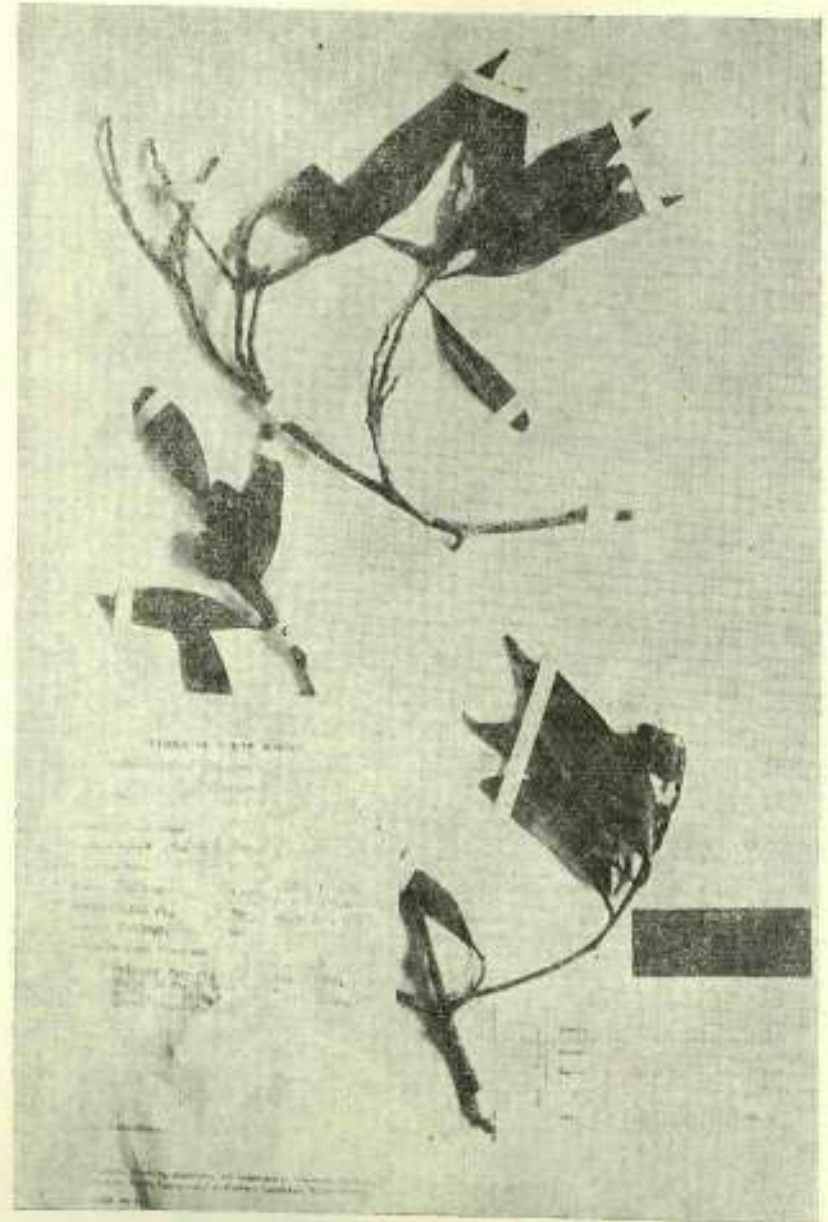


Fig. 6. — *Beilschmiedia montanoides* Kosterm.

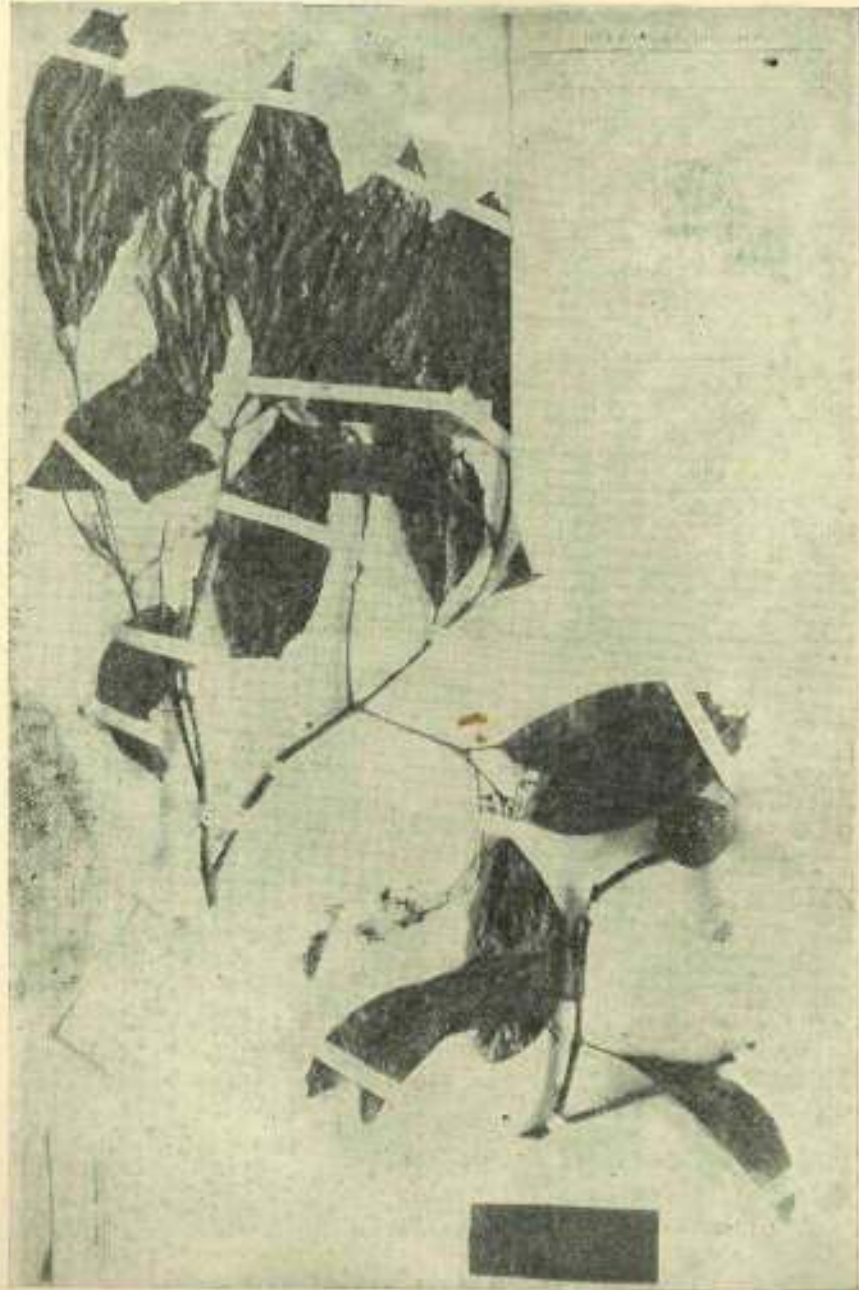


Fig. 7. — *Beilschmiedia rivularis* Kosterm.



Fig. 8. — *Endiandra ochraeea* Kosterm.

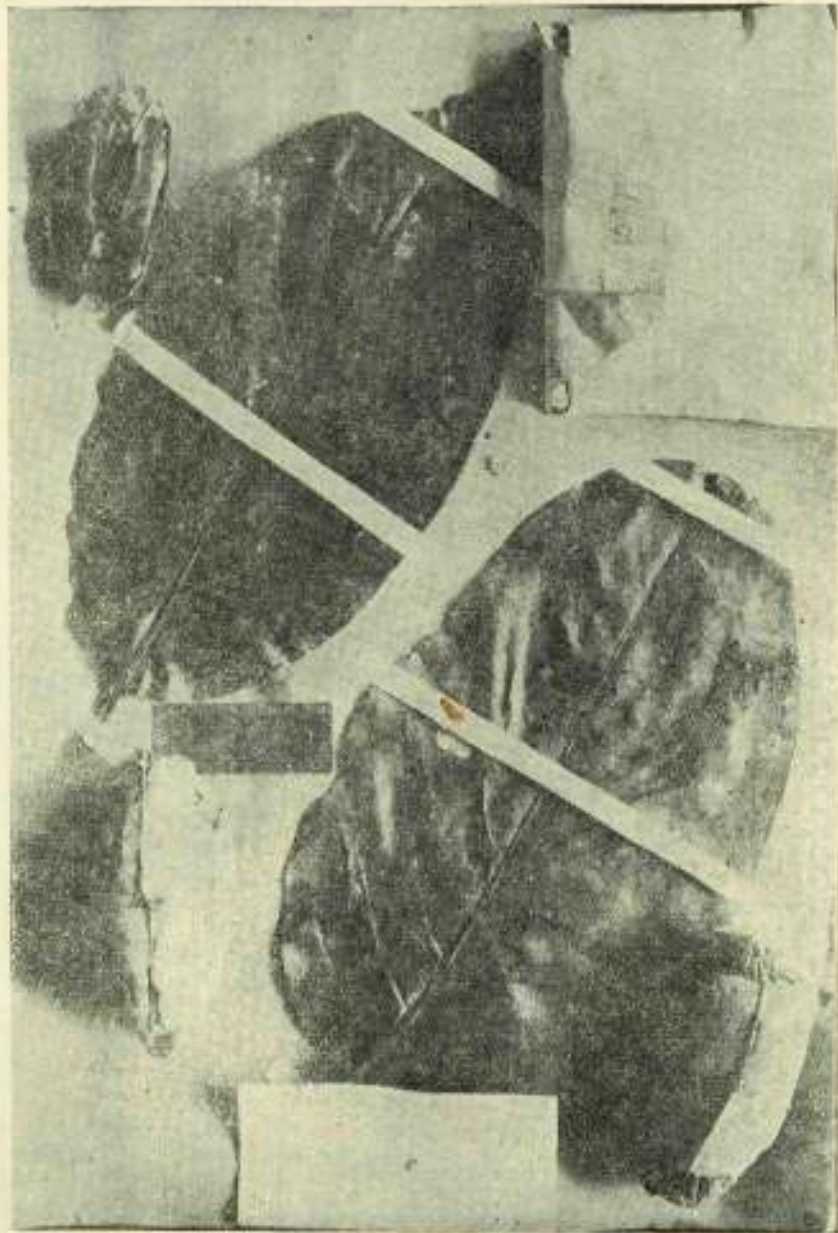


Fig. 9 a. — *Endiandra magnilimba* Kosterm.

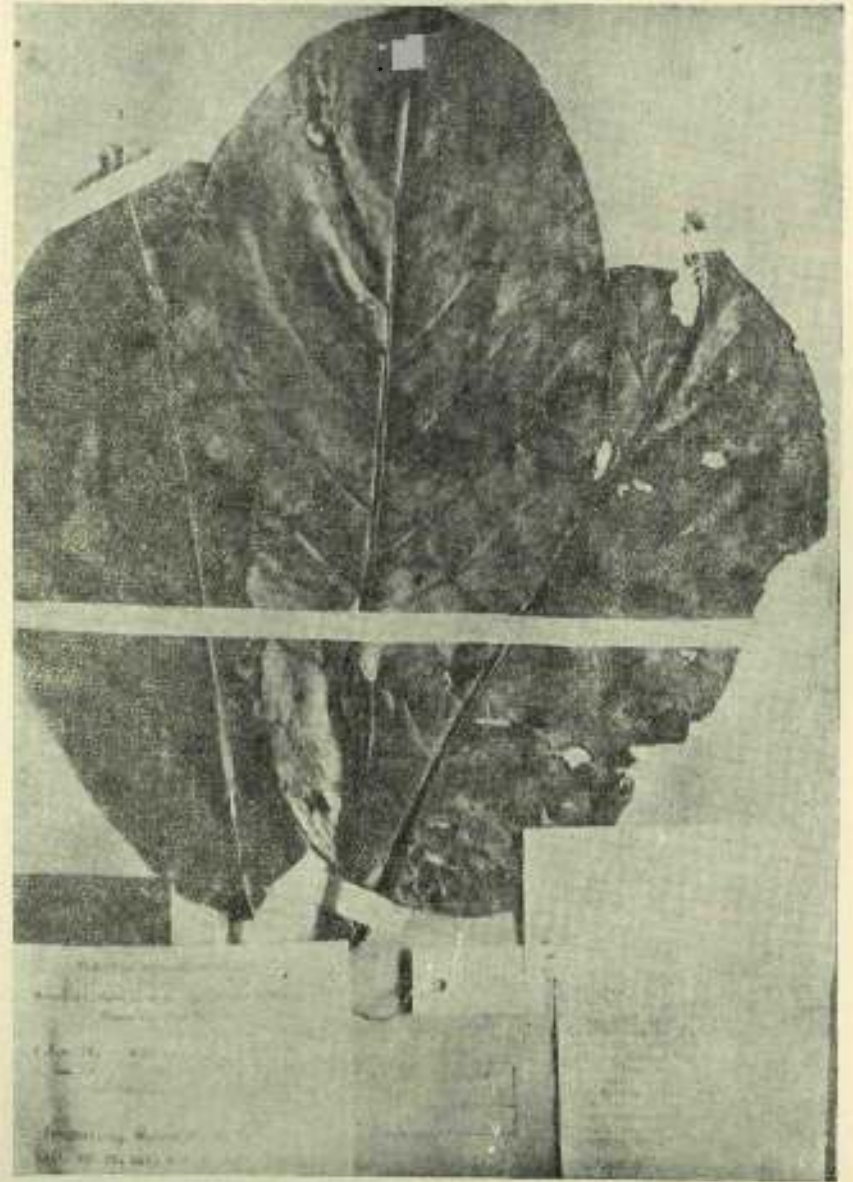


Fig. 9 b. — *Endiandra magnilimba* Kosterm.

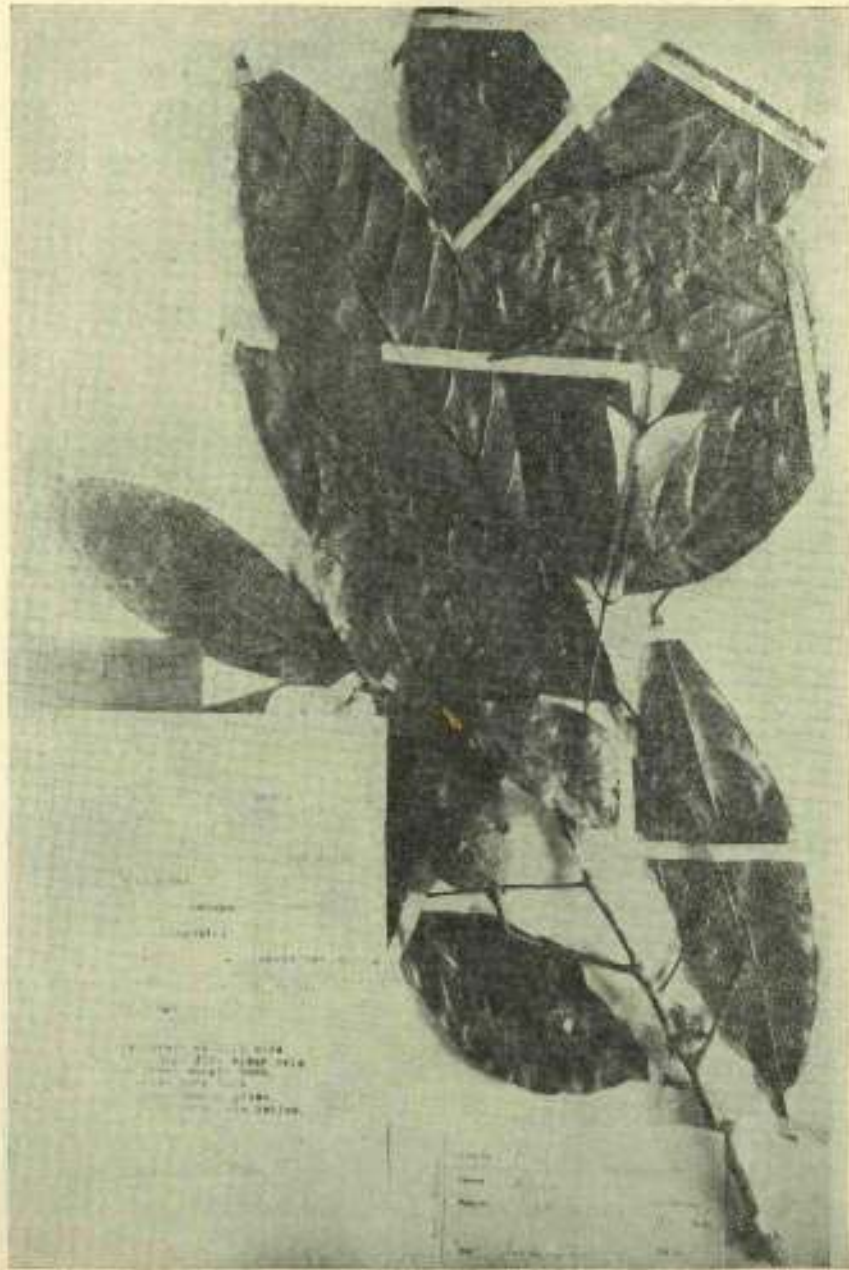


Fig. 10. — *Aphanainixis reticulata* Kosterm.

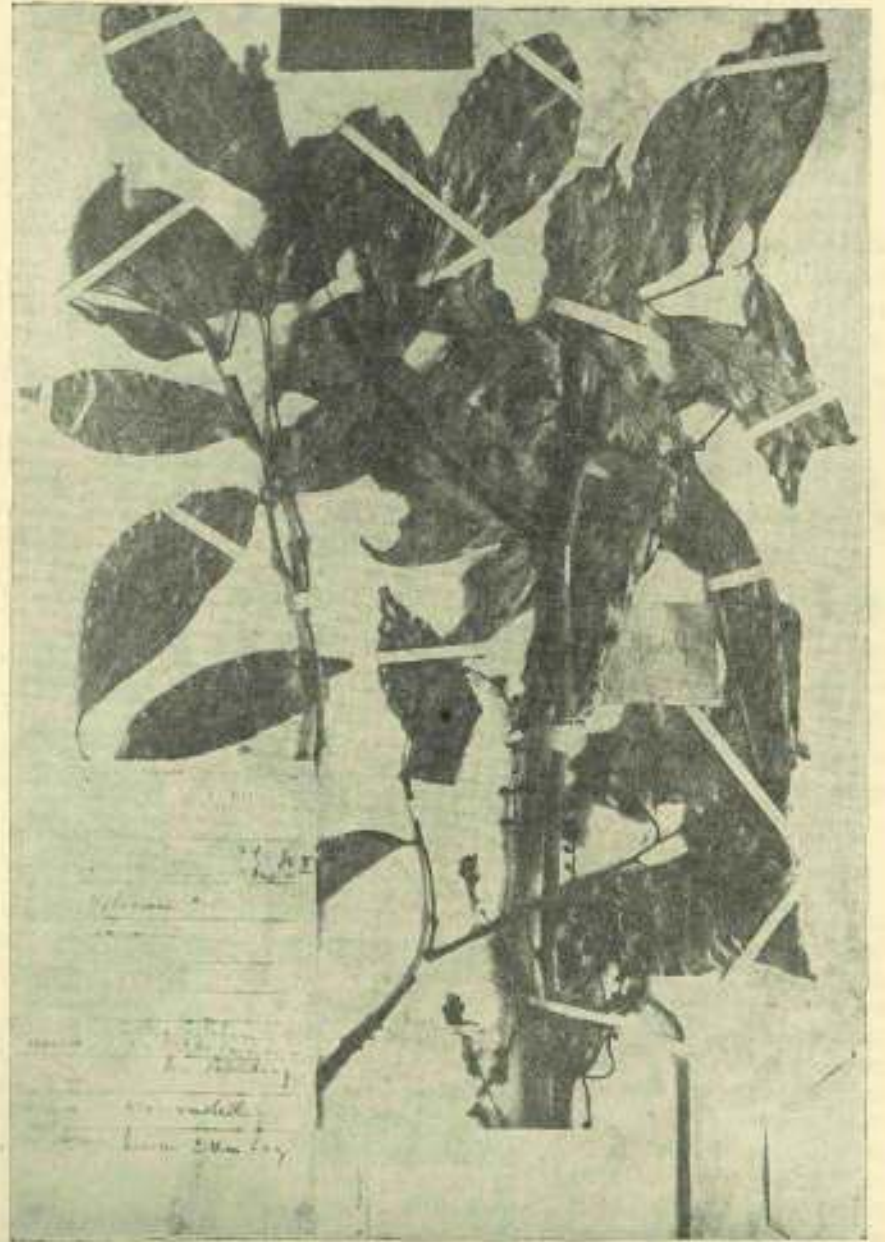


Fig. 11. — *Lansium pedicellatum* Kosterm. — Holo-typus.

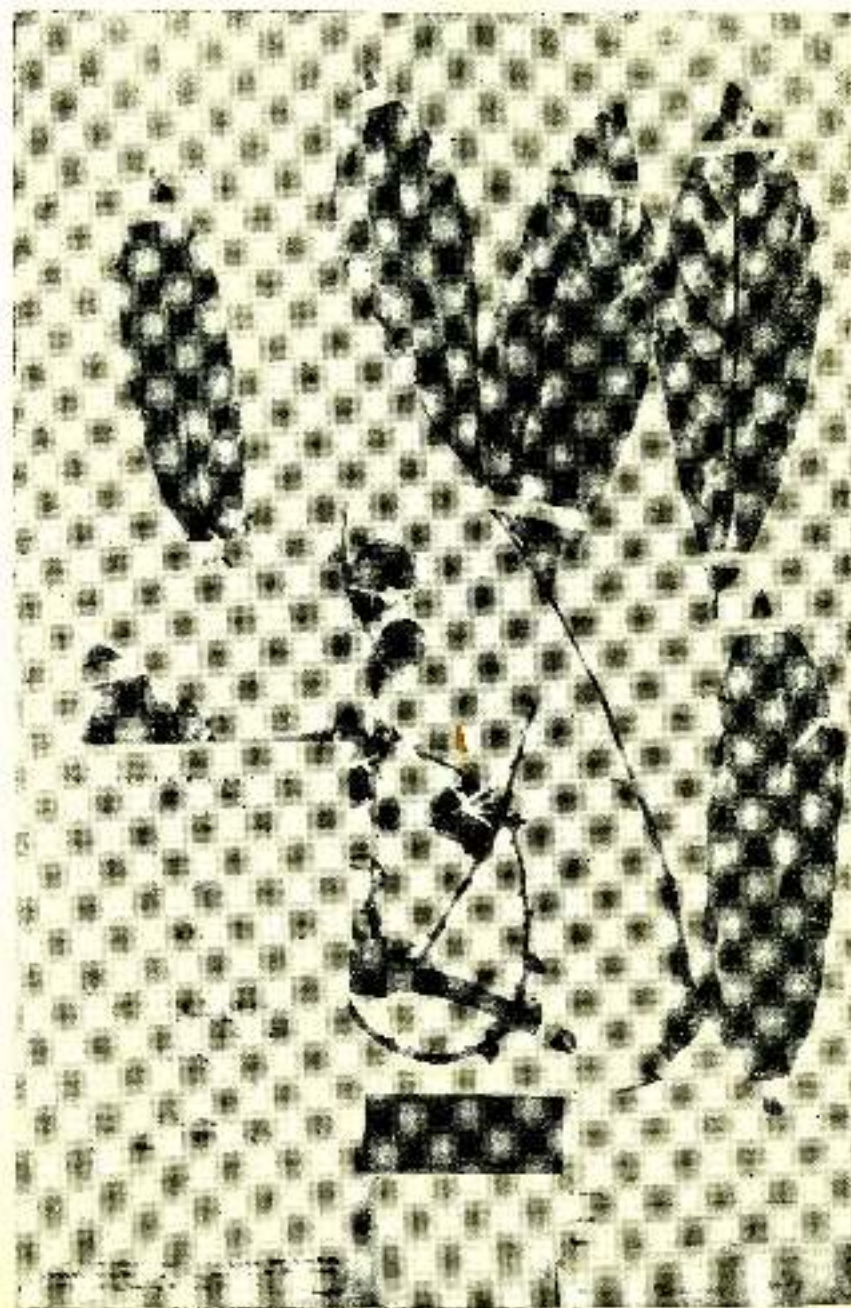


Fig. 12. — *Lumnitzera sepaliensis* Kosterm.

NEW SPECIES OF *PARINARI* Aublet (Rosaceae-Chrysobalanoideae).

by

A.J.G.H. KOSTERMANS *)

The following is an account and description of new species of Asiatic and one Fijian species of *Parinari* Aublet, originally intended to be included into a forthcoming monographic treatment of the Asiatic *Parinari* species.

Dr. Yan Franco (New York Botanical Garden) has informed me, that his revision and new classification of genera of the Chrysobalanoideae will be published soon and consequently I have deferred the publication of my monograph to a later date.

The species here are treated in a conservative way and described as belonging to the genus *Parinari* sensu lato; between brackets I have added the section to which the species belongs.

1. *Parinari* (§ *Eu-Parinari*) *argenteo-sericea* Kosterm., spec. nov.—Fig. 1

Arbor ramulis globosis foliis chartaceis glabris ellipticis vel oblongis basi rotundatis, apice breviter acuminatis, nervo medio supra impresso, subtus prominentibus, costis 11—15 paribus; petiolis brevibus; stipulis lanceolatis acutis caducis; paniculis pendente albo-sericeo-tomentosis, tomento sub-adpresso, floribus gracilibus, staminibus fertilibus 7—8, stylis aequilongis.

TYPE: SAN 16175 (BO)

Tree 25—33 m tall and 25 cm and more in diam.; bark lenticellate, brown; outer bark hard; inner bark red, hard, 1.2 mm thick; cork cambium red; cambium yellow; branchlets dark purplish brown with numerous pale tiny lenticells, glabrous. Leaves glabrous, chartaceous, elliptic to oblong or subovate-elliptic, 4.5 × 9.5 to 7 × 20.5 cm, base rounded, apex shortly, often obscurely acuminate; upper surface glossy, midrib impressed (except for its basal 1—4 mm which shows protruding tissue from the petiole), lateral nerves filiformous, reticulation prominent or inconspicuous; lower leaf surface dull, paler, lateral nerves 11—15 pairs, erect-patent (the lower ones patent), secondary nerves rather lax, prominent; base of leaf below near the petiole insertion rarely with glandular tissue. Stipules lateral, lanceolate (base 2 mm wide), acute, adpressed strigose, especially along its midline outside, 8 mm long, early caducous. Petiole 5—9 mm, glandless.

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