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Taxonomic study of the genus *Brachytome* Hook. f. (Rubiaceae)

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RÉSUMÉ

DEB, D. B. & M. GANGOPADHYAY (1987). Etude taxonomique du genre *Brachytome* Hook. f. (Rubiaceae). *Candollea* 42: 351-360. En anglais, résumé français.

Etude taxonomique du genre *Brachytome* Hook. f. (Rubiaceae) présentant une révision de ce genre qui comprend quatre espèces dont deux, *B. russellii* et *B. wardii* sont nouvelles.

ABSTRACT

DEB, D. B. & M. GANGOPADHYAY (1987). Taxonomic study of the genus *Brachytome* Hook. f. (Rubiaceae). *Candollea* 42: 351-360. In English, French abstract.

Taxonomic study of the genus *Brachytome* Hook. f. (Rubiaceae) presents a review of the genus comprising four species of which two, namely, *B. russellii* and *B. wardii* are newly proposed.

In course of taxonomic study of the genus *Lasianthus* Jack (Rubiaceae) some specimens were received on loan, which turned out to represent the genus *Brachytome* Hook. f. For establishing their proper identity and taxonomy it became essential to investigate into the status et relationship of the genus.

J. D. Hooker (1871) in postulating the monotypic genus *Brachytome* from Eastern India and Burma considered it as allied to *Randia* Houtt. ex L. On subsequent study, while describing the genus he (Hook. f., 1880) observed that this genus might probably be merged with *Randia*. Schumann (1891) probably following Hooker's observation, reduced it to a synonym of *Randia* sect. *Gymnopachys* Hook. f. King & Gamble (1903), however, appears to have ignored this reduction and described the second species of *Brachytome* from Malaya.

Randia is now considered as a heterogeneous assemblage of genera. RIDLEY (1939) was the first to draw attention to the heterogeneity of *Randia*. He raised *Randia* sect. *Anisophyllea* Hook. f. to generic status and named it *Porterandia*. FAGERLIND (1943) re-instated *Rothmannia* Thunb. and described a new genus *Rosenbergiodendron* F. Fagerl. (1948). TAYLOR (1944) re-established *Aidia* Lour. KEAY (1958) recognized twenty-one genera including seven new in the African *Randia-Gardenia* assemblage. YAMAZAKI (1970) revived *Oxyceros* Lour. and described the new genus *Himalrandia* to accommodate the Asiatic *Randia* sect. *Eurandia* Hook. f. TIRVENGADUM (1978) re-established *Catuvaregam* Wolf (1976) to replace *Xeromphis* Raf. (1833). Wong (1984) segregated *Randia* s.l. in Malay Peninsula into eight genera. In course of this work he showed that *Brachytome* is closely related to *Aidia* Lour., differing in dioecious plants, functionally unisexual flowers, widely tubular to infundibular corolla with included anthers and the internode above the flowering node always much longer than the preceding one. Thus *Brachytome* stands out as a distinct genus.

***Brachytome* Hook. f.**, Icon. Pl. III., 1: 70. t. 1088. 1871; in Benth. & Hook. f., Gen. Pl. 2: 87. 1873; Fl. Brit. India 3: 108. 1880; Kurz, For. Fl. Brit. Burma 2: 51. 1877; King & Gamble in

Journ. Asiat. Soc. Bengal 72(4): 197. 1903; Ridley, Fl. Malay Penins. 2: 69. 1923; Kanjilal & al., Fl. Assam 3: 54. 1939; Wong in Malay Nat. Journ. 3: 22. 1984. *Randia* sect. *Gymnopachys* Hook. f.; Schumann in Engler & Prantl, Nat. Pflanzenfam. IV. 4: 75. 1891, pro parte (in syn.).

Undershrubs to small trees, up to 4 m high, dioecious; branches monopodial, compressed when young, terete in age, glabrous or sparsely to densely pubescent, channelled; lateral branches with alternate nodes bearing one reduced leaf, the internode above it is much longer than the lower one. Leaves petiolate, opposite, decussate, one of the pair undeveloped at alternate nodes, 8-22 cm × 2-8 cm elliptic, obovate, oblanceolate, ovate or elliptic-oblong, acuminate at apex, sometimes slightly unequally attenuate or cuneate at base, entire, sometimes slightly incurved at margin, thin, coriaceous or membranous, glabrous or sparsely puberulous above, glabrous, glabrescent, puberulous or sparsely pubescent beneath, light to dark green, blackish brown or chocolate when dry, sometimes bacterial nodules present on lamina; midrib slender, channelled, sometimes slightly raised below; lateral nerves 8-15 on either side, subopposite, arcuate, faint at margin, usually conspicuous beneath; nervules reticulate, transverse, sub-parallel or not; petioles 5-12 mm long, slender, glabrous, puberulous or pubescent beneath; stipules intrapetiolar, 2-10 mm × 1.5-7 mm, ovate, triangular or ovate-lanceolate, acuminate to caudate-acuminate or cuspidate at apex, entire or rarely toothed at margin, membranous, glabrous, puberulous or pubescent above, villous or pubescent beneath, sometimes colleters present at base beneath. Inflorescence subsessile, cymose panicle at the axil of undeveloped leaf at alternate nodes, borne on the upperside of branches, 1-8 cm across, branches and branchlets slender, short, glabrous, pubescent or puberulous; bracts persistent, 1-3.5 mm long, ovate-lanceolate, acuminate or triangular, acute at apex, usually entire, rarely toothed, puberulous, pubescent or glabrous above, usually glabrous or rarely pubescent beneath. Flowers pedicellate, functionally unisexual, widely tubular or infundibuliform, white or yellow. Male flowers 7-9 mm long; pedicels 1-2 mm long; calyx about 2 mm long, cupular, with 5 obscure teeth; corolla ± 5 mm long, pale yellow, tube widely tubular to infundibuliform, glabrous or sparsely puberulous outside, glabrous or villous at the upper part inside; corolla lobes 5, twisted to the left; stamens 5, included, adnate below throat; filament minute, anther alternate with corolla lobes, linear-oblong, 2-celled, dorsifixed, opening through longitudinal slit, introrse; ovary vestigial; style 2-4 mm long, glabrous; stigma 2-armed, coherent, oblong; disc cupular. Female flowers 8-15 mm long; pedicel 2-4 mm long; hypanthium ovoid-ellipsoid or ellipsoid; calyx and corolla as in male; stamens 5, imperfect; filaments and anthers as in male; pollens very few, deformed, ovary 1-4 mm long, 2-loculed; ovules many, on axile median peltate placenta; style 2-2.5 mm long; stigma 2-armed, 1.5-3 mm long; disc annular. Berry stalked, globose, ovoid or ellipsoid, 8-13 mm × 6-7 mm, crowned with persistent calyx; exocarp thin, glabrous or puberulous; mesocarp fleshy, thin; endocarp thin, membranous. Seeds numerous, 1-2.5 mm across, thin, compressed, variously angular; testa reticulate; embryo embedded in thin uniform albumen, minute, ± 0.5 mm long, axis terete; cotyledons ovate, acute.

Type: *B. wallichii* Hook. f.

Distribution. — India: Meghalaya, Arunachal; China; Burma and Malesia.

Key to species

1. Leaves 10 or more nerved; stipules 4-10 mm × 3-7 mm; panicles 1.5-8 mm across... 2
- 1a. Leaves up to 10 nerved; stipules 2-3 mm × 1.5-2 mm; panicles 1-1.5 cm across
 1. **B. russellii**
2. Flowers glabrous outside; calyx teeth triangular; branches glabrous or sparsely pubescent 3
- 2a. Flowers puberulous on calyx and corolla outside; calyx teeth ovate, acuminate; branches densely pubescent... 4. **B. wardii**
3. Leaves glabrous; fruits ellipsoid; stipules glabrous above... 3. **B. wallichii**
- 3a. Leaves pubescent beneath; fruits globose; stipules pubescent or puberulous above
 2. **B. scortechinii**

1. *Brachytome russellii* Deb & Gang., spec. nova (Fig. 1).

Holotypus: Burma, Tavoy, Chaung, 1600 ft. (480 m), 19.3.1919, *P. T. Russell 21* (CAL). Paratypus: Valley of Talaingza, Chaung, 1200 ft. (360 m), 8.4.1919, *P. T. Russell 186* (CAL).

Differt a *B. wallichii* Hook. f. stipule parviore, ovato-lanceolata, foliorum nervis piliis sparsim; panícula bravoire; fructibus globosisque.

Allied to *B. wallichii* Hook. f. differing in smaller ovate-lanceolate stipules; leaves with lesser hairy nerves, shorter panicle and globose fruit.

Small tree; branchlets slender, terete, glabrous. Leaves petiolate, 11-18 cm × 4-6 cm, elliptic, oblong or ovate, acuminate at apex, entire, slightly unequally cuneate at base, subcoriaceous, glabrous, dark green when dry; midrib slender, shallow channelled above, raised beneath; lateral nerves 8-10 on either side, subopposite, arcuate, faint at margin; nervules reticulate, inconspicuous; petioles 5-10 mm, glabrous; stipules persistent, 2-3 mm × 1.5-2 mm, ovate-lanceolate, long acuminate, coriaceous, glabrous above, villous beneath. Inflorescence 1-1.5 cm across, sessile panicle at the axil of undeveloped leaf, dichotomous, glabrous; bracts persistent, 2-3.5 mm long, ovate-lanceolate, acuminate, glabrous above, sparsely pubescent beneath; hairs 0.5-1 mm long, uniseriate, acute at apex. Berries short stalked, 8-9 mm × 6-7 mm, globose, with persistent calyx, minutely 5-toothed: exocarp rugose; mesocarp fleshy; endocarp thin, membranous. Seeds 1.5-2.5 mm across, thin, compressed, variously angular in shape, testa reticulate; embryo minute, embedded in thin uniform albumen.

Flowers: not known; *fruits*: March-April.

Distribution. — Burma: Tavoy, at 360-480 m in altitude.

2. *Brachytome scortechinii* King & Gamble in Journ. Asiat. Soc. Bengal 72(4): 198. 1903; Ridley, Fl. Malay Penin. 2: 70. 1923; Wong in Malay Nat. Journ. 38: 22. 1984 (Fig. 2).

Shrubs to small trees, 1.8-3.6 m high, functionally dioecious; branchlets sparsely pubescent when young, glabrous in age. Leaves petiolate, 9-22 cm × 2-7 cm, usually elliptic, rarely oblanceolate, ovate or oblong, acuminate at apex, cuneate at base, thin coriaceous, glabrous above, sparsely pubescent on midrib, lateral nerves and rarely on lower surface, light green when dry; midrib slender, shallow channelled above; lateral nerves 10-14 on either side, subopposite, arcuate, very slender, inconspicuous above; nervules reticulate, conspicuous beneath; petioles 5-12 mm; stipules ovate-lanceolate, long acuminate, entire or rarely toothed at margin, slightly connate at base, thin coriaceous, glabrous or sparsely pubescent or puberulous above, pubescent beneath at base, few colleters present. Inflorescence leaf opposed sessile panicle of dichotomous cymes, 3-5 cm across, spreading up to 7 cm when fruiting; branches and branchlets slender, glabrous; bracts 2-3 mm long, ovate to lanceolate, acuminate or acute at apex, entire, sometimes emarginate, rarely sparsely pubescent at margin. Male flowers 8-9 mm long, pedicellate, widely tubular or infundibuliform, white; pedicels 2-4 mm long, thin, glabrous; hypanthium ± 1 mm long, obovoid, glabrous; calyx ± 2 mm × 2-2.5 mm, cupular, minutely 5-toothed; teeth triangular, acute, glabrous; corolla tube 6-7 mm long, thin, glabrous; lobes 5, 1.5-2 mm long, ovate-lanceolate, acute, glabrous; stamens 5, included; filaments minute, adnate below throat; anthers ± 2 mm long, linear-oblong, 2-celled, dorsifixed; ovary vestigial, ± 0.5 mm long; ovules obscure; style 3.5-4 mm long, thin, glabrous; stigma 2-armed, ± 2 mm long, oblong, thin; disc ± 1 mm in diameter, cupular, smooth. Female flowers widely tubular, glabrous; corolla tube longer than that of the male flower; stamens imperfect, included; ovary 2-loculed, ovules numerous, on axile peltate placenta; disc ± 1 mm across, annular, glabrous. Berries 10-13 mm × 5-7 mm, stalked, ellipsoid, crowned with persistent calyx lobes; exocarp thin, glabrous; mesocarp thin; endocarp thin, membranous. Seeds numerous, variously angular, 1-2.5 mm across, compressed, cuneate at base; testa minutely reticulate; albumen fleshy; embryo minute, subcylindric.

Flowers: March-August; *fruits*: April-August.

Vernacular name: Pahang, Telom (Malay).

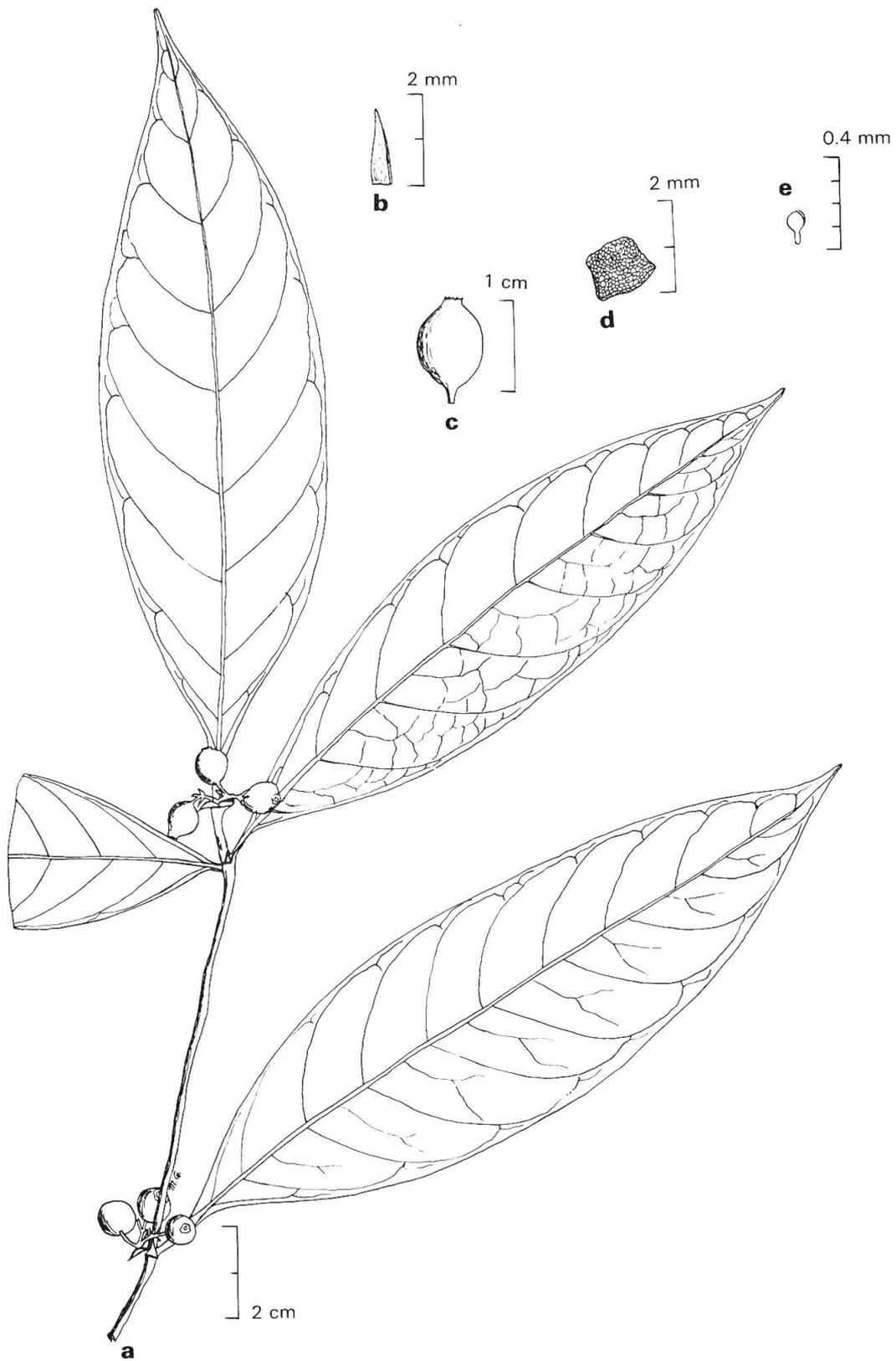


Fig. 1. — *Brachytome russellii* Deb & Gang.
a, habit; b, bract; c, fruit; d, seed; e, embryo.

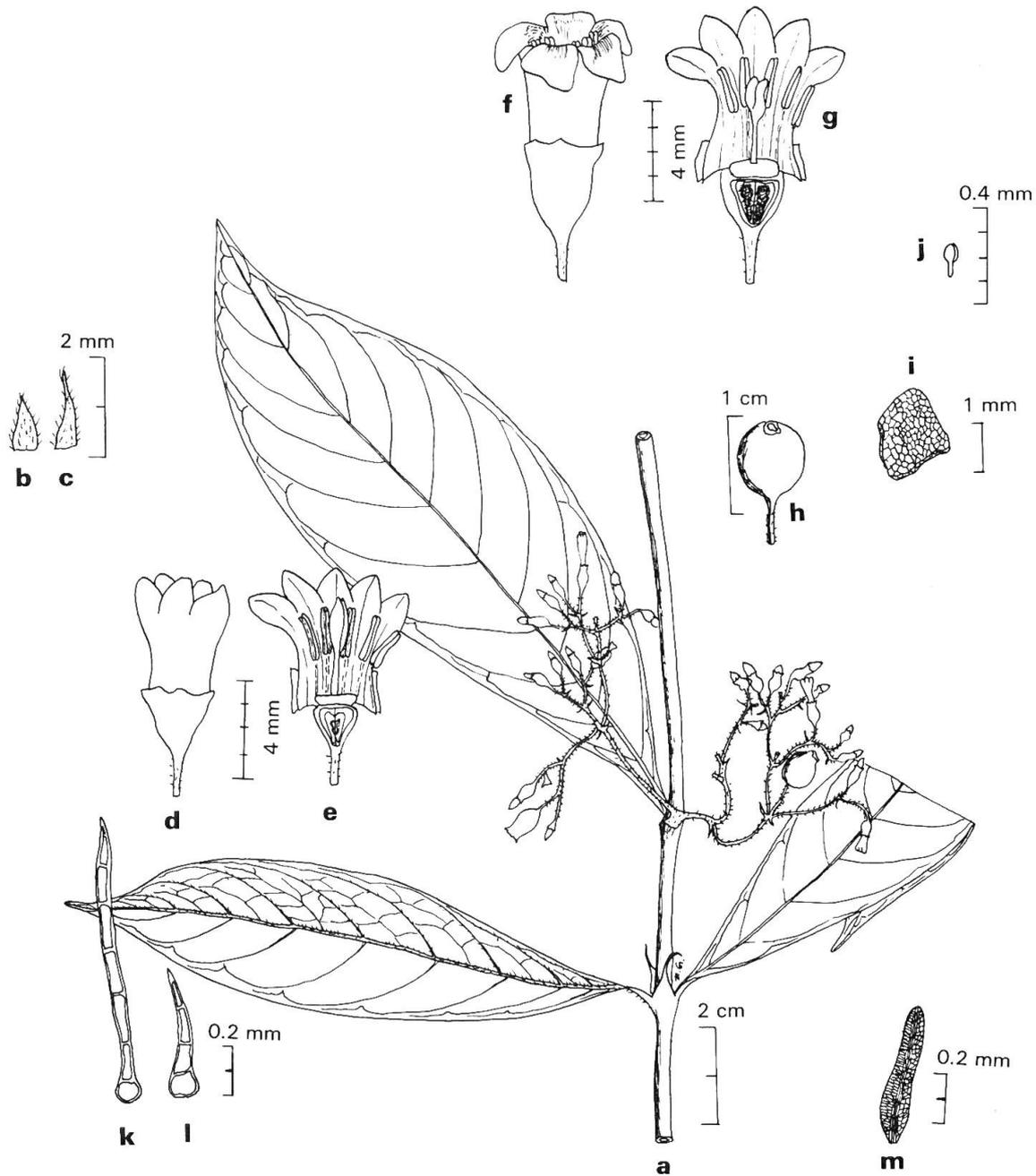


Fig. 2. — *Brachytome scortechinii* King & Gamble
 a, habit; b, c, bracts; d, male flower; e, opened male flower; f, female flower; g, opened female flower; h, fruit; i, seed; j, embryo;
 k, l, hairs; m, colleter.

Distribution. — Malesia at 900-1200 m altitude.

Type: Perak, Maxwells hills, 3000 ft. (900 m), March 1884, *Scortechini* 237 (K) selected as lectotype by Wong (l.c.); isolecto. 2 sheets (CAL!); Taiping, March 1884, *Scortechini* 14 para (CAL!); Larut, 900-1015 m, July 1881, *King's collector* 2136 para (CAL!); April 1882, *King's collector* 2930 para (CAL!); Lower camp Gumong, Batu, Puteh, 1020 m, *L. Wray* 950 para (CAL!); *L. Wray* 2812 para (CAL!); Perak, Maxwells hill, *L. Wray* 2999 para (CAL!).

Note. — Hair uniseriate, acute at apex, 8-10 celled in bracts inside, 3-5 celled in stipule, leaf beneath and bracts above; 4-6 celled, elongate in petiole. The colleter multicellular, oblongoid, obtuse at apex, stalk very minute.

3. *Brachytome wallichii* Hook. f., Icon. Pl. III. 1: 70. t. 1088. 1871 & Fl. Brit. India 3: 108. 1880; Kurz, For. Fl. Brit. Burma 2: 51. 1877; Kanjilal & al. Fl. Assam 3: 54. 1939 (Fig. 3).

Shrubs 1-1.5 m high, branches slender, terete, glabrous, sometimes striated. Leaves petiolate, 10-22 cm × 2-7.5 cm, obovate, oblanceolate, oblong or ovate, acuminate or caudate-acuminate at apex, alternate or cuneate at base, membranous or subcoriaceous, glabrous, greenish brown to blackish chocolate when dry, sometimes bacterial nodules present on lamina; midrib channelled, slender above, stout beneath, glabrous or glabrescent; lateral nerves 10-12 on either side, subopposite, arcuate, channelled, slender above, stout beneath, nervules reticulate, very inconspicuous; petiole 6-12 mm long, slender, glabrous; stipules persistent, 4-10 mm × 3-7 mm, ovate, ovate-lanceolate, acuminate or long acuminate, glabrous above, villous beneath, sometimes colleters present. Inflorescence at the axil of undeveloped leaves, sessile, panicle of dichotomous or irregular cymes, 3-5 cm across; branches and branchlets glabrous; bracts 1.5-3 mm long, ovate to lanceolate, acute or acuminate, entire or emarginate, rarely pubescent at margin. Flowers polygamodioecious. Male flowers 8-9 mm long, widely tubular or infundibuliform, pedicellate, white; pedicels 2-4 mm long, slender, glabrous; hypanthium ± 1 mm long, obovoid, glabrous; calyx ± 2 mm × 2-2.5 mm, cupular, minutely 5-toothed; teeth triangular, acute, glabrous; corolla tube 6-7 mm long, thin, glabrous; lobes 5, 1.5-2 mm long, ovate, lanceolate, acute, glabrous; stamens 5, included; filaments minute, adnate below throat; anthers ± 2 mm long, linear-oblong, 2-celled, dorsifixed; pollen numerous, matured; ovary ± 0.5 mm long; ovules deformed; style 3-4 mm long, thin, glabrous; stigma 2-armed, ± 2 mm long, oblong, thin; disc cupular, ± 1 mm across. Female flowers tubular, glabrous; corolla tube longer than that of the male flower; stamens imperfect, included; ovary 2-loculed, ovules numerous on peltate placenta; disc annular, ± 1 mm across. Berries 10-13 mm × 6-7 mm, stalked, ellipsoid, crowned by calyx lobes; exocarp thin, glabrous, mesocarp thin, endocarp thin, membranous. Seeds 1-2.5 mm across, thin, flattened, cuneate at base, various in shape, testa reticulate; albumen fleshy; embryo minute, sub-cylindric.

Flowers: December-?; *fruits:* May-October.

Distribution. — India, Meghalaya to Burma at 690-1200 m altitude.

Type: Burma, *Griffith* s.n. E.I.C. 2787 (K) photo! selected as lectotype, duplicate (CAL); Khasi hills, Pundouah hills, Feb. 1824, *De Silva* s.n. ex *Wall. Cat. 8464* (K-W) microcard! para; *De Silva* s.n. ex *Wall. Cat. 8466* (K-W) microcard! Khasia, 3000-4000 ft., *J. D. Hooker & T. Thomson 13 Stylocoryne* (K) photo! para, duplicate (CAL).

Exsiccata studied

Assam, *Kurz* s.n. (CAL); Arunachal Pradesh: the razor edge between the Lalik & Egar streams, 690 m, 27.12.1911, *I. H. Burkill 37529* (CAL); RENGING, 720 m, 25.1.1912, *I. H. Burkill 36249* (CAL). Meghalaya: Umsoi, 900 m, 7.11.1872, *C. B. Clarke 17814B* (CAL); Mamloo, 900 m, 12.5.1886, *C. B. Clarke 43804B* (K), *43804C* (CAL); 1200 m, 15.10.1886, *C. B. Clarke 45422A* (CAL); Lyndoh Lysii, 15.11.1916, *U.N. Kanjilal 7100* (ASSAM); Manipur, Ching Sow, 1800 m, Jan. 1882, *G. Watt 5911* (CAL, BSIS); Burma, *Griffith* s.n. E.I.C. 2787 (CAL).

Note. — Collection of Griffith at K is labelled to have been collected from Darjeeling but the same gathering at CAL is labelled as collected from Burma. It proves J. D. Hooker's suspicion that the type locality Darjeeling is erroneous.

4. *Brachytome wardii* Deb & Gang., spec. nova (Fig. 4).

Holotypus: North Burma, Kachin state, North triangle, Arahku, 3500 ft. (1050 m), 5.4.1953, *F. Kingdon-Ward 20624* (BM); paratypus: North triangle, Hkinlum, 4000 ft. (1200 m), 6.10.1953, *F. Kingdon-Ward 21410* (BM).

Species haec ab *B. wallichii* Hook. f. differt floribus puberulis superne, calyce dentibus ovatis acuminatisque, rames dense pubescentibus.

Allied to *B. wallichii* Hook. f. differing in flowers puberulous above, calyx teeth ovate, acuminate and branches densely pubescent.

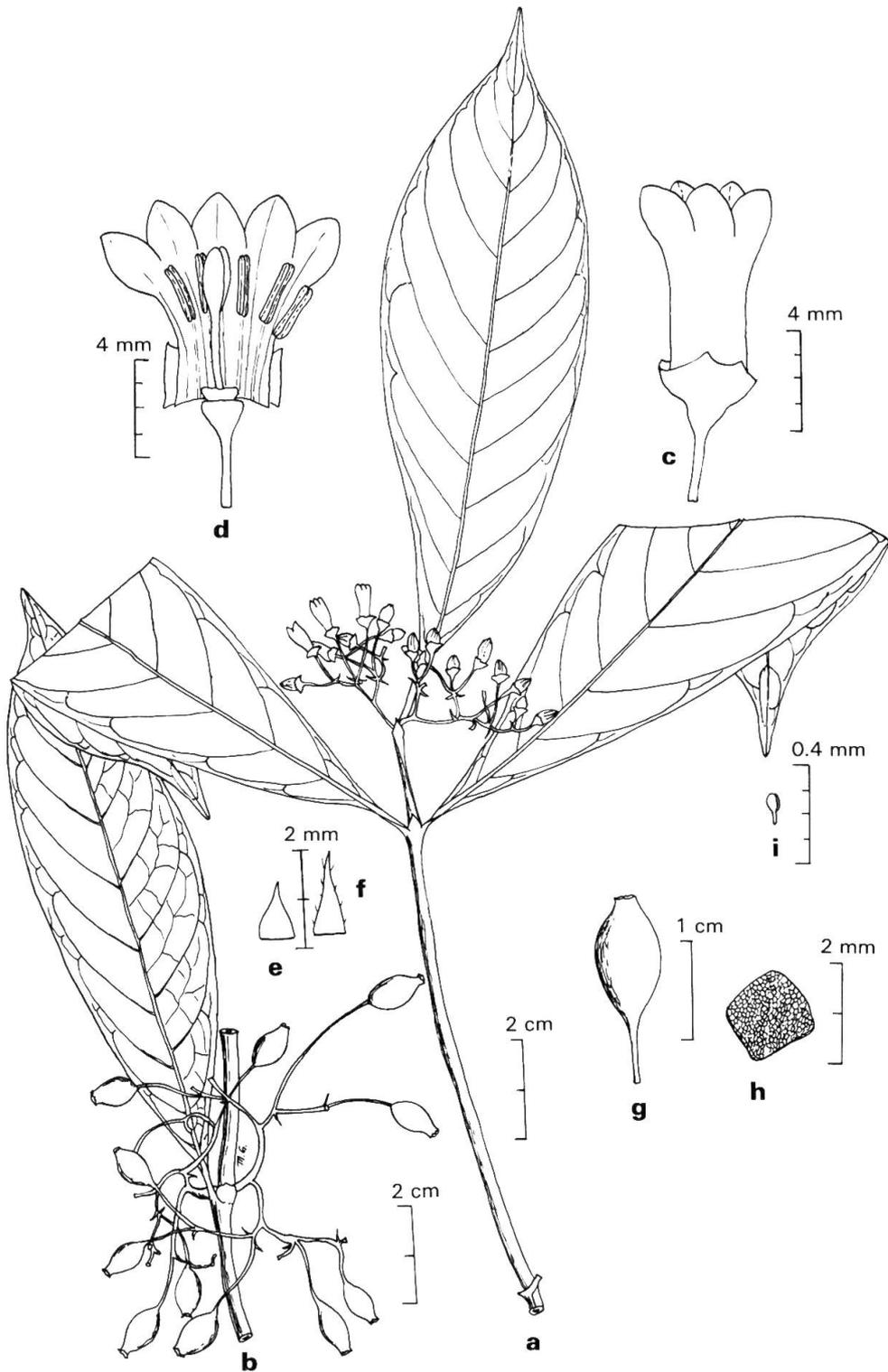


Fig. 3. — *Brachytome wallichii* Hook. f.
a, habit; **b**, infructescence; **c**, male flower; **d**, opened male flower; **e**, **f**, bracts; **g**, fruit; **h**, seed; **i**, embryo.

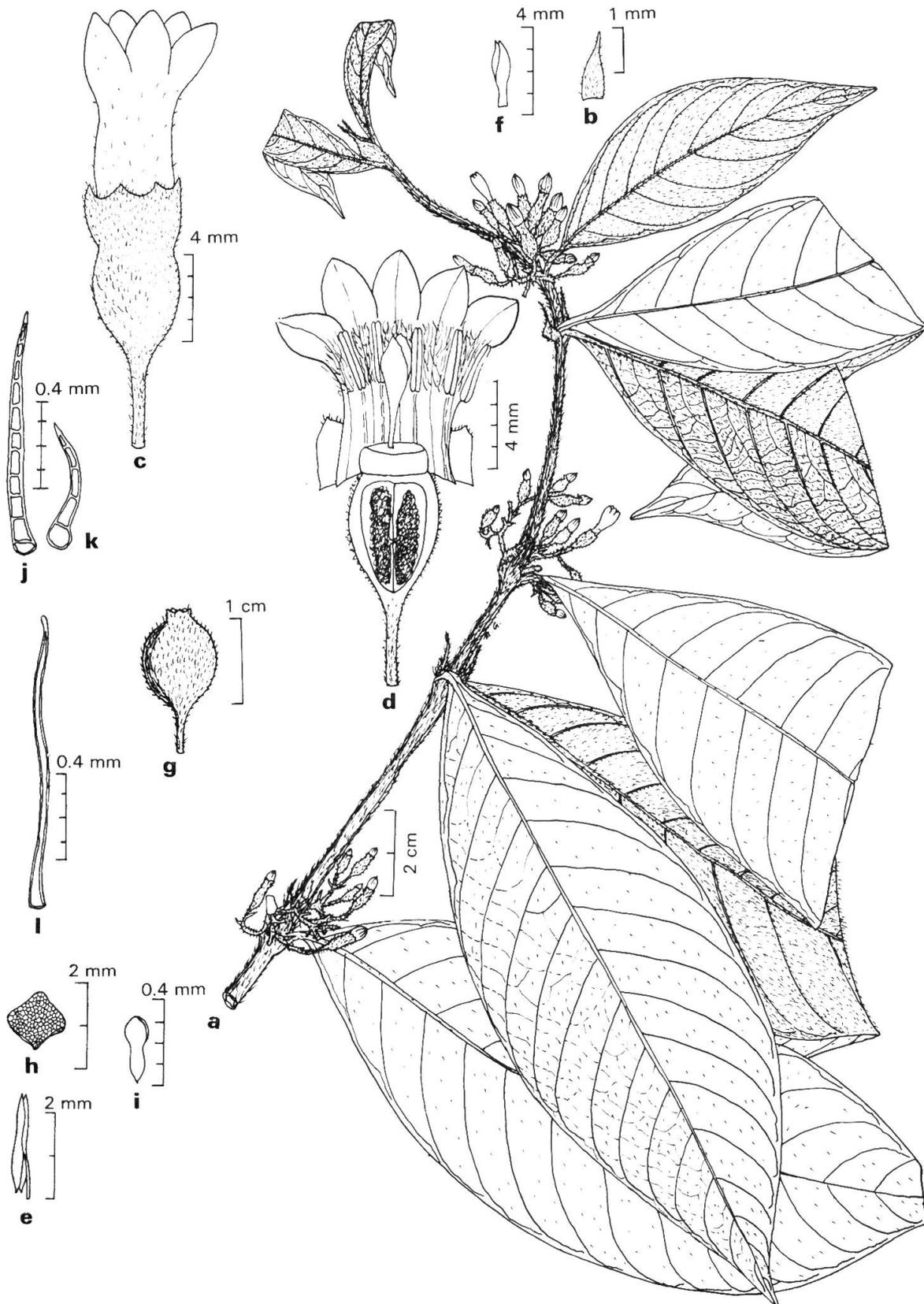


Fig. 4. — *Brachytome wardii* Deb & Gang.
 a, habit; b, bract; c, female flower; d, opened female flower; e, stamen (dorsal view); f, style and stigma in male flower; g, fruit; h, seed; i, embryo; j, k, uniseriate hairs; l, unicellular hair.

Undershrubs more or less erect; branchlets compressed when young, terete in age, densely pubescent. Leaves petiolate, 8-21 cm × 4-8 cm, elliptic or obovate, acuminate at apex, entire, attenuate at base, subcoriaceous, more or less puberulous on both sides, densely puberulous on the nerves beneath, greenish to blackish brown above, light purple beneath when dry; midrib slender, channelled, raised above; lateral nerves 10-15 on either side, subopposite, arcuate at margin, slightly raised, channelled above, flattened beneath, nervules reticulate, tertiaries transverse, subparallel; petioles 5-10 mm long, densely puberulous beneath; stipules persistent, 6-10 mm × 4-6 mm, ovate or triangular, caudate-acuminate, densely pubescent above, densely villous with few colleters at base beneath. Inflorescence at the axil of undeveloped leaf, to some extent enclosed by stipular sheath, sessile panicle of dichotomous cymes, 2-2.5 cm × 2.5-3 cm, branches and branchlets densely adpressed pubescent; bracts persistent, 1.5-2.5 mm long, ovate or lanceolate, acuminate at apex, pubescent or puberulous above, glabrous beneath. Male flowers not seen. Female flowers pedicellate, 10-15 mm long, widely tubular, yellow; pedicels 5-10 mm long, slender, puberulous; hypanthium 2.5-5 mm long, ellipsoid, puberulous; calyx persistent, 3-3.5 × 3-4 mm, cupular, 5-toothed, puberulous above; corolla tube 5-8 mm long, thin, sparsely puberulous above, villous at throat and upper part of tube within; lobes 5, 1.5-2 mm, ovate-lanceolate, minutely inflexed at apex, glabrous; stamens 5, alternate with corolla lobes, included; filaments short, 0.5-1 mm long, thin, glabrous, adnate below throat; anthers ± 3 mm long, linear-oblong, 2-celled, dorsifixed; pollen very few, deformed; ovary 2-4 mm long, 2-loculed; ovules numerous on axile median peltate placenta; style 2-2.5 mm long, slender, glabrous; stigma ± 3 mm long, 2-lobed, ovate-oblong, acute at apex, glabrous; disc ± 1.5 mm across, annular. Berries stalked, 9-10 mm × 6-7 mm, ovoid, with persistent calyx above, vermilion; exocarp thin, puberulous, mesocarp fleshy; endocarp thin, membranous. Seeds numerous, 1-2 mm across, thin, compressed, variously angular; testa reticulate; albumen thin, uniform; embryo less than 0.05 mm long, axis terete; cotyledons ovate, acute at apex, thin.

Flowers: April-?; *fruits:* October-?

Distribution. — North Burma, Kachin state, at 1050-1200 m altitude.

Note. — The hairs are uniseriate excepting those on stipules beneath which are unicellular, the apex acute and very rarely obtuse. The hairs of calyx, inflorescence and stipules above are short, 2-5 celled, where as they are 3-8 celled on stem and leaf beneath.

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