# *Begonia droopiae* Ardi (Begoniaceae), a New Species of *Begonia* from West Sumatra

W. H. ARDI [1] AND M. HUGHES [2]

[1] Bogor Botanic Garden
Jl. Ir. H. Juanda No. 13, P.O. Box 309, Bogor, Indonesia
[2] Royal Botanic Garden Edinburgh
20A Inverleith Row, Edinburgh EH3 5LR, U.K.
E-mail: m.hughes@rbge.ac.uk
Author for correspondence: wisn001@lipi.go.id

## Abstract

A new species of *Begonia* (Begoniaceae), *B. droopiae* Ardi, is described from the Indonesian island of Sumatra. It belongs to *Begonia* sect. *Reichenheimia* and is a limestone endemic in the Sawah Lunto District. Its IUCN threatened category is considered to be 'Vulnerable'.

## Introduction

During an expedition to West Sumatra in August 2009 organised by The Royal Botanic Garden Edinburgh, Kebun Raya Bogor and Andalas University Herbarium (ANDA), a new species of *Begonia, B. droopiae* Ardi, was collected from a limestone cave in the Batang Pangean I Nature Reserve, Sawah Lunto District, West Sumatra Province. *Begonia droopiae* is placed in *Begonia* sect. *Reichenheimia* because it exhibits the typical characters of the section: rhizomatous habit, protandrous inflorescences and three locular fruit with entire placentae.

This species-rich genus was previously represented by 52 species in Sumatra (Hughes, 2008; Hughes *et al*. 2009), although it is obvious from herbarium collections that many more remain to be described from the island. *Begonia* sect. *Reichenheimia* is the second-most species rich section of the genus in Sumatra, with 11 species. All available herbarium specimens in ANDA, BO, E and SING have been consulted, and hence it must be assumed, at least until more intensive collecting in West Sumatra may reveal otherwise, that this species has a very restricted range (Fig.1).

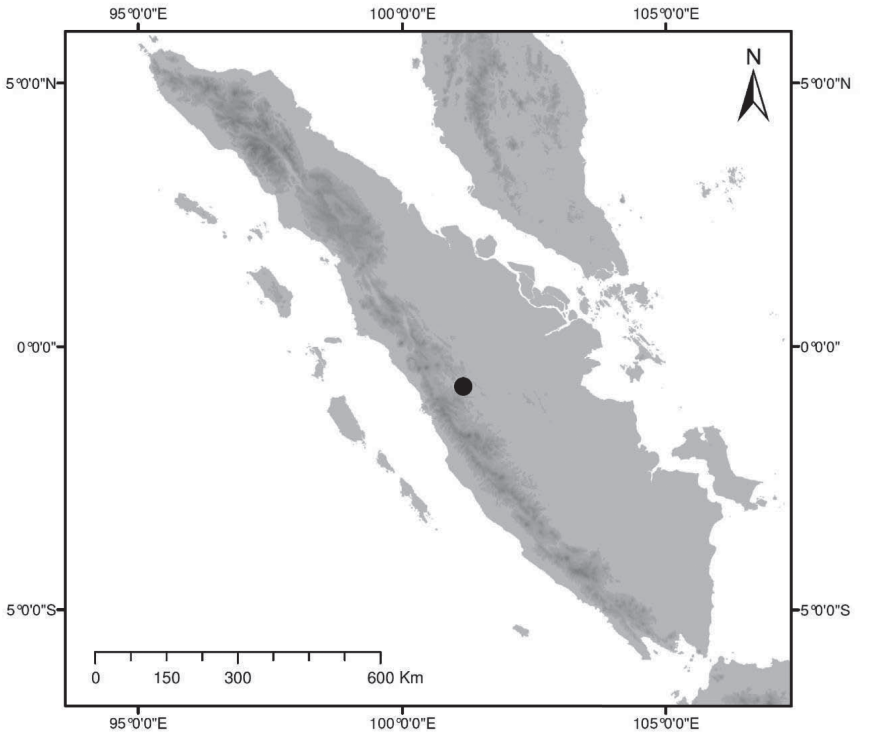


**Figure 1.** Distribution of *Begonia droopiae.*

***Begonia droopiae*** Ardi, *sp. nov*. (Sect. *Reichenhemia*)
*Haec species* Begoniae nurii *similis est sed foliis magis asymmetricis, floribus femineis tepalis* 3 (*nec* 2) *provisis et stipulis secus costam pilosis recedit*. –**Typus**: Indonesia, Sumatra, West Sumatra (Sumatra Barat), Batang Pangean Nature Reserve, Sawah Lunto District, Nagari Solok Ambah, Perkaulan cave, 00º 43' 21.7" S, 101º 09' 01.0" E, 484 m, 21viii2009, *A. J. Droop, W. H. Ardi, Nurainas & Riki AJD173* (holo, BO; iso, E, BO, ANDA). **Plate 1.**

Perennial, creeping, monoecious **herb**, to *ca* 10 cm tall, rooting at the nodes, hairy with up to *ca* 2 mm long, multicellular hairs. **Stems** rhizomatous, internodes very short, up to *ca* 2 mm long, with scattered multicellular hairs; stipules 3-6 × 3-5 mm, triangular, with an abaxially prominent midrib forming an up to *ca* 4 mm long, thin, hairy appendage at the apex, abaxially densely hairy along the midvein, persistent. **Leaves** alternate; petioles 5-19.5 cm long, sparsely to densely hairy; lamina basifixed, 3.5-9.5 × 2-6.8 cm, very asymmetric, ovate to elliptic, base cordate, lobes sometime slightly overlapping, apex acuminate, margin broadly crenate and fringed with hairs, adaxial surface glabrous, purplish-green to dark purple between the

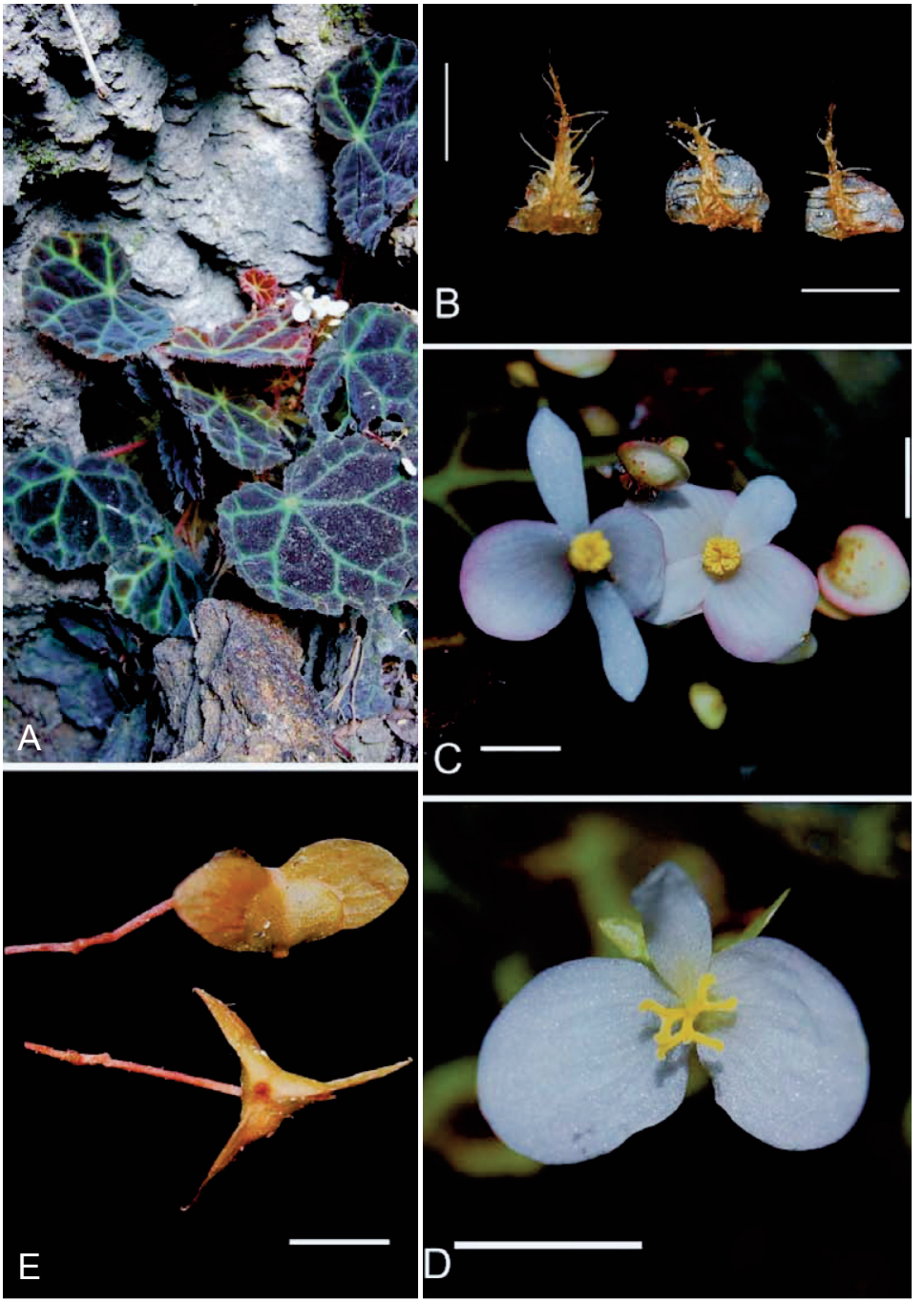


**Plate 1.** *Begonia droopiae* Ardi. A. Habit; B. Stipules (scale bar = 5 mm); C. Male flowers (scale bar = 5 mm); D. Female flower (scale bar = 5 mm); E. Fruits (scale bar = 5 mm). A-E based on A. J. Droop, W. H. Ardi, Nurainas & Riki AJD173.

veins, slightly raised, veins green, abaxial surface pale green to dark purple between the veins, hairy on the veins, venation palmate. **Inflorescences** cymose, axillary, protandrous, bisexual; peduncles 5-11 cm long, reddish, glabrescent to sparsely hairy; *bracts* sub orbicular, *ca* 1.5-2.5 × 1-2 mm, margin fimbriate, deciduous. **Male flowers,** pedicels 8-20 mm, moderately hairy; tepals 4, two outer tepals, white or white with a tinge of pink, 11-17 × 6-7 mm, elliptic to sub orbicular, base slightly cordate, apex rounded, abaxially moderately red hairy; two inner tepals white, 7-9.5 × 3-3.5 mm, oblong-obovate, glabrous; androecium of *ca* 40 stamens, yellow, filaments *ca* 1 mm long, fused at the base, anthers *ca* 1-1.5 mm long, obovate, dehiscing through unilaterally positioned slits *ca* 1/2 as long as the anther, connective not projecting. **Female flowers**, pedicels 6-9 mm, glabrous; tepals 3, unequal, two outer tepals orbicular to sub orbicular, 5.5-6 × 4.5-6 mm, one inner tepal, obovate, 5-6 × 1.4-1.6 mm; ovary 6-7 × 10-13 mm, orbicular, locules 3, placentation axile, placentae entire; wings 3, subequal, triangular, rounded at the and the apex, the widest point at the middle of the ovary, glabrous; style basally fused, 3-branched, each stylodium bifurcate in the stigmatic region, stigmatic surface a spirally twisted papillose band, yellow. **Fruits**, on thin, 6-9 mm long, sparsely hairy pedicels; capsules 8-8.5 × 10-7 mm, (excluding the wing) deflexed, dehiscent, splitting along the wing attachment, drying pale brown, glabrous, wings 4-5 mm wide at the widest point (at the middle of the ovary), wing shape as for ovary; **seeds** unknown.

*Distribution*: Indonesia, Sumatra, West Sumatra (Sumatra Barat), Batang pangean nature reserve, Sawah Lunto District, Nagari Solok Ambah, Perkaulan cave.

*Habitat*: This species is growing directly on vertical limestone wall in the front of cave at 484 m altitude.

*IUCN Conservation category*: We consider this species to belong to the VUD2 IUCN category, as it has a very restricted distribution. Although it resides in a protected area, there is some evidence of small scale agricultural activities encroaching the habitat nearby.

*Notes*: *Begonia droopiae* is morphologically similar to *Begonia nurii* Irmsch. Both species exhibit a rhizomatous habit, patterned leaves, and have male flowers with 4 tepals. However, *B. droopiae* can easily be distinguished from *B. nurii* by its very asymmetric leaves with an acuminate apex, and stipules which are hairy on the mid-vein (versus slightly asymmetric leaves, with a rounded apex and stipules which are glabrous on the mid-vein in *B. nurii*). The tepal number of the female flowers also differs; *B. droopiae* has

three tepals, whilst *B. nurii* has two. The wing shape of the fruits is a further difference: in *B. droopiae* the wings are rounded at the base and the apex, whilst in *B. nurii* the wings are rounded at the base and cuneate at the apex. *Begonia rajah* Ridl is another allied species from Peninsular Malaysia, similar in its rhizomatous habit, patterned leaves and male flowers with 4 tepals (R. Kiew, pers. comm.), but *B. droopiae* differs in having very oblique leaves (the midrib is clearly at an acute angle) which are soft and not succulent; *B. rajah* has thickly succulent leaves which are more bullate, i.e., raised between the veins. Further, *Begonia rajah* has never been found on limestone; most Peninsular Malaysia *Begonia* species grow either on limestone and not on other rock types or vice versa (Kiew, 2005). A comparison of the two species to *Begonia droopiae* is presented in Table 1. The epithet is after the first collector, Alison Jane Droop.

**Table 1.** Comparison of *Begonia droopiae*, *B. rajah* and *B. nurii*.

| **Character** | ***Begonia droopiae*** | ***Begonia rajah*** | ***Begonia nurii*** |
|---|---|---|---|
| No. tepals (male flower) | 4 | 4 | 4 |
| No. tepals (female flower) | 3 | 3 | 2 |
| Lamina shape | Very asymmetric | Asymmetric | Slightly asymmetric |
| Lamina texture | Thin | Thickly succulent | Thin |
| Lamina size | 3.5-9.5 × 2-6.8 cm | 7-15 × 6-15 cm | 2-7 × 3-11 cm |
| Lamina base | Cordate and slightly overlapping | Cordate and slightly overlapping | Cordate and often overlapping |
| Lamina apex | Acuminate | Short and acute | Rounded |
| Surface between the veins | Slightly prominent | Prominently raised | Slightly prominent |
| Stipules | Hairy on mid vein | Midvein glabrous | Midvein glabrous |
| Peduncle | 5-11 cm long | 10-25 cm long | 4-19 cm long |
| Fruit size | 8-8.5 × 10-12 mm | 6-7 × 5-6 mm | 5-9 × 10-16 mm |
| Wing shape | Rounded at the base and the apex | Rounded at the base, sub truncate at the apex | Rounded at the base, cuneate at the apex |

## Acknowledgements

We are grateful to the Indonesian Ministry of Research and Technology (RISTEK), the Indonesian Institute of Sciences (LIPI), Direktorat Jenderal Perlindungan Hutan dan Konservasi Alam (DITJEN PHKA) for giving us permission to conduct research in West Sumatra and for their help and assistance. The curators of herbaria ANDA, BO, E and SING are thanked for facilitating access to specimens. The fieldwork was supported by the ASEAN Centre for Biodiversity. Prof. Ruth Kiew is gratefully acknowledged for her constructive comments, and Dr. Robert Mill is thanked for his Latin expertise.

## References

Doorenbos, J., M.S.M. Sosef and J.J.F.E. de Wilde. 1998. The sections of *Begonia* including descriptions, keys and species lists (Studies in Begoniaceae VI). *Agricultural University Wageningen Papers* **98(2)**: 1-266.

Hughes, M. and M. Pullan. 2007. Southeast Asian *Begonia* Database. Electronic publication accessible via: www.rbge.org.uk.

Hughes, M. 2008. *An annotated checklist of Southeast Asian* Begonia. Royal Botanic Garden Edinburgh, UK.

Hughes, M., D. Girmansyah, W.H. Ardi and Nurainas. 2009. Seven New Species of *Begonia* from Sumatra. *Gardens' Bulletin Singapore* **61(1)**: 29-44

Kiew, R. 2005. *Begonias of Peninsular Malaysia*. Natural History Publications, Borneo.