
THREE NEW SPECIES AND A NEW SUBSPECIES OF *BEGONIA* (*BEGONIACEAE*) FROM ASIA

M. C. TEBBITT

Four new Asian taxa are described and illustrated as part of a forthcoming taxonomic revision of the cultivated species of *Begonia* (*Begoniaceae*). The new species *B. argenteomarginata* (sect. *Symbegonia*) is described from Papua New Guinea. Two new species from section *Petermannia* are described: *B. polilloensis* from the Philippines and *B. rachmatii* from Sulawesi, Indonesia, both of which are unusual in having palmately compound leaf blades. A key is provided for these and a previously described species, *B. oligandra*, also with palmately compound leaf blades and in section *Petermannia*. The new subspecies *B. brevirimosa* subsp. *exotica* (sect. *Petermannia*) is described from the Central Range of Papua New Guinea and a brief history of its cultivation is presented.

Keywords. *Begonia* sect. *Petermannia*, *Begonia* sect. *Symbegonia*, Indonesia, Irian Jaya, new species, new subspecies, Papua New Guinea, Philippines, Sulawesi.

INTRODUCTION

The *Begoniaceae* as currently recognized contains two genera, the species-rich *Begonia* L., widely distributed in tropical and subtropical regions of the world, and the monotypic *Hillebrandia* Oliver, endemic to the Hawaiian Islands. In their infrageneric revision of *Begonia*, Doorenbos *et al.* (1998) recognize 63 sections, together containing 1376 species. Since then three new sections have been proposed: *Begonia* section *Leprosae* Ku was created to accommodate three fleshy-fruited Chinese species (Shui *et al.*, 2002), section *Chasmophila* J.J.de Wilde & Plana was raised to accommodate the continental African species *B. iucunda* Irmsch. (de Wilde & Plana, 2003) and an additional section was added following the reduction of the genus *Symbegonia* Warb. (Forrest & Hollingsworth, 2003). The latter taxonomic change is supported by molecular sequence data, which indicate that *Symbegonia* is nested within *Begonia* sect. *Petermannia* (Klotzsch) A.DC. (Forrest & Hollingsworth, 2003).

Three of the new taxa described in this paper belong to *Begonia* sect. *Petermannia*, while the fourth is a member of section *Symbegonia*. All four are here described as part of a taxonomic revision of cultivated *Begonia* (Tebbitt, in press) and their closest relatives. Approximately 380 species of *Begonia* are currently cultivated in Europe and North America, many of which are popular indoor, greenhouse or garden plants.

NEW SPECIES

***Begonia argenteomarginata* M.C.Tebbitt (sect. *Symbegonia*), sp. nov. Fig. 1.**

B. fulvovillosae Warb. affinis sed margine folii argenteo et alis fructus truncati differt.

Similar to *B. fulvovillosa* Warb. but margin of leaf with silvery-white band or patches and fruit wings truncate.

Type: Papua New Guinea, Chimbu Province, Chuave District, Base of Mt Elimbari, 2000m, xii 1981, *Reeve* 595 (holo. E, iso. L).

Erect, branched monoecious herb to 30cm, lacking a rhizome. *Stem* pale green, densely covered with long reddish-pink glandular hairs with multicellular stalks, internodes 3–5cm long. *Stipules* tardily deciduous, green when young but soon

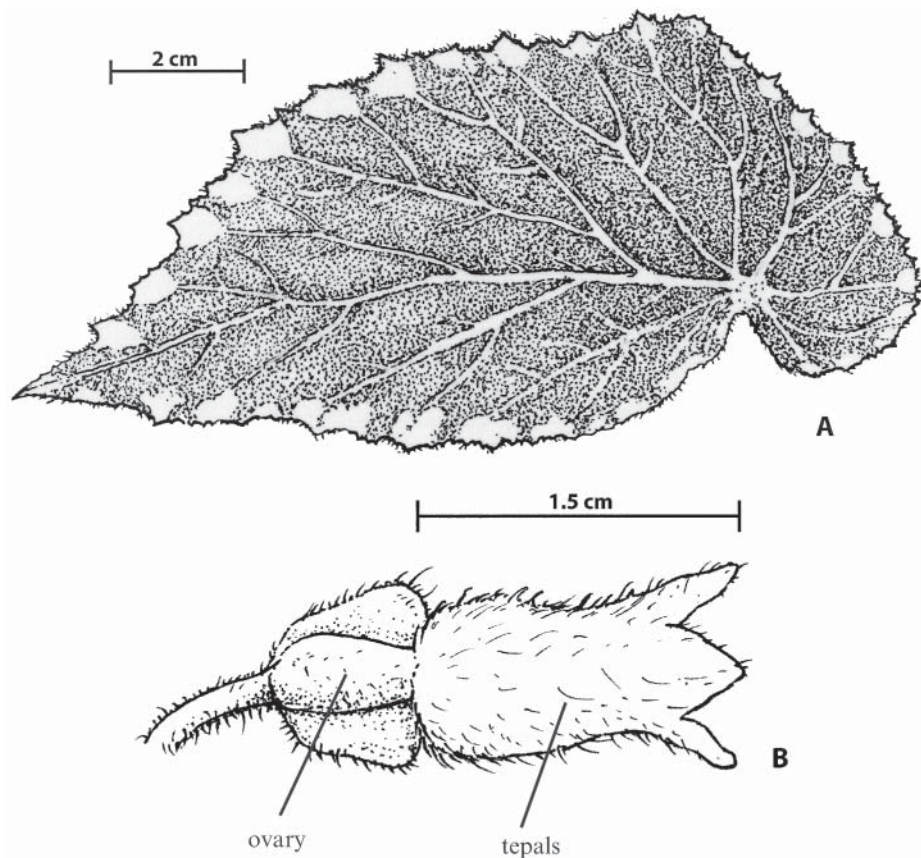


FIG. 1. *Begonia argenteomarginata* M.C.Tebbitt: A, leaf (upper surface); B, female flower. A: Drawn by Paul Harwood from type material (*Reeve* 595). B: Drawn by Paul Harwood from material cultivated at Glasgow Botanic Garden.

drying and becoming brown, triangular-ovate, 0.7–1 × 0.4–0.5cm, main vein projecting 0.25–3mm, margin entire. *Leaves* alternate, distichous; *petiole* pale green with reddish-pink hairs, 0.5–2cm long, continuing almost straight into main vein of the blade; *blade* ovate, 5–11 × 2.2–4.5cm; upper surface bronze-green with a silvery-white margin or patches c.2–6mm wide, and a green transitional zone c.1–2mm wide, pustulate, pustules tipped by short glandular hairs with multicellular stalks, veins palmate, sunken, lower surface burgundy to pinkish with a 3–4mm wide green band around the margin and short glandular hairs especially dense along the main veins. *Inflorescence* terminal, bisexual or unisexual, protogynous, c.6–10-flowered, cymose; *peduncles* c.0.4mm, green with reddish-pink hairs; *bracts* present at flowering time but eventually deciduous, pale green, ovate, 4–7 × 2–3mm, main vein shortly projecting, margin entire. *Pedicels* green with reddish-pink hairs, in male flowers 0.3–1.1cm long, in female flowers c.0.5cm long. *Male flowers*: *tepals* 2, white, ovate, 0.7–1.2 × 0.7–1.2cm, fused for 1–3mm at base, base obtuse, apex acute, outer surface with short white hairs in basal half where perianth tube bulges around androecium and along lower 3/4 of margin; *stamens* c.15–18, filaments white, 0.25–2mm long, fused into column, anthers brown, elliptic, c.0.6 × 0.25mm, dehiscent via lateral slits, connectives not projecting. *Female flowers*: *bracteoles* absent; *tepals* 5, white, outer surface with dense short white hairs, slightly more than 2/3 fused into a vase-shaped tube with fluted lobes, tube 1.2–1.4cm long, lobes triangular, c.3 × 3mm, *ovary* green throughout, with short red hairs, 3-locular, ovate, 1 × 0.5cm, with 3 subequal wings, wings triangular, base rounded, apex truncate, margin with short red hairs, *placentae* axile, entire, *styles* 3, free, white, c.6.5mm tall, style branches erect, stigmatic papillae in a broad spiral band. *Fruit* not seen.

Distribution. Papua New Guinea: Chimbu Province, Chuave District. Known only from the type locality.

Habitat and phenology. No data available.

Additional specimens examined. CULTIVATED. Glasgow Botanic Garden (GBG 008 038 87), Forrest 145 (E). Wild origin details unknown.

Begonia argenteomarginata is distinguished from all other members of section *Symbegonia* by its combination of green leaf blades with silver-edged or blotched, doubly serrate leaf margins and fruit wings truncate at the apex. This species was included in Forrest & Hollingsworth's (2003) molecular phylogenetic analyses of the *Begoniaceae* as *Symbegonia* species B.

Begonia polilloensis M.C.Tebbitt (sect. *Petermannia*), **sp. nov.** **Fig. 2.**

Begonia incisa auct. non A.DC.: L.L.Forrest & Hollingsworth, *Pl. Syst. Evol.* 241: 193–211 (2003).

B. oligandrae Merr. & L.M.Perry affinis sed alis fructus aequalibus et bracteis minoribus differt.

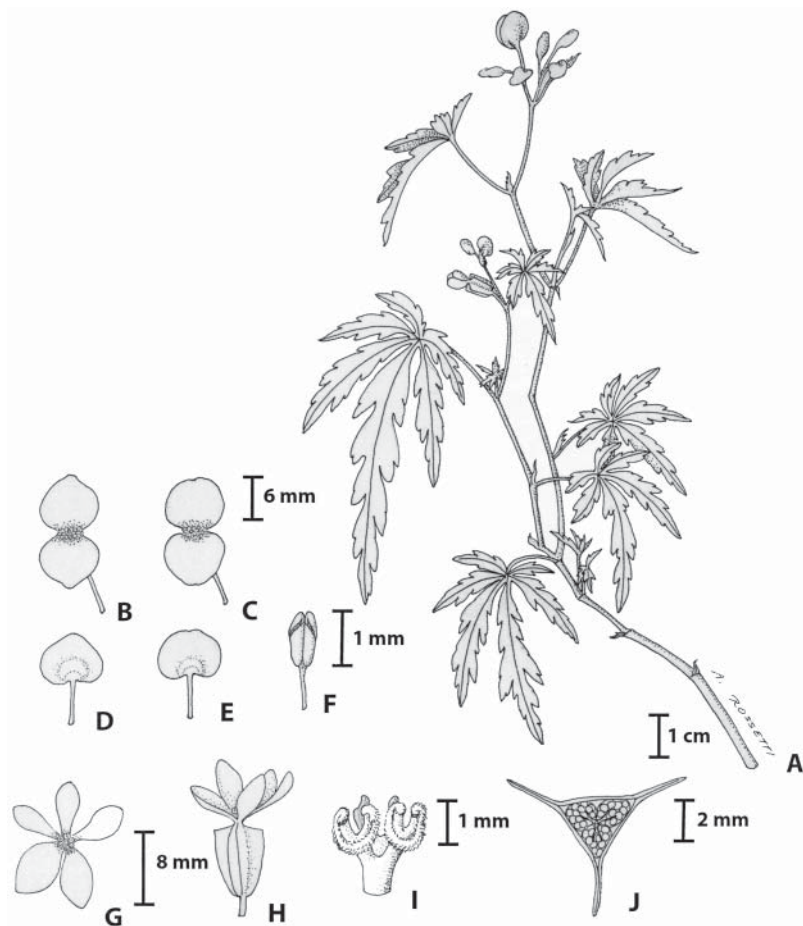


FIG. 2. *Begonia polilloensis* M.C.Tebbitt: A, habit (upper part of plant); B & C, male flowers; D & E, male flower-buds; F, stamen; G, female tepals and styles; H, female flower, lateral view; I, styles; J, transverse section of ovary. Drawn by Adèle Rossetti Morosini from Tebbitt 200.

Similar to *B. oligandra* Merr. & L.M.Perry but differing in the equal fruit wings and smaller bracts.

Type: Philippines, Luzon, Quezon Province, Real, 18 vi 1962, *Lagrimas* s.n. (Philippine National Herbarium no. 42651) (holo. L).

Erect, branched monoecious herb to c.30cm tall, lacking a rhizome. *Stem* pink, with sparse glandular hairs with multicellular stalks, flexuose towards apex. *Stipules* persistent, ovate to lanceolate-ovate, 3–8 × 1.25–3mm, main vein shortly projecting. *Leaves* alternate; *petiole* pink, sparsely hairy, 0.7–2cm long, joining blade at an oblique angle; *blade* asymmetric ovate in outline, 3.5–10.5 × 3–9cm, palmately compound, 5–6-lobed, lobes themselves deeply lobed with toothed margins, upper

surface green with red veins and sparse glandular hairs, lower surface paler green with purple veins, veins with short glandular hairs. *Inflorescences* unisexual; *male inflorescence* terminal, few-flowered, cymose; *bracts* deciduous to persistent, lanceolate, $c.1 \times 0.5$ mm; *female flowers* solitary in upper leaf axils, occasionally hidden in foliage; *bracts* persistent, ovate, $c.2 \times 1$ mm. *Male flowers*: *tepals* 2, white, tinged faint pink along veins, uppermost segment elliptic, $0.8\text{--}0.95 \times 0.55\text{--}0.6$ cm, lowermost segment elliptic to oblong-elliptic, $0.8\text{--}0.9 \times 0.55\text{--}0.75$ cm; *stamens* 45–50, arrangement slightly asymmetric, filaments of innermost stamens fused into a column $c.1$ mm tall, anthers elliptic-obovate, $c.1$ mm long, connectives not projecting. *Female flowers*: *bracteoles* persistent, paired directly beneath ovary, linear, $c.1.5$ mm long; *tepals* 5, pale pink with whitish-pink apices, ovate, elliptic or obovate, $0.6\text{--}1.2 \times 0.3\text{--}0.5$ mm; *ovary* green tinged pink, or reddish, 3-locular, ellipsoid to narrowly obovoid, $5\text{--}8 \times 2.5\text{--}5.5$ mm, with 3 equal wings, wings deltoid, $5\text{--}7$ mm \times $1\text{--}1.1$ cm, apex rounded-truncate, base cuneate, *placentae* axile, bifid; *styles* 3, yellow, shortly once-branched, stigmas in a spiral band. *Fruit* becoming scarious, grey-brown, dehiscing along junction of wings.

Distribution. Philippines: Luzon, Negros, Polillo.

Habitat and phenology. No data available.

Additional specimens examined. PHILIPPINES. Negros, Tanyas, Lake Balinsasayao, ix 1948, *Edaño* s.n. (Philippine National Herbarium no. 11617) (A).

CULTIVATED. Glasgow Botanic Garden, Scotland, originally collected in Philippines, Polillo, [Johnson 45], Tebbitt 199 (E); Jardin botanique de Montréal, Canada, originally collected in Philippines, Polillo, [Johnson 45], Tebbitt 200 (BKL); New York Botanical Garden, USA, originally collected in Philippines, Polillo, [Johnson 45], Tebbitt 102 (BKL).

This species was introduced into cultivation in the USA in the early 1980s by Martin Johnson who collected it on Polillo Island as *Begonia* number 45. It is now usually grown under the American Begonia Society code U076, and is also cultivated in Europe. In the past *B. polilloensis* was mistakenly identified in cultivation as *B. incisa* A.DC., a name under which it is still commonly grown and under which it appears in Forrest & Hollingsworth (2003). *Begonia incisa* is endemic to the Philippine island of Luzon and differs most noticeably from *B. polilloensis* by having deeply incised rather than palmately compound leaves. The palmately compound leaves of *B. polilloensis* coupled with its two-tepaled male flowers borne in cymes and solitary female flowers with five tepals instantly distinguish it from all other begonias except *B. oligandra* Merr. & L.M.Perry from Irian Jaya and *B. rachmatii* from Sulawesi, newly described below. A key to these three species follows the treatment of *B. rachmatii*.

Begonia rachmatii M.C.Tebbitt (sect. *Petermannia*), **sp. nov.** **Fig. 3.**

B. polilloensis M.C.Tebbitt affinis sed foliis minoribus et fructibus subsessilibus differt.



FIG. 3. *Begonia rachmatii* M.C.Tebbitt: habit (upper part of plant). Drawn by Paul Harwood from the holotype (*Rachmat* 475).

Similar to *B. polilloensis* M.C.Tebbitt but differing in the smaller leaves and almost sessile fruit.

Type: Indonesia, Celebes, G. Babalombang, viii 1913, *Rachmat* 475 (holo. L).

Erect, branched monoecious herb to at least 19cm tall [lower portion of specimen missing]. Rhizome details not known. *Stem* glabrous, apical portion not flexuose. *Stipules* persistent, lanceolate-ovate, 3.5–7 × 2–3mm. *Leaves* alternate: *petiole* glabrous, 0.8–2cm, joining blade at an oblique angle; *blade* asymmetrically ovate in outline, 1.6–2.2 × 1.5–2.3cm, palmately compound, 5–6-lobed, margin of lobes toothed to very shortly lobed, with sparse glandular hairs ending the lobes and teeth,

otherwise glabrous. *Inflorescences* unisexual; *male inflorescence* terminal, few-flowered, cymose; *bracts* deciduous, lanceolate, $c.4 \times 1$ mm; *female flowers* solitary in upper leaf axils; *bracts* not seen. *Male flowers*: *tepals* 2, broadly ovate, 2×2.25 –3mm, *stamens* c.15, arrangement asymmetric, filaments 0.5–0.75mm, fused at base, anthers elliptic-obovate, c.0.5mm long, connectives not projecting. *Female flowers* not seen. *Infructescence*: *pedicel* c.1mm long, *fruit* becoming scarios, grey-brown, dehiscing along junction of wings, wings deltoid, $c.5 \times 8$ mm, apex abruptly truncate, base shallowly cuneate.

Distribution. Indonesia: Sulawesi, Gunung Babalombang. Known only from the holotype.

Habitat and phenology. No data available.

Key to species of Begonia sect. Petermannia with palmately compound leaf blades

- 1a. Fruit wings markedly unequal in size; bracts of male flowers 6–8mm long (Irian Jaya) _____ **B. oligandra**
- 1b. Fruit wings almost equal in size; bracts of male flowers less than 5mm long — 2
- 2a. Main leaf lobe 3.5–10.5cm long; fruit wings rounded-truncate at apex (Philippines) _____ **B. polilloensis**
- 2b. Main leaf lobe 1.5–2.3cm long; fruit wings abruptly truncate at apex (Sulawesi) _____ **B. rachmatii**

Begonia brevirimosa Irmsch., Bot. Jahrb. Syst. 50: 358 (1913).

Erect, branched monoecious herb to 2m, lacking a rhizome. *Stem* erect, branching, red or green with red bands above the nodes, internodes 4–12cm long, with sparse to medium covering of glandular hairs with unicellular stalks, sometimes glabrescent. *Stipules* deciduous, yellowish green, oblong-lanceolate, 0.15 – 3.5×0.7 – 1.2 cm. *Leaves* alternate; *petiole* yellowish-green, pink or red, 1–6cm long, joining blade at an oblique angle, sparsely to moderately hairy; *blade* asymmetric elliptic or ovate, 10 – 23×5 – 14.5 cm, upper surface glossy green to glossy bronze-green with glossy purple or pink spots or glossy purple or with pink bands and sometimes a few additional smaller spots between the veins, sparsely hairy between the veins; lower surface burgundy, sparsely hairy throughout, base obliquely cordate, apex gradually acuminate, margin shortly toothed, ciliate, veins palmate-pinnate, slightly sunken above and raised beneath. *Inflorescence* unisexual, protogynous; male flowers in a terminal raceme of several few-flowered cymes; female flowers axillary, paired; *bracts* caducous, reddish, lanceolate-triangular, 0.7 – 2×0.25 – 0.7 cm, apex acute ending in a glandular hair. *Pedicels* reddish-pink, hairy, pedicels of male flowers 4–8mm long, those of female flowers 2–4cm long. *Male flowers*: *tepals* 2, bright pink, central part of outer surfaces with short red hairs, broadly ovate, with convex

bulge around androecium, 1–1.3 × 0.75–1.5cm, apex obtuse, base shortly fused, truncate, margin entire; *stamens* 30–45, symmetric, filaments c.2mm long, free, attached to dome-shaped receptacle, anthers yellow, obovate-oblong, c.1 × 0.5mm, apex shallowly emarginate, connectives not projecting, locules dehiscing via longitudinal slits along inner surfaces of anther, endothecial cells with perforate base plates. *Female flowers*: *bracteoles* absent; *tepals* 5, bright pink, sparsely hairy outside, ovate or elliptic, 7–16 × 4–8mm, apex acute, base wedge-shaped to attenuate, shortly fused, margin with short glandular hairs towards apex; *ovary* red, glabrous or with glandular hairs, 3-locular, ovoid to ellipsoid, 1.3–1.8 × 0.7–0.9cm, with 3 ± equal wings, wings arcuate-deltoid to rounded, 1.8–2.1cm long, exceeding distal end of capsule by 1–2mm and proximal end by 1–3mm, widest part 0.6–1.1cm, *placentae* axile, bifid, bearing numerous ovules on both sides of branches; *styles* 3, shortly united at the base, once-branched, stigmas in a spiral band. *Capsule* becoming scarious, light brown, dehiscing next to the wings. $2n=44$ (Legro & Doorenbos, 1971).

Distribution. Papua New Guinea and New Britain.

Habitat and phenology. No data available.

Key to subspecies of Begonia brevirimosa

- 1a. Leaf blade elliptic, upper surface with glossy purple or pink spots _____
 _____ subsp. **brevirimosa**
- 1b. Leaf blade ovate, upper surface with glossy purple or pink bands and sometimes
 a few additional smaller spots between the veins _____ subsp. **exotica**

Subsp. **exotica** M.C.Tebbitt (sect. *Petermannia*), **subsp. nov.** **Fig. 4A.**

B. brevirimosae Irmsch. subsp. *brevirimosae* affinis sed foliis ovatis et supra roseo fasciatis recedit.

Similar to *B. brevirimosa* Irmsch. subsp. *brevirimosa* but leaves ovate and striped pink above.

Type: Papua New Guinea, Western Highlands, Baiyer River, 3800ft, 26 xi 1954, *Floyd & Womersley* 6845 (holo. A).

Distribution. Papua New Guinea: Western Highland Province, Baiyer River Sanctuary and Wahgi River system.

Additional specimens examined. PAPUA NEW GUINEA. Western Highland Province, “Enga Province”, Paiela Census Division, Lagaip District, Korombi Alt. 1500m, ii 1978, *Reeve* 142 (E, K).

CULTIVATED. Papua New Guinea National Botanic Garden, originally collected in Enga Province, Paiela Census Division, Lagaip District, Korombi Alt. 1500m, ii 1978, *Reeve* 142 (E, K, L); Royal Botanic Garden Edinburgh, 7 ix 1984 originally collected in Enga Province, Paiela Census Division, Lagaip District, Korombi Alt. 1500m, ii 1978, *Reeve* 142 (2 sheets E); New York Botanical Garden (accession no. 177/92B), *Tebbitt* 108 (BKL).

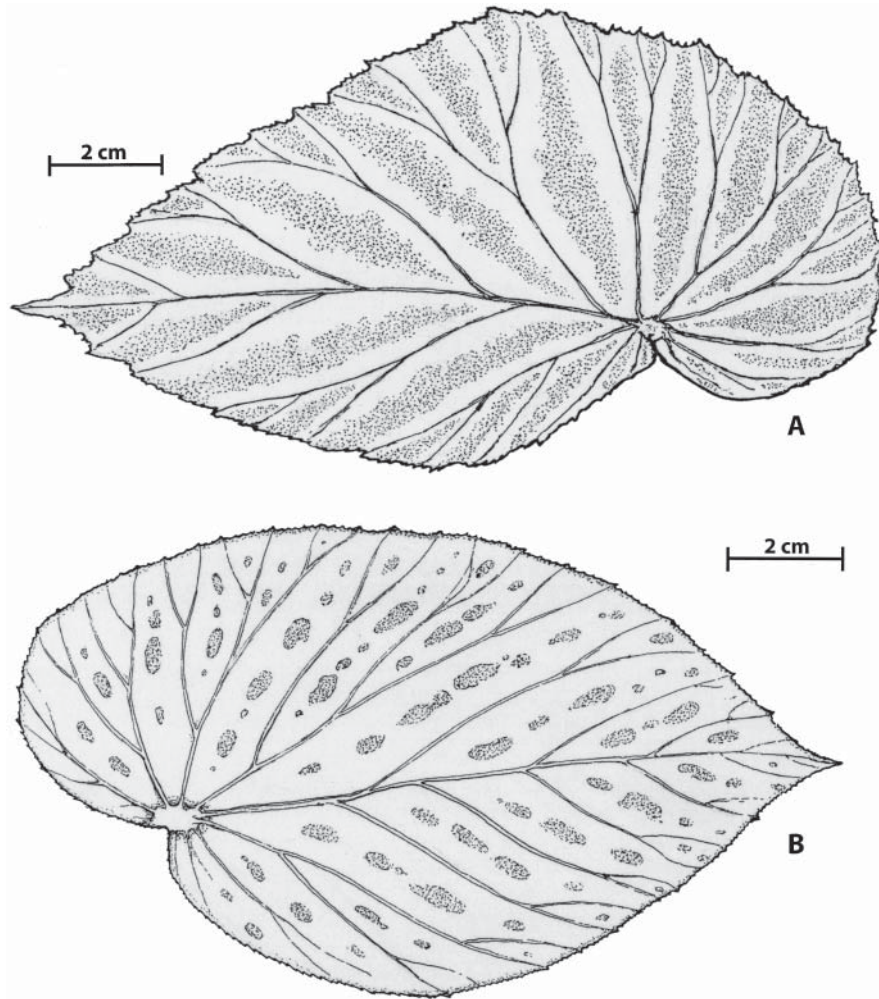


FIG. 4. A, *Begonia brevirimosa* Irmsch. subsp. *exotica* M.C.Tebbit: leaf (upper surface). Drawn by Paul Harwood from the holotype (Floyd & Womersley 6845). B, *Begonia brevirimosa* Irmsch. subsp. *brevirimosa*: leaf (upper surface). Drawn by Paul Harwood from Schlechter 16240.

This new subspecies is currently cultivated under the unpublished name *Begonia exotica*, as well as under the cultivar names *B. brevirimosa* 'Exotica' and *B. brevirimosa* 'Edinburgh'. Alfred B. Graf originally coined the name *B. exotica* in 1960 while he was in Australia. He had collected the plant in New Guinea from the garden of York Meridith. The name first appears in print on page 295 of Graf's 1963 edition of *Exotica* (Graf, 1963). Graf intended the name 'exotica' to be an informal temporary epithet but since it is nowadays widely used for this popular plant I decided to retain it when describing the new subspecies. Cultivated material

of subspecies *exotica* is likely to have been originally distributed by Alfred Graf since on page 157 of the 1981 edition of *Tropica* (Graf, 1981) there is a photograph labelled '*Impatiens hawkeri* brought to Australia from New Guinea 1960' and next to the *Impatiens* is a potted specimen of *B. brevirimosa* subsp. *exotica*. However, I have been unable to find any record of Graf having brought the plant to the Nursery of the Roehrs Company in New Jersey, USA, with which he was associated. Nevertheless, material of subspecies *exotica* does appear to have first entered cultivation in America around the time he returned from Australia. *Begonia brevirimosa* subsp. *exotica* was also collected in the wild by T.M. Reeve (Reeve 142) in 1978 and cultivated at the Royal Botanic Garden Edinburgh. This clone is widely grown today as *B. brevirimosa* 'Edinburgh'.

Begonia brevirimosa subsp. *exotica* differs from the type subspecies (*B. brevirimosa* Irmsch. subsp. *brevirimosa*) in that its leaf blades are ovate with gradually acuminate apices and toothed margins and with glossy purple or pink bands on their upper surfaces, sometimes with additional smaller splotches between the veins. The leaf blades of subspecies *brevirimosa* (Fig. 4B) are elliptic with often abruptly acuminate apices, subentire margins and upper surfaces with purple or pink spots or small blotches between the veins but usually no bands. A specimen of subspecies *brevirimosa* collected on the island of New Britain (White s.n. [N.G.F. no. I0074], A) is somewhat intermediate between the two subspecies since it has spots on its leaf blades that are largely joined into bands. The resulting bands are, nevertheless, different from those of subspecies *exotica* since their margins are much more irregular. The two subspecies also differ in their distribution and altitude preference. *Begonia brevirimosa* subsp. *exotica* occurs in the Central Range of Western Highland Province in the Baiyer River Sanctuary and in the Wahgi River system at an altitude of 1160–1525m, while *B. brevirimosa* subsp. *brevirimosa* occurs along the Torricelli mountain range in both West Sepik and East Sepik Provinces, on the northern fringe of the Central Range in Madang Province, and on the islands of Karkar (Madang Province) and New Britain (West New Britain Province) at an altitude of 15–760m.

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