



Begonia ranoposoensis (Begoniaceae), a new species from Sulawesi, Indonesia

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ABSTRACT: The new species *Begonia ranoposoensis* Saleh, Bandjolu & Ardi (Begoniaceae, *Begonia* section *Petermannia*) is described from material collected in Central and South Sulawesi. A detailed description, photoplate, distribution information and a provisional conservation status assessment are provided.

KEY WORDS: *Begonia comestibilis*, *Begonia vermeulenii*, Poso Lake, sect. *Petermannia*, Wallacea.

INTRODUCTION

Several plant groups show remarkable species radiations and associated high levels of diversity and endemism on the Indonesian island of Sulawesi, e.g. *Begonia* (Begoniaceae) *Cyrtandra* (Gesneriaceae) and *Etilingera* (Zingiberaceae) (Atkins and Kartonegoro, 2021; Poulsen, 2012; Thomas *et al.*, 2012, 2013 - continuously updated). However, the flora of Sulawesi remains understudied, underexplored, and has one of the lowest collection densities among the major islands in Indonesia (Cannon *et al.*, 2007; Middleton *et al.*, 2019). The publication of a comprehensive checklist of Southeast Asian *Begonia* (Hughes, 2008) and an online database, the *Begonia Resource Centre* (Hughes *et al.*, 2015-continuously updated), has greatly accelerated taxonomical research on the genus in Malesia and facilitated the identification and description of a significant number of new species discoveries from Sulawesi; a total of 62 indigenous species of Sulawesi *Begonia* have been reported, the majority of which were described in the last 20 years (Hughes, 2006; Thomas and Hughes, 2008; Girmansyah *et al.*, 2009; Thomas *et al.*, 2009a,b, 2011, 2018; Wiriadinata, 2013; Ardi *et al.*, 2014, 2018, 2019, 2021; Lin and Peng, 2017; Ardi and Thomas, 2019, 2020, 2022; Thomas and Ardi 2019, 2020; Dayanti *et al.*, 2020).

In March 2021, a geological expedition to Poso Regency, Central Sulawesi, was organized by the Mosintuwu Institute, and material of a new species of *Begonia* was collected from Goa Torau. The new species is classified in *Begonia* sect. *Petermannia* as it shows typical characters of the section: protogynous

inflorescences with basal female flowers and distal male flowers; 1- or 2-flowered female partial inflorescences; anthers with unilaterally positioned slits; the ovary and fruit have three equal or unequal wings; the ovaries are 3-locular; and the placentae are bilamellate (Doorenbos *et al.*, 1998; Moonlight *et al.*, 2018). All available herbarium specimens from major collections (B, BO, E, K, L, SING) and images of specimens from numerous other herbaria available in the *Begonia Resource Centre* (Hughes *et al.*, 2015-continuously updated) were consulted, but no additional material was found. Therefore, based on the currently available material, it must be assumed that this species has a very restricted range and is endemic to lowland limestone habitats in Sulawesi.

TAXONOMIC TREATMENT

Begonia ranoposoensis Saleh, Bandjolu, & Ardi, *sp. nov.*

Fig. 1

Type: INDONESIA. Central Sulawesi, Poso Regency, spread on wet rock wall at Torau Cave, 1°47'58.5"S 120°31'57.2"E, 300–500 m asl, 28 November 2021, *Bandjolu K 002* (holotype BO!; isotype CEB!).

Diagnosis: *Begonia ranoposoensis* vegetatively resembles *Begonia vermeulenii* Thomas because of the succulent, peltate leaves, but the male inflorescences are composed of up to 18 monochasial partial inflorescences, each with 4–12 flowers (vs composed of 1–3 cymose-subumbellate partial inflorescences composed of 2 compressed monochasia with up to 5 flowers), an androecium of 21–29 stamens (vs 35–44 stamens), the female flower pedicel is 1–4 mm long (vs 5–10 mm long),

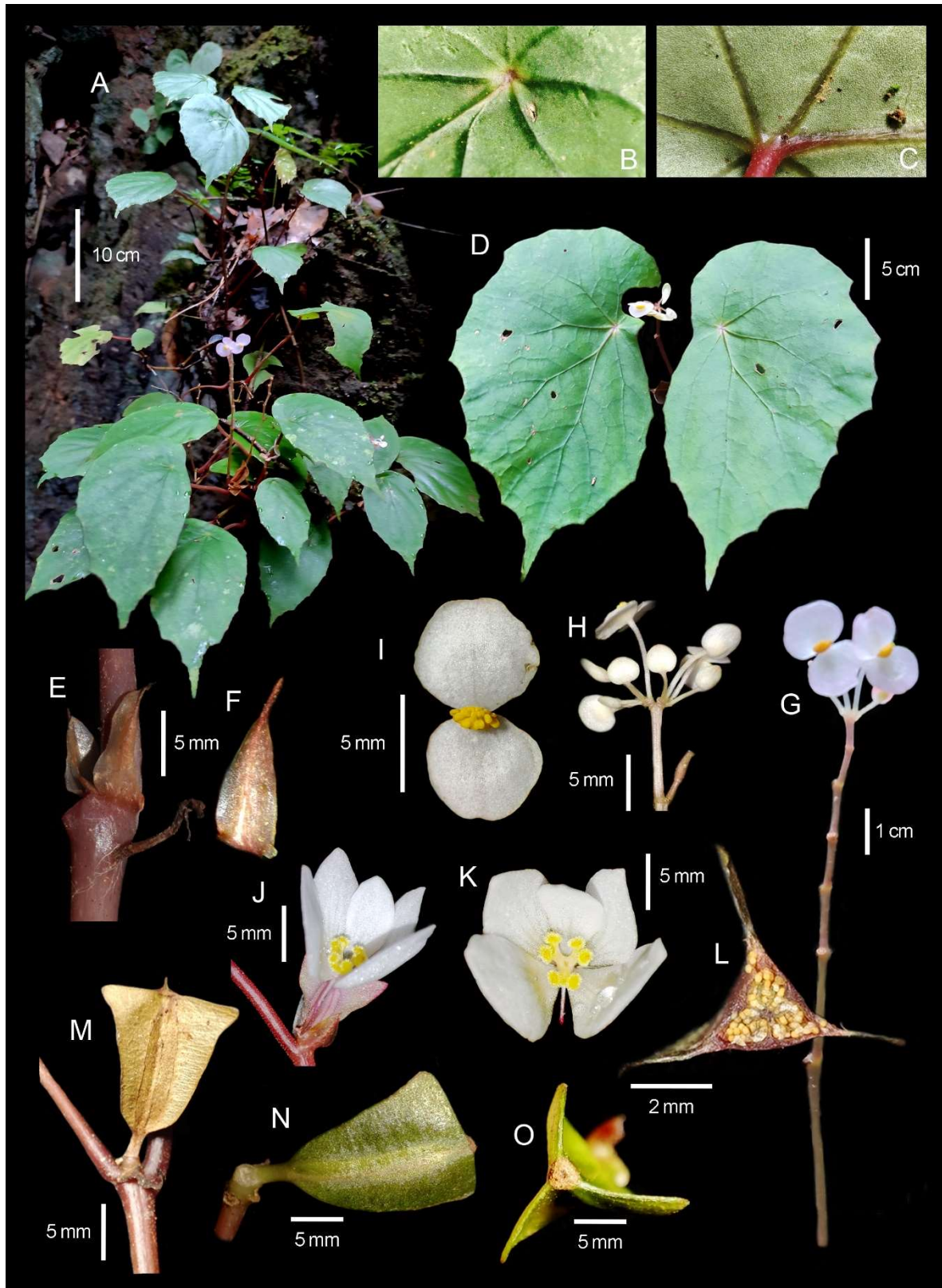


Fig. 1. *Begonia ranoposoensis* Saleh, Bandjolu & Ardi, sp. nov. **A:** Habit. **B:** Adaxial leaf lamina. **C:** Abaxial leaf lamina, petiole insertion. **D:** Leaves. **E-F:** Stipules. **G-H:** Male inflorescence. **I:** Male flowers, front view. **J:** Female flower, side view. **K:** Female flower, front view. **L:** Ovary, cross-section of middle, three-locular with axile, bilamellate placentae. **M-N:** Fruit, side view. **O:** Fruit, front views (Photographs by Bandjolu, K.P).

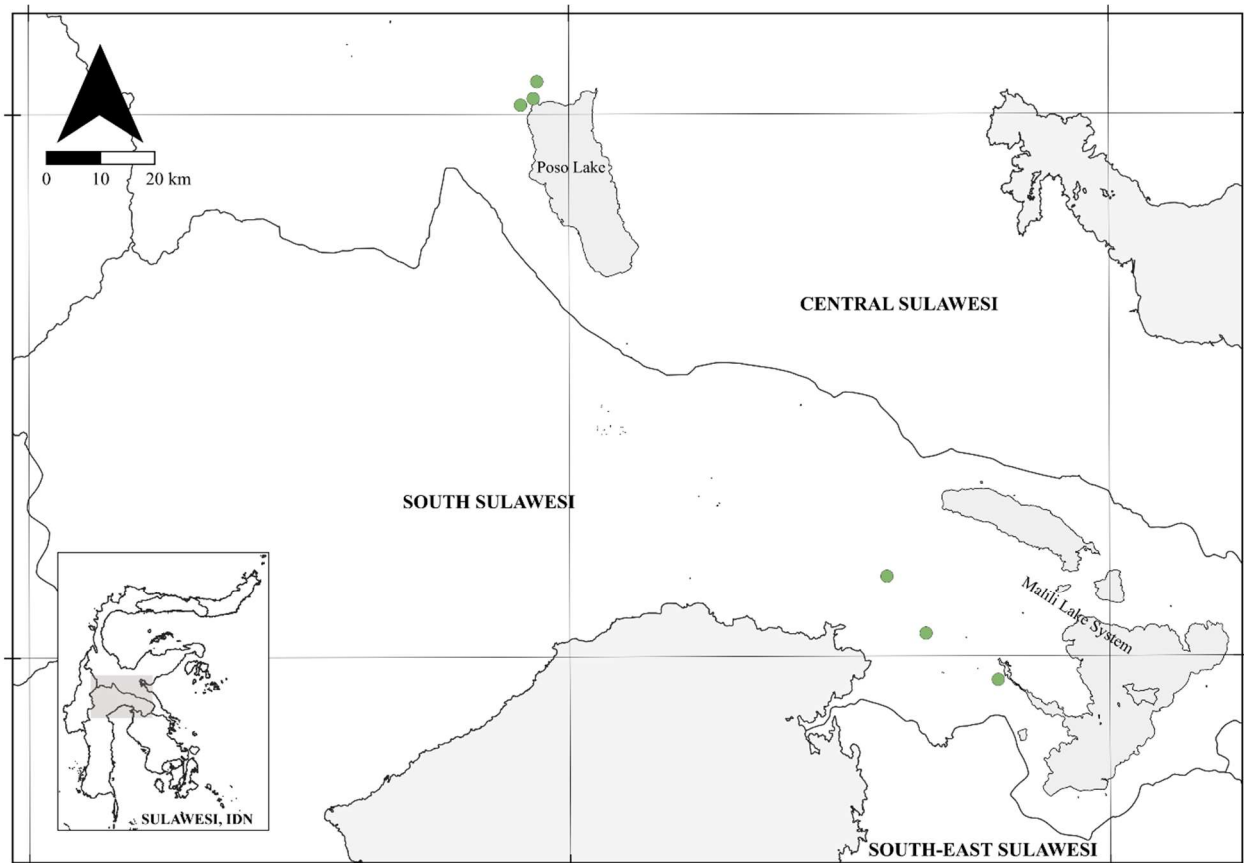


Fig. 2. Distribution of *Begonia ranoposoensis* sp. nov. in Central Sulawesi and South Sulawesi

and the ovaries and fruit (dry capsules) have 3 well-developed wings (vs ovaries and fruit wingless; fruit fleshy and indehiscent).

Perennial, monoecious herb, creeping to semi-erect, forming clumps, up to 50 cm tall. Stem brownish-red, swollen at the nodes, glabrous except for microscopic glandular hairs, internodes 2–6.7 cm long. *Leaves* alternate, excentrically peltate; *stipules* caducous, ovate to elliptic, slightly asymmetric, 6–11 × 3–6 mm, midrib abaxially prominent, apex shortly cuspidate, cusp up to 4 mm long, margin entire, brownish-red, translucent, glabrous; *petioles* (4.5–) 6.6–14 cm long, brownish-red, terete, glabrescent; *lamina* 8–20 × 3–11 cm, asymmetric, ovate to elliptic, apex acuminate, margin irregularly and distantly dentate or serrate, adaxial surface green and abaxial surface pale green, glabrous; venation palmate-pinnate, primary veins 5–7, actinodromous, secondary veins craspedodromous. *Inflorescences*: protogynous; *female inflorescences* basal to male inflorescences, 1 or 2-flowered, peduncles 1–3 mm long; bracts ovate-lanceolate, 7–8 × 3–4 mm, midrib prominent, mucronate, mucro 1–2 mm long, pale red; *male inflorescences* racemose-cymose (a thyrse) composed of up to 18 partial inflorescences, each compressed subumbellate with 4–12 flowers, peduncles 0.6–3.5 cm long, greenish-red; bracts

ovate to lanceolate 4–6 × 2 mm, midrib prominent, projecting up to 1 mm long. *Male flowers*; pedicels 12–14 mm, pale green, glabrous; tepals 2, white or white tinged with pink, 6–11 × 6–12 mm, broadly ovate, base rounded, apex rounded-retuse, glabrous; androecium of 21–29 stamens, yellow, filaments 0.5–1.1 mm long, fused at base, unequal, longer in the middle of the androecium, anthers c. 0.5 mm long, obovate, dehiscing through unilaterally positioned slits c. 1/2 as long as the anther, connective not projecting. *Female flowers*: pedicels 1–4 mm long, greenish-red, glabrous; tepals 5, white or white tinged pink, unequal, the four larger outer 8–10 × 5–6 mm, elliptic-lanceolate, the smaller inner one 8–9 × 3–4 mm, elliptic-lanceolate, glabrous; ovary (excluding wings) 8–9 × 1.5–2.5 mm, cylindrical, pink or reddish-white, glabrous, locules 3, placentation axile and bilamellate, wings 3, rounded at the base, truncate or rounded at the apex, up to 6 mm at the widest point (apically); style basally fused, 3-branched, each stylodium bifurcate, stigmatic region spirally twisted and papillose, the style and stylodia pale yellow, stigma yellow. *Fruits*: peduncles 1.5–2 mm long; pedicels 1–4 mm long, greenish-red; seed-bearing part ellipsoid, 9–17 × 2.5–5 mm (without wings), wings shape as for ovary, widest point at the apex, up to 7 mm. Seeds unknown.

**Table 1.** Comparison of morphological characters of *Begonia ranoposoensis*, *B. vermeulenii*, and *B. comestibilis*.

Characters	<i>Begonia ranoposoensis</i>	<i>Begonia vermeulenii</i>	<i>Begonia comestibilis</i>
Growth habit	Creeping to semi-erect, up to 50 cm tall	Erect stems, to c.100 cm tall	Erect stems, to c.80 cm tall
Stipules	Ovate to elliptic, 6–11 × 3–6 mm	Ovate to oblong, 8–21 × 5–9 mm	Elliptic to oblong, 13–17 × 6–12 mm
Lamina	Excentrically peltate	Peltate	Usually excentrically peltate, or sometimes both peltate and basifixed laminas present
Lamina size	8–20 × 3–11 cm	8–15.5 × 5.5–9.5 cm	13–17.3 × 7.1–10.5 cm
Male flowers			
Pedicel length	12–14 mm	10–19 mm	15–31 mm
Androecium	21–29 stamens	35–44 stamens	76–92 stamens
Female flowers			
Pedicel length	1–4 mm	5–10 mm	6–10 mm
Tepals shape	Elliptic-lanceolate, subequal to unequal, the four larger outer 8–10 × 5–6 mm, the smaller inner one 8–9 × 3–4 mm	Obovate to elliptic, subequal to unequal, 15–17 × 6–11 mm	Obovate to elliptic, subequal, 14–18 × 8–11 mm
Wing(s)	Equal to unequal	Wingless	Subequal
Fruits	Dry capsule, dehiscent	Fleshy, indehiscent	Semi-fleshy, indehiscent
Pedicel length	1–4 mm	Up to 1 cm	Up to 1 cm

Distribution: INDONESIA. Central Sulawesi (Poso Regency, Pamona Puselemba District, Torau Cave, Saluopa waterfall, Leboni); South Sulawesi (Soroako, Karrebe) (Fig. 2).

Habitat: Growing on vertical limestone cliffs, cave entrance or the forest floor in lowland karst forest, at 300–500 m elevation.

Etymology: The specific epithet is derived from the local name of the locality where the species was found and collected - Rano Poso (Pamona Language): Poso Lake.

Proposed IUCN status: Endangered EN B2ab(iii). This species is only known from a few collections, and some anthropogenic threats including agriculture and mining were observed near the collection localities. The type specimens were collected from lowland forests in a legally unprotected area near Poso Lake. Given the small EOO (687 km²) and AOO (24 km²), we consider the IUCN Red List Category (IUCN, 2019) of Endangered (EN) to be appropriate.

Note: Only a few Sulawesi species in *Begonia* section *Petermannia* have peltate leaves. *Begonia vermeulenii* (Thomas *et al.*, 2011) shows peltate leaves, while both peltate and basifixed leaves can be found in *B. varipeltata* (Thomas and Hughes, 2008) and *B. comestibilis* (Thomas *et al.*, 2011). *Begonia ranoposoensis* can be differentiated from these species by its inflorescence morphology, fruit morphology and multiple other characters as indicated in Table 1.

Additional specimens examined: INDONESIA. Sulawesi, Central Sulawesi: Poso Regency, Tentena, Saluopa Waterfall, 31 vii 2018, *WH Ardi et al. WI 253* (BO, CEB, SING, FIPIA); Poso Regency, Tentena, Leboni, Tentena-Bada road, 1 viii 2018, *WH Ardi et al. WI 256* (BO, SING, FIPIA); Poso Regency, Tentena, Tentena-Bada road, 1 viii 2018, *WH Ardi et al. WI 274* (BO, SING, FIPIA); Poso Regency, Tentena, Danau Poso, 1 viii 2018, *WH Ardi et al. WI 275* (BO, CEB, FIPIA). South Sulawesi: Sungai Bambalano, 20 km SW on road Soroako-Wasuponda-Malili, 26 vii 1979, *de Vogel et al.*, 6005 (L, BO); Walambano village, Soroako, 17 vi 1979, *E Hennipman 5885* (A, BO, K, L); Karebbe, 15 viii 1929, *G Kjellberg 2107* (BO).

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