

## TWO NEW SPECIES OF *BEGONIA* FROM SUMATRA

W. H. ARDI<sup>1</sup> & M. HUGHES<sup>2</sup>

Two new species of *Begonia* sect. *Bracteibegonia*, *B. curvifolia* Ardi and *B. ocellata* Ardi, are described from West Sumatra, Indonesia. The species are endemic to Sumatra and belong to the IUCN category Data Deficient. A modified identification key to all 11 species of *Begonia* sect. *Bracteibegonia* in Sumatra is provided.

*Keywords.* *Begonia*, *Bracteibegonia*, new species, Sumatra.

### INTRODUCTION

Sumatra is one of the *Begonia* diversity hotspots in Indonesia; currently, there are 63 accepted species known from the island, with most of them being endemic (Hughes *et al.*, 2015, 2015–). *Bracteibegonia* is a small section of the genus which is distributed in Sumatra and Java, with Sumatra as its centre of diversity. Currently, there are 12 species known in this section, with only one species (*Begonia lepida* Blume) in Java; the other 11 are endemic to Sumatra (this study; Hughes *et al.*, 2009; Girmansyah, 2012; Hughes *et al.*, 2015; see Appendix). The section was proposed by Candolle (1859) to accommodate two related species, *Begonia bracteata* Jack and *B. lepida*, which are allied to those in *Begonia* sect. *Petermannia* (Klotzch) A.DC. but consistently different in several characters. The section is characterised by few-flowered and bisexual inflorescences with no separation between the basal female and the distal male portion, as commonly found in *Begonia* sect. *Petermannia*, and persistent bracts (Doorenbos *et al.*, 1998).

This paper describes two new species from Sumatra in *Begonia* sect. *Bracteibegonia*: *B. curvifolia* Ardi and *B. ocellata* Ardi. All available *Begonia* material in ANDA, B, BO, E, K, L and SING has been consulted, and therefore it must be assumed, at least until more intensive collecting reveals otherwise, that these species have restricted distributions and are endemic to West Sumatra.

*Key to Begonia sect. Bracteibegonia in Sumatra (Hughes et al., 2015–)*

- 1a. Stipules broadly ovate, leaf-like, staying green near the apex of the plant \_\_\_\_ 2
- 1b. Stipules lanceolate, not leaf-like, rapidly drying to become papery \_\_\_\_\_ 3

<sup>1</sup> Center for Plant Conservation Botanic Gardens – LIPI, Jalan Ir. H. Juanda 13, Bogor 16003, Indonesia.

E-mail: [wisn001@lipi.go.id](mailto:wisn001@lipi.go.id)

<sup>2</sup> Royal Botanic Garden Edinburgh, 20A Inverleith Row, Edinburgh EH3 5LR, Scotland, UK.

- 2a. Leaves sinuate; male flower tepals ovate \_\_\_\_\_ *B. aberrans*  
 2b. Leaves sinuate-dentate; male flower tepals orbicular \_\_\_\_\_ *B. horsfieldii*  
 3a. Leaves dentate-denticulate or serrulate, margin hairy \_\_\_\_\_ 4  
 3b. Leaves entire to sinuate-dentate or crenate, margin glabrous \_\_\_\_\_ 6  
 4a. Leaves with dense soft white hairs above \_\_\_\_\_ *B. bracteata*  
 4b. Leaves with evenly spaced bristles above between the veins \_\_\_\_\_ 5  
 5a. Leaves elliptic to rhomboid, 2.5–5.5 × 1.2–2.5 cm; androecium symmetrically clustered, c.25 stamens \_\_\_\_\_ *B. jackiana*  
 5b. Leaves suborbicular 6–9 × 2–4.5 cm; androecium asymmetrically clustered, c.18 stamens \_\_\_\_\_ **B. ocellata**  
 6a. Plants less than 20 cm tall, becoming repent and rooting at the lower nodes, often with fewer than 5 leaves \_\_\_\_\_ 7  
 6b. Plants taller than 20 cm, not repent, usually with more than 5 leaves \_\_\_\_\_ 10  
 7a. Inflorescence protandrous \_\_\_\_\_ 8  
 7b. Inflorescences protogynous \_\_\_\_\_ 9  
 8a. Male flowers with 2 tepals; fruits deflexed, wings rounded at base and at apex \_\_\_\_\_ *B. behudruvenea*  
 8b. Male flowers with 4 tepals; fruits slightly deflexed, wings subcuneate at base and subtruncate at apex \_\_\_\_\_ **B. curvifolia**  
 9a. Inflorescences in short and compact cymes; male flowers with 4 tepals; fruits strongly deflexed, wings rounded at base and cuneate at apex \_\_\_\_\_ *B. verecunda*  
 9b. Inflorescences lax cymes; male flowers with 3 tepals; fruits not deflexed, wings cuneate at base and subtruncate at apex \_\_\_\_\_ *B. triginticolium*  
 10a. Leaf lamina ovate-lanceolate, base subcordate; male flowers with 4 tepals; fruit cuneate at base \_\_\_\_\_ *B. lepidella*  
 10b. Leaf lamina elongate-lanceolate, base narrowly cuneate; male flowers with 2 tepals; fruit rounded at base \_\_\_\_\_ *B. flexula*

#### SPECIES DESCRIPTIONS

***Begonia curvifolia* Ardi sp. nov.** § *Bracteibegonia* – Type: Cultivated from material collected in the wild (Indonesia, West Sumatra, Tanah Datar, Lintau Buo) *Wisnu H. Ardi* WI 190 (holo BO, iso SING).

Closest to *Begonia verecunda* M. Hughes from Gunung Leuser National Park, similar in its small stature, leaf shape and male flowers with four tepals, but differs in having a laterally curved midrib (not straight), fruits slightly recurved (not strongly recurved), wings subcuneate at the base and subtruncate at the apex (not rounded at the base and the apex), and entire ovary placentae (not bilamellate). **Fig. 1.**

Perennial, monoecious herb, lower part of the stems prostrate and creeping, rooting at the nodes when in contact with the substrate, erect part to c.13 cm tall, with



FIG. 1. *Begonia curvifolia* Ardi. A, Habit (scale bar, 5 cm); B, male flowers (scale bar, 1 cm); C, female flowers (scale bar, 1 cm); D, ovary with tepals (scale bar, 1 cm). (Photograph: Wisnu Ardi.)

a dense indumentum of multicellular, red bristles. *Stem* few-branched; internodes 1.5–3 cm long, to c.6 mm in diameter, terete, greenish at the base and reddish at the apex. *Leaves* alternate; *stipules* persistent, 4–7 × 1.5–3 mm, triangular-ovate, prominent and hairy, apex filiform, margin ciliate, concolorous with the stem, semitranslucent at the margins; *petioles* c.0.5–4 cm long, shorter towards the apex, with

dense indumentum of red bristles; *lamina* basifixed, 8–11.5 × 3.5–5 cm, asymmetrical, curved laterally along the midrib, narrowly obovate, base cordate and lobes slightly overlapping, apex acute, margin crenate-dentate, adaxially mid-green, sometimes with a blue iridescence, glabrous or with sparse, evenly spaced, red bristles, prominent between the veins, abaxially maroon red with hairs on veins, primary veins 7 or 8, actinodromous, secondary veins craspedodromous. *Inflorescences* protandrous; bisexual, a single monochasium or sometimes dichasially branched with a central flower and two monochasia, each with 3 or 4 male flowers and a single female flower at end of each monochasium, peduncle c.4–6 cm long, pinkish to reddish, hairy, bracts triangular c.1.5–2 mm long, red, margin serrulate. *Male flowers*: pedicels 10–20 mm long, hairy, pink; tepals 4, two outer elliptic, 9–11 × 6–8 mm, margin serrulate, apex rounded, pinkish, abaxially sparsely hairy, two inner tepals narrowly elliptic, c.9–12 × 3–4 mm; androecium of 26–31 stamens, asymmetrically clustered like a bunch of bananas, yellow, filaments c.1.5 mm long, anthers c.1 mm long, oblong, dehiscing through unilaterally positioned slits about half as long as anthers, apex retuse. *Female flowers*: pedicels c.5–10 mm long, hairy, pink; tepals 5, white to pale pink, unequal, the four larger 6–8 × 3–4 mm, elliptic to asymmetrically elliptic, sparsely hairy on abaxial surface, margin serrulate, apex acute, the smallest one 2–3 × 6–8 mm, elliptic; *ovary* cylindrical, c.5–10 × 3 mm (excluding wings), widest point subapically c.3 mm, white, pinkish, glabrescent, locules 3, placentation axile, placentae entire, wings 3, equal, white tinged with pink, base subcuneate, margin ciliate, apex subtruncate, style basally fused, 3-branched, each stylodium bifurcate in stigmatic region, stigmatic surface a spirally twisted papillose band, c.2.5–3.5 mm long, orange. *Fruits* with semipersistent tepals, slightly recurved on a stiff pedicel, c.10 mm long, wings as in ovary. *Seeds* barrel-shaped, c.0.4 mm, collar cells about a quarter the length of seed.

*Distribution and habitat.* Endemic to West Sumatra. Known from Lintau Buo (the type locality), where it grows on shaded clay soil banks over limestone base rock at 300–400 m altitude, and also from Batang Pangean Nature Reserve, Sijunjung (from a cultivated collection with no voucher).

*Etymology.* The specific epithet is derived from the Latin *curvi-* (curved) and *folia* (leaves), after the curved shape of the leaves.

*Conservation status.* *Begonia curvifolia* is currently known from two localities in West Sumatra, Lintau Buo and Sijunjung, which are separated by c.45 km, and is an obviously rare and local endemic species. We have no information on the population sizes at these localities, or on the status of the Lintau Buo site apart from the fact that it is not protected. We consider *Begonia curvifolia* to belong to the IUCN category Data Deficient.

This species mostly resembles *Begonia verecunda*, but it can be easily distinguished by several key characters (see Table 1). Entire placentae are found in only 4 of the 12 species of *Begonia* sect. *Bracteibegonia*: *B. beludruvenea* M.Hughes (Hughes *et al.*, 2015), *B. triginticolium* Girm. (Girmansyah, 2012), and *B. curvifolia* and *B. ocellata*,

TABLE 1. Comparison of *Begonia curvifolia*, *Begonia beludruvenea* and *Begonia verecunda*

Character	<i>Begonia curvifolia</i>	<i>Begonia beludruvenea</i>	<i>Begonia verecunda</i>
Lamina			
Midrib	Curved laterally	Straight	Straight
Colour	Mid-green	Dark green	Dark green
Margin	Crenate-dentate	Dentate-crenate	Entire to minutely denticulate
Inflorescences			
Peduncle length	4–6 cm	1.5–2.5 cm	c.3.5 cm
Flowers per peduncle	3–7 male, 1 or 2 female	2–4 male, 1 or 2 female	2–4 male, 1 or 2 female
Male flowers			
Tepals	4	2	4
Outer tepal shape	Elliptic	Suborbicular	Suborbicular
Female flowers			
Placentae	Entire	Entire	Bilamellate
Fruits	Slightly recurved	Recurved	Strongly recurved

which are described here. A comparison of the salient features of *Begonia curvifolia* with allied species is shown in Table 1.

***Begonia ocellata* Ardi sp. nov.** § *Bracteibegonia* – Type: Cultivated from material collected in the wild (Indonesia, West Sumatra.) Wisnu H. Ardi WI 191 (holo BO). *Begonia ocellata* is distinct among Sumatran members of *Begonia* sect. *Bracteibegonia* in its suborbicular leaves. Fig. 2.

Perennial, monoecious herb, stems initially semi-erect, to 9 cm, but prostrate and creeping in older plants, rooting at nodes when in contact with substrate, to c.15 cm, with a dense indumentum of multicellular, red bristles. *Stem* branched; internodes 1.5–3 cm long, to c.6 mm in diameter, terete, reddish. *Leaves* alternate; *stipules*, persistent, 6–12 × 4.5–7 mm, triangular, ovate, slightly anisophyllous, midrib slightly prominent and sparsely hairy, apex shortly filiform, margin ciliate, concolorous with the stem; *petioles* c.2–4 cm long, shorter towards apex, with a dense indumentum of red bristles; *lamina* basifixed, 3.5–6.5 × 4–7 cm, asymmetrical, suborbicular, base cordate and lobes overlapping, apex rounded, margin undulate-serrulate with teeth pointed, adaxially brownish green, slightly iridescent, sometimes with pink spots between veins and a pink band along margin, red bristles between veins, abaxially maroon-red with hairs on veins, primary veins 6 or 7, actinodromous, secondary veins craspedodromous. *Inflorescences* protandrous; bisexual, a single compressed monochasium with 3 or 4 male flowers and a single female flower at end of monochasium, peduncle c.4–4.5 cm long, pinkish, densely hairy, bracts ovate c.1.5–2 × 4.5 mm long, red, margin serrulate. *Male flowers*: pedicels 2–3 cm long, hairy, white; tepals 4, two outer elliptic, 9 × 5–

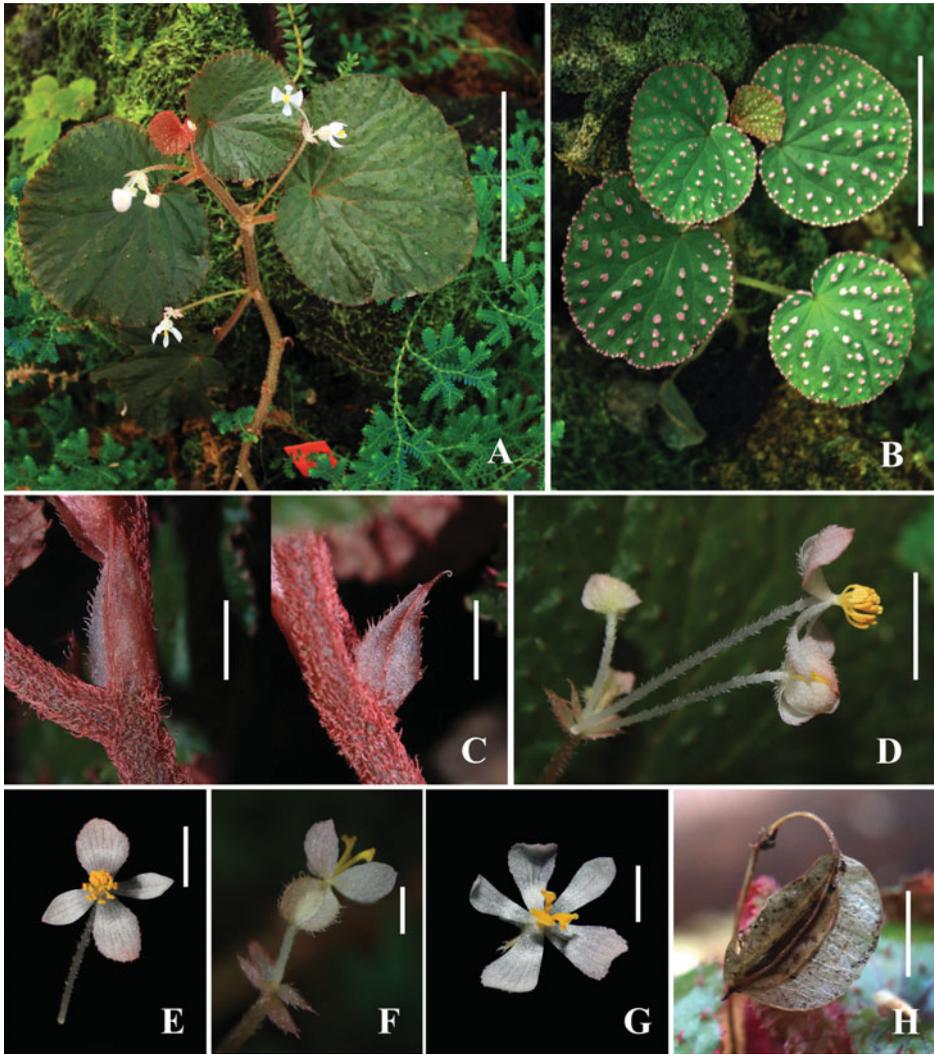


FIG. 2. *Begonia ocellata* Ardi. A, B, Habit (scale bar, 5 cm); C, stipule (scale bar, 5 mm); D, male inflorescence (scale bar, 1 cm); E, male flower (scale bar, 1 cm); F, female flower, side view showing ovary (scale bar, 0.5 cm); G, female flower (scale bar, 0.5 cm); H, mature fruit (scale bar, 0.5 cm). (Photograph: Wisnu Ardi.)

5.5 mm, margin serrulate, apex rounded, white tinged pink or red, abaxially hairy, two inner tepals narrowly elliptic, c.  $9 \times 3$ –3.5 mm, margin entire, apex acute; androecium of c.18 stamens, asymmetrically clustered like a bunch of bananas, yellow, filaments c.1.5 mm long, anthers c.1–1.5 mm long, oblong, dehiscing through unilaterally positioned slits about half as long as anthers, apex retuse. *Female flowers*: pedicels c.4 mm long, hairy, white; *tepals* 5, white tinged pink, unequal, the three larger obovate

8–9 × 3.5–4.5 mm, sparsely hairy on abaxial surface, margin serrulate from middle part up to apex and entire from middle part down to base, apex emarginate, the two smaller elliptic c.8 × 2.5 mm, abaxially glabrescent; *ovary* cylindrical, c.5 × 1.5 mm (excluding wings), white, tinged pink, glabrescent, locules 3, placentation axile, placentae entire, wings 3, equal, white tinged with pink, base rounded, margin ciliate, apex subtruncate, widest point subapically c.2 mm long, style basally fused, 3-branched, each stylodium bifurcate in stigmatic region, stigmatic surface a spirally twisted papillose band, c.4.5–5 mm long, orange. *Fruits* with semipersistent tepals, deflexed on stiff pedicels, c.8 mm long, ovary cylindrical c.10 × 3.5–4 mm, wings equal, with rounded base and apex, widest point at middle, to 3 mm. *Seeds* unknown.

*Distribution and habitat.* Endemic to West Sumatra, exact locality unknown.

*Etymology.* The specific epithet of *ocellata* (Latin) refers to the orbicular, spotted leaves, which resemble the ocellate river stingray (*Potamotrygon motoro*).

*Conservation status.* We lack information on the type locality, therefore we consider *Begonia ocellata* to belong to the IUCN category Data Deficient.

*Begonia ocellata* has been propagated for sale among *Begonia* collectors in Indonesia and neighbouring countries; it is a rather attractive species in cultivation. *Begonia ocellata* is one of the most distinct species in *Begonia* sect. *Bracteibegonia*, with its colourful suborbicular leaves decorated with pink spots between the veins and a pink band running along the margin, and the showy white tinged pink or red flowers immediately make it a very striking species.

#### ACKNOWLEDGEMENTS

The authors would like to express gratitude to the curators of A, ANDA, B, BM, BO, CEB, E, K, L and SING for allowing access to herbarium material, and to Mr Alfaret Dongoran, Mr Siaw Yu Zhang and Mr Zulherman for their kindness in donating invaluable specimens. The Royal Botanic Garden Edinburgh is supported by the Scottish Government's Rural and Environment Science and Analytical Services Division.

#### REFERENCES

- CANDOLLE, A. L. P. P. DE (1859). Mémoire sur la famille des Bégoniacées. In: *Ann. Sci. Nat., Bot., Sér.* 4, 11: 93–149.
- DOORENBOS, J., SOSEF, M. S. M. & WILDE, J. J. F. E. DE (1998). *Studies in Begoniaceae VI. The sections of Begonia including descriptions, keys and species lists.* Wageningen Agric. Univ. Pap. 98-2: 1–266.
- GIRMANSYAH, D. (2012). Two new species of *Begonia* (Begoniaceae) from Bukit Tigapuluh National Park, Riau, Sumatra. *Reinwardtia* 13(3): 229–233.
- HUGHES, M., GIRMANSYAH, D., ARDI, W. H. & NURAINAS, (2009). Seven new species of *Begonia* from Sumatra. *Gard. Bull. Singapore* 61(1): 29–44.

- HUGHES, M., GIRMANSYAH, D. & ARDI, W. H. (2015). Further discoveries in the ever-expanding genus *Begonia* (Begoniaceae): fifteen new species from Sumatra. *Eur. J. Taxon.* 167: 1–40.
- HUGHES, M., MOONLIGHT, P. W., JARA, A., TEBBITT, M. C., WILSON, H. & PULLAN, M. (2015–). *Begonia Resource Centre*. Online database. Available: <http://padme.rbge.org.uk/begonia>

*Received 18 January 2018; accepted for publication 18 April 2018;  
first published online 29 May 2018*

#### APPENDIX

##### *Species of Begonia sect. Bracteibegonia in Sumatra*

- Begonia aberrans* Irmsch.  
*Begonia beludruvenea* M.Hughes  
*Begonia bracteata* Jack  
***Begonia curvifolia*** Ardi  
*Begonia flexula* Ridl.  
*Begonia horsfieldii* Miq. ex A.DC.  
*Begonia jackiana* M.Hughes  
*Begonia lepidella* Ridl.  
***Begonia ocellata*** Ardi  
*Begonia triginticolium* Girm.  
*Begonia verecunda* M.Hughes