

REINWARDTIA

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A MONOGRAPH OF THE GENUS *NEESIA* * Blume (Bombacaceae)

SOEPADMO **

SUMMARY

- 1) Eight species are described: *N. altissima*, *synandra*, *glabra*, **kostermansiana**, *malayana*, *purpurascens*, *piluliflora* and *strigosa*.
- 2) *N. kostermansiana* is a species new to science.
- 3) *N. glabra* and *synandra*, formerly included in *N. altissima* are reinstated as distinct species.
- 4) The area of distribution of the genus covers Lower Siam, the Malay Peninsula, Sumatra, Java and Borneo, with Borneo as centre.

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INTRODUCTION

The generic name *Neesia* was founded by Blume in 1828 (Fl. Jav., l.c.), as a new name for the genus *Esenbeckia* which he had described in 1825 but which was a later homonym; its single species was *A.^r altissima* (Bl.) Bl.

In 1874 Masters added *N. synandra* from Malacca, and in 1875 a third species, *N. strigosa* from Borneo.

Beccari added three new species from Borneo: *N. ambigua*, *glabra*, and *purpurascens* in 1889, and segregated the specimen P.B. 2037 from *N. strigosa* as *N. piluliflora*.

Name d after Th. Fr. L. Nees von Esenbeck (1787—1837).

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Bakhuizen v.d. Brink Sr. (1924) described one new species, *IV. malayana*, from Sumatra and the Malay Peninsula; he reduced *IV. synandra* Mast., *N. ambigua* Becc. and *IV. glabra* Becc. to the synonymy of *IV. altissima* Bl.

Furtado (1929) reinstated *IV. synandra* as a proper species.

The genus *Neesia* is closely allied to *Coelostegia*, *Durio* and *Kostermansia*. The alliance of these four genera has been discussed by Soengeng (in *Reinwardtia* 5 (3): 271—272. 1960). Kostermans in his monograph of *Durio* (in *Communication*, Forest Research Institute, Bogor 62: 2. 1958 and in *Reinwardtia* 4(3): 361. 1959) suggested the desirability of combining *Neesia* and *Coelostegia*, as *Neesia* differs only from *Coelostegia* by the presence of prurient hairs in its fruit-valves. Soengeng, on the contrary, advocates to keep the genera separate, until more material should be available and I believe too, that this is the best policy.

The differential characters of *Neesia* and *Coelostegia* are:

Neesia

1. Leaves with distinct, parallel, secondary nerves; lower surface glabrous or covered by stellate hairs or rarely sparsely covered by minute long-fimbriate scales.
2. Epicalyx completely enveloping the bud.
3. Calyx lobes neither saccate nor induplicate.
4. Corolla hypogynous.
5. Filament topped by one two-celled anther.
6. Ovary superior, covered by hirsute, stellate hairs.
7. Inside of the fruit-valves densely covered by brownish, hirsute, prurient hairs.

Coelostegia

1. Leaves without distinct, parallel secondary nerves; lower surface covered by scales.
2. Epicalyx reduced, subtending the calyx.
3. Calyx lobes induplicate, saccate.
4. Corolla subperigynous.
5. Filament topped by three, one-celled anthers.
6. Ovary partly embedded in the receptacle, covered by peltate scales.
7. Inside of the fruit-valves glabrous.

From the specimens examined, I am convinced that each filament is topped by one anther, and that the anthers are two-celled, not one-celled as assumed by Bentham & Hooker f. and Baillon. The ovules are biseriate, not uniseriate as contended by Endlicher and Miquel;

The indumentum of the young branchlets and leaves is very variable, it may consist of simple or of stellate hairs, or of fimbriate to long-fimbriate scales. It is, therefore, not advisable to use this character to distinguish between the young specimens, as both types of hairs and scales are often found on the same specimen. In old leaves, however, the indumentum of

the lower surface becomes rather important, as this character is constant in some species.

Valuable characters for specific delimitation are the shape of fruit and calyx after anthesis.

The name *Neesia* Blume is conserved against *Neesia* Sprengel (Compositae, 1818).

NEESIA Blume (nomen. gen. conserv.)

Neesia Blume, PL Java 1: vii, in nota, 1828; in Nov. Act. Caes. Leop. Car. 17 (1a): 75—84. 1835; Endlicher, Gen. Pl. 990. 1840; Griffith, Not. PL As (4): 513. 1854; Miquel, Pl. Ind. batav. 1(2)2: 206. 1859; Bentham & Hooker f., Gen. PL 1: 213. 1862; Baillon, Hist. PL 4: 159. 1872; Masters in Hooker f., Fl. Brit. Ind. 1: 352. 1874; in 3. Linn. Soc. Bot. 15: 503. 1875; Beccari, Malesia 3: 259. 1889; Boerlage, Handl. Fl. Ned. Ind. 1: 119. 1890; King in J. As. Soc. Bengal 60(2): 55. 1891; Schumann in Engler & Prantl, Nat. Pfl. Fam. 3(6): 68. 1895; Koorders & Valetton in Med. 's Lands Plantentuin Buitenzorg 14: 128. 1895; De Dalla Torre & Harms, Gen. Siphon.: 310. 1901; Backer, Schooffl. Java 133. 1911; Ridley, Fl. Mai. Pen. 1: 265. 1922; Bakhuizen v.d. Brink Sr. in Bull. Jard. bot. Buitenzorg 3, 6: 220 & 245. 1924; Lemée, Diet. descr. Genres 4: 664. 1932; Burkill, Diet. econ. Prod. Mai. Pen. 2: 1537. 1935; Corner, Wayside Trees Mai. 1: 433. 1951.

Esenbeckia Blume, Bijdr. Fl. Ned. Ind., 3de Stuk 118. 1825, non *Eseubeckia* H.B.K. 1825.

Blumea Rchb., Consp. 209. 1828, non Nees 1823.

Cotylephora Meissner, Gen. Comm. 28. 1837.

TYPE SPECIES — *N. altissima* (Bl.) Bl.

Trees, branchlets stout, glabrous, or covered by stellate hairs or by minute fimbriate scales, leaf-scars protruding. Leaves simple, alternate, crowded at the apex of the branchlets, penninerved; nerves patent, parallel, running out arcuately, impressed on the upper surface and prominent on the lower surface. Petioles cylindrical, thickened at apex and base. Stipules extrapetiolar, caducous or long-persistent. Inflorescences generally cymose, axillary, subtended by caducous bracts, covered by stellate hairs and long-fimbriate scales. Buds conical or ovoid-globose. Epicalyx before anthesis completely covering the bud, at anthesis splitting into 2—5 valvate lobes, after anthesis bell-shaped or campanulate, outside lepidote, inside glabrous or in some species pubescent, soon caducous. Calyx monophyllous, coriaceous, before anthesis cone-shaped or ovoid-globose, in some species umbonate; after anthesis with a circular, irregularly crenulate apical orifice, sometimes becoming disk-like, the disk with or without incurved margin, outside lepidote (the scales are larger than those on the epicalyx), inside glabrous or partly pubescent. Corolla hypogynous, calyptriform, consisting

of 5 free or rarely agglutinate, obtuse petals; aestivation imbricate, slightly contort; the entire corolla soon caducous; petals alternating with the epicalyx lobes. Stamens numerous, filaments glabrous, filiform, unequal in length, connate at the base only or forming a more or less well-developed staminal tube for half of their length, the upper free part in 5 bundles, alternate with the petals. Each filament with one two-celled anther. Anthers reniform or subglobular, versatile, cells parallel, separate, longitudinally dehiscent. Ovary ovoid, pentangular, 5-celled, sessile, covered by hirsute, stellate hairs, septa alternating with the petals. Ovules anatropous, 5—12 in each cell, biseriate, placentation axillary, ascendant; style one, short, conical or filiform; stigma capitellate, small, rounded or subpentagonous. Fruit capsular, ovoid or ellipsoid, woody, 5-angular, 5-celled, almost completely loculicidally dehiscent into five valves; valves concave, outside muricate-tesselate, inside densely covered by light-brown, hirsute, prurient hairs. Seeds subhorizontal, alternate on both side of the septae, ellipsoid, smooth, subtended by a reddish-brown, thick caruncle. Cotyledons foliaceous, ovate, base emarginate, penninerved, enveloped by the two flat-convex parts of the endosperm. Radicle short, conical, fleshy, basal.

DISTRIBUTION — Lower Siam, the Malay Peninsula, Sumatra, Java and Borneo; the centre is found in Borneo.

HABITAT — Confined to humid primary forest, from sea level up to 1800 m altitude; on all kinds of soils.

KEY TO THE SPECIES

- | | |
|---|-----------------------------|
| 1. a. Calyx after acthesis disk-like. | 2 |
| b. Calyx after anthesis not disk-like. | 7 |
| 2. a. Lower surface of adult leaf glabrous. | 3 |
| b. Lower surface of adult leaf pubescent. | 4 |
| 3. a. Buds conical. Style filiform. | 5 |
| b. Buds ovoid-globose or obovoid. Style conical. | 6 |
| 4. a. Leaves 6—12 X 3—5 cm. Calyx concave. | 6. <i>N. purpurascens</i> |
| b. Leaves 35—60 X 16—24 cm. Calyx flat. | 2. <i>N. synandra</i> |
| 5. a. Stipules 1—15 X 0.5—0.7 cm. Fruit-valves areolate, glaucous. | 5. <i>N. malayana</i> |
| b. Stipules 2—6 X 0.5—3 cm. Fruit-valves tuberculate, not glaucous. | 4. <i>N. kostermansiana</i> |
| 6. a. Epicalyx campanulate, buds ovoid-globose. Stipules 2—4 x 0.2—1 cm | 1. <i>N. altissima</i> |
| b. Epicalyx bell-shaped, buds obovoid. Stipules 3—9 X 1.5—3 cm | 3. <i>N. glabra</i> |
| 7. a. Fruit ovoid, rounded. | <i>S. N. strigosa</i> |
| b. Fruit ellipsoid, acute. | 7. <i>N. piluliflora</i> |

NEESIA ALTISSIMA (Bl.) Bl. — Fig. 1—2

Xcesia altissima Blume in Nov. Act. Caes. Leop. Car. 17(la) : 83, t. 6. 1835; Walpers, Rep. 1: 331. 1842; Hasskarl in Tijdschr. Nat. Gesch. en Phys. 12: 125. 1845; Miquel, Fl. Ind. batav. 1(12) 2: 207. 1859; De Sturler, Beschrijv. Houtsoorten Ned. O. Ind. 41. 1866; Masters in J. Linn. Soc. Bot. 14: 504. 1875; Beccari, Malesia 3: 261. 1889; Schumann in Engler & Prantl, Nat. Pfl. Fam. 3(6): 68, f. 36 A—C. 1895; Koorders & Valetton in Med. 's Lands Plantentuin Buitenzorg 14: 129. 1895; Jansso-nius, Mikrogr. Holzes 1: 408, f. 52. 1906; Backer, Schoolfl. Java 133. 1911; Bakhuizen v.d. Brink Sr. in Bull. Jard. bot. Buitenzorg 3, 6: 221 & 246. 1924, p.p. (excl. *N. glabra* Becc. and *N. synandra* Mast.); Den Berger in Med. Proefst. Thee, Java 97: 112. 1926; Hej-ne, Nutt. Plant. Ned. Ind., ed. 2, 2: 1058. 1927; ed. 3, 1: 1058. 1950; Furtado in Gard. Bull. S.S. 4: 424. 1929, p.p. (excl. *N. glabra* Becc. and *N. synandra* Mast.); Bur-kill, Diet. econ. Prod. Mai. Pen. 2: 1538. 1935. — *Esenbeckia altissima* Blume, Bijdr. Xed. Ind., 3de Stuk. 119. 1825. — *Thespesia altissima* (Bl.) Sprengel, Syst. Veg. 4(2) : 257. 1827. — *Corylephora altissima* (Bl.) Meissner, Gen. Comm. 28. 1837. — *Blume s.n.* (L).

Payena nigropunctata Buick in Ann. Jard. Buitenzorg 5: 53. 1886. — *Teijsmann s.n.* (BO).

Neesia ambigua Beccari, Malesia 3: 261. 1889; Merrill in J. Str. Br. Roy. As. Soc., Special Number 377. 1921. — *Beccari P.B. 3087* (FI).

Tree up to 40 m tall, 120 cm in diam.; bark slightly fissured, cracked, greyish-brown; living bark 0.8 cm, brownish-red. Sapwood dirty white, heart-wood brown. Branchlets lenticellate, glabrous or sparsely covered by fimbriate scales, in young plants densely covered by yellowish hirsute, stellate hairs. Leaves coriaceous, oblong or obovate-oblong, (10—) 35—40 (—50) x (6—) 10—15 (—20) cm, emarginate or truncate (in young plants acute), base gradually attenuate, truncate or cordate, margin sometimes slightly undulate and in young plants with stellate hairs or fimbriate scales; nerves 15—20 pairs; upper surface glabrous or sparsely covered by stellate hairs and fimbriate scales, mainly on the nerves; lower surface light green (fresh), glabrous or sparsely covered by fimbriate scales; nerves glabrous or covered by minute fimbriate scales. Leaves of young specimens with stellate or simple hirsute hairs all over. Petioles 4—11 cm, 0.3—0.5 cm in diam., glabrous or sparsely covered by minute fimbriate scales. Stipules caducous, coriaceous, linear-lanceolate, 2—4 x (0.2—) 0.3—0.5 (—1) cm, base truncate, apex acute or slightly emarginate, pale green (fresh); young ones with a dense layer of minute fimbriate scales and stellate hairs on both surfaces, glabrescent. Inflorescence cymose, much-branched, multi-flowered, densely scaly, 2—5 cm long, as a rule in the axils of fallen leaves. Peduncle terete or angular, 1—2 cm, 0.5—1 cm thick; pedicels 1—1.5 cm, 0.3—0.5 cm thick. Bracts caducous, ovate, 0.5—0.8 x 0.3—0.4 cm, acute, base truncate, outside covered by brownish, minute, long-fimbriate scales, inside stellate-

tomentose. Epicalyx campanulate, with three concave, ovate obtuse lobes, up to 1 cm and 1 cm in diam.; outside covered by minute brownish fimbriate scales, inside stellate-tomentose. Bud ovoid-globose, truncate, at first convex, later concave and umbonate-mammillate, 1—1.5 cm in diam. Calyx disk-like, 2—3 cm in diam., margin circinnately incurved; inside red-brown (fresh, Blume), glabrous or stellate-tomentose, outside brownish, scaly. Petals free, elliptic-oblong, base truncate, 1.5—1.7 x 0.3—0.5 cm; outside densely covered by yellowish-brown stellate hairs, apical part pink, base dirty white (fresh, Blume); inside glabrous. Stamens ca 25; filaments 0.6—0.8 cm, connate at the very base, pale straw-coloured (Blume); anthers reniform, yellowish (Blume), ca 0.1 cm in diameter. Ovary ovoid-conical, 0.8—1 cm, apex pink (Blume), gradually merging into the conical, angular, 0.14 cm, glabrous or sparsely stellate-haired style; stigma capitellate, greenish (Blume); ovules ellipsoid, 0.01—0.04 cm, 0.01—0.02 cm in diam., 10—12 in each locule. Fruit ovoid-globose, 15—20 cm, 10—15 cm in diam., acute, base with a short neck; valves outside muriccate-tuberculate. Stalk cylindrical, woody, ca 2—3 cm, 1—1.5 cm in diam. Seeds ellipsoid, compressed, 2—3 x 1—1.2 cm, blackish, glossy, smooth.

VERNACULAR NAMES — Bungan (Blume, Java), Bengang or Ki Bengang (Java, sometimes also in Sumatra); Punggai, Durian antu (Sumatra).

DISTRIBUTION — Malay Peninsula, Sumatra, W. & C. Java and Borneo.

HABITAT — Primary forest, alt. 100—1800 m.; sometimes quite common (Mt. Pajung, Ujungkulon).

USE — Timber not durable. A decoction of the fruit's valves mixed with other diuretic substances is used against gonorrhoea (Burkill).

Although, this species is closely related to *N. synandra* Mast., I believe like Furtado, that it is different, as elucidated below:

A.^f synandra

1. Adult lower leaf-surface densely stellate-haired.
2. Bud slender, rounded.
3. Calyx flat, margin erect.
4. Filaments connate into a tube for half of their length.
5. Fruit obtuse.

N. altissima

1. Adult lower leaf-surface glabrous or sparsely covered by long-fimbriate scales and stellate hairs, mainly on the nerves.
2. Bud broad, concave, umbonate.
3. Calyx concave, with circinnately incurved margin.
4. Filaments only connate at the very base.
5. Fruit acute.

Bakhuizen had reduced *N. ambigua* and *N. glabra* to the synonymy of *N. altissima*. Of *N. ambigua* I could only examine a sterile fragment of the type specimen; from this material it is not possible to differentiate it from *N. altissima*. According to Beccari the fruit of *N. ambigua* matches that of *N. altissima*.

N. glabra is a distinct species. It differs from *N. altissima* by its very large, up to 9 cm long stipules, obovoid buds and bell-shaped epicalyx.

Hasskarl (1855) misidentified the Teijsmann (*s.n.*) specimen, collected from Banten, with the vernacular name "Karet Kehalan" (a misspelling of "Karet Kihelang", cf. label), as a Sapotoceous species. Burck accepted Hasskarl's contention and described the specimen as *Payena nigropunctata*. Koorders & Valeton reduced it to *N. altissima*.

MALAY PENINSULA. Perak. S. Krian Estate, ster., *S.F.N.* 36737 (BO, SING); Perak R., Aug., ster., *S.F.N.* 963 (SING).

SINGAPORE. Seletar Road, near 10th mile, May, ster., *Corner s.n.* (SING).

SUMATRA. Atjeh. Gajo, Lueus, Mt. Agosan, alt. 1800 m, Aug., ster., *bb.* 32402 (A, BO, BZF, L, SING). W. Coast. Old Agam, alt. 1300 m, Pebr., ster., 66.2929 (BO, BZF, L); Pajakumbuh, Mt. Sago, alt. 1000 m, May, ster., *Maradjo* 5 (L); Padang Upper Lands, Solok, Supajang, ster., *s. coll., s.n.* (BO); *ibid.*, Lubuk Selasih, alt. 1000 m, April, ster., *bb.* 5501 (BO, BZF, L, W); Benkulu. Redjang Lebong, Apr., ster., 66.2956 (BO, BZF); Redjang, N. slope of Mt. Batu Kaba, alt. 1700 m, ster., *Endert* 1055 (BO, BZF, L); East Coast. Bandarbaru, alt. 850m, Jan., fr., *Lorzing* 7035 (BO); Riau. Lingga, Febr., ster., *bb.* 17263 (BO, BZF); Palembang, Febr., ster., *Bum-man v. Vreeden* 195 (BO).

JAVA. W. Java. Banten. Mt. Karang, Pulosari, Tjiudjan, alt. 1050 m, June, ster., *Koorders* 1,590 (BO, L); Tjamara, Tjiringin, Mt. Pangisisan, alt. 10—200 m, July, fl., *Koorders* 4592 (BO, L); Mt. Hondje, alt. 100 m, Sept., ster., *Kostermii* *s.n.* (BO); Tjitoreh, Muntjang, alt. 500 m, fr., *Backer* 1841 (BO); Bogor. Leuwiliang, Mt. Tjiputih, alt. 500 m, Aug., fr., *Bakhuizen v.d. Brink Sr.* 6000 (BO); near Tjiampea, Tjiteureup R., alt. 500 m, May, fr., *Bakhuizen* 5503 (BO, K, L, PNH, US); near Nangela, S.W. Puraseda, Febr., ster., *Bakhuizen* 7081 (BO, L); Nangela, along Tjiteureup R., March, fl., *Bakhuizen* 7621 (BO, L); *ibid.*, alt. 600 m, Apr., fl., *Bakhuizen* 5884 (B, BO, BRI, CAL, G, K, L, P, PNH, SING, U, UC); Pasir Sireungit, Estate Bolang, alt. 600 m, June, ster., *Bakhuizen* 6415 (BO); Bolang, alt. 700 m, July, ster., *Van Steenis* 5037 (BO); *ibid.*, May, fr., *Docters v. Leeuwen* 7902 (BO); Pasir Tjihideung, Estate Bolang, alt. 600 m, June, seedling, fr., fl., *Bakhuizen* 6392 (BO, L, U); Mt. Salak, alt. 1000 m, May, ster., *Koorders* 33278 (BO, L); *ibid.*, *Zippelius* 7018 (BO); Mt. Pantjar, alt. 500 m, Dec, ster., *Dakkus* 61 (BO, K, L, PNH, SING, U, UC, WAG); Mt. Kembang, July, ster., *Ja* 5356 (BO, BZF); Sukabumi, Mt. Gede, Pasir Tangkil, alt. 800 m, Febr., ster., *Ja* 3138 (BO, BZF, PNH); Tjiparaj, alt. 1200—1400 m, Febr., ster., *Ja* 3169 (BO, BZF); Sanggrawa, Djampang-Kulon, alt. 400 m, July, ster., *Koorders* 4593 (BO), et 8205 (BO); Tjiandjur, Takoka, Djampang Wetan, alt. 1100m, March, ster., *Koorders* 12038 (BO, L), et 12039 (BO); et 12040 (BO, L), et 32759 (BO), et 39597 (BO); *ibid.*, March, fl., *Koorders* 15219 (BO, L); *ibid.*, Oct., ster., *Koorders* 25574 (BO, L); *ibid.*, Apr., ster., *Koorders* 4588 (BO), et 4589 (BO); Tjiemas, July,

fr., *Kartamah s.n.* (BO); Tjirengkas R., alt. 950m, July, ster., *Backer 14952* (BO); Tjadas Malang, near Tjidadap, Tjibeber R., alt. 1000 m, Oct., ster., *winckel 1682* (BO, L); *Culta* in Hort. Bogor., sub no. XVI. 19—19a, Apr., fl., *Koorders 15045* (BO); Priangan. Tasikmalaja, Pendjalu, alt. 720 m, July, fr., *Koorders 47801* (BO). Central Java. Bandjarnegara, Pringombo, alt. 700—1000 m, Nov., ster., *Koorders 4515* (BO, L); *ibid.*, alt. 800 m, Aug., ster., *Koorders 33786* (BO); *ibid.*, alt. 1000 m, Sept., fr., *Koorders 21917* (BO, L); *ibid.*, alt. 1000 m, Nov., ster., *Koorders 4594* (BO, L); *ibid.*, alt. 1000 m, Oct., ster., *Koorders 21906* (BO, L); *ibid.*, alt. 1000 m, Apr., ster., *Koorders 27183* (BO, L); Mt. Kapal, Pandanarum, alt. 700—900 m, Nov., ster., *Koorders 11139* (BO, L).

BORNEO. Sarawak. Kuehing, June, fr., *Beccuri P.B.3087* <FI, K>, type of *N. ambigua* Becc.

2. NEESIA SYNANDRA Mast. — Fig. 3—4

Neesia synandra Masters in Hooker f., Fl. Brit. Ind. 1 (2) : 352. 1874; IM J. Linn. Soc. Bot. 14: 504. 1875; Beccari, Malesia 3: 263. 1889; King *hi* J. As. Soc. Bengal 60 (2) : 56. 1891, p.p. (quoad specim. *Maingay 1516*); Ridley in J. Str. Br. Roy. As. Soc. 33: 51. 1900, p.p. (quoad specim. *Ridley s.n.*, anno 1890, 1904, 1908); Fl. Mai. Pen. 1: 265. 1922, p.p. (quoad specim. *Forest guard 3* et *Maingay 1516*); Merrill in 3. Str. Br. Roy. As. Soc. 86: 328. 1922; Furtado in Gard. Bull. S.S. 4: 422. 1929. — *Maingay 1516* (K).

Tree up to 30 m tall, 70 cm in diam. Buttresses up to 2 m high, 50—100 cm out. Bark dark-brown, smooth or superficially cracked, peeling off; strips 1 cm wide, hard. Living bark 1.2 cm dark-brown, outside red. Sapwood dirty white, heartwood light-brown. Branchlets stout, lenticellate, the leaf-bearing part covered by fimbriate scales and stellate hairs. Leaves chartaceous-coriaceous, obovate-oblong or elliptical, 35—60 x 16—24 cm, emarginate, base truncate or cordate; upper surface sparsely covered by stellate hairs and long-fimbriate scales, mainly on the nerves, lower surface densely covered by stellate hairs and long-fimbriate scales (especially on the main nerves); nerves 20—25 pairs. Petioles up to 10 cm, 0.7 cm thick, covered by minute, fimbriate scales or stellate hairs. Stipules coriaceous, ovate-lanceolate, 2—5 x 1—1.5 cm, acute, base truncate, outside densely lepidote, inside densely stellate-haired or sparsely covered by minute fimbriate scales. Inflorescence corymbose, or cymose to cincinnous, densely scaly, in the axils of fallen leaves. Peduncle 0.5—1.5 cm, 0.3—0.4 cm thick; pedicel 0.5—1 cm, ca 0.3 cm thick. Epicalyx bell-shaped, 0.5—0.7 cm in diam., 3-lobed, outside densely lepidote, inside glabrous. Bud conical. Calyx depressed, forming a flat disk of 1—1.5 cm in diam., margin erect, outside densely lepidote, inside glabrous. Petals free, lanceolate, ca 1 x 0.5 cm, acute, base truncate, outside densely stellate-tomentose, inside glabrous. Staminal tube 0.3—0.5 cm; anthers globular or reniform. Ovary ovoid, ca 0.5 cm; style conical, ca 0.2 cm, sparsely stellate-haired; stigma discoid, margin stellate-haired.

Very young fruit pentagonal, ellipsoid, pale-purple; ripe fruit ellipsoid-subglobose, obtuse, glaucous, ca 16 x 12 cm. Seeds ellipsoid, 1—2 cm, 0.5—1 cm in diam., smooth, blackish, rounded, base cuneate.

DISTRIBUTION — Malay Peninsula and Borneo.

HABITAT — In marshy lowland.

MALAY PENINSULA. Perak, fl., *Scortechini 1831* (BO, L, SING); Kedah. Kubang Pasau, Compt. 6, Perangin F.R., alt. 70 m, Febr., ster. *Key. 74801* (KEP); Penang, fl., *Maingay 1516* (K, L), type; Telok Bahang, Dec, ster., *Curtis 3081* (SING); *ibid.*, Febr., fl., *Burkill 4556* (K, SING, UC); Penara Bukit, March, fl., *Forest Guard 3* (SING); Batu Ferengi, s. coll., s.n. (BO); Trengganu. Dungun, Bukit Bauk F.R., Aug., ster., *Kep. 53368* (KEP); Selangor. Kuala Lumpur, Wild Hill, Febr., ster., *Hamid CF 2301* (SING); 20 miles from Ginting Simpah, Sept., fr., *Strugnell 13386* (SING); Johore. 23th mile Kota Tinggi-Jumaluang Road, May, ster., *Sinclair S.F.N. 40301* (KEP, SING).

SINGAPORE. Bukit Timah, Febr., fl., *Kiah S.F.N. 4585* (SING); *ibid.*, May, fl., *Sinclair s.n.* (BO, L); *ibid.*, alt. 300 m, Nov., fl., fr., *Holttum & Furtado 19788* (BO, SING).

BORNEO. Sandakan, fr., *Ramos 1540* (BO, US); Betottan, July, fr., *Boden Kloss 18989* (SING, US); Indonesian S. E. Borneo. Tidung, alt. 15 m, Aug., ster., *bb.17802* (BO, BZF, L, PNH); Berouw, Mt. Has Bungaan, alt. 300 m, Sept., fr., *Kostermans 13846* (BO, K, L); Balikpapan Distr., Mentawir R. region, Febr., fr., *Kostermans 10082* (BO).

3. *NEESIA GLABRA* Becc. — Fig. 5.

Neesia glabra Beccari, Malesia 3: 263. 1889; Merrill in J. Str. Br. Roy. As. Soc, Special Number 377. 1921. — *Beccari P.B.2276* (Fl).

Tree up to 40 m high, 80 cm in diam. Branchlets glabrous or sparsely lepidote or sometimes sparsely covered by stellate and simple hairs. Leaves oblong or oblong-lanceolate or obovate-oblong, 17—52 x 8—20 cm, chartaceous-coriaceous, acute, or rounded to slightly emarginate, attenuate towards the rounded base. Petioles 6—12 cm, 0.2—0.5 cm thick. Stipules foliaceous, ovate-lanceolate, 3—9 x 1.5—3 cm. Leaves, nerves, petioles and stipules glabrous or sparsely lepidote.

Cymes axillary, up to 15 cm; bracts ovate-concave, ca 0.5 x 0.4 cm, inside glabrous, outside sparsely lepidote. Epicalyx and calyx glabrous inside and densely lepidote outside. Epicalyx campanulate, ca 1 cm in diam. Bud obovoid, truncate or concave, mammillate, ca 1 cm in diam. Calyx disk-like, margin circinnately incurved. Petals agglutinate, in bud ca 0.7 x 0.5 cm, glabrous. Staminal tube ca 0.3 cm; anthers reniform, ca 1 cm. Ovary Ovoid, 0.5 cm, gradually merging into the conical, glabrous style; stigma capitellate, glabrous. Fruit unknown.

SUMATRA. A t j e h. Singkel, alt. 15 m, Dec, ster., 66. 6029 (BO, BZF); T a p a n u l i. Sibolga, alt. 15 m, Nov., ster., 66. 3794 (BO, BZF, L); Lapien, alt. 20 m, Febr., ster., 66. 3792 (BO, BZF, L); Manduamas, Pangkalan Tapus, low, Oct., ster., 66. 29589 (A, BO, BZF, L); Kobun, Dec, stev., *bb. 31004* (A, BO, BZF, L); Pondok Rotan, low, Oct., ster., 66.29553 (A, BO, BZF, L); W. Coast. Ophir, alt. 15 m, June, ster., 66.19833 (BO, BZF, L, PNH); E. Coast. Simpang Toba, alt. 30 m, Sept., ster., *bb.7159* (BO, L); Langkat, Nov., ster., *bb. 0374* (BO, BZF); Labuan Batu, low, Aug., ster., *bb.10349* (BO, BZF, L).

BORNEO. S a r a w a k. Mattang, July, fl., *Beccari P.B. 1990* (F1); *id.* 2276 (F1), type; Sept., fl., *Beccari P.B.2507* (F1); Kuching, Sept., fl., *Haviland 1805* (K, SAR).

4. *Neesia kostermansiana* Soepadmo, *spec. nov.* — Fig. 6—7.

Neesia altissima (non Blume) Furtado in Card. Bull. S.S. 4: 425. 1929, excl. synonyms: *N. ambigua*, *glabra* et *synandra*.

Neesia sytwndra (non Masters) Narayanaswami in J. Proc. As. Soc. Bengal, New Series 27, 3: 345. 1933.

Folia chartaceo-coriacea, obovata vel obovato-oblonga. Stipulae foliaceae, chartaceae, ovato-lanceolatae, acutae, distincte venosae. Alabastrum conicum. Calyx discoideus, margine circinnato-incurvo. Stylus tenet cylindricus. Fructus ovoideus acutus tuberculatus.

Tree up to 30 m tall, 120 cm in diameter. Branchlets of young plants covered with hirsute simple and stellate hairs, glabrescent. Leaves chartaceous-coriaceous, obovate or obovate-oblong, 13—35 x 7—16 cm, emarginate or rounded, gradually attenuate towards the truncate base; upper surface glabrous, in young plants sparsely stellate-haired; lower surface glabrous or sparsely covered by minute, long-fimbriate scales, mainly on the nerves. Stipules foliaceous, chartaceous, ovate-lanceolate, 2—6 x 0.5—3 cm, acute, base attenuate, truncate; veins distinct, sparsely covered by hirsute simple and stellate hairs or sparsely lepidote. Petioles glabrous or sparsely lepidote, 2—7 cm, 0.2—0.7 cm thick.

Cyme dichasial, up to 3 cm, densely lepidote, in the axils of fallen leaves; pedicels 1—2 cm, 0.1—0.2 cm thick. Bracts caducous, concave, ovate, 0.2—0.3 x 0.1—0.2 cm, acute, inside glabrous, outside lepidote. Bud conical. Epicalyx campanulate, 3—5lobed, 0.5—0.8 cm in diam., obtuse, inside glabrous, outside lepidote. Calyx disk-like, about 1 cm in diam., inside central part stellate-haired, glabrescent, outside densely lepidote. Petals free, lanceolate, 0.5—1 x 0.3 cm, obtuse, base truncate, inside glabrous, outside upper part stellate-haired. Filaments 0.2—0.4 cm, connate at base; anthers globular, ca 0.05 cm in diam. Ovary ovoid, 0.2—0.4 cm, ca 0.3 cm in diam.; style slender, cylindrical, ca 0.5 cm, glabrous; stigma capitellate, sparsely lepidote. Fruit ovoid, ca 15—17 cm, 12—15 cm in diameter, acute, base

with a short neck; valves outside tuberculate. Seeds blackish-brown, ca 2 cm, 1 cm thick.

DISTRIBUTION — Malay Peninsula.

HABITAT — Fresh water swamp.

TYPUS: *Wray 2271* (SING).

The species is named in honour of Dr. A. J. G. H. Kostermans to whom I owe so much.

It differs from *N. altissima* and from *N. syndandra* by its large stipules and cylindrical style. It is closely related to *A^T. malmjana*, but it may be easily differentiated by its larger stipules, leaves and tuberculate fruit valves. From *N. glabra* it differs by its conical bud and cylindrical style.

PENINSULAR SIAM. Khaw Pok Hill, Dec, fr., *Haniff & Nur S.F.N. 3905* (SING).

MALAY PENINSULA. Perak. Taiping, Batu Kurau, May, fl., *Haniff S.F.N. 13265* (SING, UC); *ibid.*, June, fl., fr., *Henderson S.F.N. 23815* (BO, SING); Sungai Larut Plains, July, fl., *Wray 2271* (K, KEP, L, SING), *type*; *ibid.*, Aug., fr., *Wray 2875* (SING, UC); *ibid.*, alt. 100 m, Dec, fl., *King's Collector 5240* (BO, K, L, SING, US); *ibid.*, Apr., fr., *King's Collector 5768* (K, L, SING, UC); Krian, Bagan Serai, Apr., ster., *Mitchell 5679* (SING); Sungai Krian Estate, Jan., ster., *Spare S.F.N. 36747* (BO, SING); Sungai Perak, Lambar Kiri, July, ster., *Strugnell 57309* (KEP); Ipoh, Bota Kiri P.R., alt. 30 m, March, fr., *Shah & Kadim 278* (A, BO, K, L, SING); Dindings, Bruas, low, June, ster., *Kep. 54730* (KEP); State Land Batu Hampar, Apr., ster., *Kep. 69057* <KEP>; Kinta, State Land Batu Kiri. Sept., ster., *Kep. 54694* (KEP); Telok Anson, Tukang Sedin, Sept., fr., *Haniff S.F.N. H161* (SING, UC); Selangor. Kuala Selangor. Sungai Tinggi, Oct., fr., *S.F.N. 34121* (KEP, SING, UC).

5. NEESIA MALAYANA Bakh. — Fig. 8—9.

Neesia malayana Bakhuiizen v.d. Brink Sr. in Bull. Jard. bot. Buitenzorg 3, 0: 221 & 247, t. 34 & 35. 1924; Heyne, Nutt. Plant. Ned. Ind., ed. 2, 2: 1059. 1927; ed. 3, 1: 1059. 1950; Furtado in Gard. Bull. S.S. 4: 425. 1929; Burkill, Diet. econ. Prod. Mai. Pen. 2: 1535. 1935. — *Grashoff 815* (BO).

Neesia syndandra (non Masters) Ridley in J. Str. Br. Roy. As. Soc 33: 51. 1900, p.p. (quoad specim. *Ridley 3770, 5816* et *Furtado s.n.*); Fl. Mai. Pen. 1: 265. 1922, p.p. (quoad specim. *Ridley 5846*).

Tree up to 50 m tall, 70 cm in diam. Buttresses short, thick. Bark dark chocolate-grey, fissured and tending to crumple and flake. Structure of wood clearly visible to the naked eye. In young plants the branchlets, petioles, stipules and leaves (mainly on the nerves) densely stellate-and simple-haired, sometimes sparsely lepidote, glabrescent. Leaves coriaceous, ovate-elliptical, 9—20 x 4—13 cm, emarginate, base rounded or subcordate; nerves 12—18 pairs. Petiole (1—) 3.5 (—5) cm, 0.2—0.25 cm in diam.,

glabrous. Stipules linear-lanceolate, 1—1.5 x 0.5—0.7 cm, acutish, base truncate. Inflorescence corymbose or cymose, multi-flowered, densely lepidote, 5—6 cm. Bracts caducous, ovate, ca 0.3 x 0.2 cm, inside stellate-haired, outside lepidote. Bud conical, concave, mammillate. Epicalyx campanulate, 3—5lobed, ca 0.5—0.7 cm in diam., inside basal part densely stellate-haired, outside lepidote. Calyx disk-like, ca 0.5—2 cm in diam., margin circinnately incurved, inside at base stellate-haired, outside densely lepidote. Petals free, linear-lanceolate, 0.5—1.5 x 0.2—0.3 cm, acutish, base truncate, inside glabrous, upper part outside stellate-haired. Filaments shortly connate at base, 0.2—0.5 cm; anthers reniform, ca 0.1 cm, 0.05 cm thick. Ovary ovoid-conical, 0.2—0.4 cm, 0.2—0.3 cm in diam.; style cylindrical, curved, ca 0.35—0.4 cm; stigma globular, ca 0.1 cm in diam. Fruit ovoid, 10—15 cm, (7—) 10 (—15) cm in diam., acute, base with a short neck; outside areolate-muricate, glaucous; septs brownish; stalk terete, 2—4 cm, ca 1.5 cm in diam. Seeds elliptical-obovoid, glossy, red-brown to blackish, 1—1.5 cm, 0.7—1 cm thick.

DISTRIBUTION — Malay Peninsula, Sumatra and Borneo.

HABITAT — Fresh water swamp.

VERNACULAR NAMES — Bengang, Sibengang or Sebongang (Sumatra);
Apa-apa (Malay).

Bakhuizen v.d. Brink Sr. cited *Grashoff 815*, 56.108 E. tP. 773, bb. 108 E. IP. 1008 and *Ridley 3770*, from which I chose *Grashoff 815* as the lecto-type. It has good inflorescences, leaves and is accompanied by dried fruits.

N. malayana differs from *N. altissima* by its cylindrical style, conical bud and smaller leaf, flower and fruit.

Mature leaves of *N. malayana* are as a rule glabrous or sometimes stellate-haired or sparsely lepidote (mainly on the nerves), but in the specimen *Anderson 9111* the leaves are densely stellate-tomentose on both surfaces; it may eventually represent a variety, but more material is needed to make a definite conclusion.

MALAY PENINSULA. Pahang. Gudang Resau, Kuantan, Apr., ster., *Forest Dept. F.M.S. Field No. 3161* (SING); Johore. W. Johore, State Land Ulu Benut, Dec, ster., *Kep. 09951*, (KEP); S. Benut, State Land Kiri Mudek Ulu, low, Jan., ster., *Kep. 72801* (KEP); State Land Ulu Sanglang, Pontian, Dec, ster., *Kep. 69801* (KEP); Mawai, May, fl., *Corner s.n.* (SING).

SINGAPORE. Kranji, fl., *Ridley 5846* (SING); Chan Chu Kang, fl., fr., *Ridley 3770* (BO, K, L, SING); Mandai Road, June, ster., *S.F.N.S7138* (SING); Cluny Road, near Hermit Road, Febr., fl., *Furtado s.n.* (SING); Hermit Road, fl., *Achmad bin Hassan s.n.* (BO).

SUMATRA. Riouw. Karimun, Simpang Kiri, low, Dec, fl., 6b. 20381 (A, BO, BZF, BISH, L, NY, SING); *ibid.*, May, ster., *bb.* 171*09 (BO, BZF, L); Bengkalis, Kajenan, low, Jan., ster., *de Haan Iliia* (BO, NY); Djambi. Indragiri, Keritang, Pangkalan Kasai, Lemang, low, Aug., ster., *bb.* 28173 (A, BO, L); Simpang, alt. 45 m, Nov., ster., *bb.* 12871 (BO, BZF); Palembang, Banjuasin, Kubu Region, low, Nov., fl., *Grashoff* 815 (BO, K, L), lectotype; *ibid.*, low, June, fl., Dec, fl., Jan., fr., *bb.* 108 *E. IP.* 773 (BO, BZF, L); *ibid.*, Sept., fl., *bb.* 108 *E. IP.* 1008 (BO, BZF, K, L, UC).

BORNEO. Sarawak. Kuching, Setapak F.R., low, fl., *Zehnder* 9583 (BO, K, L, SAR, SING); Brunei, Lawas, behind Kampung Kuala Lawas, low, July, fr., *Anderson* 9111 (BO, K, L, SAR, SING); Indonesian Borneo. Pontianak, Kubupadi, low, Apr., ster., *bb.* 6356 (BO, BZF).

6. NEESIA PURPURASCENS Becc. — Fig. 10.

Neesia purpurascens Beccari, Malesia 3: 264. 1889; Merrill in J. Str. Br. Roy. As. Soc, Special Number 377. 1921; Bakhuizen v.d. Brink Sr. in Bull. Jard. bot. Buitenzorg 3, 6: 223 & 247. 1924. — *Beccari P.B.* 1386 (F1).

Branchlets densely stellate-haired. Leaves chartaceous, elliptic-obovate, 6—12 x 3—4 cm, obtuse or slightly emarginate, base rounded; upper surface sparsely stellate-haired (mainly on the nerves), lower surface densely stellate-haired. Petiole ca 2.5 cm and 0.15 cm thick, densely stellate-haired. Stipules caducous, ovate, 0.4—0.5 cm, tomentose (according to Beccari). Racemes axillary, few-flowered; peduncles slender, 4—5 cm, ca 0.1 cm thick, covered by stellate hairs and fimbriate scales; pedicels 0.5—1 cm, densely lepidote. Bud globular, 0.5—0.7 cm, ca 0.5 cm in diam., truncate or concave, mammillate. Calyx disk-shaped, 1—1.5 cm in diam., margin circinnately incurved, basal part inside stellate-haired, outside lepidote. Petals free, ovate-lanceolate, 0.7—1 x 0.2—0.3 cm, inside glabrous, upper part outside stellate-haired. Staminal tube 0.3—0.4 cm; anther globular, ca 0.03 cm thick. Ovary ovoid, ca 0.3 cm, 0.2 cm in diam.; style conical, ca 0.2 cm, glabrous; stigma capitellate, ca 0.1 cm in diam.

BORNEO. Sarawak, Mt. Mattang, Apr., fl., *Beccari P.B.* 1386 (BO, F1, K, S).

7. NEESIA PILULIFLORA Becc. — Fig. 11—12.

Neesia piluliflora Beccari, Malesia 3: 267, t. 34 & 35. 1889; Merrill in J. Str. Br. Roy. As. Soc, Special Number 377. 1921; Bakhuizen v.d. Brink Sr. in Bull. Jard. bot. Buitenzorg 3, 6: 233 & 247. 1924. — *Beccari P.B.* 2037 (F1).

Neesia strigosa Masters in J. Linn. Soc. Bot. 14: 504. 1875, p.p. (quoad specim. *Beccari P.B.* 2037).

Tree up to 18 m tall, 30 cm in diam. Branchlets in young individuals densely stellate-haired, subglabrescent. Leaves chartaceous-coriaceous, ovate-lanceolate or elliptic-oblong, (7.5—) 20—25 (—45) x (6—) 10—12

lepidote. Bud globular, ca 1 cm in diam. Calyx 1—3 cm in diam., margin crenulate, 4—5 lobed, inside central part stellate-tomentose, glabrescent, outside lepidote. Petals free, lanceolate, 1 x 0.5 cm, acute, base truncate, inside glabrous, outside stellate-tomentose. Filaments 0.3—0.6 cm, connate for half of their length; anther reniform, 0.1—0.15 cm in diam. Ovary ovoid, 0.5 cm, ca 0.3 cm in diam.; style conical, 0.1—0.2 cm, glabrous; stigma capitellate, ca 0.1 cm in diam. Fruit ovoid, up to 10 cm, 6.5 cm in diam., obtuse, base with a short neck; tessellate-muricate, glaucous (Beccari).

BORNEO. Sarawak. Mai-rap, Apr., fl., *Beccari P.B.* 3253 (Fl, K), type; Indonesian Central Borneo, ster., Jaheri s.n. (BO).

INDEX OF COLLECTOR'S NUMBERS.

The number following the colon refers to the number of the species in this paper.

Achmad bin Hassan s.n.: 5; *Anderson* 9111: 5; *Backer* 1841: 1; 14952: 1; *Bakhuizen* 5503: 1; 5884: 1; 6000: 1; 6392: 1; 6415: 1; 7081: 1; *bb.*2929: 1; 2956: 1; 3792: 3; 3794: 3; 5501: 1; 6029: 3; 6356: 5; 7159: 3; 9374: 3; 10349: 3; 12871: 5; 17263: 1; 17409: 5; 17802: 2; 19833: 3; 20381: 5; 22462: 1; 28173: 5; 29539: 3; 29553: 3; 31004: 3; 34624: 7; 24629: 7; 108 E. IP. 773: 5; 108 E. IP. 100S: 5; *Beccari P.B.* 1386: 6; 1990: 3; 2037: 7; 2276: 3; 2507: 3; 3087: 1; 3253: 8; *Boden Kloss* 18989: 2; *Barkill* 4556: 2; *Buurwan v. Vreeden* 195: 1; *Comer* s.n.: 1; s.n.: 5; *Curtis* 3081: 1; *Dakkus* 61: 1; *Docters v. Leeuwen* 7902: 1; *Endert* 1055: 1; 3029 (= *bb.*35705): 7; *For. Dept. F.M.S.* 3161: 5; *For. Guard* 3: 2; *Furtado* s.n.: 5; *Grashoff* 815: 5; *De Haan* *Ilia*: 5; *Hamid CF* 2301: 2; **Haniff S.F.N. 13265: 4**; 14161: 4; *Haniff & Nur* S.F.N. 3905: 4; *Haviland* 1805: 3; *Henderson* S.F.N. 23815: 4; *Holtum & Furtado* 19788; 2; *Ja* 3138: 1; 3.709: 1; 5356: 1; *Jaheri* s.n.: 8; *Kartanah* s.n.: 1; *Kcp.* 53368: 2; 54694: 4; 54730: 4; 69057: 4; 69801: 5; 69954: 5; 7^ASOi: 5; **74801: 2**; *Kiah* S.FJV. 45S5: 2; *King's Collector* 5240: 4; 5768: 4; *Koorders* 4588: 1; **4589: 1**; 4590: 1; -45.92: 1; 4592: 1; .4593: 1; -4594: 1; 4595: 1; S205: 1; 11139: 1; **12038: 1**; 13039: 1; 12040: 1; 12519: 1; 15645: 1; 2.190S: 1; 220i7: 1; 25574: 1; **27183: 1**; 32759: 1; 35278: 1; 33786: 1; 39597: 1; 47801: 1; *Kostermans* 10082: 2; 13846: 2; *Lör zing* 7035: 1; *Maingay* 1516: 2; *Maradjo* 5: **1**; **Mitchel 5679: 4**; *Ramos* 1540: 2; *Ridley* 3770: 5; 5S-46: 5; *Seortechini* 1831: 2; *Shah & Kadim* 278: 4; *Sinclair* s.n.: 2; jr. coH., s.n.: 1; *Spare* S.F.N. 36746: 4; *Van Steenis* 3768: 7; 5037: 1; *Strngnell* 13386: 2; 57309: 4; S.F.iV. (*Singapore Field Number*) 963: 1; 34121: 4; 3S737: 1; 37138: 5; *Traub* S.M.: 7; *winkel* 1682: 1; *Wray* 2271: 4; 2875: 4; *Zehnder* 7583: 5; *Zippelius* 7018: 1.

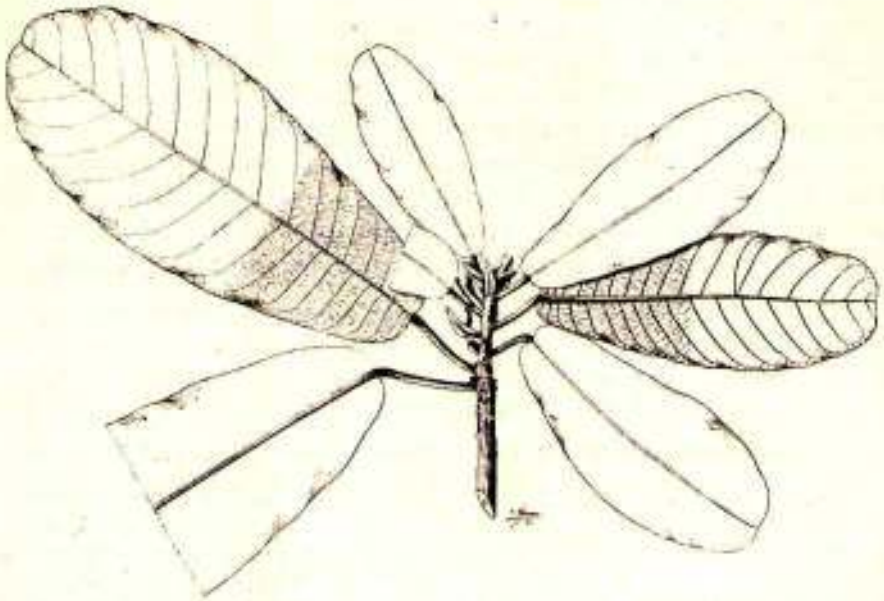


FIG. 1. — *Neesia altissima* (Bl.) Bl. — After living material cultivated in the Bogor Botanic Garden sub-no. XVI. H. 19 (BO), leafy branch.

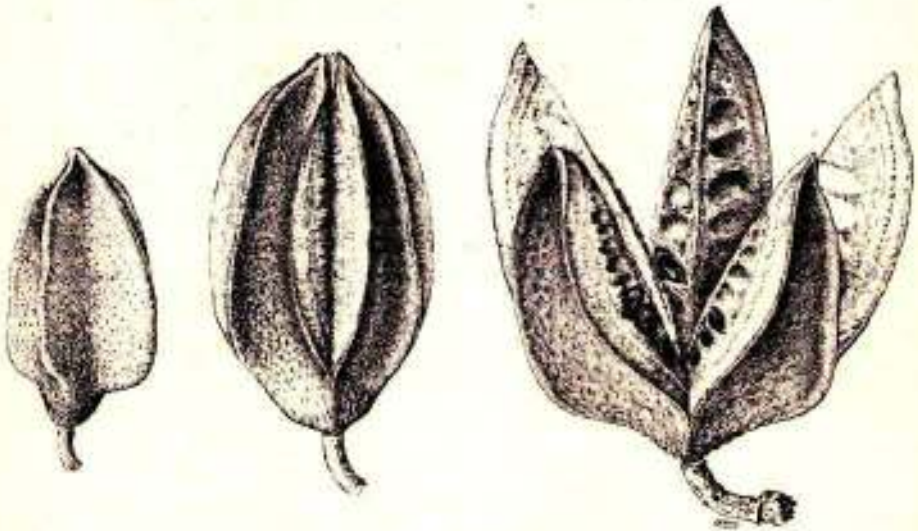
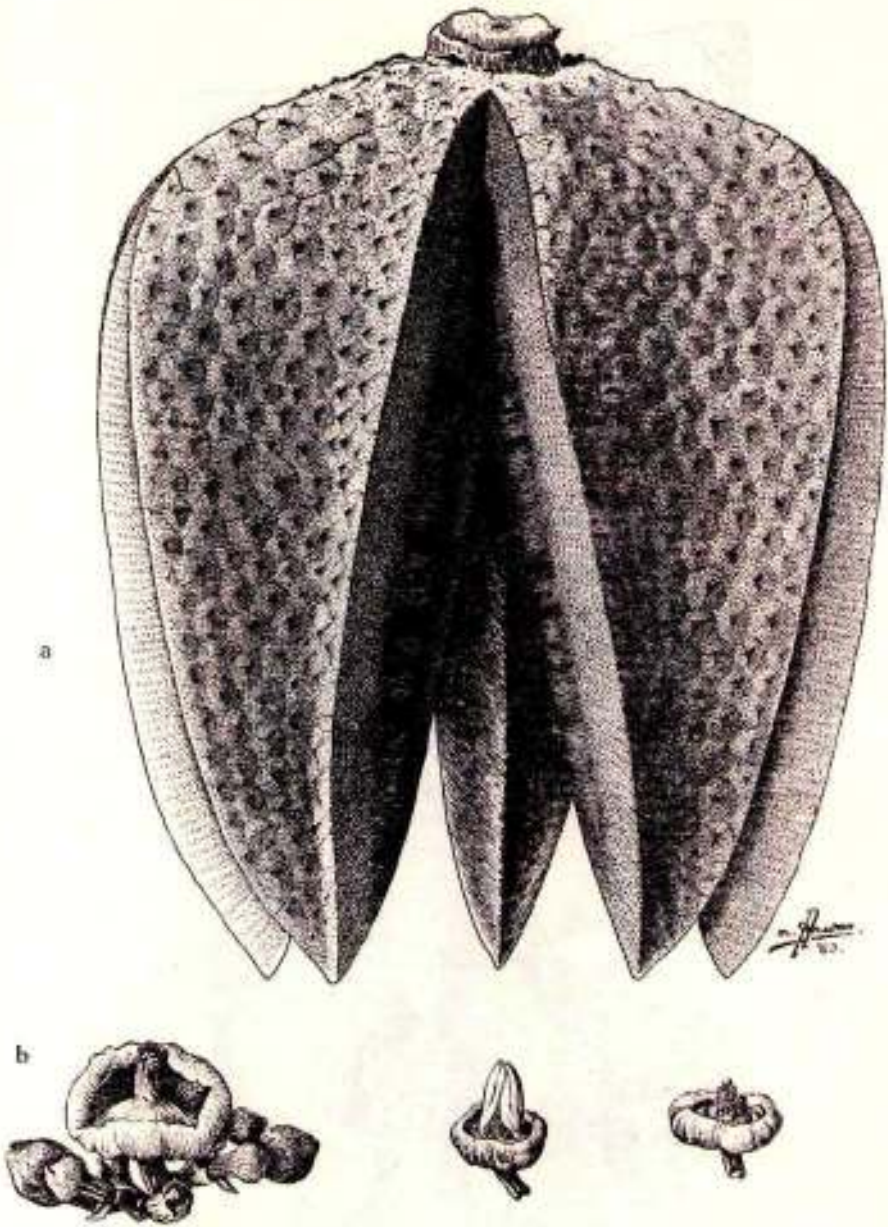


FIG. 9. — *Neesia malayana* Bakh. — After *b.b.* 108 *E. IP.* 1008 (BO), fruits.



Fu., 2. — *Necsia altissima* (Bl.) Bl. — a. After *Bukhuizen 6392* (BO), old fruit; li. after *Bakhuizen 5884* (BO), flowers.

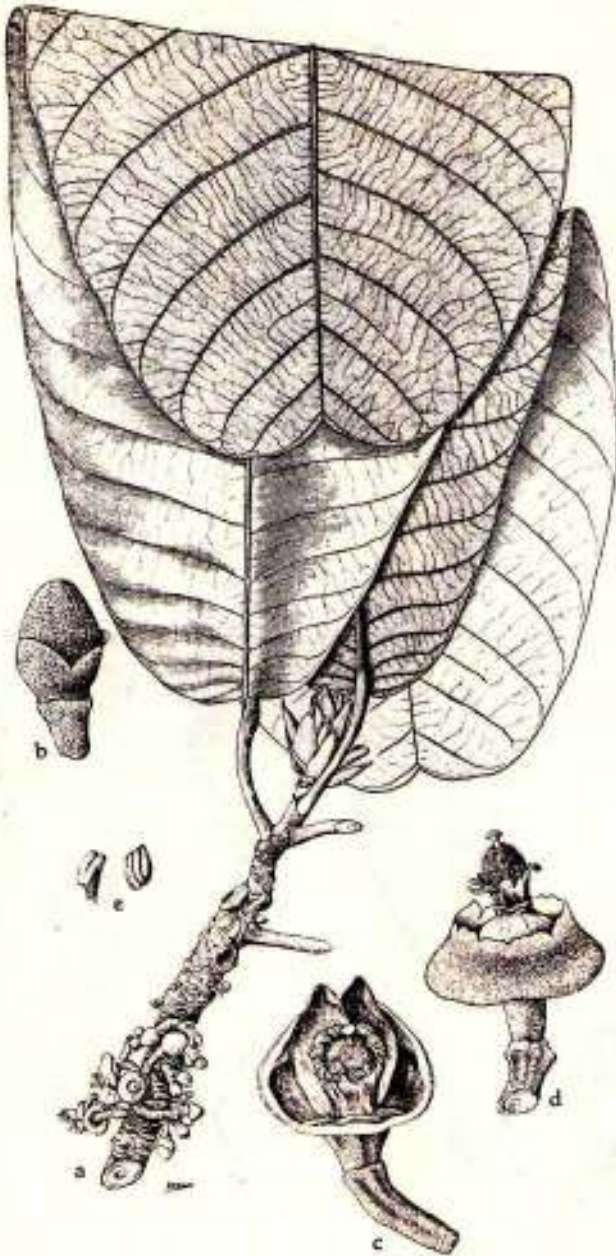


FIG. 3. — *Neesia synandra* Mast. — After Kiah S.F.N. 34685 (BO); a. flowering branch; b. bud; c. opened flower before anthesis; d. flower after anthesis; e. anthers.

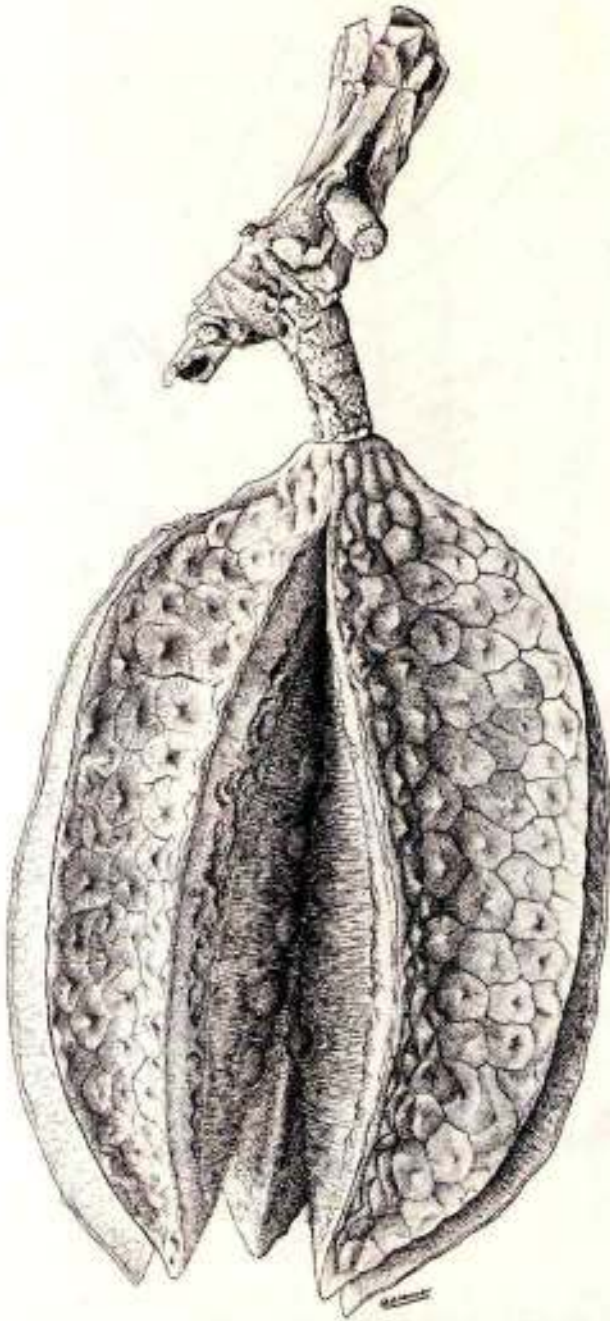


FIG. 4. — *Neesia synandra* Mast. — After *Kostermans 10082* (BO), ripe fruit.

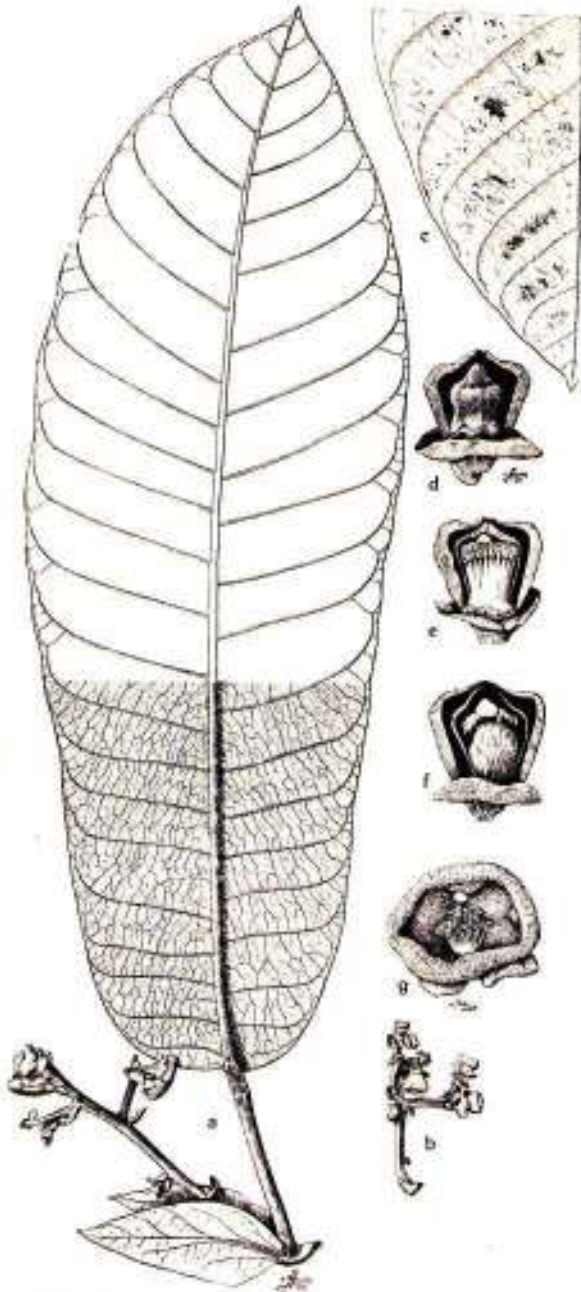


FIG. 5. — *Nectesia glabra* Becc. — a, c, g After *Huvilund 1805* (SAR); b, d, a, f after *Beccari P.O. 2276* (BO); a. lower leaf surface, stipules and inflorescence; b. inflorescence; c. upper leaf surface; d. opened bud; e. corolla removed; f. corolla and stamens removed; g. flower after anthesis.

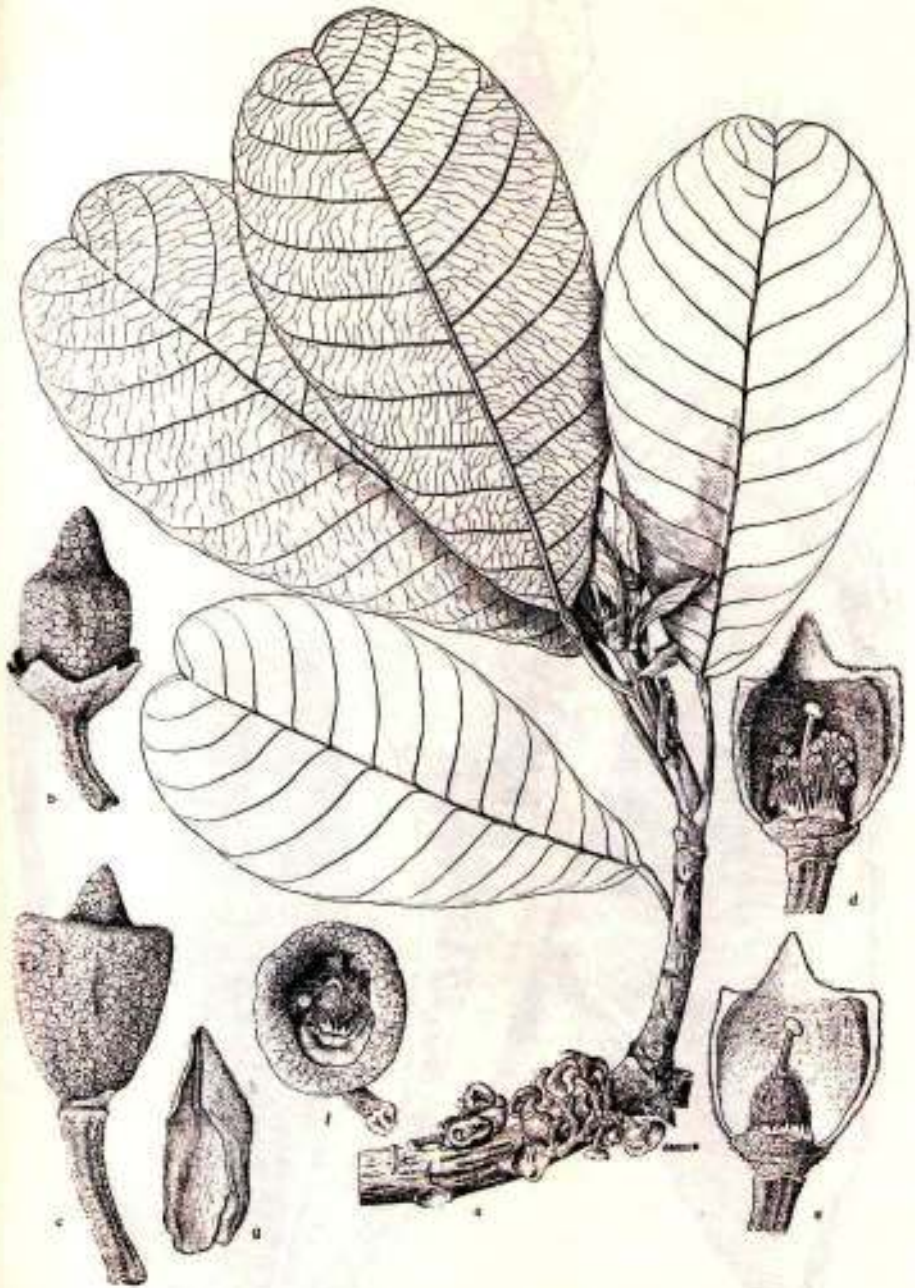


FIG. 6. — *Neesia kostermansiana* Soepadmo — After Wray 2271 (SING) ; a. flowering branch; b, c, d, e buds; f. flower after anthesis; g. petals.

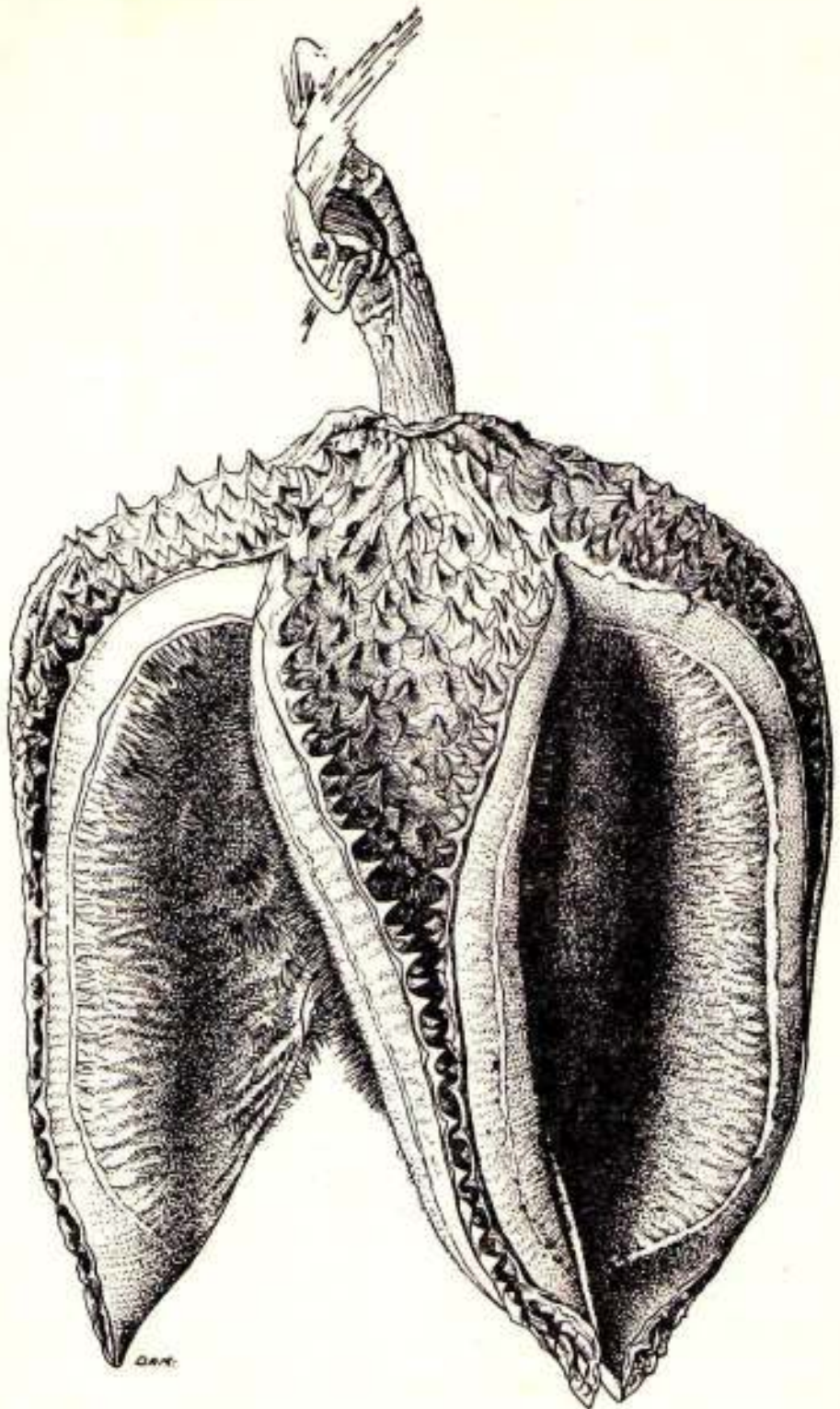


FIG. 7. — *Nresin kostermansiana* Soepadmo — After Shah & Kadim 278 (SING),
lipe fruit.

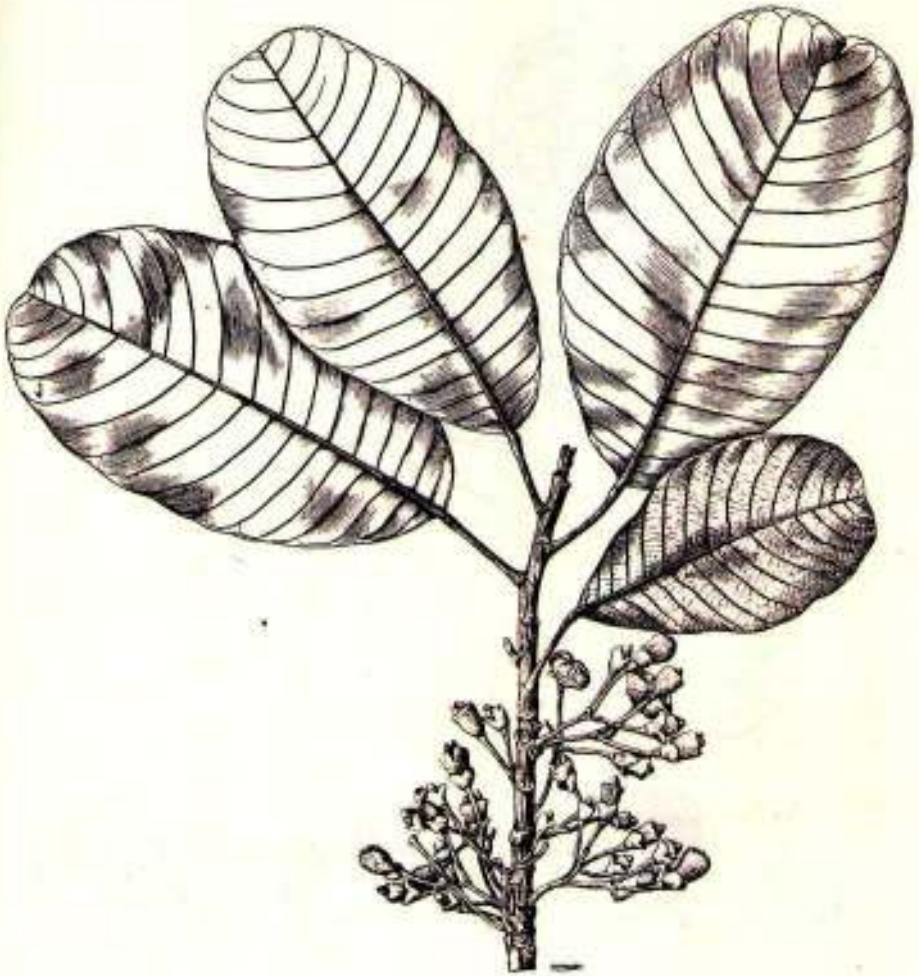


FIG. 8. — *Nesia malayana* Bakh. — After *Grashoff* 815 (BO), flowering branch.



FIG. 10. — *Neesia purpurascens* Becc. — After *Beccari P.B. 1386* (BO); a. flowering branch; b. corolla; c. opened calyx; d, e flowers after anthesis.

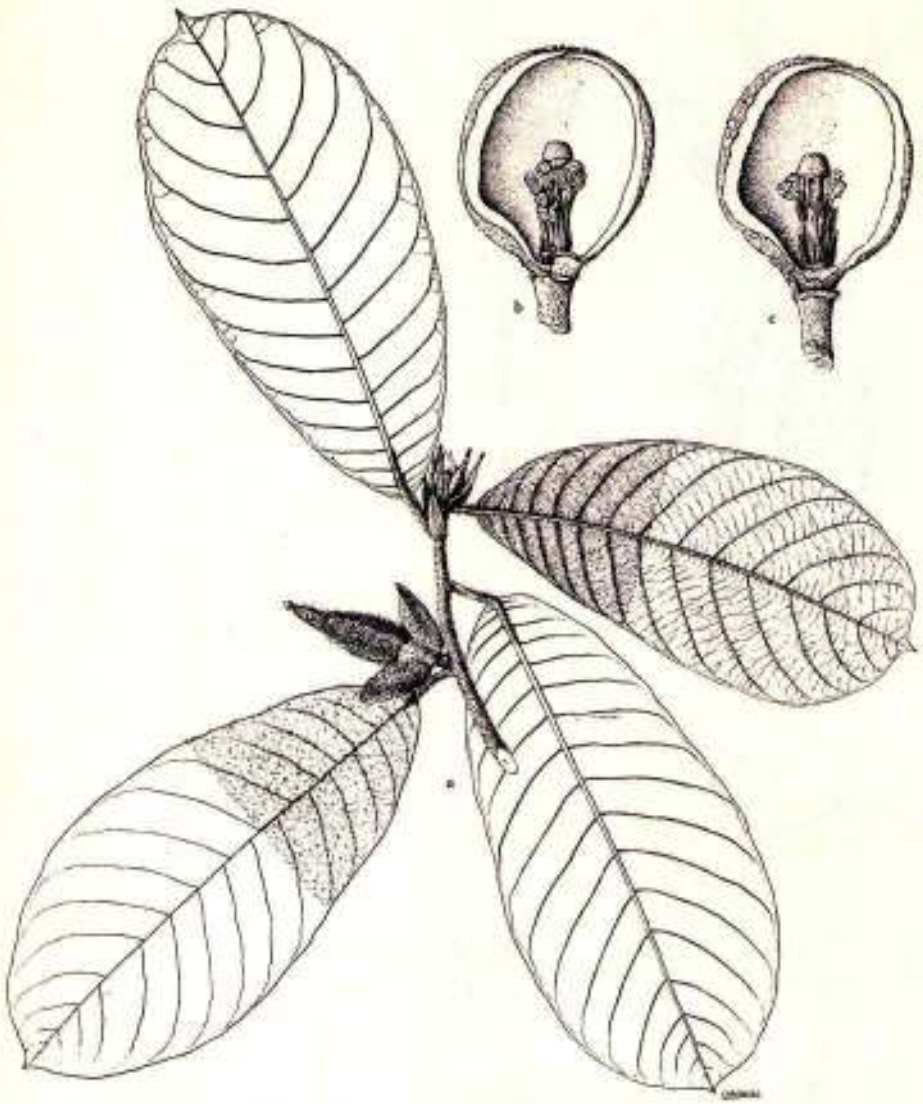


FIG. 11. — *Neesia piluliflora* Becc. — After *b.b.* 34624, (BO); a, fruiting-branch; b, c opened flower buds.

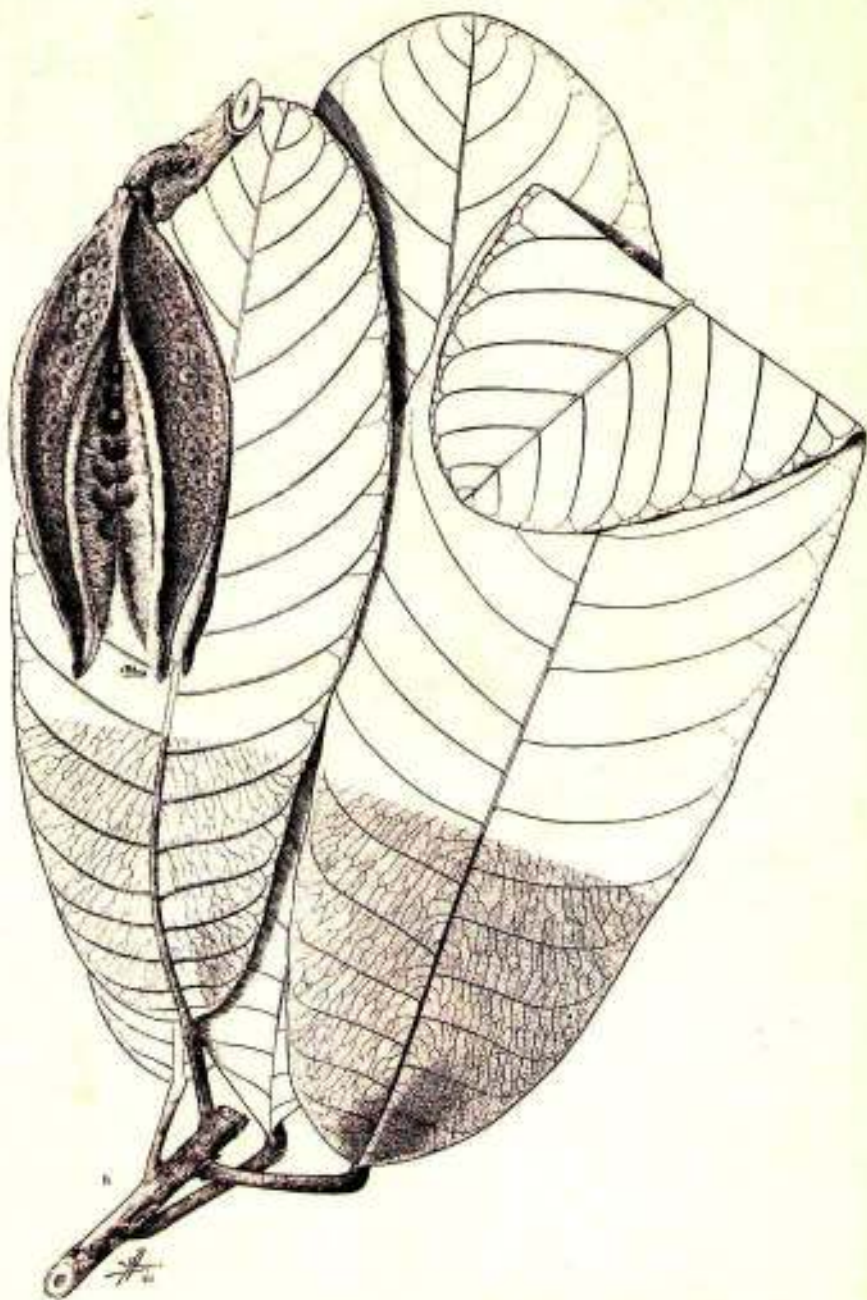


FIG. 12. — *Neesia piluliflora* Becc. — a. After Endert 3029 (BO), leafy branch; b. after V. Steenis 3768 (BO), ripe fruit.



FIG. 13. — *Neesia strigosa* Mast. — After de Vriese 117 (BO), young branchlets; a — i after Beccari P.B. 3253 (BO); a, b buds; c. pistil; d, e petals; f. stamens; g. opened flower; h. corolla; i. stipule.

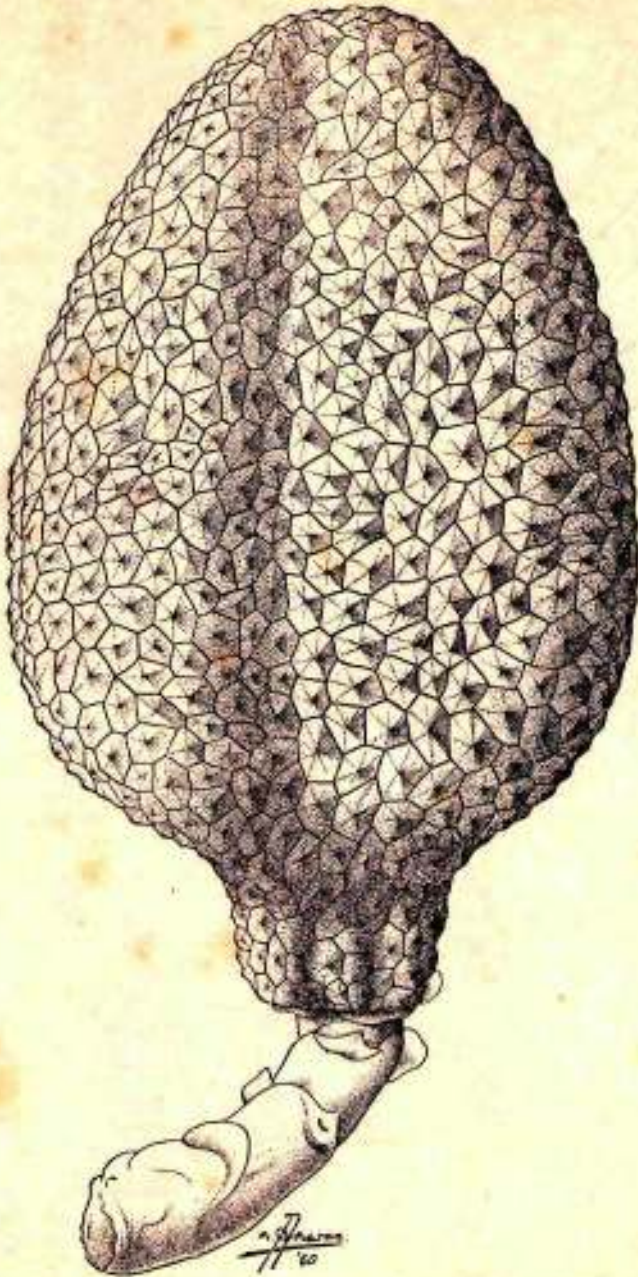


FIG. 14. — *Neesia strigosa* Mast. — After Beccari, Malesia 3, t. 33.