II. BURCKELLA PIERRE

by

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Trees with leaves crowded at tip of thick branchlets; stipules subulate or narrowly deltoid, caducous; leaves obovate or obovate-oblong, tertiary nerves ascending near the midrib, transverse near the margins of the leaf; flowers crowded at tips of branchlets, forming a pseudo-terminal, many-florous inflorescence; calyx with two whorls of two lobes each; corolla exsert, tube solid, pubescent without at apex, petals 8, imbricate; stamens 9—40, inserted in one or two rows in the throat; style subulate, exsert, glabrous; ovary glabrous, 3—8-celled, cells 1-ovuled, ovules attached at the apex of the central axis; sometimes an indistinct annular disc present; fruit large, often edible, crowned by the persistent style; fruit usually 1-seeded; seed ovoid with large to very large scar and apical hilum; testa thick, crustaceous; albumen none or membranous, if present especially around the radicle; cotyledons fleshy; radicle inferior, not exsert — 11 species distributed from the Moluccas to the Samoa and Tonga Islands.

The last revision of this genus was given by Lam in 1942. After a small but important publication of White (J. Arn. Arb. 31, 1, 1950, 104) and the investigation of some new collections it seemed appropriate to give a concise revision of this genus in preparation for the "Flora Malesiana". Some new species are described and of some old ones more details are given. The publications of Lam are abbreviated as follows:

Lam 1925 = The Sapotaceae, etc. of the Dutch East Indies, Bull. Jard. Bot. Bzg, sér. 3, 7, 1925, 112.
Lam 1927 = Further studies etc., Bull. Jard. Bot. Bzg, sér. 3, 8, 1927, 381.
Lam 1932 = Sapotaceae, in Nova Guinea 14, 4, 1932, 554.
Lam 1942 = A tentative list of wild Pacific Sap. etc., Blumea 5, I, 1942, 36.

Key to the species.

1.a. Leaves densely appressed pubescent beneath. (See also *B. obovata*) . . . 2
b. Leaves glabrous beneath 3
2.a. Stamens about 25; ovary 7- or 8-celled; leaves obovate, top retuse to crenate, 9—18 × 4—8 cm; secondary nerves 17—25. *New Guinea* . **7. B. polymera** v. Royen
b. Stamens about 40; ovary 4-celled; leaves obovate, top obtuse, 16—21 × 6—9 cm; secondary nerves 15—17. *Fiji* . . . **11. B. thurstonii** (Hemsley) H. J. Lam

3.a. Stamens 25 or more; secondary nerves about 25. *Moluccas to South Eastern New Guinea* . . . . . 8. **B. poolei** H. J. Lam
b. Stamens 20 or less 4
4.a. Secondary nerves 20—25. *Fiji* . . . . . 5. **B. multinervis** H. J. Lam
b. Secondary nerves 17 or less 5
5.a. Petiole of leaf 3—7.5 cm. *New Guinea* 3. **B. macropoda** (Krause) H. J. Lam, var. **macropoda**
b. Petiole 0.7—3 cm 6
6.a. Calyx of the flower glabrous, sometimes the inner sepals of the flower fimbriate at top 7
b. At least two sepals pubescent or densely appressedly haired, sometimes sparsely pilose, inner sepals not fimbriate at top (See, however, *B. obovata*) . . . 8
7.a. Secondary nerves 6—10; corolla up to 1.5 cm long; stamens up to 0.7 cm long; apex of leaf bluntly acuminate; pedicel 0.8—1.9 cm. *New Hebrides, Fiji* 1. **B. brachypoda** H. J. Lam
b. Secondary nerves 7—11; corolla up to 0.6 cm long; stamens up to 0.3 cm long; apex of leaf rounded; pedicel 0.8 cm long. *Tonga* . 9. **B. richii** (Gray) H. J. Lam *New Guinea* . . . . . 10. **B. erythrophylla** H. J. Lam
8.a. Leaves 4—12 × 2.5—5 cm 9
b. Leaves 10—25 × 4.5—10 cm 10
9.a. Leaves obovate, base cuneate, tapering into a petiole, which is 1.5—3.5 cm long; calyx 0.5—0.6 cm; corolla 1.2—1.4 cm, petals 7. *Samoa, Tonga* 4. **B. microphylla** H. J. Lam & E. v. Olden
b. Leaves ovate or elliptic with a broad, abruptly narrowed base; petiole 0.5—0.9 cm; calyx 0.3—0.5 cm; corolla 0.6 cm, petals 8. *Fiji* 2. **B. hillii** (J. G. Baker) H. J. Lam
10.a. Secondary nerves 11—13, tertiary nervation distinct, prominent, with numerous nerves; leaves obovate, top shortly and bluntly acuminate, base cuneate, tapering into petiole which 2.5—3 cm long; inflorescences many-florous; calyx 0.5—0.6 cm; corolla 1.2—1.4 cm; ovary 4-celled; styles up to 2.5 cm long; pedicel of fruit densely appressedly pubescent, slender, 1.2—3.5 cm long. *Moluccas to Solomon Islands* . . . . . 6. **B. obovata** (Forster) Pierre
b. Secondary nerves 10—12, tertiary nervation indistinct or absent, with few nerves; leaves obovate to oblong-obovate, top rounded to retuse, base broad and gradually narrowed, petiole 2—2.8 cm long; inflorescences few-florous; calyx about 1 cm long, corolla unknown; ovary 5-celled; styles up to 4 cm long; pedicel of fruit glabrescent, stout, up to 2.5 cm long. *Fiji* . 3. **B. macropoda** (Krause) H. J. Lam, var. **macrantha** (H. J. Lam) Lam & v. Royen

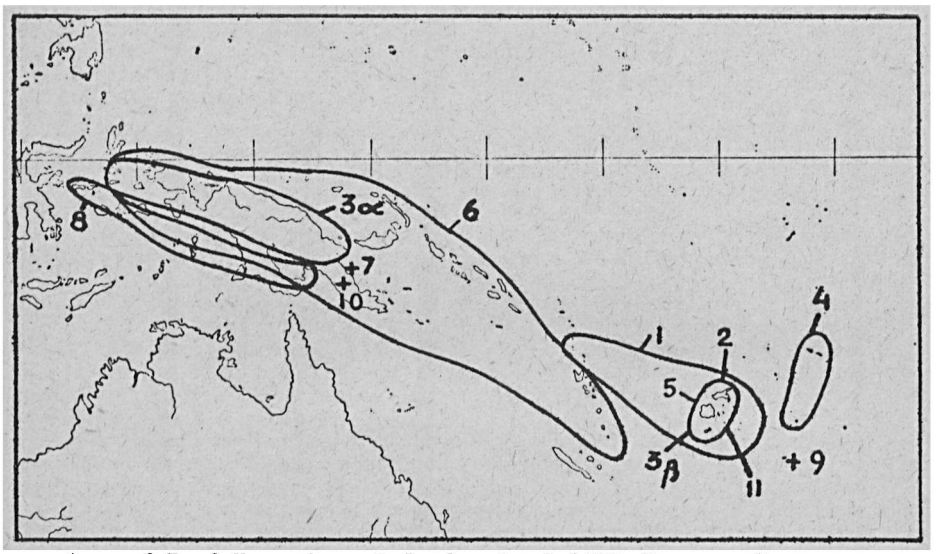
Affinities and distribution (cf. map).

In his paper of 1925, Lam followed Pierre as to the generic characteristics and limits of *Burckella*. These limits are admittedly vague, as seems to be a feature of almost the entire family of the *Sapotaceae*. *Burckella* is generally characterized by its often thick branchlets, the leaves conferted towards their tips, as well as by the congregation of flowers in the uppermost leaf-axils, the number of flower parts (S 4, P 8, A 9—40, G 3—8), and the type of pubescence of the corolla. From related genera (*Madhuca, Ganua, Payena,* in this order) it is geographically distinguished, being a truly Western Pacific genus, with a centre both in New Guinea and in the Fiji area, extending westward not farther than the Sula Islands and Ternate (Moluccas) and eastwards as far as Samoa and Tonga.

In *Burckella* two more or less distinct categories can be distinguished, viz., one with large leaves (9—26 cm), many secondary nerves (15—30) and a large number of stamens (25—40) in which *B. polymera, B. poolei, B. multinervis* and *B. thurstonii* are included, and a second category with mainly smaller leaves (4—12 cm) — except in *B. macropoda, B. brachy-*

poda and *B. obovata* (10—35 cm) — fewer secondary nerves (7—13) and fewer stamens (11—20). It should be remembered, that the number of stamens is thus far unknown in *B. richii* and *B. macropoda* var. *macrantha*.

In the first-mentioned category *B. polymera* and *B. thurstonii* are distinguishable from all other *Burckella* species by the pubescence of the leaves. In the second category a small-leaved group may be distinguished (4—12 cm long) next to a larger-leaved group (10—35 cm), the former including *B. microphylla*, *B. hillii* and *B. richii* (with *B. erythrophylla*), the latter comprising *B. macropoda* and its variety *macrantha*, and *B. obovata*.



Areas of *Burckella* species — 1. *brachypoda*; 2. *hillii*; 3. *macropoda*, α var. *macropoda*, β var. *macrantha*; 4. *microphylla*; 5. *multinervis*; 6. *obovata*; 7. *polymera*; 8. *poolei*; 9. *richii*; 10. *erythrophylla*; 11. *thurstonii*.

The lack of complete material in several species is the main difficulty in as exhaustively tracing the affinities as we should like to do. Due to the same cause we were sometimes unable to include a species for certain in the key, not being sure whether a given character is constant, e.g. the pubescence of the calyx was used as one clue in our key but it should be emphasized that it is by no means certain that this is the most natural one.

Regarding a geographical correlation, if any, with the taxonomically accepted subdivision of the genus, it must stated, in accordance with the rather vague specific limits, that such a correlation is not very clear. *B. obovata* extends its range from Ternate to the New Hebrides while at both ends a polymorphic group of species has arisen, viz., at the western end *B. macropoda* var. *macropoda* and *B. poolei*, both with a relatively large area and *B. polymera* and *B. erythrophylla* known from the type-locality only. If we compare this with the taxonomical subdivision given above, one finds that species of both categories are found side by side.

At the eastern end a similar polymorphic group with its centre around Fiji, Tonga and the Samoa Islands is found, including *B. brachypoda*, *B. hillii*, *B. microphylla*, *B. multinervis*, *B. macropoda* var. *macrantha*, and *B. thurstonii*. Here also the species of both categories are found together in one region. The small-leaved group of the second category is found for the main part in this region, but *B. erythrophylla* is found in the centre of the area of *B. obovata*. Possibly the last-named species is

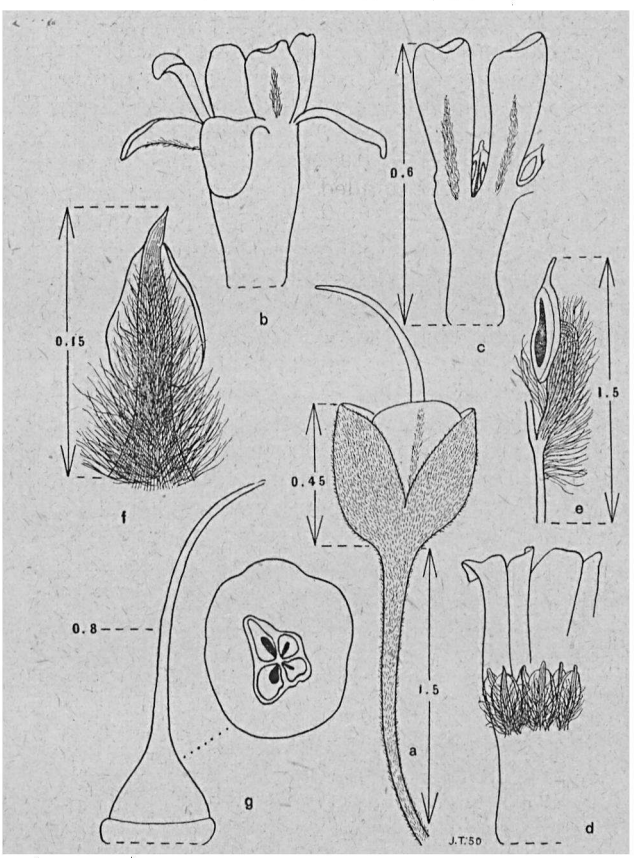


Fig. 1 — *Burckella hillii* (J. G. Baker) H. J. Lam — a. flower — b. corolla — c. corolla showing stamens — d. corolla, inner side — e. stamen aside — f. stamen dorsal — g. gynaecium (with transversal section of ovary).

to be regarded as the oldest species while the other species might have sprung from it in two separate centra.

1. B. brachypoda H. J. Lam, 1942, 36, f. 9. In the legend of the figure erroneously the name *B. macropoda* has been used.

Distribution: New Hebrides, Fiji.

2. B. hillii (J. G. Baker) H. J. Lam, 1942, 38 — *Payena hilli* J. G. Baker, J. Linn. Soc. 20, 1883, 368; mentioned as *P. hilli* sine aut. in J. Horne, A year in Fiji, 1881, 266; Hartog mss in sched., nomen nudum — *Fig. 1.*

Description of the type specimen:

Tree with slender, terete, glabrous and smooth branchlets (up to 0.2 cm thick), minutely ferrugineously pulverulent at innovations only. *Leaves* exstipulate, scattered or at least not densely conferted at tips of branchlets, thinly coriaceous, glabrous, oblong with more or less broad, abruptly contracted base and bluntly acute apex, 6—12 × 2—5 cm, petioles 0.5—0.9 cm, midrib distinctly prominent below, secondary nerves faint, about 10, straight and close to margin, widely arching, tertiary venation loosely reticulate with some stout nerves parallel to secondary nerves. *Inflorescences* in axils of upper leaves or leaf-scars, between foliage, 1—2-florous. Pedicels very slender, 0.5 mm thick and often curved downward, minutely pulverulent, 1—1.7 cm long, slightly broadened underneath calyx. *Calyx* in bud subglobose, when young 0.4—0.5 cm long, outer sepals densely appressedly pubescent with a rounded to subacute apex, inner ones with broad glabrous margins enclosing a narrow pubescent keeled centre, all sepals glabrous inside. *Corolla* subinfundibuliform, 0.6 cm long, tube glabrous, as long as the oblong lobes (4 outer and 4 inner ones), which bear for about $^2/_3$ of their length from base a narrow central slip of appressed hairs, for the rest glabrous outside, tips rounded. *Stamens* 11—13, about 0.15 cm long, inserted in two closely adherent whorls in corolla throat, insertions and the short filaments densely and coarsely pubescent, filaments flat at base, solid and thick at apex, even when, apparently, adult not longer than thecae which are glabrous and scarious, connective ending in a short glabrous acumen, in sicco dark brown as are connective and filaments. *Ovary* conoidal or semiglobular, glabrous, at its base surrounded by an annular and somewhat undulated disk, 4-celled (a single one examined), subabruptly contracted into a more or less curved style, protruding about 0.5 cm from corolla. *Fruit* unknown.

FIJI — Rabi, near Vanua Levu: *J. Horne 484, type specimen* (K), tree 40 ft or so in height, bark dark brown, fl. small and greenish, March 1878.

Remarks: It is certainly surprising that this remarkable species never has been collected again after 1878. Its most striking features are the short and stout filaments, the small thecae, and the small number of stamens (which are not sessile as is mentioned by Baker). For the rest it shows all characters typical for the genus (venation, petals partly hairy outside and pubescent in the throat, 4-celled ovary).

It seems most related with *B. obovata*, from which it differs by the small oblong leaves, the short filaments and the small number of stamens. *B. obovata* has 9—16 stamens; most other *Burckella* species possess a far greater number and for *B. kajewskii*, which is considered a synonym of *B. obovata*, 16 subsessile stamens are reported. There are no indications on the sheet of the type specimen that the corolla lobes should be "purplish brown" as is mentioned by Baker.

Its relation is probably with *B. microphylla* from Tonga and Savaii, from which it differs by the broader leaf-base, the slightly longer leaves and the distinctly smaller flowers with broad anthers on short solid filaments.

Distribution: Fiji.

3. B. macropoda (Krause) H. J. Lam, var. **macropoda**, Lam 1932,

554, t. 99 — ? *Burckella may* (Becc.) Pierre, Not. bot. Sapot., 1890, 4; Dubard, Rév. Gén. Bot., 20, 1908, 201; Lam 1925, 118; Lam 1927, 423; Lam 1932, 566 — ? *Bassia may* Becc. msc. ex Pierre, l. c. 4 — ? *Illipe may* (Becc.) Engler, Nat. Pfl. Fam., Nachtr., 1897, 272; Boerlage, Handb. Fl. Ned. Indië 2, 1, 1891, 310; Krause, Engl. Bot. Jahrb. 58, 1923, 468 — *Illipe macropoda* Krause, l. c. 466 — *Burckella oxycarpa* H. J. Lam, 1925, 113, f. 53; Lam 1927, 422 — *Burckella ovalifolia* H. J. Lam 1927, 422, f. 9.

The following may be added to Krause's description:

Carr 15783: Leaves glabrous, largest width near apex, from there gradually and regularly narrowing towards acute base, apex rounded or very shortly and bluntly acuminate or subacute, conferted at tips of thick and rugose branchlets, 7.5—19.5 × 2.7 cm, petioles 1.5—4.7 cm, midrib strongly prominent below, secondary nerves 10—15, faint and hardly more conspicuous than the loosely reticulate tertiary venation, angle rather large, c. 75°. *Inflorescences* in the axils of small scales above leaves; the naked parts of branchlets more or less clearly show zones with leaf-scars and a short distance above these, zones of flower-scars between the more or less smooth internodes: cf. Lam 1932, t. 99. Pedicels slender, glabrous, 2—2.8 cm long. *Calyx* hard and broad, 0.7—1 cm long, glabrous but for some coarse hairs on margins of tips of inner sepals. Sepals broadly obovate, ovate or subtruncate, sometimes bluntly subapiculate, 0.2—0.4 cm long. *Corolla* c. 0.7—1 cm exsert from calyx, c. 1—1.3 cm long, the tube 0.4 cm, the latter densely appressedly pubescent outside (except for the lower third), as are the middle portions of the petal-bases; lobes probably 8 (all corollas were insect-eaten), imbricate, ovate, with rounded tip and contracted base, c. 0.7 × 0.55 cm, tube c. 0.5 cm, glabrous inside, except at throat. *Stamens* small, not exsert, number uncertain but probably about 16, inserted in the upper half of corolla tube; filaments stout and densely pubescent, about 0.2 cm long, anthers glabrous, with the acute 0.1 cm long connectival acumen 0.4 cm long. *Ovary* glabrous, together with basal disc 0.15—0.2 cm high and slightly more in diam., 4- or 5-celled. Style slender, 4—4.2 cm long, 3—3.2 cm exsert from calyx. *Fruit* unknown.

Clemens 3202 and *8084* are undoubtedly conspecific, but the leaves are broader. In *3202* they are obovate with a rounded apex and acute base, 7—13 × 3.7—7 cm, petioles 1.7—3.5 cm, lateral nerves 11—14. Flowers as in *Carr 15783*, but the pedicels 1.7—3.2 cm, corolla-lobes 8, 0.9—1.1 × 0.6 cm; stamens 18—21 (insect-eaten), ovary 4-celled, style up to 3 cm long.

In *Clemens 8084* the leaves are narrowly oblong with rounded tips and acute base, 10—25 × 4.8—9 cm, petioles 2.5—6.5 cm, lateral nerves 12—17; flowers as in preceding specimen.

NEW GUINEA — Papua, Isuarava, c. 1050 m, in secondary forest: *C. E. Carr 15783* (L, SING), tree 24 m, fl. brown, Febr.; Morobe-district, Sattelberg, hill forest below cabin: *Clemens 3202* (A, L), tall tree, diam. breast high 1—2 ft, fl. cream white, May; ibidem, hill trail above watersupply, open forest, 3300 ft: *Clemens 8084* (A, L), big tree, diam. 15—18 inch, infl. green, abundant in ample leaved terminals, April.

The type specimen (*Schlechter 17293*) has probably been destroyed in the Berlin bombardment; no duplicate types are known. Judging from the figure in Lam's paper of 1932 which was made after the (poor) type specimen and from Krause's not very complete description, the identification

of the above-named specimens of which ample material was available, seems fairly certain. In case of a total loss of the type specimen, *Carr 15783* is recommended to serve as a neo-type.

Remarks: The species seems very constant in its flower-characters but rather variable as to its leaf-shape and size. This implies that *B. oxycarpa* could not be maintained as a species.

To *B. macropoda* the mysterious *Burckella may* (Becc.) Pierre may possibly be added. The last name is an illegitimate combination based upon a "nomen nudum" (*Bassia may* Becc. msc., New Guinea). No material is known, but in the Paris herbarium there is a picture with this name which pretty well agrees with *B. macropoda*, but for the emarginate leaf-tips. This picture shows some fruits, which were thusfar unknown: a young one about 4 × 2.3 cm somewhat pointed at the top and with the remainder of a style, and an, apparently, mature one of about 11 × 6.5 cm, pyriform and with a shortly and bluntly mamillate apex. Both are smooth, not furrowed, as in *B. obovata*. No seeds are known, but the ovary is 4-celled and the dimensions of the calyx agree with those of *B. macropoda*.

Distribution: New Guinea.

Var. **macrantha** (H. J. Lam) Lam & v. Royen, nov. comb. — *Burckella macrantha* H. J. Lam, 1942, 39, f. 9.

This variety differs from the type-variety *macropoda* in the calyx which is densely appressedly pubescent. No other details giving any clue to separate it as a distinct species, it is matter of the taxonomical value to be attributed to this character whether its specific or even varietal rank should be maintained. Also on account of the geographical distribution of both varieties it seems preferable to provisionally keep the two groups separate as varieties.

Distribution: Fiji.

4. B. microphylla H. J. Lam & E. van Olden, Bernice P. Bishop Museum Bull. 154, 1938, 34, pl. 1 B; Lam 1942, 39.

Distribution: Samoa, Tonga.

5. B. multinervis H. J. Lam, nov. sp. — *Fig. 2.*

Arbor alta, ramulis crassis in sicco rugosis glabris. *Folia* glabra, ad apices ramulorum conferta, chartacea, in sicco brunneo-viridiuscula ovata vel oblonga vel paulo obovata, apice obtusa vel subrotundata, basi obtuse vel late acuta, 14—26 cm longa, 6.7—9.2 cm lata, petiolo forti, 2.3—4.2 cm longo; costa media subtus valde prominens, nervi secundarii graciles 20—25, angulo 70—90° de costa adscendentes, prope margine tenuiter arcuatim conjuncti, tertiarii laxe reticulati, generatim transversi. *Inflorescentiae* floresque ignoti. *Fructus* supra folia inserti, pedicellis solidis 2.5—3.5 cm longis, petiolis subaequicrassis. *Calyx* durus, c. 1 cm longus, extus dense sericeus, intus glaber, sepala interiora margine fimbriata, omnia ovata, 0.7—0.8 cm longa, 0.6—0.7 cm lata. Fructus novelli 4-loculati, maturi monospermi, elongato ovoidei, acutati, c. 6 × 2.3 cm, glabri, in sicco sulcati, apice contracti, styli rudimento coronati. Seminis unici testa (normalis?) tenuis, c. 0.6 mm crassa, pro dimidio fructus axi connata, cicatrice probabiliter latissima. Embryo exalbuminosum, cotyledones planae crassae.

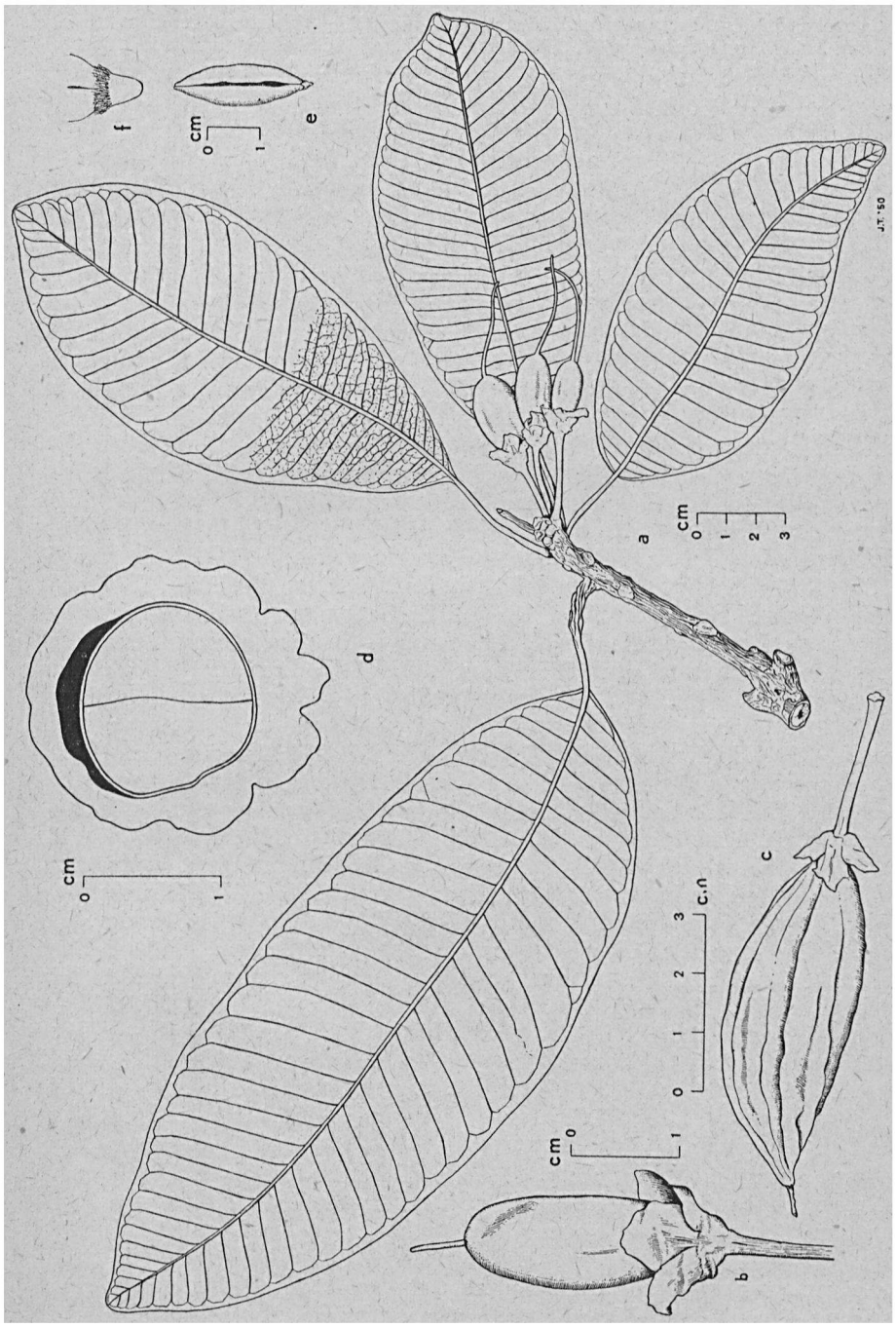


Fig. 2 — *Burckella multinervis* H. J. Lam — a. branchlet with leaves and fruits — b—c. fruit, juvenile an mature — d. fruit transverse — e—f. seed.

FIJI — Viti Levu, Nandronga & Navosa (Tholo North), northern portion of Rairaimatuku Plateau, between Nandrau and Rewasau, 725—825 m alt., in dense forest: *A. C. Smith 5631, type specimen* (L, US), tree 25 m high, with abundant latex, July 31—Aug. 11, 1947; with attached young and detached mature fruits.

Remarks: Undoubtedly related to the large-flowered *B. macropoda* but differs in the dense secondary nervation.

Distribution: Fiji.

6. B. obovata (Forster) Pierre, Not. bot. Sapot., 1890, 4; Dubard, Rév. Gén. Bot. 20, 1908, 201; Lam 1925, 118; Lam 1932, 555; Lam 1942, 40; White, J. Arn. Arb. 31, 1, 1950, 104 — *Bassia obovata* Forster, Fl. Ins. Austr. Prodr., 1786, 35, no 200; Guillaumin, J. Arn. Arb. 13, 1932, 16 — *Bassia (?) cocco* Scheffer, Ann. Jard. Bot. Bzg 1, 1876, 34; Burck, ibid. 5, 1886, 46 (err. cocca) — *Payena bawun* Scheffer, l. c. 133; Burck, l. c. 58; Engler, Notizbl. Berl. Bot. Garden 1, 1895, 102; Schumann & Lauterbach, Fl. Deutsch. Schutzgeb. Südsee 1901, 493 — *Lucuma cocco* v. Mueller, Descr. Not. Pap. Pl. 5, 1877, 100 — *Bassia (Illipe) erskineana* v. Mueller, Viet. Chem. and Druggist, April 1885; idem, Descr. Not. Pap. Pl. 6, 1885, 12; idem, Bot. Centralbl. 23, 1885, 224; idem, Gard. Chron. 6, VI, 1885, 734 — *Bassia hollrungii* K. Schum., Engl. Bot. Jahrb. 9, 1888, 214 — *Illipe hollrungii* K. Schum. & Hollrung, Fl. Kais. Wilh. Land, 1889, 107; Warburg, Engl. Bot. Jahrb. 13, 1891, 401; Boerlage, Handl. Fl. Ned. Ind. 2, 1, 1891, 310; Schumann, Notizbl. Bot. Gart. Mus. Berl. 1, 1895, 55; Engler, Nachtr. Nat. Pfl. Fam. 1897, 272; Schumann & Lauterbach, l. c. 493; Krause, Engl. Bot. Jahrb. 58, 1923, 465 — *Burckella cocco* (Scheffer) Pierre, l. c. 3; Dubard l. c. 201; Lam 1925, 115; Lam 1927, 423; Lam 1942, 38; Heyne, l. c. 1229 — *Schefferella bawun* (err. bawum) Pierre, l. c. 5 — *Illipe cocco* (err. cocca) Engler, Bot. Jahrb. 12, 1890, 509; Boerlage, l. c. 309; Engler, Nat. Pfl. Fam. 4, 1, 1897, 134; Krause, l. c. 466 — *Burckella hollrungii* (Schum.) Pierre, l. c. 4; Dubard, l. c. 201; Lam 1925, 117; Lam 1927, 423; Lam 1932, 555 — *Burckella erskineana* (F. v. Mueller) Pierre, l. c. 4 (nomen); Dubard, l. c. 201; Lam 1925, 117; Lam 1927, 423; Lam 1932, 556 — *Illipe erskineana* (F. v. M.) Engler (err. erskieana), l. c. 1890, 509; Boerlage, l. c. 310; Engler, l. c., 1897, 272; Krause, l. c. 466 — *Illipe bawun* (Scheff.) Baill., Hist. Pl. 11, 1892, 265; Engler, l. c. 1897, 272; Krause, l. c. 466 — *Payena mentzelii* K. Schum., Notizbl. Berl. Bot. Gart. 1, 1895, 102; Schum. & Laut., l. c. 493; idem, Nachtr. Nat. Pfl. Fam., 1923, 465 — *Illipe obovata* (Forst.) Engl., l. c. 1897, 272 — *Madhuca obovata* Macbr., Contr. Gray Herb., N. S. 53, 1918, 18 — *Illipe mentzelii* (K. Schum.) Krause, l. c. 465 — *Bassia bawun* (Scheff.) Guill., Journ. Arn. Arb. 13, 1932, 16 (sub *Bassia kajewskii* Guill.) — *Bassia kajewskii* Guill., l. c. 15 — *Burckella kajewskii* (Guill.) H. J. Lam, 1942, 39. (Full synonymy).

Type specimen of *Burckella obovata* (Forster) Pierre is *Forster s. n.* (K) from Tana; *Hollrung 198* (B) of *Bassia* and *Illipe hollrungii*; *Teysmann s. n.* (L) of *Bassia cocco*; *Teysmann s. n.* (L) of *Payena bawun*; *Mentzel 13* (B) of *Payena mentzelii*.

In various publications and in annotations on labels the synonymy given above has already been hinted at. In the extensive annotations of Pierre, accompanying the Paris specimens of *B. erskineana*, the writer remarks: "Le

B. erskineana, le B. obovata et le B. cocca (sic) pourraient être la même espèce. Par leurs feuilles et leurs fleurs rien ne l'empêche, mais les graines du B. erskineana sont plus petites que celle de B. cocca. Celles de B. obovata sont inconnues". White in 1944 regarded *B. obovata* as "a somewhat polymorphic species widely spread over the Pacific" and reduced *Burckella cocco, B. hollrungii* and *B. kajewskii* to synonyms of *B. obovata.* Lam in 1942 already hinted that these 4 species could be reduced to one.

In the new delimitation the leaves in this species are mostly more or less broadly obovate with rounded top and acute base, but those with acute and even acuminate apices and intermediate ones are not rare, e.g. *Weinland s. n.,* apex subacute, *Atasrip 149,* leaves oblong and in *Kajewski 2399* leaves obovate to oblong-lanceolate with subacute or slightly bluntly acuminate apex, *Kajewski 2205* with oblong leaves, shortly more or less acutely acuminate. The narrowest and most pointed leaves are found in the Paris specimen of *B. erskineana* which are perfectly agreeing with those of *Stoddard 28* except in as far as in the last-named specimen the leaves are glabrescently pubescent on either side. These narrow leaves could be a reason for maintaining *B. erskineana* as a separate species, but on account of the many transitional forms between the leaves of *B. obovata* and *B. erskineana* it seems logical to combine the two and there seems to be no reason even to distinguish varieties or forms.

A similar variability is found in the flowers though chiefly restricted to the pubescence of the corolla. The indumentum may be confined to a narrow and more or less interrupted belt around the upper part of the tube, leaving the base as well as the petals entirely glabrous (e. g. in *Kajewski 2399*) or it may be more continuous and extending both downwards and upwards on the bases and along the margins of the petals, as is, in various degrees, the case in the type of *Bassia bawun,* in *Weinland s. n.,* the type (?) of *Burckella hollrungii* and markedly, in *Stoddard 28.* For the rest, the flowers are of the same type, cream-coloured or whitish, with slender, graceful pedicels and appressedly pubescent calyces, 0.3—0.5 cm long and cleft halfway down, the entire flower about 1—1.2 cm long, with mostly 8 petals and (9—?) 16 (—18) stamens with pubescent filaments and a 4—6-celled glabrous ovary. Also on these grounds, as well on those of the leaves, a subdivision of the species seems impossible. The only uncertainty remains in the fruit. This is according to the labels and the descriptions, large (4—5 inches long), pyriform or applelike globose, with furrowed pericarp, and edible. The white flesh is said to be delicious. A fruit in dry state, accompanying *Kajewski 2399* is, in spite of the annotations on the label narrow and pointed at either end and one-seeded; it is doubtful whether it belongs here and it rather reminds the equally detached fruits of *B. multinervis* (see there).

The scar of the seed is said to occupy almost one half of the surface and the back is said to be rounded in a 1-seeded fruit of *B. cocco.* However, seeds, probably from more-seeded fruits, are found to be more or less compressed and keeled at the dorsal side, the scar occupying not more than about one third of the surface. The seeds are 4—6.5 cm long. Albumen none or very little around the base of the embryo.

MOLUCCAS — Halmaheira-group, Kasiruta, alt. 100 m: *de Haan 103* (= *N.I.F.S. bb 23222*) (BO, L), fl. Sept.

NEW GUINEA — Dinner Island: *H. D. Forbes 12* (BRI, L), large tree, fl. cream white with pink, Sept.; lowlands of New Guinea: *W. Mo Gregor s.n.*, (Melb.-Phyt.), large flowering tree — Papua, South Cape, *Rev. W. Gill s.n.* (P, some leaves, 1 fragment of branchlet, 1 dissected seed and some dito flowers); Port Moresby: *W. G. Lawes A° 1884* (P, herb. Pierre 5097, 1 leaf, 1 fragment of branchlet and some dissected seeds); Kaiser Wilhelmsland, Finschhafen: *Weinland s.n.* (B, L), fl. fr.

SOLOMON ISLANDS — Banika Isl., *C. H. Stoddard 28* (A), 1944 — Ulava Isl., common in coastal rain forest: *L. J. Brass 29385* (A), large tree with brown, furrowed bark, lvs glossy, fr. large, on 8.10.1923, ribbed, apiculate, pale green with paler green blotches and large warts, nat. name: lao — Bougainville, Maimaiomino: *Kajewski 2205*, fl. fr. Sept. (A, L) — Guadalcanal, Berande river: *Kajewski 2399* (A, L, S), fl. fr. Jan.

Distribution: Accepting that the above-named combination of synonyms is correct *B. obovata* is now known from the Moluccas (Kasiruta), New Guinea (Manokwari, Finschhafen, Huon-gulf, Dinner Island, Tami Island, South New Guinea), the New Hebrides (Tana, Aneityum, Efate, Banks), the Bismarck-archipelago, and the Solomons (Bougainville, Guadalcanal, Banika, Ulava, Malaita, New Georgia).

7. B. polymera van Royen, nov. sp. — *Fig. 3* — Arbor alta. Ramuli crassi aspera glabri. *Folia* satis crassa fragilia, supra glabra, subtus ferruginei-sericea, obovata, apice retusa ad crenata, basi cuneata in petiolum decurrentia, 9—18 cm longa, 4—8 cm lata, petiolis 1—4 cm longis, subpilosis, 4-sublateribus; costa media subtus prominens, supra paulo sulcata, nervi secundarii tenues, utrinque 17—25, angulo 60° de costa ascendentes, margines versus (c. 3 mm) furcati, arcuatim conjuncti, tertiarii satis conspicui, reticulati, saepe apice aliqui distincte secundariis paralleli. *Inflorescentiae* fasciculatae, pauciflorae, supra folia confertae; pedicelli dense sericei, 1—3 cm longi. *Sepala* 2 + 2, extus dense sericea, intus glabra, exteriora late deltoidea, c. 0.6 cm longa, c. 0.8 cm lata, interiora late cordata, obtusa, c. 5 mm longa et lata. *Petala* 7 vel 8, orbicularia ad deltoidea, basi subcordata, extus basi sericea, intus sparse pilosa vel basi regione angusta pilorum sericeorum suffulta, 0.4—0.6 × 0.3—0.5 cm, margine undulata. *Stamina* c. 25, 2-serialiter inserta, 3—4 mm longa, apice filamentis et antherae pilis paucis longis instructa, antheris sagittiformibus, longe acuminatis dorse pilis suffultis, granulis pollinis globosis, 4-poratis; ovarium glabrum, 7- vel 8-loculare, c. 0.4 cm diam, in stylum subulatum, c. 0.4 cm longum abrupte contractum. Fructus tantum juveniles noti, ellipsoidei, sparse pilosi.

NEW GUINEA — Buna hinterland, about 9 miles N of Embi-lakes, in rain forest, alt. 50 ft: *L. S. Smith 1258* (BRI, L), tree 150 ft, fl. white, fr. pale brown, March, leaves brownish beneath.

Remarks: This species is provisionally placed under *Burckellá* since its ovary is 7- or 8-celled (in other species 3—6-celled). In this character it obscures the limits of the genus towards *Madhuca*. Fully grown fruits being unknown, which could give it its final status, the species is, on account of the venation, the terminal cluster of flowers and the pubescence of the corolla, inserted in *Burckella*.

In the number of secondary nerves *B. polymera* agrees with *B. multinervis*, from which it differs in the ferruginous-sericeously haired lower

side of the leaf. This character *B. polymera* has in common with *B. thurstonii* and *B. obovata*. From the former it differs in the fewer stamens and the retuse to crenate top of the leaf, with appressed indumentum. From

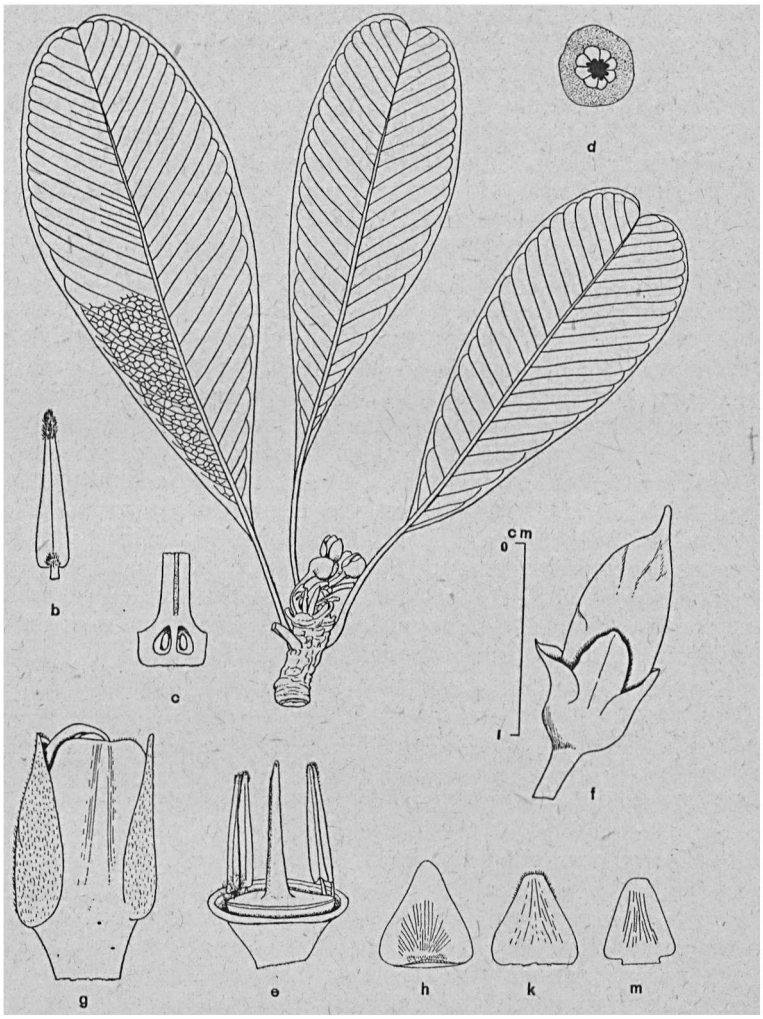


Fig. 3 — *Burckella polymera* v. Royen — a. habit (about one third) — b. juvenile stamen — c. longitudinal section of ovary — d. cross-section of ovary — e. juvenile flower — f. young fruit — g. flowerbud (4 ×) — h. inner surface of petal — k. sepal of outer whorl, outside — m. sepal inner whorl, outside.

B. obovata it differs in the more numerous secondary nerves and stamens and the indumentum.

8. B. poolei H. J. Lam, 1932, 555—556, t. 102.

Additions to the description of the type:

Leaves 12—30 cm long; secondary nerves 19—26; juvenile calyx densely appressedly sericeous; corolla lobes 8, spathulate, obtuse, known

young only, densely hairy at top, slightly fimbriate in the upper part of the margin; stamens about 30, in 2 series, known young only; ovary 4- or 5-celled.

MOLUCCAS — Sula Islands, Mangoli, alt. 250 m: *N.I.F.S. bb 29916* (BO, L), young flowers and fruit, Oct.; ibidem, Taliabu, alt. 25 m: *N.I.F.S. bb 29928* (BO, L), Oct.; ibidem, Taliabu, alt. c. 25 m: *N.I.F.S. bb 29931* (BO, L), Oct. — Aru Islands, alt. 5 m: *N.I.F.S. bb 25312* (BO, L), May.

NEW GUINEA — Mimika district, Anidua (Uta), alt. 5 m: *Lundquist 200* (= *N.I.F.S. bb 32919* (BO, L), tree 22 m high, 35 cm diam., nat. name: javare etepako.

Distribution: Moluccas to South Eastern New Guinea.

9. B. richii (Gray) H. J. Lam, nov. comb. — *Isonandra* (?) *richii* Gray, Proc. Am. Ac. Arts and Sc. 1861, 327; Lam 1925, 259 — *Bassia retusa* Rich. ex Gray l.c. 327 (nomen).

Additions to the description of the type:

Leaves 6—8 × 3.5—4.5, elliptic, with rounded apex, glabrous. Secondary nerves faint, 7—11, angle c. 70°. Pedicel 0.8 cm, calyx glabrous, 0.45 cm long. Parts of corolla c. 0.6 cm long (tube and petal), glabrous outside, filaments densely hairy, 0.1 cm, anthers glabrous, narrow, 0.2 cm.

Remarks: This species, although incompletely known, could not be identified with any of the known species and is therefore probably a separate one. It is surprising, however, that it should not have been collected again after 1862. It seems to belong to the group of *B. microphylla* and *B. brachypoda*. From *B. microphylla* (Samoa) it differs in its broader leaves with broadly rounded apex, its much shorter pedicels (in *B. microphylla* 1.5—3.5 cm) and its slightly smaller calyx and much smaller corolla. From *B. brachypoda* (Banks Isl., Fiji) it is distinguished by its rounded leaf-tip and its much smaller flowers.

A specimen in Florence Herbarium (Labillardière s.n.), with flowers and fruit, is undoubtedly conspecific with this species, but the label bears the locality: Amboina. It is not impossible that this specimen has been wrongly labeled.

TONGATABU: U.S. Explor. Exp.: *Wilkes s.n.* (US), *type specimen.*

Distribution: Tonga Islands (Tongatabu).

10. B. erythrophylla H. J. Lam, 1932, 554, t. 100.

Originally we were inclined to include this species in the synonymy of *B. richii* since we were unable to detect any adequate differences between the two species. The incomplete knowledge of particularly *B. erythrophylla*, however, together with the large distance between the two localities induced us to provisionally maintain *B. erythrophylla* as a distinct species.

Distribution: South Eastern New Guinea.

11. B. thurstonii (Hemsley) H. J. Lam, 1925, 259; idem, 1927, 423; Gillespie, B. P. Bish. Mus. Bull. 74, 1930, 12, f. 13 — *Bassia thurstonii* Hemsley, Hooker Icon. Pl. 26, 1899, t. 2569.

Distribution: Fiji.

Excluded species.

12. B. amicorum (A. Gray) H. J. Lam, 1942, 41 (is a mystification).

13. B. pachyphylla (Krause) H. J. Lam, 1932, 555, t. 101 — *Illipe pachyphylla* Krause, 1923, 467 = *Ganua pachyphylla* (Krause) H. J. Lam.

List of collectors' numbers.

(The numbers between brackets indicate the number of the species)

Brass 2985 (6); Carr 15783 (3); Clemens 3202 (3); 8084 (3); Forbes 12 (6); Gill s.n. (6); de Haan 103 (6); Horne 484 (2); Kajewski 2205 (6); 2399 (6); Lawes A° 1884 (6); Lundquist 200 (8); Mc Gregor s.n. (6); N. I. F. S. bb 23222 (6); bb 25312 (8); bb 29916 (8); bb 29928 (8); bb 29931 (8); 32919 (8); Schlechter 17293 (3); A. C. Smith 5631 (5); L. S. Smith 1258 (7); Stoddard 28 (6); Weinland s.n. (6); Wilkes s.n. (9).

Index.

(The numbers between brackets indicate the number of the species)