

FLORAE MALESIANAE PRECURSORES

XI. NEW TAXA IN CANARIUM

by

P. W. L E E N H O U T S

(Flora Malesiana, Leiden)

(Issued 31. XII. 1955)

English diagnoses of the following new taxa will before long be published in Flora Malesiana, I, 5²; with the exception of *C. pseudosumatranum*, the Latin diagnoses are exclusively based on the type-collection.

The abbreviations used are as follows:

BS = Bureau of Science, Manila

BW = Boswezen, Dutch New Guinea

FRI = Forest Research Institute, Bogor

KEP = Conservator of Forest, Kepong

NGF = New Guinea Forestry, Lae

PNH = Philippine National Herbarium, Manila

SF = Singapore Fieldnumber.

The herbarium-abbreviations are as proposed by Lanjouw & Stafleu, Index Herbariorum 1, ed .2 (1954).

I am indebted to Dr R. C. Bakhuizen v. d. Brink jr for the Latin translations.

The drawings have been made by Miss R. van Crevel and Mr H. J. Tammel, artists of the Flora Malesiana Foundation and the "Rijksherbarium" respectively.

Sect. Canarium

1. *Canarium caudatum* King

f. *auriculiferum*, nov. f. — Stipulae auriculiformes, in petiolo insertae.

Type: *Haviland* 2877 (♂), Borneo, Sarawak, near Kuching (Holotype in SING; Isotypes in BM, K, L, SAR).

Paratypes: Sumatra: *Buwalda* 6778; FRI. bb. 27564 (= *Buwalda* 6644); *Rahmat si Boeea* 5044; Borneo: BS 2466; *Haviland* & *Hose* 3275; *Hose* 183, 262, 288.

2. *Canarium denticulatum* Bl

Ssp. *kostermansii*, nov. subsp. — Differt a ssp. *denticulato* praecipue characteribus sequentibus: Omnes partes pilis subpersistentibus ferrugineo-pubescentes. Folia 3—4-jugata. Foliola subtus et in costa utrimque dense pubescentia; margines dense serrati. Inflorescentiae laxae, floribus pluribus quam in subspecie typica.

Type: *Kostermans 5226* (♀), E. Borneo, Sg. Menubar region, alt. 30 m (Holotype in L; Isotypes in BM, BO, K).

Paratypes: E. and NE. Borneo: *FRI. bb. 10751*; *Kostermans 5112, 5300, 5395, 5907, 5921*; P. Laut: *FRI. bb. 12237*.

Named in honour of Dr A. J. G. H. Kostermans, who recently made very fine collections in E. Borneo.

3. *Canarium indicum* L.

Var. *platyceroideum*, nov. var. — Differt a var. *indico* praecipue characteribus sequentibus: Stipulae orbiculares, 8—12 × 10—14 cm, subcoriaceae, marginibus undulatis. Foliola obliquo-ovata, c. 35 × 15 cm, coriacea.

Type: *FRI. bb. 32637* (ster.), West New Guinea, Vogelkop, Tisa near Steenkool (Holotype in BO; Isotype in L).

Paratypes: West New Guinea, Vogelkop: *Beccari PP 568*; *Kostermans 265*.

The name *platyceroideum* refers to the stipules, which are resembling the basal leaves of *Platycerium*.

4. *Canarium kaniense* Laut.

Var. *globigerum*, nov. var. — Differt a var. *kaniense* praecipue a characteribus sequentibus: Fructus globosi 5 × 5 cm, exocarpium durum, pericarpium crassum fibrosum, pyrena acute 3-alata; stipularum margo fimbriatum dentatus; apex foliorum longe et anguste (usque ad 30 × 1 mm) acuminatus.

Type: *Hoogland 3727* (fr.), East New Guinea, Northern Div., 3 km N. of Divinikoari village, alt. 30 m (Holotype in L; Isotype in CANB).

The taxonomic status of this variety is not quite certain. In its vegetative characters — though they are very conspicuous — the present variety is linked to var. *kaniense* by intergrades. For the time being, var. *globigerum* seems to be sharply defined by its peculiar fruits. As both varieties are still very incompletely known, it is possible that they will show to be either good, though closely related, species, or mere extreme forms, linked by a series of intergrades. Geographically and altitudinally they are not separated.

5. *Canarium kinabaluense*, nov. sp. — *Fig. 1.*

Arbor. Ramuli 0.5—0.8 cm diam., glabrescentes; medulla cylindro peripherali e fasciculis vasorum minutis constituto suffulta. *Stipulae* subpersistentes, petioli basi insertae, suborbicularia ad ellipticae, c. 2 × 1.5 cm, subcoriaceae, glabrae, integrae. *Folia* 2—3-jugata, glabra. Foliola elliptico-ovata, 10—16 × 5—8 cm, coriacea; basis rotundata ad late cuneata; margo prope apicem crenulatus; apex sat abrupte et late acuto-acuminata; nervi utrimque 9—14, conspicue arcuatim conjuncti. *Infructesciae* terminales, laxe paniculatae, 10—20 cm longae, glabrescentes, c. 12 fructus gerentes; calyx crateriformis 1.25 cm diam., disci annulari fimbriati residuis munitus, stamina libera disco haud connata. *Fructus* anguste fusiformes, in sectione transversa triangulares, basi et apice acuti, 6—6.5 × 2—3 cm, glabri; pyrena rotundato-triangularis, apice acute 3-costata; valvae 3 mm crassae. Semen 1; loculi steriles plus minusve valde reducti et superficiem versus translati.

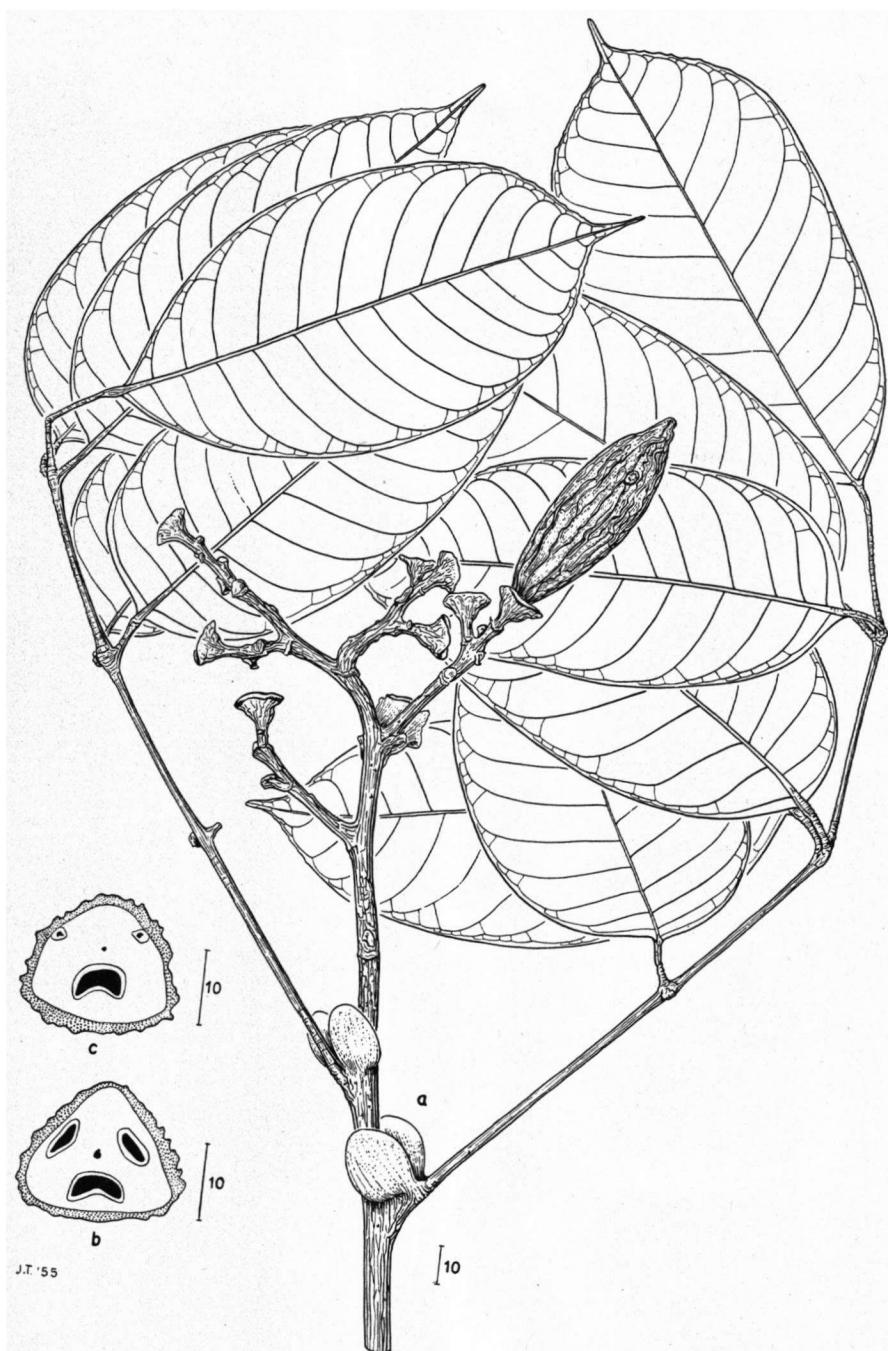


Fig. 1. — *C. kinabaluense* Leenhou. — a. branchlet with leaves and infructescence; b, c. cross sections of fruits (Ramos 1698).

Type: *Ramos* 1698 (fr.), North Borneo, Sandakan vic. (Holotype in L; Isotypes in A, BO, BM, K, P).

Paratypes: North Borneo, Mt Kinabalu: *Clemens* 31612, 31807, 51315.

This species is related to *C. patentinervium* Miq. and *C. divergens* Engl., from which it conspicuously differs by its stipules.

6. *Canarium lamii*, nov. sp. — *Fig. 2.*

Arbor 20 m × 50 cm. Ramuli 6—7 mm diam., leprosi; medulla cylindro peripherali e fasciculis vasorum minutis constituto suffulta. *Stipulae* semipersistentes in petiolo 1—1.5 cm a basi insertae, decurrentes, obliquo-obovatae, 1.25—2 × 1 cm, rigidiusculae. *Folia* 3-jugata, glabra. Foliola ovata ad lanceolata, 11—18 × 6—7 cm, coriacea; basis subobliqua, rotundata; margo integer; apex subabrupte breviter et obtuse acuminatus; nervi utrimque 10—12 (angulo 60—80°), moderatim curvati, prope marginem plus minusve distinete arcuatim conjuncti; nervi tertiarii secundarii paralleli conspicui. *Infructescentiae* terminales, parvae, monocarpae; calyx patens, orbicularis, 1.75 cm diam. *Fructus* ovoidei 6 × 4 cm glabri; pericarpium 5—7.5 mm crassum fibrosum; pyrena laevis, apice rostrata, in sectione transversa rotundato-triangularis; valvae 7.5 mm crassae, durissimae. Semina 1—2.

Type: *BW*. 1609 (fr.), West New Guinea, Holtekang near Hollandia, alt. 2 m (Holotype in L).

Apparently related to *C. harveyi* Seem., a Melanesian species, which occurs from the Solomon Is to Samoa.

I have named this species in honour of Prof. Dr H. J. Lam, who has published some important papers on the morphology and taxonomy of Malaysian Burseraceae, and who, moreover, has done a great deal for the advancement of study in New Guinean botany.

7. *Canarium maluense* Laut.

Ssp. *maluense*

f. *celebica*, nov. f. — Differt a f. *maluense* praecipue a characteribus sequentibus: Stipulae in conjunctione ramulorum cum petiolis insertae. Foliola 9.5—16 × 4—6.5 cm, 2—2.5 × longiora quam lata; nervi utrimque c. 15.

Type: *FRI*. bb. 13573 (♂), Celebes, Malili, Lampea, c. 50 m alt. (Holotype in L; Isotype in BO).

Paratypes: Central Celebes: *FRI*. Cel./II-413; *Kjellberg* 1837, 2012.

f. *bullata*, nov. f. — *Fig. 5 b.* — Differt a f. *maluense* praecipue characteribus sequentibus: Foliola coriacea, bullata, nervatione subtus prominent, 15—17 × 8—10 cm, 1.5—2 × longiora quam lata; subtus plus minusve dense tomentosa. Stipulae in conjunctione ramulorum cum petiolis insertae. Fructus 1-spermi, loculis sterilibus 2 fere complete reductis.

Type: *Brass* 13136 (fr.), West New Guinea, Idenburg River, Bernhard Camp, 900 m alt. (Holotype in L; Isotype in A).

Paratypes: West New Guinea: *Brass* 12586; *FRI*. bb. 31112, 31127.

Ssp. *borneense*, nov. subsp. — Differt a ssp. *maluense* praecipue characteribus sequentibus: Nervi utrimque 10—12(—15). Inflorescentiae ♂ laxe paniculatae pauciflorae. Flores ♂ 8—9 mm longi. Stamina basi

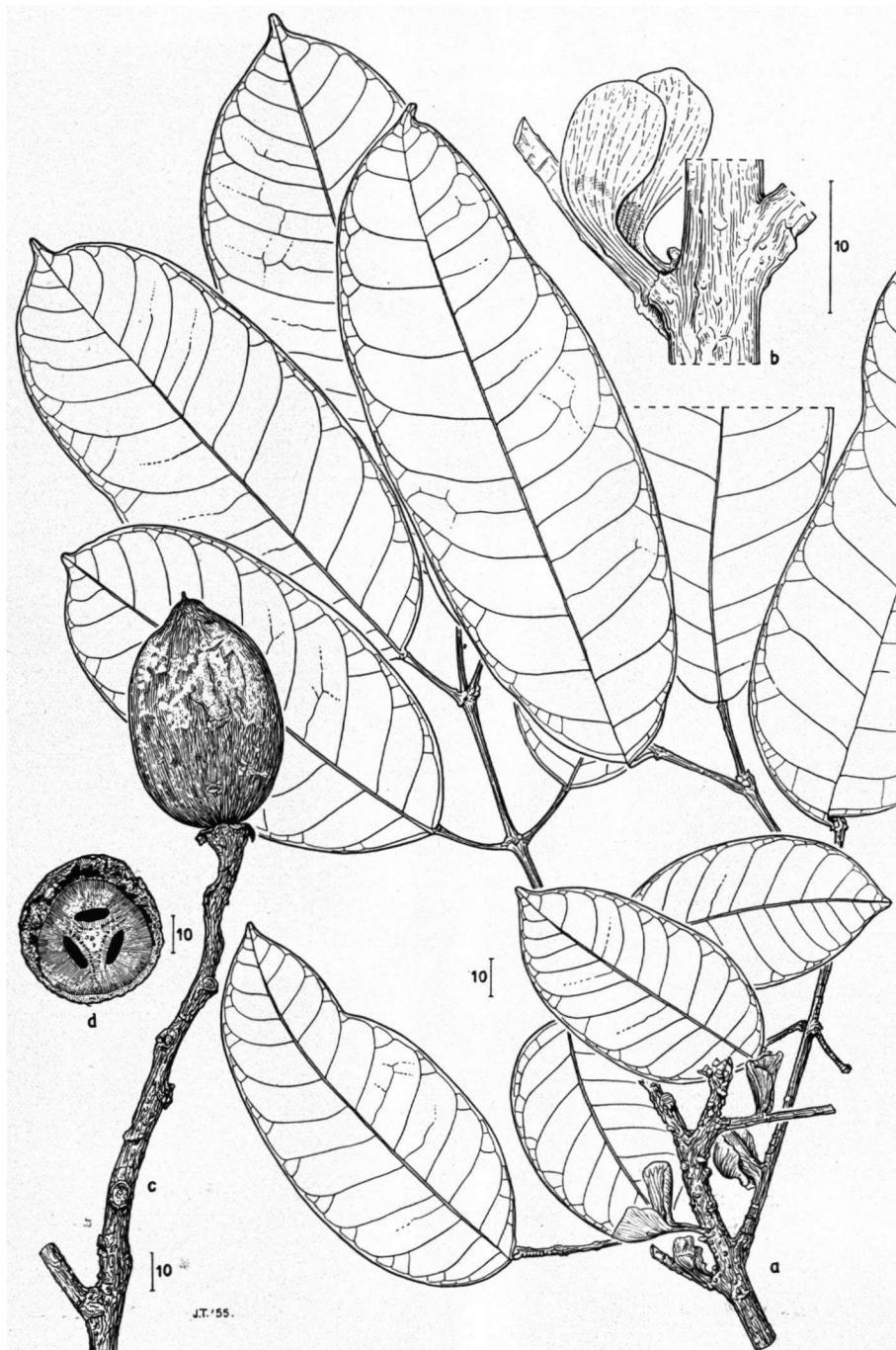


Fig. 2 — *C. lamii* Leenhou. — a. branchlet with leaves; b. stipules; c. infructescence with fruit; d. cross section of fruit (BW. 1609).

confluentia. Discus pistilloideus sensim in stylum reductum filiformem angustatus.

Type: *Kostermans 7525* (♂), Borneo, Peak of Balikpapan, alt. 640 m (Holotype in L; Isotypes in BO, K).

Paratypes: NE. Borneo: *Kostermans 7148, 7362, 7591*.

This subspecies is interrelated between the western *C. patentinervium* Miq. and the eastern *C. maluense* f. *celebica*.

8. *Canarium megacarpum*, nov. sp. — Fig. 3.

Arbor 35 m × 40 cm. Ramuli 1.2 cm diam., glabrescentes; medulla fasciculis vasorum multis minutis sparsis suffulta. *Stipulae* caducae in petioli basi insertae, reniformes, 5 × 8 mm, dense tomentosae, margine denticulatae. *Folia* 4—5-jugata. Foliola ovata ad elliptico-oblonga, 15—19 × 5—8.5 cm, subcordacea, supra in costa et subtus in nervis omnibus breviter fulvo-tomentosa; basis rotundata ad truncata; margo integer; apex subabrupte et breviter acuto-acuminata; nervi utrimque 17—22 (angulo 55°), recti ad subcurvati, in parte apicali solum distincte arcuatim conjuncti; nervi tertiarii plerumque transversi densi. *Fructus* evoidei, in sectione transversa triangulares, 8 × 5 cm, glabri; pericarpium 5 mm crassum fibrosum; pyrena acute 3-alata, valvis concavis, scaberulis, 3—3.5 mm crassis. Semina 2; loculus sterilis moderatim reductus.

Type: *FBI. bb. 22547* (fr.), West New Guinea, W. Rauna (Holotype in BO).

9. *Canarium perlisanum*, nov. sp.

Arbor c. 10 m alta. Ramuli 0.6 cm diam. glabri; medulla cylindro peripherali e fasciculis vasorum minutis constituto suffulta. *Stipulae* caducae in petiolo insertae 0.5—1 cm a basi remotae, cicatricibus 3 mm longis. *Folia* 2-jugata, glabra. Foliola subsessilia, late elliptica, 11—16 × 5—7 cm, chartacea; basis rotundata; margo praecipue apicem versus crenulatus; apex sensim angustatus longe et late obtuso-acuminatus; nervi utrimque 14—18 (angulo c. 50°), recti, prope marginem sensim arcuatim conjuncti. *Inflorescentiae* ♂ axillares, anguste paniculatae, usque ad c. 13 cm longae, glabrescentes, glomerulis pro majore parte subsessilibus. Bracteae concavae. *Flores* ♂ 8 mm longi, extus parce tomentosi. Calyx 4 mm altus. Stamina 6, glabra, filamentis pro dimidio connatis. Discus cylindricus 6-lobatus, 1 mm altus, apice conica parce pilosus, canali centrali suffultus; pistillum abest.

Type: *SF. 35311* (♂), Malay Peninsula, Perlis, Kaki Bukit, alt. 75 m (Holotype in SING).

This species apparently belongs in the relationship of *C. littorale* Bl.

10. *Canarium piloso-sylvestre*, nov. sp.

Canario sylvestri Gaertn. multo affinis, sed differt characteribus sequentibus: Ramuli et inflorescentiae pilis subpersistentibus dense ferrugineo-lanati. *Stipulae* usque ad 8 mm a basi in petiolo insertae, auriculiformes ad lingulata, usque ad 6 × 3.5 mm. Foliola subtus sparse pilosa. *Flores* ♂ 8 mm longi. Stamina 6—3.

Type: *Aet (exp. Lundquist) 138* (♂), West New Guinea, Mc Cluer Bay, Anakasi near Babo, alt. 50 m (Holotype in L; Isotype in BO).

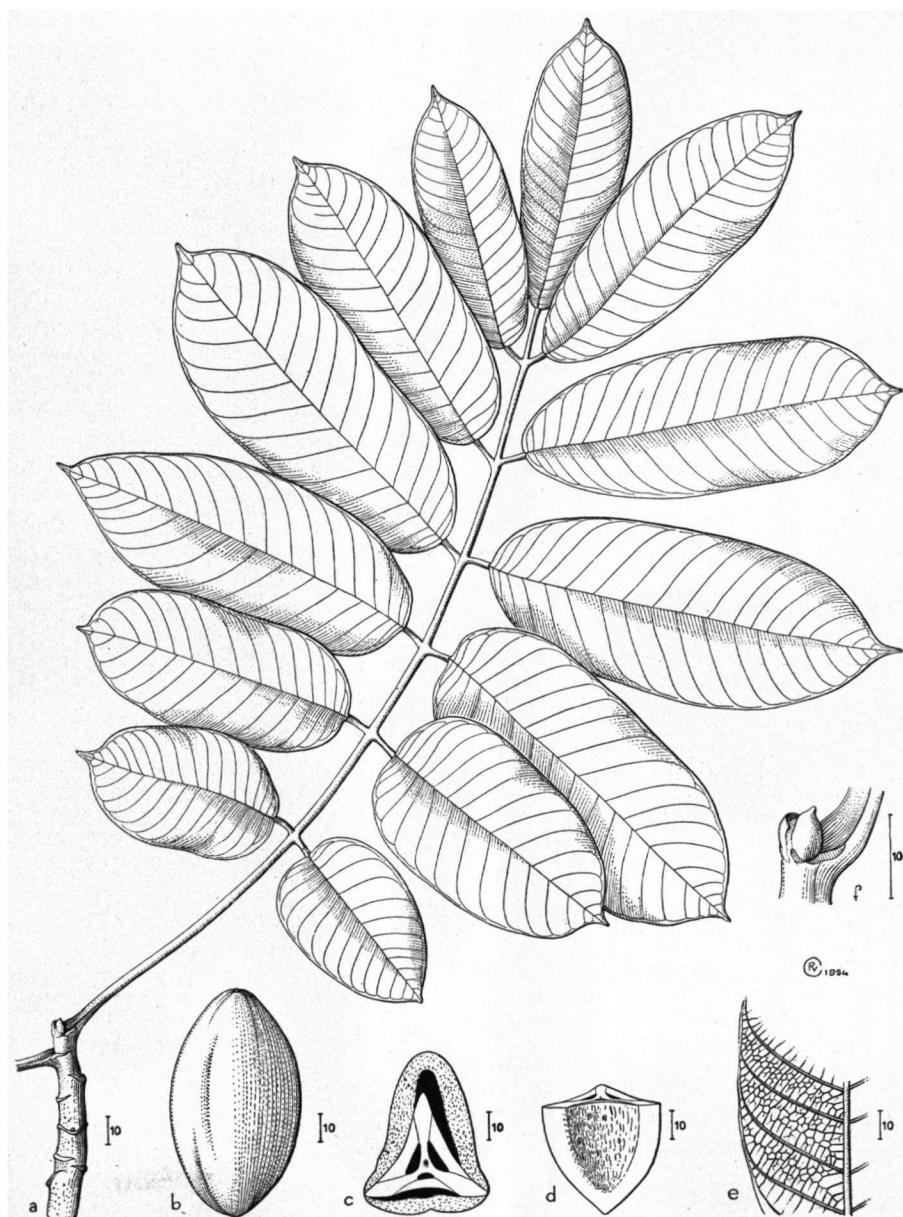


Fig. 3. — *C. megacarpum* Leenah. — a. branchlet with leaf; b. fruit; c. ditto, cross section; d. outer surface of the pyrene; e. part of leaflet, lower surface; f. terminal bud, enveloped by the stipules of the next, not yet unfolded leaf. (FRI. bb. 22547).

11. *Canarium salomonense* B. L. Burtt

Ssp. *papuanum*, nov. subsp. — *Fig. 5 f.* — Differt a ssp. *salomonense* praecipue characteribus sequentibus: *Stipulae* subcaducae. *Folia* 3-jugata. *Foliola* elliptico-ovata, $7-8 \times 4-4.5$ cm; acumen quam in subspecie typica minus. *Fructus* parviusculi, $3.5 \times 2.25 \times 1.5$ cm, subcompressi; pericarpium plus minusve fibrosum; valvae durissimae, usque ad 5 mm crassae; loculi steriles fere complete reducti.

Typus: *Hoogland 3844* (fr.), East New Guinea, Northern Div., foothills of Hydrographer's Range near new Inota village, alt. c. 125 m (Holotype in L; Isotype in CANB).

Paratypes: East New Guinea, Northern Div.: *Hoogland 3823, 3877; NGF. 2099.*

12. *Canarium vulgare*, nov. sp. — *C. commune* (non L.) H. J. Lam, Bull. Jard. Bot. Btzg III, 12 (1932) 509; and of nearly all modern authors.

Arbor. Ramuli c. 0.5 cm diam., laeves, canescentes; medulla fasciculis vasorum multis pro parte peripheralibus suffulta. *Stipulae* subcaducae in conjunctione ramulorum cum petiolis insertae, ellipticae, c. 1.5×1 cm, sub-pulverulentas, apice rotundatae, margine integræ. *Folia* 2—3-jugata, glabra. *Foliola* ovata ad oblonga, $11-14 \times 4-6$ cm, chartacea; basis cuneata; margo integer; apex sensim ad subabrupte acuminatus, acumine obtuso, 1—1.5 cm longo; nervi utrimque 12—15, distincte arcuatim conjuncti. *Infructescientes* terminales; calyx fructifer patens, orbicularis, 1 cm diam., margine undulato. *Fructus* ovoideus, in sectione transversa subtriangularis, $3.5 \times 2 \times 1.25$ cm; loculus fertilis 1; loculi steriles 2 sat multo reducti.

Typus: *Becking 142* (fr.), Bali, Tjandikusuma, alt. 20 m (Holotype in L; Isotype in BO).

Paratypes: probably wild: Kangean: *C. A. Backer 27830, 27954, 29608; Dames 22; Bawean: Karta 1; Flores: FRI. bb. 9638; Timor: Van Steenis 18204; Wetar: FRI. bb. 27244; Tanimbar: Buwalda 4476; FRI. bb. 24355; N. Celebes: Forsten 438; FRI. bb. 15050, 32752; Salejor: Docters van Leeuwen 1551; FRI. bb. 24114; Talaud: H. J. Lam 3131; Morotai: FRI. bb. 24571, 33753, 33852, 33859, 33863, 33917; H. J. Lam 3457; Sula: FRI. bb. 29787; Ceram: FRI. bb. 23043; Banda: Lauterbach 3038; Reinwardt (herb. L 898.319—149); Aru: Beccari herb. 2166, herb. 2169; FRI. bb. 25484; Moluccas s. loc.: De Vriese & Teysmann (herb. L 898.319—145).*

probably cultivated: d'Allerzette herb. 1161; C. A. Backer 22, (herb. U 11313 & 11314); Bakhuizen v. d. Brink jr. 1582; Bakker jr. 20; Blume 667, (herb. L 898.319—144 & 146); Boerlage (herb. L 908.352—155 & 679); E. G. & N. L. Britton 9226; Broadway (herb. L 910.298—16); BS. 29255, 85684; Burmann 149; Cantley 2681; Chevalier 31334; Clemens 22427; Commerson 592; Dorgelo 1708; Evrard 2874; Fairchild 3702; Forbes 6, 1208; Greenway 2884; Griffith 170; Henderson 1360; Van Heurn (herb. L carp 11760/2); Hooker 887; herb. Hooker (herb. CAL 78103); Hort. Bot. Bogor 42, 51, VI B 66; Hort. Bot. Pamplemousses 108, 150; Hort. Bot. Singapore H 64; Hullett 137; Jack 4199, 4790; Junghuhn 59, (herb. L 908.247—222), (herb. U 32921); Kanehira 848; Karta 198; Kehding 1014; Koorders 917 B, 975 B; Kuntze 5086; Lahiae 153, 193; H. J. Lam 2297; Lindeman 4486; Long 176; L. H. MaoDaniels 413; Maorae 332; Nur 195; Parham 1540; PNH. 380, 394; Popita 603/198 A, B & C; Proefstation v. d. Java-suikerindustrie 305a & b; Reinwardt (herb. L 898.319—153 & 390); Ridley 6895, (herb. CAL 78157); Rock 17140; herb. Van Royen (herb. L 898.319—158); SF. 4161, 34847; Volkens 35; De Voogd 667; De Vriese 45; Wallich 8047, 8493; D, E & F; Warburg 2059; Wawra 1247; Wetmore & Abbe 286; Wight 387; Wilder 462, 860; Zollinger Pl. Jav. 2994.

Sect. *Pimela* DC. Prodr. 2 (1825) 80.

13. *Canarium acutifolium* (DC.) Merr.

Var. *celebicum*, nov. var. — Differt a var. *acutifolio* praecipue charac-

teribus sequentibus: Ramuli solidi. Stipulae in petiolo 1—5 mm a basi insertae, usque ad 1.5 cm longae. Foliola oblonga ad lanceolata, 10—20 × 4—6 cm; apex sensim angustatus; nervi utrimque 20—25. Inflorescentiae et flores sparse tomentosi. Stamina 6. Discus et pistillum pilosi.

Type: *FRI. bb. 28279* (♀), North Celebes, Menado, Palu, Sidaunta, alt. 400 m (Holotype in L; Isotypes in A, BO, SING).

Paratypes: Central Celebes: *FRI. Cel./V-190 & 310*.

14. *Canarium asperum* Benth.

f. *triphyllum* H. J. Lam (Ann. Jard. Bot. Btzg 42, 1932, 211, nom. provis.), nov. f. — Folia 1(—2)-jugata. Foliola usque ad 14 × 7 cm, rigida. Spicae rigidae. Fructus c. 10 × 7 mm.

Type: *H. J. Lam 3505* (fr.), Moluccas, Morotai, alt. 100 m (Holotype in L; Isotype in BO).

Paratypes: S. Borneo: *Kostermans 4678*; Morotai: *FRI. bb. 33861, 33918*; Main & Aden 946; Ternate: *Beguin 2a*.

15. *Canarium australianum* F. Muell.

Var. *glabrum*, nov. var. — Differt a var. *australiano* foliolis subtus glaberrimis.

Type: *Specht 571* (fr.), Australia, Northern Territory, Gulf of Carpentaria, Bickerton Island, South Bay (Holotype in L; Isotypes in K, LAE).

Paratypes: Australia, Northern Territory and Queensland: *Brass 2005*; E. Brown 5425; Michael 1360; Prager 28; Schomburgk 116; Schultz 586; Specht 1074; T. A. Stephenson 700; D. F. Thomson 18; Thurston 268; C. T. White 11682; New Guinea, Papua: *Brass 6561, 8425*.

16. *Canarium cestacion*, nov. sp. — *Fig. 5 g.*

Arbor c. 20 m alta. Ramuli 8 mm diam., glabri; medulla fibrosa fasciculis vasorum multis sparsis minutis percursa. *Stipulae* caducae in ramulis prope petioli basim insertae. *Folia* 3—5-jugata, glabra. Foliola late lanceolata, 11—20 × 4.5—7 cm, rigido-chartacea; basis rotundata ad late acuta; margo integer; pars apicalis acuta, sensim acuminata, acumine brevi, lato et obtuso; nervi utrimque 10—12 (angulo 65—75°), recti ad subcurvati, sed marginem versus conspicue curvati, et c. 2—3 mm a margine plus minusve distinete arcuatim conjuncti. *Inflorescentiae* axillares, racemosae, 15—20 cm longae, fructibus 1—3 gerentes, glabrae; calyx patens 3-angularis, 6—8 mm diam., lobis reflexis. *Fructus* elliptici, basi et apice acuminati, in sectione transversa triangulares, 4—4.5 × 2.5—2.75 × c. 1.5 cm, glabri; pyrena profunde sulcata, 6-costata, costis multo prominentibus; valvae 3.5 mm crassae. Semina 1—2; loculi fertiles radialiter angusti, steriles fere complete reducti.

Type: *Carr 12796* (fr.), New Guinea, Papua, Koitaki, alt. 500 m (Holotype in SING; Isotypes in BM, K, L).

This species is possibly related to *C. polyphyllum* K. Schum.

Named after the fish-genus *Cestacion*, which the fruit resembles in shape.

17. *Canarium hirsutum* Willd.

Ssp. *hirsutum*

Var. *beccarii*, nov. var. — Differt a var. *hirsuto* praecipue characteribus sequentibus: Ramulorum medulla fasciculis vasorum multis sparsis



Fig. 4. — *C. pseudosumatranum* Leenah. — a. branchlet with ♂ inflorescence and leaf; b. longitudinal section of ♂ flower, corolla removed; c. petal of ♂ flower, seen from within; d. ditto, longitudinal section; e, f. pyrene; g. fruit; h. ditto, cross section (a—d from KEP. 55781, e—h from KEP. 20476).

minutis suffulta. Stipulae 0. Foliola subtus in nervis sparse rigido-pilosa; nervi utrimque 14—16. Fructus ellipsoideus, in sectione transversa circularis, apice acutus, 28—30 × 17—19 mm; pyrena rostrata, gibbosa, costis 6-acutis; monospermus.

Type: *Beccari herb. 2171* (fr.), SE. Celebes, Lepo-Lepo near Kandari (Holotype in FI).

Paratypes: same locality: *Beccari herb. 2169a, 2170, 2172*.

Named in honour of the great Italian botanist O. Beccari.

Ssp. *multicostulatum*, nov. subsp. — *Fig. 5 e.* — *C. hirsutum* Willd. f. ζ (*multicostulatum*) H. J. Lam, Ann. Jard. Bot. Btzg 42 (1932) 212, nom. provis. — *C. multijugum* H. J. Lam, l. c.; Bull. Jard. Bot. Bteg III, 12 (1932) 476, t. 11 f. 70. — Differt a ssp. *hirsuto* praecipue characteribus sequentibus: Inflorescentiae sat late paniculatae. Pyrena ut in malo persico profunde et irregulariter ruminata; fructus sparse pilosi ad fere glabri.

Type: *Beguin 2245* (fr.), Moluccas, Halmahera, W. Pitu, alt. 60 m (Holotype in L; Isotype in BO).

Paratype: Halmahera: *Beguin 2106*.

Var. *leeuwenii*, nov. var. — *C. hirsutum* Willd. f. ♀ (*Leeuwenii*) H. J. Lam, Ann. Jard. Bot. Btzg 42 (1932) 212, nom. provis. — Differt a var. *multicostulato* praecipue characteribus sequentibus: Stipulae adsunt. Nervi utrimque 14—15. Fructus subglobosi, 3.5 × 2.75 cm; pericarpium 4 mm crassum, fibrosum.

Type: *Kajewski 1931* (fr.), Solomon Islands, Bougainville, Kugumaru, Buin, alt. 150 m (Holotype in L; Isotypes in A, BISH, BO, BRI, G, P, SING).

Paratype: West New Guinea: *Dooters van Leeuwen 11875*.

18. *Canarium kostermansii*, nov. sp. — *Fig. 5 a.*

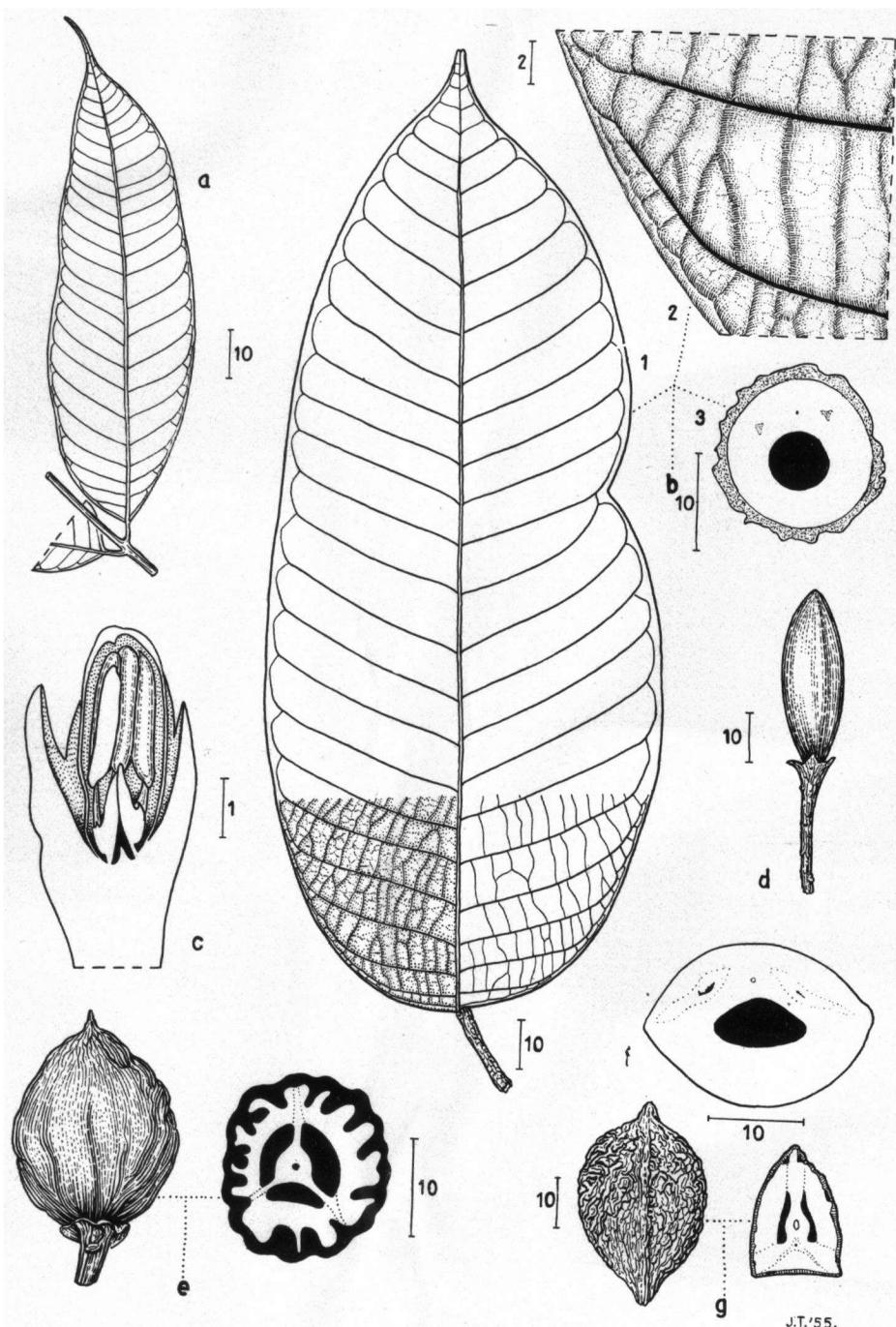
Arbor 30 m × 60 cm. Ramuli usque ad 1 cm diam., ferrugineo-tomentosi; medulla cylindris 2 concentricis e vasorum fasciculis constitutis suffulta. Stipulae caducissimae, in petiolo 3—5 mm a basi insertae, subulatae, c. 6 mm longae, cicatricibus prominentibus. Folia 6—7-jugata. Foliola lanceolata, 10—12 × 3—3.5 cm, sat rigide chartacea, glabra; basis subinaequilateralis, late cuneata; margo integer; apex sensim acuminatus, acumine acuto, usque ad 15 × 3—4 mm; nervi utrimque 22—25 (angulo c. 60°), recti, marginem versus subcurvati, margine valde propinquuo abrupte arcuatim conjuncti. Inflorescentiae ♀ axillares racemosae 10—15 cm longae sparse tomentosae glabrescentes. Flores ♀ 12 mm longi receptaculo cavo. Calyx 9 mm altus. Stamina 4.25 et 5.5 mm longa; filamenta glabra, tubo 1.5 mm longo. Discus annularis 0.5 mm altus, fimbriis usque ad 1.5 mm longis. Pistillum glabrum. Fructus glabri, 1-spermi.

Type: *Kostermans 5515* (♀), E. Borneo, Sangkulirang, G. Tepian Lobang, alt. 100 m (Holotype in L; Isotypes in BM, BO, K).

Probably related to *C. pilosum* A. W. Benn.

19. *Canarium macadamii*, nov. sp. — *Fig. 5 c.*

Arbor magna. Ramuli tenues, seabiuseculi, lenticellati; medulla cylindro-peripherali e fasciculis vasorum constituto suffulta, fasciculis centralibus plus minusve conspicue quasi-cylindraceis. Stipulae petioli basi insertae, lineares, 5—6 mm longae, ut folia et inflorescentiae glabrae. Folia 2—4-



J.T./55.

jugata. Foliola obliquo-ovata, 12–15 × 6–8 cm, subcoriacea, basis valde inaequilateraliter rotundata; margo integer; apex abrupte breviter (5 mm) obtuso-acuminatus; nervi utrimque 14–16 (angulo 60–70°, in foliorum parte basali usque ad 90°), recti ad subcurvati, prope marginem indistincte ad conspicue arcuatim conjuncti. *Inflorescentiae* ♂ axillares anguste paniculatae c. 12 cm longae. *Flores* ♂ 7 mm longi, breviter pedicellati, extus glabri, receptaculo cavo. Calyx 4.5 mm altus. Filamenta basi subconfluentia. Discus conoideus, 1.5 mm altus, glaber, canali centrali basin versus dilatato et pistillum rudimentarium includente. Calyx fructiger patens triangularis 5 mm diam., lobis reflexis. *Fructus* elliptici, in sectione transversa rotundati, 3.5 × 1.5 cm, apice acuminati, glabri; pyrena laevis; valvae 3 mm crassae. Semen 1; loculi steriles moderatim reducti.

Type: *J. B. McAdam 206* (♂, loose fr.), NE. New Guinea, Morbe Distr., Wau, alt. 1500 m (Holotype in BRI; Isotypes in L, LAE).

Named in honour of the Australian botanist J. B. McAdam, collector of the type-specimen.

20. *Canarium pilosum* A. W. Benn.

Ssp. *borneensis*, nov. subsp. — *Fig. 5 d.* — *Dacryodes scandens* Husson, Blumea 7 (1952) 164, f. 1. — Differt a ssp. *pilosum* praecipue characteribus sequentibus: Stipulae 0. Inflorescentiae angustiores floribus paucioribus. Flores glabri. Pistillum glabrum. Fructus ellipsoidei ad fusiformes, basim et apicem versus angustati, 3.8–4.5 × 1.4 cm.

Type: *Clemens 40163* (♀, fr.), Borneo, Mt Kinabalu, Penataran basin, alt. 1500 m (Holotype in L; Isotypes in A, BM, BO, G, NY).

Paratypes: Borneo, Mt Kinabalu: *Clemens 31095, 40546, 40599*, (herb. BO 125342 & 125456); SF. 26956.

21. *Canarium pseudosumatranum*, nov. sp. — *Fig. 4.*

Arbor usque ad 50 m × 120 cm. Ramuli robusti c. 12 mm diam., alabastro terminali tomentoso excepto glabri; medulla cylindro peripherali e fasciculis vasorum minutis constituta suffulta. Stipulae 0. *Folia* 7–9-jugata, glabra. Foliola anguste lanceolata, 13–20 × 3.5–5 cm, rigidochartacea; basis subinaequilateralis, rotundata ad subcordata, saepe paulum decurrens; margo integer; apex sensim acuminata, acumine obtuso, tenui, c. 1 cm longo; nervi utrimque 16–20 (angulo c. 55°), recti ad subcurvati, prope marginem valde curvati et inconspicue arcuatim conjuncti. *Inflorescentiae* ♂ axillares, anguste paniculatae c. 20 cm longae, glabrae, rami primarii fere decussati. *Flores* ♂ 7 mm longi, graciles. Calyx 2 mm altus, subglabrus. Petala apicem versus extus subrugosa. Stamina glabra, filamentis inaequaliter confluentibus. Discus tubulosus, 1 mm altus, crasse carnosus,

Fig. 5. — a. *C. kostermansii* Leenh., leaflet (*Kostermans 5315*); b. *C. maluense* Laut. f. *bullata* Leenh.: 1. leaflet, 2. part of leaflet, upper surface, 3. cross section of fruit (1 from *Brass 12586*, 2–3 from *Brass 13136*); c. *C. macadamii* Leenh., longitudinal section of ♂ flower (*McAdam 206*); d. *C. pilosum* A. W. Benn. ssp. *borneensis* Leenh., fruit (*Clemens 40163*); e. *C. hirsutum* Willd. var. *multicostulatum* Leenh., habit and cross section of fruit (*Beguin 2245*); f. *C. salomonense* B. L. Burtt ssp. *papuanum* Leenh., cross section of pyrene (*Hoogland 3844*); g. *C. cestacion* Leenh., pyrene and cross section of the fruit (*Carr 12796*).

ad orificio et intus dense pilosus; pistilli rudimentum 0. *Fructus* ovoidei, in sectione transversa circulares, 5 × 2.5 cm, glabri; pericarpium sat crassum; pyrena 6-costata, costis valvarum 3 acutis, costis ceteris 3 obtusis; valvae conspicuae, 2.5 mm crassae. Semina 2; loculus sterilis paulo quam loculi fertiles angustior.

Type: KEP. 55781 (♂), Malay Peninsula, Selangor, Kuala Lumpur, Bukit Lagong forest reserve (Holotype in KEP; Isotype in K).

Paratypes: Malay Peninsula: KEP. 2132, 11599, 20476, 20900, 23087, 71256, 71974.

Up to now this species was included in the closely related *C. sumatranum* Boerl. et Koord. It differs especially from the latter by its larger fruits (which H. J. Lam, Bull. Jard. Bot. Btzg III, 12, 1932, 474, t. 11 f. 69, described under *C. sumatranum*); as well as by its smaller ♂ inflorescences and different flowers.

22. *Canarium vrieseanum* Engl.

f. *stenophyllum*, nov. f. — Differt a f. *vrieseano* praecipue characteribus sequentibus: Forma sat robusta. Folia 7-jugata, subglabra. Foliola oblonga, c. 20 × 4 cm, rigida; nervi utrimque 20—26, sat approximati. Infructescentiae compactae 8—15 cm longae. Fructus c. 17 × 12 mm.

Type: BS. 49156 (fr.), Mindanao, Davao prov., Mati (Holotype in SING; Isotype in NY).

Paratype: Mindanao, Davao prov.: BS. 49539.

Index to scientific names

	Nr		Nr
<i>Canarium acutifolium</i> (DC.) Merr.		<i>Canarium kinabaluense</i>	5
var. <i>celebicum</i>	13	— <i>kostermansii</i>	18
— <i>asperum</i> Benth. f. <i>triphylum</i>	14	— <i>lamii</i>	6
— <i>australianum</i> F. Muell. var. <i>glabrum</i>	15	— <i>macadamii</i>	19
— <i>caudatum</i> King f. <i>auriculiferum</i>	1	— <i>maluense</i> Laut. — ssp. <i>borneense</i>	7
— <i>cestracion</i>	16	— f. <i>bullata</i>	7
— <i>commune</i> (non L.) Auct.	12	— f. <i>celebica</i>	7
— <i>denticulatum</i> Bl. ssp. <i>kostermansii</i>	2	— <i>megacarpum</i>	8
— <i>hirsutum</i> Willd. var. <i>beccarii</i>	17	— <i>perisanum</i>	9
var. <i>leeuwenii</i>	17	— <i>pilososo-vilestre</i>	10
ssp. <i>multicostulatum</i>	17	— <i>pilosum</i> A. W. Benn. ssp. — <i>borneensis</i>	20
— <i>indicum</i> L. var. <i>platyceroides</i>	3	— <i>pseudosumatranum</i>	21
— <i>kaniense</i> Laut. var. <i>globigerum</i>	4	— <i>salomonense</i> B. L. Burtt — ssp. <i>papuanum</i>	11
		— <i>vrieseanum</i> Engl. f. <i>steno-</i> — <i>phyllum</i>	22
		— <i>vulgare</i>	12
		<i>Dacryodes scandens</i> Husson	20