

FOUR NEW SPECIES OF *BEGONIA* (*BEGONIACEAE*) FROM SULAWESI

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Four new species of *Begonia* (*Begoniaceae*) are described from the Indonesian island of Sulawesi. All four species (*Begonia chiasmogyna* M.Hughes, *Begonia macintyreana* M.Hughes, *Begonia mendumae* M.Hughes and *Begonia stevei* M.Hughes) belong to *Begonia* section *Petermannia*, and they increase the number of *Begonia* species known from the island to 30.

Keywords. *Begonia*, new species, Sulawesi.

INTRODUCTION

Recent expeditions to northern Sulawesi from the Royal Botanic Garden Edinburgh have brought to light several new species of *Begonia*, four of which have been brought into cultivation and are described below. This species-rich genus was previously represented by 26 species on Sulawesi (Doorenbos *et al.*, 1998; Doorenbos, 2000; Tebbitt, 2005), although it is obvious from herbarium collections that many more remain to be described from the island. The majority of *Begonia* from Sulawesi belong to *Begonia* section *Petermannia* (19 species), and the four species covered here are no exception, each having protogynous inflorescences and bifid placentae. At present only one of the four species (*Begonia chiasmogyna*) is known from specimens other than the holotype, which may be due in part to the paucity and often scrappy nature of *Begonia* collections from Sulawesi. It is thus possible that these species have wider distributions on the island, and may therefore exhibit considerable morphological variation from the type material when they become better known. However, all available *Begonia* specimens from Sulawesi in E, L, K, P, B and A (plus some photographic duplicates from BO) have been consulted, and hence it must be assumed, for now at least, that these species have very restricted ranges. As such, they are all 'prone to the effects of human activities or stochastic events within a very short time period in an uncertain future' (IUCN, 2001), and must therefore be placed in the 'Vulnerable' IUCN Red List Category.

As most botanists will come across these species *in sicco* only, images of the holotypes (Fig. 1) are provided as an aid to identification. Cultivated material grown from seed collected from the holotypes was used to supplement the descriptions. Figure 2 shows the collecting localities in northern Sulawesi.



FIG. 1. Photographs of the holotypes (in E) of *Begonia chiasmogyna* (top left); *Begonia macintyreana* (top right); *Begonia mendumae* (bottom left) and *Begonia stevei* (bottom right).

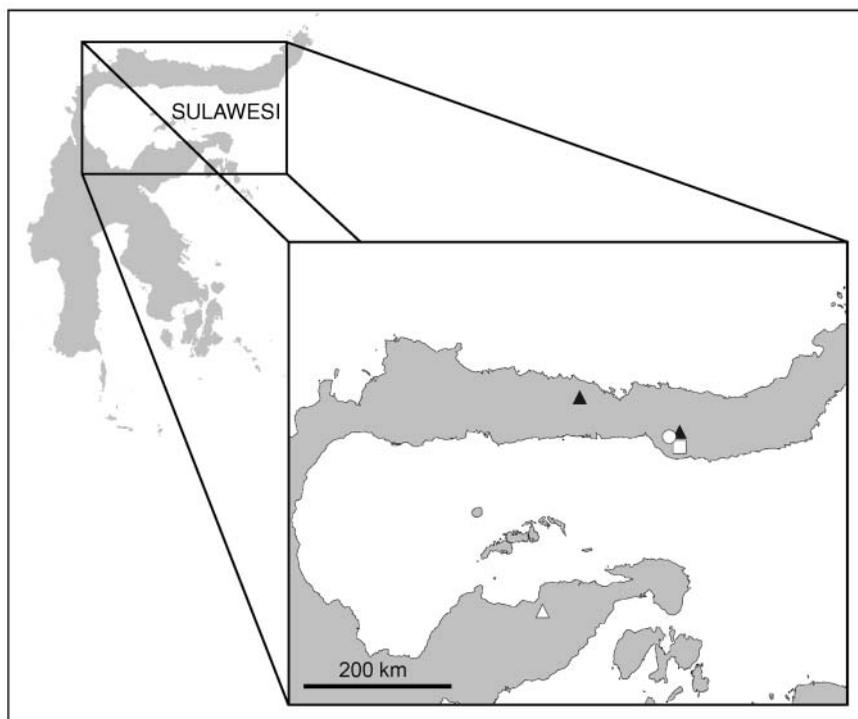


FIG. 2. Map showing collection localities in northern Sulawesi. *Begonia chiasmogyna* (▲); *Begonia macintyreana* (○); *Begonia mendumae* (□); *Begonia stevei* (△).

SPECIES DESCRIPTIONS

***Begonia chiasmogyna* M.Hughes, sp. nov.** Sect. *Petermannia*. Figs 1, 3.

A *Begonia celebica* Irmsch. flore femineo tepalis quattuor et indumento haud ferrugineo differt. – Type: Sulawesi, Gorontalo, Gunung Boliohutu, 420 m, 23 iv 2002, M. Mendum, H.J. Atkins, M.F. Newman & A. Sofyan 167 (holo E).

Erect softly hairy much branching herb to c.50 cm high. *Stem* woody at base, sometimes rooting where nodes touch substrate, densely hairy, internodes 5–13 cm. *Stipules* c.10 × 7 mm with a filiform extension at the tip, hairy, semi-persistent. *Petioles* 2–6 cm long, densely hairy. *Leaves* very asymmetric, up to 7–17 cm long from base to tip and 3–6 cm wide, midrib 5–13 cm, ovate–lanceolate, venation pinnate–palmate, covered with colourless hairs, margin scalloped and irregularly dentate with a fringe of short hairs, shallowly cordate at the base, pale green. *Inflorescence* bisexual, terminal, protogynous, female flowers occasionally borne separately; bracts ovate, c.3 mm long, fimbriate. Male flowers borne in monochasial cymes of c.14 flowers; tepals 2, suborbicular, c.8 × 9 mm, base cordate becoming truncate at maturity, outer surface with a few short colourless hairs, margin slightly fimbriate, white; stamens 45–50, yellow, anthers c.0.75 mm long, dehiscing through

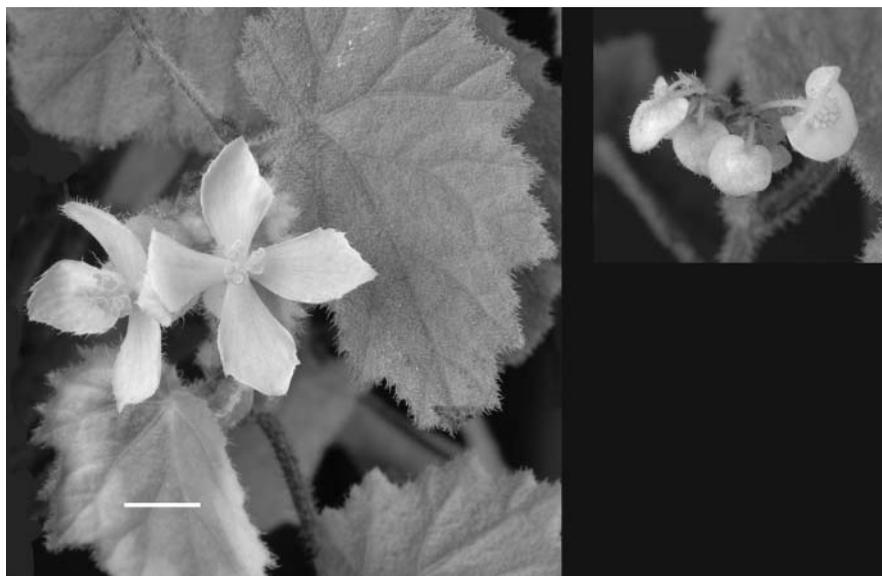


FIG. 3. *Begonia chiasmogyna* M. Hughes. Left, female flowers; right, male part of the inflorescence. Scale bar represents 1 cm.

short slits near the tip, filaments the same length, slightly fused at the base. Female flowers borne in pairs; pedicel c.3 mm long; tepals 4, equal, sub-rhomboid, denticulate, white, c.15 × 11 mm; styles 3, twice spirally twisted, yellow, deciduous; ovary 10 × 14 mm with 3 equal wings, truncate across the apex, scattered with colourless hairs, pale green or pink, placentation axile, placentae bifid, wings rounded at the base and acute at the tip. *Fruit* c.12 × 16 mm, drying pale brown, dehiscent, capsule oval. *Seeds* barrel shaped, c.0.3 mm long, collar cells c.2/3 the length of the seed.

Paratypes. Sulawesi: Gorontalo, Gunung Boliohutu, by stream, 250 m, 22 iv 2002, *Mendum et al.* 146 (E); Gorontalo, route along the Olama River to Gunung Gambuta, 800 m, 9 iv 2002, *Mendum et al.* 46 (E, L).

Notes. This species does not appear to thrive in cultivation. It is unusual in section *Petermannia* in the female flowers having four rather than five tepals, the rhomboidal tepals giving a cross-shape to the perianth; hence the epithet *chiasmogyna* ('female cross'). Known from two localities in Sulawesi Utara (Fig. 2). IUCN category VU D2.

***Begonia macintyreana* M. Hughes, sp. nov.** Sect. *Petermannia*. **Figs 1, 4.**

A *Begonia imperfecta* Irmsch. omnino glaberrima (haud secus venos ferruginea), tepalis masculis ad apices acutis, et inflorescentia cymosa (haud subumbellata) recedit. – Type: Sulawesi, Gorontalo, near Tulabolo, in dense shade on steep bank near track in disturbed secondary forest, 177 m, 4 iv 2002, *M. Mendum, H.J. Atkins, M.F. Newman, Hendrian & A. Sofyan* 2 (holo E; iso E, L).



FIG. 4. *Begonia macintyreana* M.Hughes. Left, female flowers with immature male inflorescence beneath; middle, male flower showing shield-shaped tepals; right, mature male part of the inflorescence subtended by a ripening fruit. Scale bars represent 1 cm.

Erect glabrous branching herb to c.80 cm high. *Stem* woody at base, c.12 mm across, internodes 5–8 cm. Stipules 10 × 8 mm, broadly lanceolate with a filiform extension at the tip, semi-persistent. Petioles 4–7 cm long. *Leaves* very asymmetric, up to c.15 cm long from base to tip and up to 7 cm wide, midrib 6–10 cm, ovate–lanceolate with an acute tip, margin scalloped and denticulate, cordate at the base, deep glossy green above and pale grey-green below. *Inflorescence* bisexual, terminal or axillary, protogynous; bracts lanceolate, 3 mm long, deciduous. Male flowers borne distally to the female in a monochasial cyme usually comprised of three main axes each with c.30 male flowers; tepals 2, 12 × 12 mm, shield shaped, base sub-cordate to truncate, apex slightly pointed, white; stamens c.35, yellow, anthers c.0.75 mm long, dehiscing through slits c.half as long as the anther, filaments up to twice as long, slightly fused at the base. Female flowers borne in pairs at the base of the inflorescence; pedicels c.12 mm long; tepals 5, equal, ovate-lanceolate, 20 × 13 mm, white to palest pink; styles 3, twice spirally twisted, orange, deciduous; ovary 12 × 18 mm with 3 equal wings, obtusely indented across the apex, pale pink with darker venation, placentation axile, placentae bifid, wings rounded at the base, acute at the tip, extended distally. *Fruit* 15 × 22 mm, drying pale brown, dehiscent; capsule oval, 8 × 5 mm. *Seeds* barrel shaped, c.0.3 mm long, collar cells c.2/3 the length of the seed.

Notes. In cultivation this species forms a splendid hemispherical mound nearly a metre across, and has a long flowering period. The scalloped edge to the leaf is characteristic of many species of *Begonia* from Sulawesi. It is named in honour of

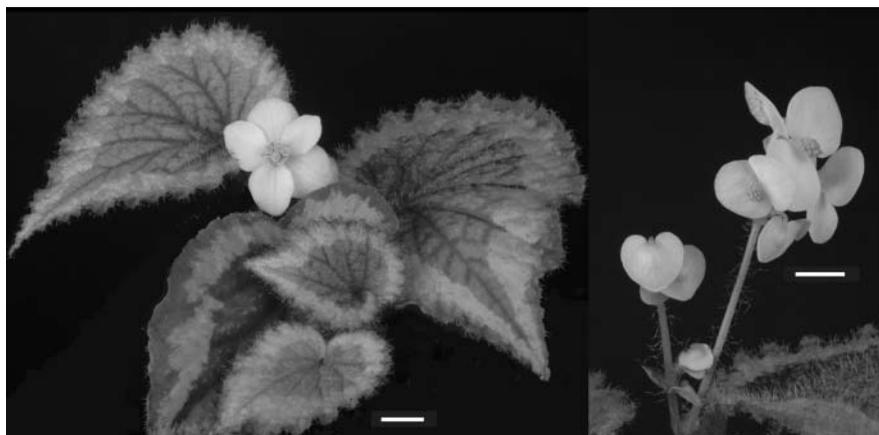


FIG. 5. *Begonia mendumae* M.Hughes. Left, solitary female flower; right, maturing male inflorescence showing three sub-umbellate clusters of flowers. Scale bars represent 1 cm.

Mr and Mrs Malcolm L. MacIntyre, the founders of the M. L. MacIntyre *Begonia* Trusts, which have facilitated much research into the genus. Known only from the type locality in Sulawesi Utara (Fig. 2). IUCN category VU D2.

***Begonia mendumae* M.Hughes, sp. nov. Sect. *Petermannia*. Figs 1, 5.**

A *Begonia siccacaudata* J.Door. foliis magis pilosis et magis asymmetricis differt. – Type: Sulawesi, Gorontalo, Gunung Ali, growing on almost vertical rock face in heavy shade, 200 m, 28 iv 2002, *M. Mendum*, H.J. Atkins, M.F. Newman, Hendrian & A. Sofyan 240 (holo E).

Creeping pubescent herb to c.20 cm high. *Stem* rhizomatous, c.7 mm across with scattered hairs; internodes 5–10 mm. *Stipules* broadly lanceolate, 10 × 8 mm with a filiform extension at the tip, fimbriate on the keel. *Petioles* 5–10 cm long with scattered hairs, pink. *Leaves* very asymmetric, up to 9 cm long from base to tip, up to 6 cm wide, midrib 4–5.5 cm, ovate with an acute tip, venation palmate-pinnate, scattered with pinkish red hairs, margin shallowly sinuate–dentate with a fringe of short hairs, cordate at the base, lobes sometimes overlapping, deep green in the centre and around the margin with darker mottling on the veins, a paler band running inside the margin. *Inflorescence* bisexual, terminal, protogynous; bracts ovate to sub-orbicular, c.4 mm long. Male flowers borne distally to the female in a monochasial cyme with up to three sub-umbellate clusters (actually very compressed cymes) of 6–8 flowers, subtended by 2 bracts with no others visible; tepals 2, sub-orbicular, c.12 × 12 mm, base cordate becoming truncate at maturity, pale dusky pink; stamens 35, orange, anthers c.0.75 mm long, dehiscing through slits more than half as long as the anther, filaments c.three times as long, slightly fused at the base. Female flowers borne singly at the base of the inflorescence, subtended by two bracteoles c.5 mm from the base of the ovary; pedicel c.1.5 cm long; tepals 5,

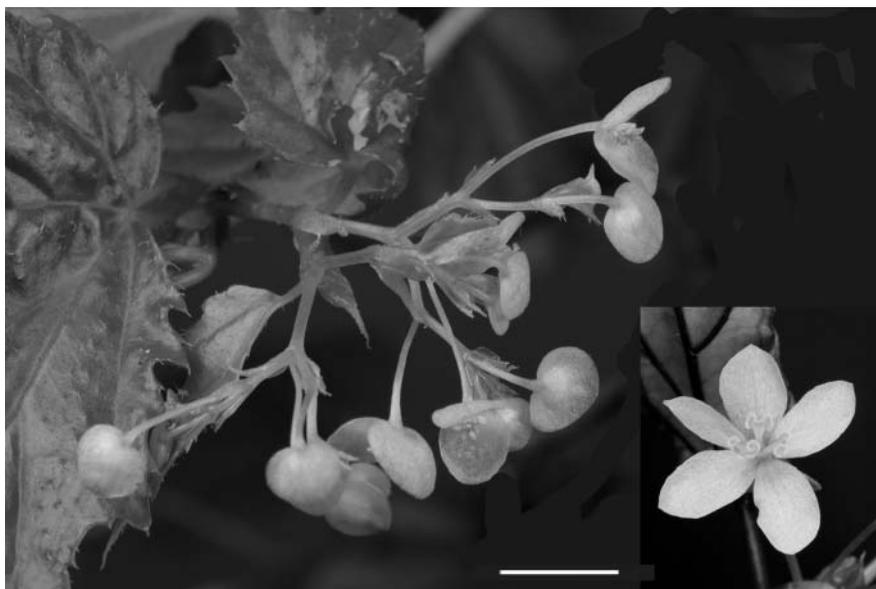


FIG. 6. *Begonia stevei* M.Hughes. Left, mature male inflorescence; right, female flower. Scale bar represents 1 cm.

sub-equal, broadly ovate-lanceolate, slightly fimbriate, dusky pink, outer pair 15×12 mm, inner three $14 \times 6-11$ mm; styles 3, twice spirally twisted, orange, deciduous; ovary 13×12 mm with 3 equal wings, deep dull-red, truncate across the apex, with scattered hairs, placentation axillary, placentae bifid, wings rounded at the base and acute at the tip. *Fruit* c. $13 \text{ mm} \times 12 \text{ mm}$, drying pale brown, dehiscent; capsule oval, $8 \text{ mm} \times 5 \text{ mm}$. *Seeds* barrel shaped, c. 0.3 mm long, collar cells c. $2/3$ the length of the seed.

Notes. The dusky pink tepals of this species combined with orange anthers and stigmas make it quite beautiful. It is named in memory of the late collector, Mary Mendum. I have diagnosed this species against *Begonia siccacaudata* as it is the only other Sulawesi species with anything like a similar habit, but it differs greatly in terms of inflorescence structure. *Begonia mendumae* has a sub-umbellate male inflorescence, whilst *B. siccacaudata* bears its male flowers in a comparatively lax thyrse. Known only from the type locality in Sulawesi Utara (Fig. 2). IUCN category VU D2.

***Begonia stevei* M.Hughes, sp. nov.** Sect. *Petermannia*. Figs 1, 6.

Ab omnibus aliis speciebus *Begoniae* celebicis foliis pinnatim incisus distincta. – Type: Sulawesi, Luwuk District, Bunta Sub district, Sumber Agung, Gunung Hek, Sungai Hek, evergreen forest, 660 m, 25 ii 2004, *Hendrian, M.F. Newman, S. Scott, M. Nazre Saleh & D. Supriadi* 877 (holo E; iso L).

Sprawling herb to c.60 cm high. *Stem* woody at base, c.7 mm across with scattered hairs, striate when dry, internodes 4–8 cm. *Stipules* lanceolate, $10-15 \times \text{c.}6$ mm with a filiform extension at the tip, glabrous or slightly hairy. *Petioles* 1–4 cm long

sometimes with scattered hairs. *Leaves* asymmetric, up to 13 cm long from base to tip and up to 6 cm wide, midrib 5–10.5 cm, lanceolate but with an irregularly incised outline, venation palmate-pinnate, scattered with colourless hairs on the upper and lower surface, sub-cordate to cordate at the base. *Inflorescence* usually bisexual, female flowers sometimes borne separately, terminal or axillary, protogynous; bracts lanceolate, 7 mm long, semi-persistent. Male flowers borne distally to the female in monochasial cymes usually comprising c.30 flowers; tepals 2, orbicular, c.5 mm in diameter, glabrous, pale green or white or coral pink; stamens c.20, pale yellow to orange, anthers c.0.75 mm long, dehiscing through slits more than half as long as the anther, filaments the same length or shorter, slightly fused at the base. Female flowers borne in pairs at the base of the inflorescence; pedicels c.12 mm long; tepals 5, sub-oval, sub-equal (outer 2 slightly larger), c.8 × 5 mm, pale green or white or coral pink; styles 3, once spirally twisted, pale yellow, deciduous; ovary with 3 equal wings, pale green or pink, truncate across the apex, placentation axillary, placentae bifid, wings rounded at the base and at the tip. *Fruit* c.18 × 14 mm, drying pale brown, dehiscent, capsule oval. *Seeds* barrel shaped, c.0.3 mm long, collar cells c.2/3 the length of the seed.

Notes. Several individuals of this species sown from a single seed collection were grown to maturity, and exhibited considerable variation in leaf incision and indumentum. This was matched in flower colour variation, ranging from palest green with pale yellow anthers to coral orange-pink with orange anthers. Whilst male flowers were produced abundantly in the cultivated specimens, female flowers were rare. The epithet is after one of the collectors, Steve Scott, who has also provided the cultivated material for the four species in this account. Known only from the type locality in Sulawesi Tengah (Fig. 2). IUCN category VU D2.

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