

---

## THE *GESNERIACEAE* OF SULAWESI III: THREE NEW SPECIES OF *AESCHYNANTHUS*

M. MENDUM\*†

Three new species of *Aeschynanthus* (*Gesneriaceae*) from Sulawesi (Celebes), *A. batesii*, *A. burttii* and *A. lobaticalyx*, are described and illustrated. The phylogenetic position of *A. batesii* and *A. lobaticalyx* is briefly discussed; *A. burttii* has not yet been sequenced.

*Keywords.* Biogeography, new species, phylogeny, taxonomy.

### INTRODUCTION

The genus *Aeschynanthus* Jack (*Gesneriaceae*, subfamily *Cyrtandroideae*, tribe *Trichosporeae*) contains about 160 species and is widespread from the Himalaya and throughout SE Asia to the Solomon Islands. Despite this, there is a high degree of endemism at species level, increasing eastwards. The genus is presently divided into six sections, based largely on seed morphology (Clarke, 1883; Wang, 1984; Mendum *et al.*, 2001). A phylogeny based on nuclear ribosomal internal transcribed spacer (ITS) sequences of 50 species, selected to include all biogeographic areas and infrageneric groupings (Denduangboripant *et al.*, 2001), casts doubt on the monophyly of all but section *Aeschynanthus* ( $\equiv$  *Holocalyx* Benth.). Scanning electron microscopy studies of seed and appendage morphology (Mendum *et al.*, 2001) support these conclusions, but the sections nevertheless remain of considerable practical value for identification purposes. They are therefore retained for the present, pending further studies.

The three species here described belong to section *Microtrichium* C.B. Clarke as currently understood, defined by the possession of a short stout appendage at each end of the seed. The centre of diversity is New Guinea, where there are over 50 species compared with just three or four in Borneo and probably about 10 in the Philippines. The section has not previously been recorded from Sulawesi. The three species here described are endemic to the island and there are undoubtedly more awaiting discovery. All three have a corolla with a strongly oblique mouth and widely spreading lobes, morphological characters shared with the Bornean *A. magnificus* Stapf and *A. vinaceus* P. Woods, and also with *A. guttatus* P. Woods, *A. musaensis* P. Woods and *A. oxychlamys* Mendum from New Guinea. Two of the species described in this paper were included in the phylogeny of Denduangboripant *et al.* (2001): *A. batesii* as *A. sp.* 00293 and *A. lobaticalyx* as *A. sp.* 001 and *A. sp.*

\* Royal Botanic Garden Edinburgh, 20A Inverleith Row, Edinburgh EH3 5LR, UK.

† Died 13 ii 2004.

0025/1234. They are not grouped with the sequenced New Guinea members of sect. *Microtrichium*, but are both in a clade containing species occurring west of Wallace's line and belonging to sections *Microtrichium* and *Aeschynanthus*.

**1. *Aeschynanthus batesii* Mendum, sp. nov. Fig. 1.**

Ab omnibus aliis speciebus *Aeschynanthi* corolla 5cm longa viridilutea intus marronino notata et intus papillosa sine pilis grossis, calyce etiam ad basin divisio 4–12mm longo distincta. *Aeschynantho guttato* P. Woods, species novo-guineensis, in corollae forma similis, a qua foliis majoribus haud canescentiviridibus et calyce non tubuloso recedit.

Type: RBGE cult. 20000564, from cuttings of *Mendum, Argent & Hendrian* 00298; South Sulawesi, Rantemario near Rantelemo, Enrekang, c.3°30'S, 120°00'E, alt. 1000m (holo. E, iso. BO).

Terrestrial or epiphytic subshrub; *stems* stiff then arching and pendulous, to 3m, glabrous, occasionally rooting from nodes, internodes to 7cm. *Leaves* opposite; blade stiff and leathery, glabrous, dark green above, much paler below, 5–9.5 × 1.5–4.1cm, elliptic, apex acuminate, base rounded to acute, margin entire, midvein impressed above and prominent below, other veins faintly visible; petiole 6–7mm, glabrous. *Inflorescences* 1- or 2-flowered in leaf axils towards tips of stems. *Peduncle* c.1.5mm, glabrous. *Bracts* and *bracteoles* to 2mm, narrowly triangular, glabrous. *Pedicel* 10–15mm, glabrous. *Calyx* 4–12mm, green, glabrous, divided to base, lobes narrowly triangular and uneven, the posticous shortest. *Corolla* 5.2–5.4cm long, slightly arcuate; pale greenish lemon yellow, lobes marked inside with maroon dots, dashes and stripes extending into tube; upper lobes c.10 × 7mm (central sinus 5mm), rounded oblong, forward-pointing; lateral lobes c.11 × 10mm, bluntly triangular, somewhat reflexed; lower lobe c.12 × 10mm, rounded oblong, downward-pointing; corolla glabrous outside except for sparse minute glandular hairs fringing lobes, inside with a band of small glandular hairs ringing mouth, with areas of thickened tissue at lobe sinuses, and with papillae on floor of throat as far as insertion of filaments. *Filaments* not exerted, arising in upper half of tube, swollen at attachment to anther, cream, glandular hairy especially apically; posticous pair c.22mm, anticous pair c.16mm. *Anthers* narrowly oblong, purplish, glandular hairy on back, posticous pair c.4 × 1.5mm, anticous pair slightly smaller; pollen grey. *Staminode* c.2mm. *Disk* 1.5 × 2.5mm, fleshy, unlobed, yellow-brown. *Stipe* c.19mm, glabrous; *ovary* with sparse to infrequent sessile glands; *style* c.7mm with patent glandular hairs; *stigma* c.2mm diam., capitate. *Capsule* linear, slender, to 24cm long. *Seed* 0.9mm, papillose, testa cells with strongly spiral orientation; hilar appendage c.1.3mm, apical appendage 0.8mm, both stout.

*Habitat.* Recorded as growing on trees, through shrubs and over rocks in forest and by rivers.

*Altitude.* 750–1500m.

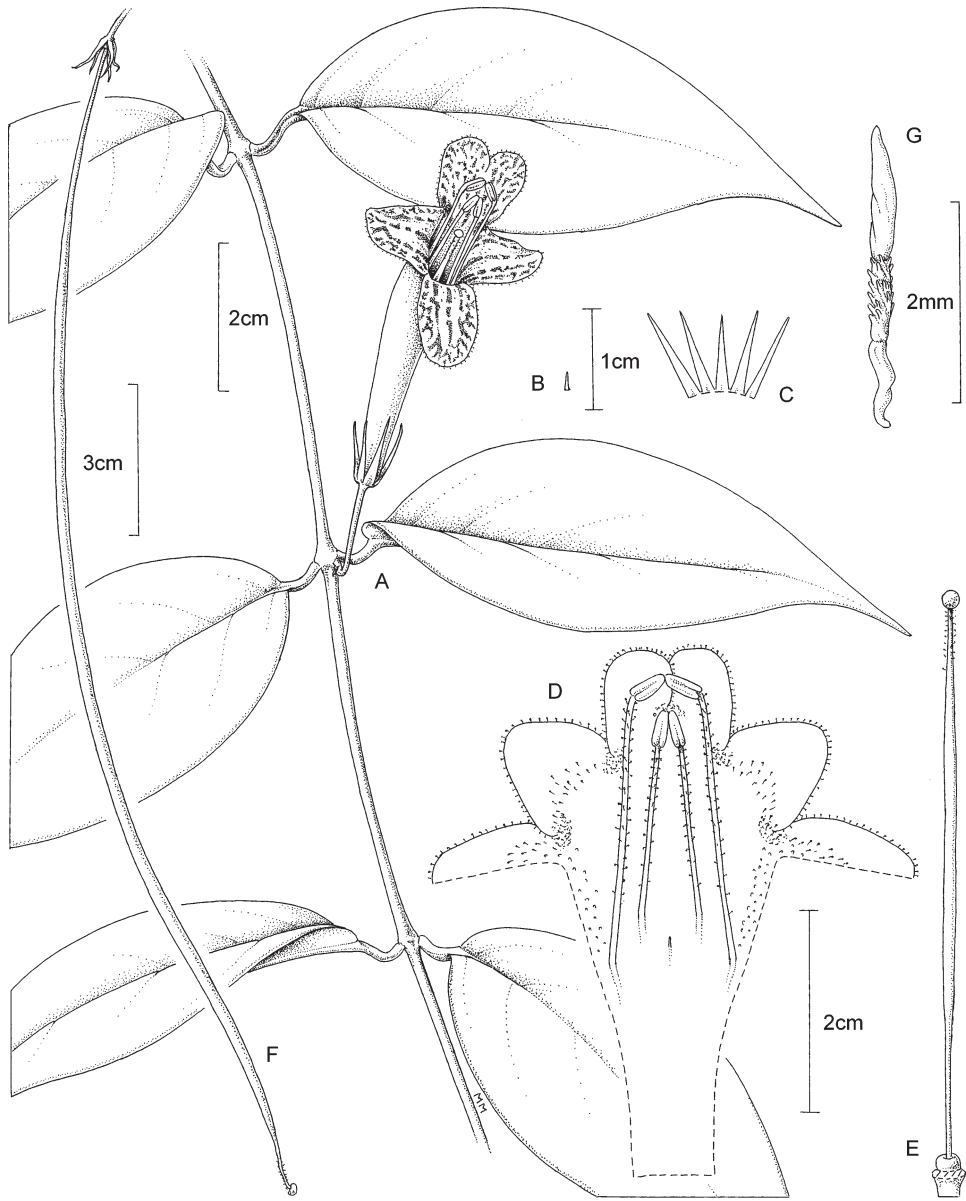


FIG. 1. *Aeschynanthus batesii*. A, habit; B, bract; C, calyx (cut ventrally); D, corolla (cut ventrally); E, gynoecium; F, capsule; G, seed. From RBGE cult. 20000564.

*Specimens examined.* SULAWESI. **Central Sulawesi:** pass between Poso and Wotu, c.750m, 2 ii 2000, *Mendum, Argent & Hendrian* 00223 (BO, E). **South Sulawesi:** Rantemario, c.1500m, vi 1929, *Kjellberg* 4045 (S); Rantemario near Rantelempo, Enrekang, c.1000m, 8 iii 2000, *Mendum, Argent & Hendrian* 00298 (BO, E); RBGE cult. 20000564 from cuttings of *Mendum, Argent & Hendrian* 00298 (E).

The corolla of *A. batesii* is very distinctive, and the species cannot be mistaken for any other. Greenish flowers are very uncommon in *Aeschynanthus* and are usually found in members of sect. *Polytrichium* Benth., but in that section they are smaller and duller, with corolla lobes not spreading and exerted stamens. The only other known species of sect. *Microtrichium* with maroon-mottled, greenish flowers is the New Guinean *A. guttatus* P. Woods. It also has spreading lobes, but has grey-green leaves, a tubular calyx and five tufts of coarse hairs inside, near the base of the corolla.

*Derivation.* *Aeschynanthus batesii* is named for my father, Richard A. Bates, who has had a lifelong interest in botany.

**2. *Aeschynanthus burtii* Mendum, sp. nov. Fig. 2A–F.**

Corolla huius speciei est usque ad 5.9cm longa et in forma illi *A. lobaticalycis* Mendum similis sed species nova ab eo foliis crassioribus coriaceis breviter acuminatis et calyce ad medium asymmetricice lobato differt.

Type: Sulawesi, South Sulawesi, subdiv. Enrekang, 2800–3000m, 16 vi 1937, *Eyma* 635 (holo. BO; iso. K, L, U).

Terrestrial or epiphytic subshrub; *stems* arching to pendulous, glabrous or young growth very rarely minutely puberulous, green or purplish when young; internodes to 4.4cm. *Leaves* opposite, blade thin leathery, very deep green and glossy above, much paler or rarely purple-flushed below, with scattered minute sessile glands on both surfaces especially visible in fresh material, 2.5–7.6 × 0.6–3.2cm, narrowly to broadly ovate, apex long acuminate with rounded tip, base acute, margins entire, midvein impressed above and prominent below, other veins faintly visible; petiole 4–9mm, green, glabrous. *Inflorescences* single-flowered in leaf axils towards tips of stems. *Peduncle* to 2mm, glabrous. *Bracts* and *bracteoles* to 7 × 0.8mm, linear, green, glabrous. *Pedicel* 12mm, slender, green streaked reddish, glabrous. *Calyx* 4.5–14mm, greenish or green streaked reddish or purple, divided to base, lobes linear with minute sessile glands at base inside and occasional hair at tips, very rarely minutely puberulous. *Corolla* 4.2–5.9cm long, slightly arcuate; outside variable from cherry red at base shading to scarlet apically, plain scarlet, orange-red, or yellowish shading to pinkish red apically, inside paler or yellowish in tube and sometimes at base of lobes, and with variable amounts of heavy dark blotching on lobes and throat; upper lobes c.12 × 7mm (central sinus c.6mm), forward-pointing; lateral lobes c.10 × 9mm, widely spreading; lower lobe c.11 × 6mm, downward-pointing; all lobes rounded oblong; corolla glabrous outside except for glandular hairs fringing lobes, very rarely minutely puberulous, inside with variable amounts of minute glandular hairs at base of lobes and ringing throat, and papillae on floor of throat and tube as far as insertion of stamens; whole corolla, especially tube, quite thick-textured. *Filaments* not exerted, arising in upper part of tube, swollen at attachment to anther, cream with minute glandular hairs and sessile glands; posticous pair c.28mm, anticous pair c.18mm. *Anthers* ovate, purplish, c.3.0 × 2.0mm; pollen ochre turning

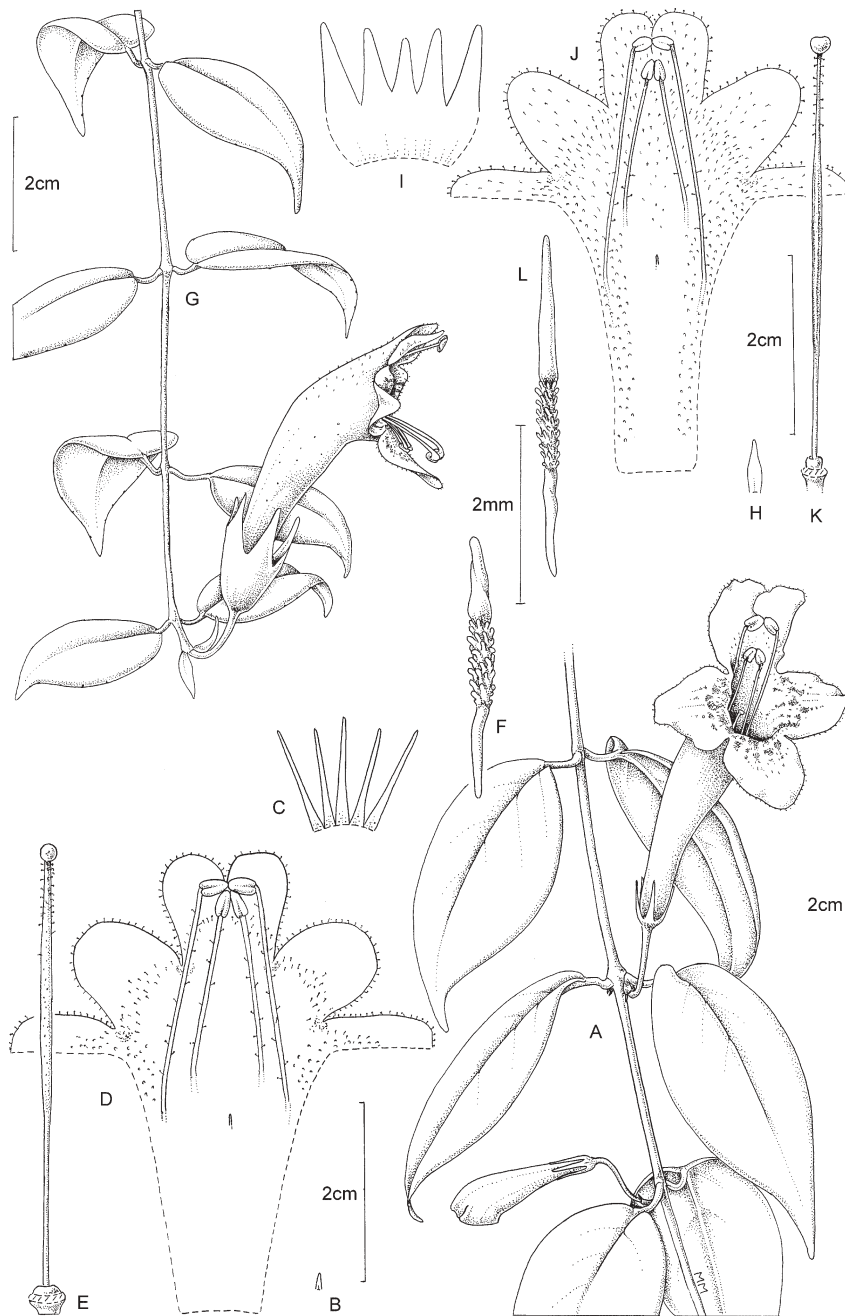


FIG. 2. A–F, *Aeschynanthus burtii* (A from RBGE cult. 20000750, B–E from *Mendum et al.* 00293, and F from RBGE 20000647). A, habit with flower at early male stage; B, bract; C, calyx (cut ventrally); D, corolla (cut ventrally); E, gynoecium; F, seed. G–L, *A. lobaticalyx* (from *Mendum et al.* 20000424). G, habit with flower at female stage; H, bract; I, calyx (cut ventrally); J, corolla (cut ventrally); K, gynoecium; L, seed.

grey. *Staminode* c.1mm. *Disk* 1.5 × 2mm, slightly lobed. *Stipe* glabrous; *ovary* with scattered sessile glands and a few hairs towards apex; *style* c.6mm, glandular hairy; *stigma* 2mm diam., capitate, minutely papillose. *Capsule* linear, slender, to 15.5cm. *Seed* c.0.9mm, papillose, testa cells with strongly spiral orientation; hilar appendage 10–11mm, apical appendage 11–15mm, both stout.

*Habitat.* Ground-rooted or epiphytic subshrub in primary submontane and montane rainforest.

*Altitude.* 1500–2900m.

*Specimens examined.* SULAWESI. **Central Sulawesi:** Gunung Sojol, c.0°40'S, 120°10'E, c.1500m, 26 ii 2000, *Mendum, Argent & Hendrian* 00172 (BO, E); c.2000m, 27 ii 2000, *Mendum, Argent & Hendrian* 00195 (BO, E); RBGE cult. 20000750, grown from seed (*Smith & Galloway* SULSG 347); B. Poka Pindjang, 2500m, 27 v 1929, *Kjellberg* 1456 (BO, S); between Poka Pindjang and Tinabang, G. Roroka Timbu, W. slope, 2100m, 9 v 1979, *Balgooy* 3242 (BO, L); G. Roroka Timbu, W. slope, c.1°16'S, 120°18'E, 1950m, 14 v 1979, *de Vogel* 5352 (L). **South Sulawesi:** Enrekang District: Angin Angin-Pinteaon, 1550–2600m, 15 vi 1937, *Eyma* 508 (BO); Gunung Rantemario, Gowa subcamp, c.3°24'S, 120°00'E, alt. 2000–2500m, 9 xi 1993, *Kofman* 249 (L); G. Rantemario above Rantelemo, c.3°30'S, 120°00'E, c.1750m, 5 iii 2000, *Mendum, Argent & Hendrian* 00239 (BO, E); c.2800m, 6 iii 2000, *Mendum, Argent & Hendrian* 00254 (BO, E); 2100m, 7 iii 2000, *Mendum, Argent & Hendrian* 00293 (BO, E); Latimojong Mts, ridge slope between Rampunan Tekken & Bunte Djanke, 2900m, 24 x 1969, *Sands* 323; SE of Bunte Pese I, 1850m, 20 ii 1969, *Sands* 519; RBGE cult. 20000562, grown from cuttings (*Smith & Galloway* SULSG 173) collected on G. Rantemario; Mamboeliling near Mamasa, central mountains, 2500m, 1937–9, *Monod de Froideville* 126 (BO).

Specimens of *A. burttii* are entirely glabrous, except for one collection from G. Sojol (RBGE cult. 20000750, grown from seed, *Smith & Galloway* SULSG 347), which has minutely puberulous young stems and flowers. Another collection from the same mountain is typical. Very few collections in general have been made from G. Sojol, so RBGE cult. 20000750 is here treated merely as atypical.

The acuminate leaf tip of *A. burttii* is longer than that of *A. lobaticalyx* Mendum (see below), and the two species are instantly separable on calyx shape. In cultivation, the leaf colour of *A. burttii* is a much deeper green than that of *A. lobaticalyx*.

*Derivation.* This species is named after Mr B.L. Burt, who has contributed so much to our knowledge of the Old World *Gesneriaceae*.

### 3. *Aeschynanthus lobaticalyx* Mendum, sp. nov. Fig. 2G–L.

Corolla huius speciei usque ad 4.7cm longa est et calyx usque ad medium (lobo postico brevissimo) lobatus; hac calycis forma ab omnibus aliis speciebus sect. *Microtrichii* cognitae distincta.

Type: Sulawesi, South Sulawesi, Gunung Bonthain, in forest, 2200m, 9 vi 1921, *Bünnemeijer* 11979 (holo. BO, iso. L).

Epiphytic subshrub; *stems* pendulous, flexuous and trailing, rooting from some nodes, glabrous, purple when young; internodes to 5.5cm. *Leaves* opposite; blade

convex, hard and leathery, deep glossy green above, paler below, with minute sunken glands on both surfaces especially visible in fresh material, 1.5–6.5 × 1–2.4 cm, narrowly to broadly ovate, apex acuminate with blunt tip, base rounded to acute, margins subentire with small purplish glands, midvein impressed above, prominent below, other veins faintly visible; petiole 6–10 mm, purple, glabrous. *Inflorescences* 1- or 2-flowered in leaf axils towards tips of stems, often on short side-shoots. *Peduncle* c. 4–10 mm, glabrous. *Bracts* and *bracteoles* 5–12 × 1.5–2.5 mm, lanceolate, green heavily flushed maroon, glabrous. *Pedicel* 8–11 mm, slender, green sometimes flushed red apically, sparsely gland-dotted. *Calyx* 1.3–1.8 cm, glossy cream to pale green or pale red with green lobe tips, with scattered sessile glands, asymmetrically lobed from just above to just below halfway, lobes narrowly triangular with blunt tips. *Corolla* yellowish outside where enclosed by calyx tube then bright deep scarlet, yellow at base of lower three lobes, inside deep scarlet shading gradually to white at base of tube, yellow on floor of throat and base of lower three lobes, 4.1–4.7 cm long, slightly arcuate in upper half, upper lobes c. 10 × 7 mm (central sinus c. 4 mm), rounded oblong, forward-pointing; lateral lobes c. 9.5 × 8.5 mm, widely spreading; lower lobe c. 11 × 7 mm, pointing forwards and downwards, all lobes rounded oblong with slightly undulate margins; corolla outside with infrequent sessile glands and glandular hairs on upper part of apical half and fringing lobes, inside with minute glandular hairs on lobes becoming denser and ringing throat, and with papillae on sides and floor of tube almost to base. *Filaments* not exerted, arising in upper part of tube, swollen at attachment to anther, cream at base shading to pinkish, scarlet or purple and with scattered glandular hairs in lower part; posticous pair c. 2.5 mm, anticus pair c. 1.6 mm. *Anthers* ovate, purplish, posticous pair c. 3 × 1.5 mm, anticus pair slightly smaller; pollen dark yellow. *Staminode* c. 1 mm. *Disk* 1.5 × 2.5 mm, slightly lobed, greenish yellow. *Stipe* c. 1.4 mm, light green with occasional papillae; *ovary* green with four lines of maroon blotches and sparse to moderate colourless sessile glands; *style* c. 9 mm, white to pale green with patent colourless glandular hairs; *stigma* c. 2.5 × 2 mm, slightly shield-shaped, peltate, white to pale green and minutely papillose; nectar copious. *Capsule* linear, slender, to 18.6 cm. *Seed* c. 1 mm, papillose, testa cells with strongly spiral orientation; hilar appendage 11–16 mm, apical appendage 10–13 mm, both stout.

*Habitat.* Recorded as a common epiphyte in the submontane mossy forest.

*Altitude.* 750–900 m.

*Specimens examined.* SULAWESI. **South Sulawesi:** Gunung Lompobatang [G. Bonthain], NW side, 2000 m, 16 v 1921, *Bünnemeijer* 11573 (BO); 2000 m, 5 vi 1921, *Bünnemeijer* 11824 (BO); 2200 m, 6 vi 1921, *Bünnemeijer* 11828 (BO); S. of Gunung Lompobatang, above Desa Bonto Lojang, Kab. Bantaeng, c. 5°24'S, 119°56'E, c. 750 m, 8 ii 2000, *Mendum, Argent & Hendrian* 001; c. 800 m, 001A; c. 900 m, 9 ii 2000, *Mendum, Argent & Hendrian* 0025 (BO, E); RBGE cult. 20000424, grown from seed collected on G. Lompobatang, 850 m, 8 ii 2000, *Smith & Galloway* SULSG 4 (E).

So far known only from Gunung Lompobatang, in the SW tip of the island. Gunung Bonthain is the old Dutch name for G. Lompobatang. Calyx colour is noted as creamy to reddish or as pale green, and in cultivation it is light scarlet. Although many *Aeschynanthus* species do show a slight tendency to asymmetry of the calyx, marked asymmetry is uncommon. *Aeschynanthus pachyanthus* Schltr. from New Guinea and *A. vinaceus* P. Woods from Borneo are also in sect. *Microtrichium* and both have a strongly asymmetric calyx, but they are twiggy plants with much larger leaves and flowers unlike those of *A. lobaticalyx*.

Jisaboro Ohwi worked in the Buitenzorg (Bogor) herbarium from 1943 to 1945, where he annotated many sheets but did not publish any names. His proposed epithet *lobaticalyx* (lobed calyx) is adopted here, and *Binnemeijer* 11979, annotated by him, is designated the type.

#### ACKNOWLEDGEMENTS

I wish to thank the curators of the following herbaria for loan of material: BO, K, L, S and U. I also thank Dr Robert Mill for the Latin diagnoses, Dr Toby Pennington for helpful discussion, and the horticultural staff at RBGE, especially Steve Scott, for their skills.

#### REFERENCES

- CLARKE, C. B. (1883). Cyrtandreae. In: DE CANDOLLE, A. & DE CANDOLLE, C. (eds) *Monographiae Phanerogamarum*, vol. 5(1). Paris: Sumptibus G. Masson.
- DENDUANGBORIPANT, J., MENDUM, M. & CRONK, Q. C. B. (2001). Evolution in *Aeschynanthus* (Gesneriaceae) inferred from ITS sequences. *Plant Syst. Evol.* 228: 181–197.
- MENDUM, M., LASSNIG, P., WEBER, A. & CHRISTIE, F. (2001). Testa and seed morphology in *Aeschynanthus* (Gesneriaceae): phylogeographical patterns and taxonomic implications. *Bot. J. Linn. Soc.* 135: 195–213.
- WANG, W. T. (1984). *Aeschynanthus*. *Bull. Bot. Lab. NE Forest Inst.* 4: 26–30.

*An invited contribution to the Festschrift for B.L. Burt's ninetieth birthday*