

# Two new species of *Begonia* (Begoniaceae) from Borneo

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**Summary.** *Begonia mentewangensis* and *B. dolichobracteata* from Borneo, are newly described and illustrated. The habit of *B. mentewangensis* is similar to *B. anthonyi*, while the fruit is similar to that of *B. guttapila*. *B. dolichobracteata*, with imbricate bracts, is allied to *B. imbricata* from Sabah. Distribution maps, line drawings and conservation status are provided for each taxon.

**Key Words.** *Begonia* section *Petermannia*, Central Kalimantan, Conservation, Indonesia, taxonomy.

## Introduction

*Begonia* is one of the largest angiosperm genera, containing around 1500 species which are divided into 63 sections with many more new species waiting to be discovered (Doorenbos *et al.* 1998; Hughes 2008; Kiew 2005). *Begonia* section *Petermannia* (Klotzsch) A. DC. is the biggest section in Southeast Asia with 247 species, with 190 of these being found in Indonesia, with most occurring in Borneo. Recent studies of *Begonia* in Borneo show that 105 indigenous species of *Begonia* section *Petermannia* have been reported from the island (Kiew & Julia 2007; Hughes 2008; Kiew & Julia 2009; Julia *et al.* 2013).

*Begonia* sect. *Petermannia* is characterised by a terrestrial, perennial, cane-like erect habit (rarely rhizomatous), woody at base, the plants sometimes suffrutescent; the inflorescences are usually terminal, sometimes axillary, with male flowers distal, female flowers basal, often in pairs, protogynous; placentas with 2 branches; capsule pendulous (rarely erect), 3-locular (Doorenbos *et al.* 1998; Kiew 2005).

During field work carried out in Central Kalimantan, Indonesia in 2011 – 2012, a number of collections of *Begonia* were made. Among these collections, two new species in section *Petermannia* were recognised and are described here. Examinations of herbarium specimens from BO, E, K, SING and available digital images were carried out to confirm the novelty of the species. The preliminary conservation status of each species was assessed following the guidelines and criteria published by the IUCN (2001).

## Taxonomy

***Begonia mentewangensis* Girm. sp. nov.** Sect. *Petermannia*. Type: Indonesia, Central Kalimantan, PT Sari Bumi Kusuma (SBK) Katingan-Seruyan logging concession area, Mentewang hill entered from Km 87 Forest logged in 2000, S00°57'32.5" – 31.5", E112°21'32.2" – 28.8", c. 283 m alt., 16 Nov. 2011, Deden 1548 (holotype BO!, isotype BO!).

<http://www.ipni.org/urn:lsid:ipni.org:names:77146174-1>

Erect, hairy *herb*, up to 60 cm tall. *Stem* woody at base and fleshy near the apex, swollen at nodes, rooting at the nodes, internodes 2 – 7.5 cm apart, shorter nearer the apex, with dense long hairs near to the apex of the stem, becoming glabrous with age near the base, reddish brown. *Stipules* widely to narrowly triangular, with scattered hairs along the dorsal midvein, with a hair-like appendage at the apex, 0.9 – 1 × 0.4 – 0.5 cm, caducous. *Leaves* alternate; petioles 0.7 – 1 cm long, sparsely to densely hairy; lamina 15 – 17 × 5 – 10 cm, slightly asymmetric, elliptic-oblong, base unequal, cuneate at one side and rounded the other side, one side extending 4 – 5 mm further down the petiole than the other, broad side 3 – 4.5 cm wide, narrow side 2.5 – 4 cm wide, apex acute to acuminate, margin biserrate with minute hairs at the end of each tooth, upper surface dark green with scattered short hairs on the main vein and between the vein, underside pale green with scattered reddish hairs along the veins, venation pinnate, 8 – 9 pairs, two pairs nearest the base arising opposite, remaining pairs alternate. *Inflorescence* racemes, peduncle 2 – 4 cm long, male

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and female flower on the same inflorescences, male flower distal with many flowers and female flowers basal in pairs. *Male flowers*: pedicels 0.4 – 1 cm long, hairy; tepals 2, white with scattered short red hairs on dorsal side, 0.4 – 0.5 × 0.5 – 0.6 cm, rounded to obovate; androecium 0.2 – 0.25 cm diam., cluster globose, stamens c. 20, filaments c. 1 mm long, fused at the base, anthers c. 2 mm long, oblong, dehiscing through unilateral slits c. ½ as long as anther. *Female flowers*: pedicels c. 0.3 cm long; tepals 5, unequal, biggest 0.5 × 0.9 cm, smallest 0.3 × 0.6 cm; ovary capsule c. 0.6 – 0.7 × 1 cm, ovoid, locules 3, placentation axile, placentae 2 per locule; wings 3, equal, rounded at the apex, 2 mm wide, stigmas 3, style Y-shaped, 2.5 mm long. *Fruit*: pedicel red hairs, 0.6 – 0.8 cm long; fleshy-walled capsule, ovoid, covered in fleshy bristles, 1 – 1.2 × 0.5 – 0.7 cm, with 3 equal wings, wings 3 mm wide at the widest point, thick fibrous, 2.5 – 4 mm wide, splitting between the locules and wings. *Seed* ovoid, 0.32 – 0.34 mm long, collar cells more than half of the seed length. Figs 1, 2.

**RECOGNITION.** Related to *Begonia antonyi* Kiew, differing in the leaf shape (elliptic to oblong, not slightly falcate); number of veins 8 – 9 pairs (vs veins 6 – 7 pairs in *B. antonyi*); the fruit (ovoid and covered in fleshy bristles, not broadly deltoid and glabrous). The bristly fruit resembles that of *B. guttapila* D. C. Thomas & Ardi, covered by bristles but is on a longer pedicel (0.6 – 0.8 cm vs 0.1 – 0.2 cm in *B. guttapila*); and the widest point of the wing is 2.5 – 4 mm (vs 6 – 9 mm).

**DISTRIBUTION.** Only known from two locations in Borneo, km 87 in Mentewang Hill and km 67 in PUP5 **SPECIMENS EXAMINED.** **CENTRAL KALIMANTAN.** Mentewang hill, entered from Km 87, 16 Nov. 2011, Deden 1548 (BO); Central Kalimantan, Permanent Measurement Plot 5 of Selective logging with line planting (PUP5/TPTJ) inside Katingan block of Sari Bumi Kusuma (SBK) Concession area, entered from Km 67, 1 Oct. 2012, Deden 1786 (BO).

**HABITAT.** Terrestrial or sometimes lithophytic herb on thick humus on rock surfaces in mixed lowland and hill Dipterocarp forest, frequently along the stream margin in wet and damp places, alt. 300 m.

**CONSERVATION STATUS.** *Begonia mentewangensis* is known from two localities about 20 km apart. It is likely to be found in other similar habitat in Borneo and more extensive collections from the region are needed to confirm its distribution. Further explorations are necessary to ascertain the status of the species. A preliminary conservation status of Data Deficient (DD) seems appropriate (IUCN 2001).

**ETYMOLOGY.** The species is named after the type locality Mentewang hill in West Kalimantan.

**NOTES.** *Begonia mentewangensis* a very distinctive species in section *Petermannia* with short hairy petioles,

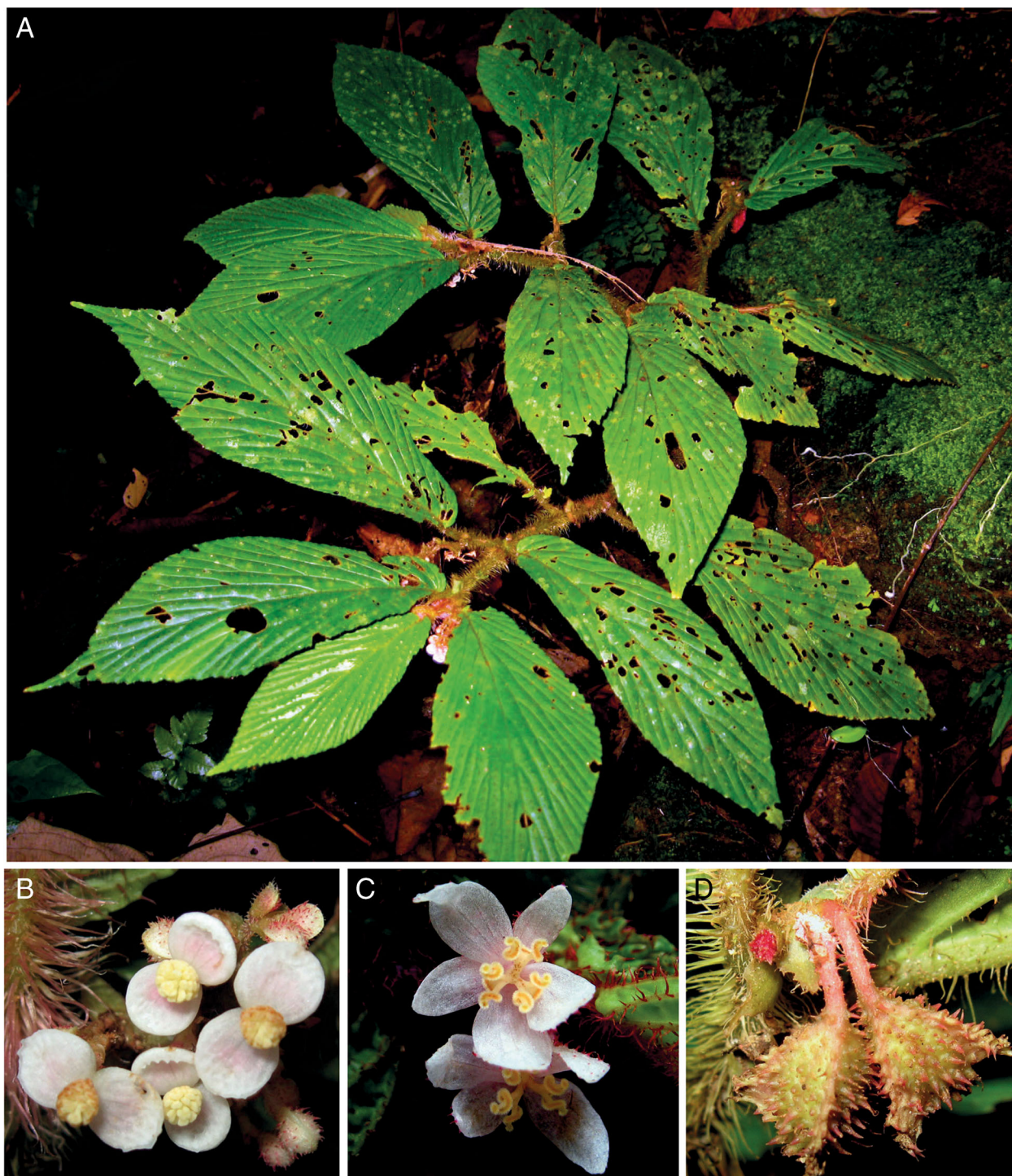
lamina with slightly asymmetric leaves and a fleshy-walled capsule. The upper surface of the leaves is dark green with scattered short hairs on the main vein and between the veins, and the undersurface pale green with scattered reddish hairs along the veins.

***Begonia dolichobracteata* Girm. sp. nov.** Sect. *Petermannia*. Type: Central Kalimantan, Km 87, Bukit Mentewang, PT Sari Bumi Kusuma (SBK) Katingan-Seruyan logging concession area, 1 July 2012, Deden 1744 (holotype BO!, isotype BO!).

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Erect *herb*, up to 50 cm tall. *Stem* woody at base and fleshy through the apex, swollen at nodes, rooting at the nodes, internodes 1 – 10 cm apart, shorter nearer the apex, with dense hairs near to the apex of the stem, becoming glabrous with age near the base, reddish brown. *Stipules* oval, with hairs at the dorsal side, with a hair-like appendage at the apex, 1 – 1.5 × 0.5 – 0.8 cm, caducous. *Leaves* alternate, slightly oblique; petioles 0.4 – 0.5 cm long, sparsely hairy; lamina 10 – 17 × 5 – 10 cm, asymmetric, ovate-oblong, base unequal, cuneate at one side and rounded the other side, one side extending 5 – 6 mm further down the petiole than the other, broad side 3 – 6.5 cm wide, narrow side 2 – 3.5 cm wide, apex acute to acuminate, margin sinuate to dentate with minute hairs at the end of each tooth, upper surface dark green with scattered short hairs on the main vein and between the veins, underside reddish green to light red with scattered reddish hairs along the veins, venation pinnate, 3 – 4 pairs, two pairs nearest the base arising opposite, remaining pairs alternate. *Inflorescence* protogynous, cymose, peduncle 2 – 5 cm long, male and female flower on the same inflorescences. Bracts white to pink, persistent, elliptic, margin with glandular hairs, apex rounded, those associated with male and female flowers are rounded, imbricate, emarginated. One or pair of female flowers basal and many male flowers distal. *Male flowers* pedicels 0.5 cm long, pure white, glabrous; tepals 4, white with reddish along the margin, larger tepals 1 × 1 cm, rounded to obovate; smaller tepals 0.3 × 0.7 cm, androecium 3 mm diam., cluster globose, stamens c. 60, filaments c. 0.5 – 1 mm long, fused at the base, anthers c. 1 mm long, oblong, dehiscing through unilateral slits c. ½ as long as anther. *Female flowers* pedicels 0.5 – 1 cm long; tepals 6, three large tepals, 0.6 – 0.8 × 0.7 – 0.9 cm, three small tepals, 0.2 – 0.3 × 0.5 cm; ovary capsule, white with reddish to light reddish along the middle, 0.7 – 0.8 × 0.3 – 0.4 cm without wings, ovoid, locules 3, placentation axile, placentae bifid; wings 3, equal, rounded at the apex, 2 – 11 mm wide, stigmas 3, style Y-shaped, 2.5 – 3 mm long. *Fruit* pedicel pale green to



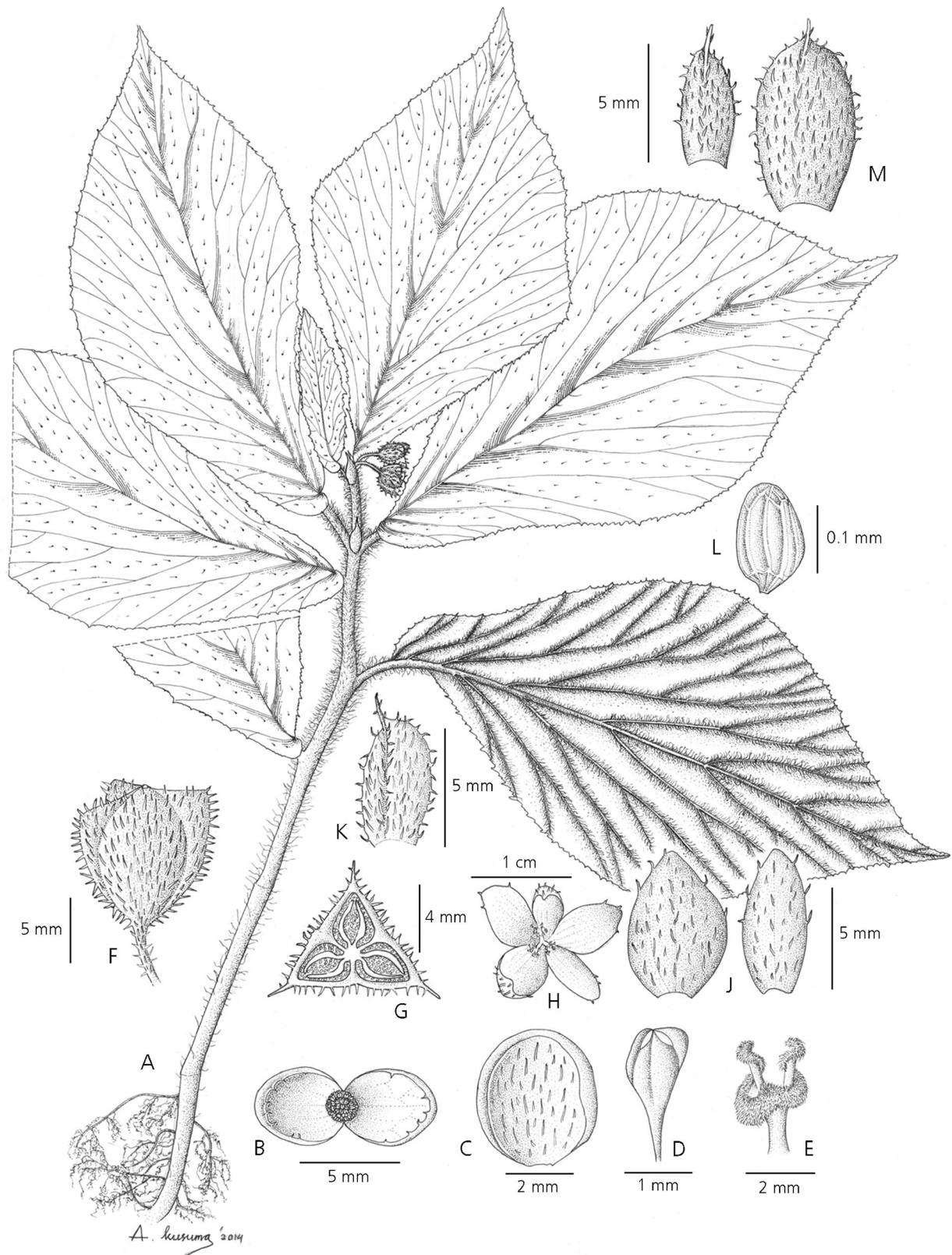


**Fig 1.** *Begonia mentewangensis*. A habit; B male flower; C female flower; D fruit. PHOTOS: DEDED GIRMANSYAH.

red with short hairs, 0.8 – 1.2 cm long; capsule ovoid, plain with scattered hairs along the capsule, 1.2 – 2.3 × 0.2 – 0.4 cm without wing, wing 3 subequal, 4 – 11 mm wide at the widest point, splitting between the locules and wings. *Seed* ellipsoid, 0.34 – 0.36 mm long, collar cells more than a half of the seed length. Figs 3, 4.

**RECOGNITION.** Related to *Begonia imbricata* Sands, differing in having white to reddish white bracts (vs pale green to yellowish green in *B. imbricata*); number of female tepals six (vs five), stipules widely to narrowly triangular shaped (vs broadly ovate to ovate-oblong), stipule size 1 – 1.5 × 0.5 – 0.8 cm (vs 1.9 – 3 × 1.2 – 1.6





**Fig. 2.** *Begonia mentewangensis*. A habit; B open male flower; C male flower tepal with hairs on dorsal side; D stamen; E pistil; F fruit; G fruit in cross section; H female flower; J female flower tepals; K stipule; L seed; M bract and bracteole. DRAWN BY ANE KUSUMAWATI.





**Fig. 3.** *Begonia dolichobracteata*. A habit; B male flower; C female flower; D fruit. PHOTOS: DEDEN GIRMANSYAH.

cm) and single female flower (vs two per axil or in pairs).

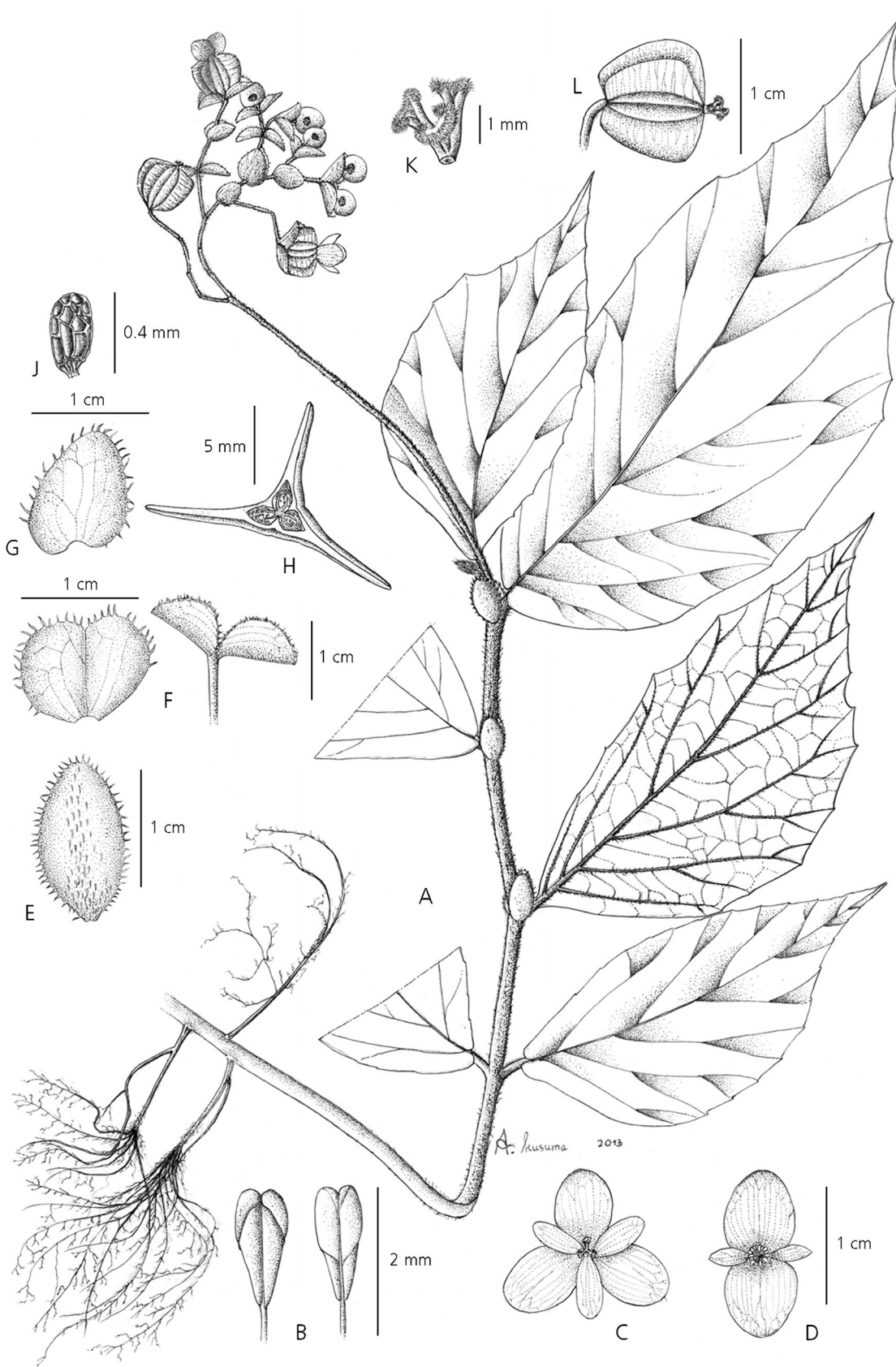
**DISTRIBUTION.** Known from the type locality, PT Sari Bumi Kusuma Forest Concession area, Katingan Block, Central Kalimantan, Borneo, Indonesia. This species has a wider distribution compared to *Begonia mentewangensis*. As for the previous species, *B. dolichobracteata* can be found in wet areas near rivers, but also on forest floor with thick litter.

**SPECIMENS EXAMINED.** BORNEO, Flora Fauna Protected Area (KPFF) km 84 PT. Sari Bumi Kusuma

concession, 23 Jan. 2011, *Koizumi* 2806 (BO); Borneo, Km 39 PT. Sari Bumi Kusuma concession on the border with Bukit Baka Bukit Raya National Parks, 1 July 2012, *Deden* 1744 (BO); Borneo, Permanent Measurement Plot 3 (PUP 3/TPTJ) km 85 PT. Sari Bumi Kusuma Concession, 30 Sept. 2012, *Deden* 1776 (BO).

**HABITAT.** Terrestrial herb, grows in substrate with thick litter, quite open areas up to closed canopy, along the trail and slope of the hill in tropical forest lower than 500 m asl.





**Fig. 4.** *Begonia dolichobracteata*. A habit; B stamens; C female flower; D male flower; E stipule; F bract; G bracteole; H fruit in cross section; J seed; K pistil; L fruit. DRAWN BY ANE KUSUMAWATI.

**CONSERVATION STATUS.** According to IUCN Red List criteria (IUCN 2001), the conservation status of *Begonia dolichobracteata* must be considered Data Deficient (DD) because it is known only from three collections. More extensive collections from the region are needed to confirm its distribution. Further explorations are necessary to ascertain the status of the species.

**ETYMOLOGY.** The epithet is derived from the long bract that gives the inflorescence its beautiful appearance.

**NOTES.** *Begonia dolichobracteata* is a distinctive species in its persistent bracts that are relatively large and white to reddish in colour, and the 3 narrow tepals alternating with 3 broad tepals on the female flower are also unusual within section *Petermannia*. This species is similar to *B. imbricata* from Sabah, but distinguished by having white bracts, six white female tepals, white to green ovary with a red line along the middle, and capsule ovoid, plain with scattered hairs along the capsule. Their habitats are also different; *B. imbricata* grows on river sides or banks at high altitude (1000 – 1100 m) whilst *B. dolichobracteata* is found on dryer soils on hill slopes lower than 500 m asl.

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