Taiwania 71(4): 638–642, **2026**
DOI: 10.6165/tai.2026.71.638

Begonia andariasii (Begoniaceae), a new species from Mamasa, Sulawesi

Wendy A. MUSTAQIM[1,2,*], Wisnu H. ARDI[3,4]

1. *Program Studi Biologi, Fakultas Sains dan Teknologi, Universitas Samudra, Jl. Prof. Dr. Syarief Thayeb, Meurandeh, Langsa Lama, Langsa, Aceh 24416, Indonesia.* ***2.*** *Tumbuhan Asli Nusantara Foundation, BTN Korpri Blok C1 No 96, Kawatuna, Mantikulore, Palu, Sulawesi Tengah 94233, Indonesia.* ***3.*** *Research Center for Biosystematics and Evolution, National Research and Innovation Agency (BRIN), KST Soekarno – BRIN, Jl. Raya Jakarta - Bogor KM 46, Cibinong, Bogor 16911, Indonesia.* ***4.*** *UF/IFAS Mid-Florida Research and Education Center, University of Florida, 2725 S. Binion Road Apopka, Florida, United States 32703. [*]Corresponding author's email: wendyachmmadm@gmail.com*

(Manuscript received 29 April 2026; Accepted 30 July 2026; Online published 11 August 2026)

ABSTRACT: *Begonia andariasii* (Begoniaceae) is described as a new species endemic to Mamasa Regency, Sulawesi Barat Province, Indonesia. The species is provisionally assigned as Critically Endangered (CR). Detailed descriptions, distribution, photographs, and discussions are given.

KEY WORDS: *Begonia ranoposoensis*, Cucurbitales, herbs, Indonesia, taxonomy, Wallacea.

INTRODUCTION

Begonia Linnaeus (1753) is among the largest plant genera in the world with at least 2,200 accepted species worldwide (Hughes *et al*., 2015–onwards). This genus is characterised by being herbaceous or rarely shrubby, with stipules usually well-developed, leaves asymmetric, flowers unisexual, an inferior ovary, and a 3-loculed capsule (de Wilde, 2011). The genus has a pantropical distribution (Moonlight *et al*., 2018) with the centre of diversity in South America and Asia (Thomas *et al*., 2012; Bramley, 2020). It is one of the fastest-growing genera in the world in terms of the number of species (Moonlight *et al*., 2018).

Sulawesi is one of the centres of diversity of *Begonia* in insular Southeast Asia, harbouring numerous narrowly endemic species (Thomas *et al*., 2024). Nearly every botanical expedition to the island yields new species discoveries. During our ongoing exploration of the western part of the island in Mamasa Regency, several unidentified specimens were collected from under-sampled areas. This region is home to numerous species described since the 2000s, including *B. sanguineopilosa* D.C.Thomas & Ardi (Thomas *et al*., 2011) and *B. tjiasmantoi* Ardi & D.C.Thomas (Ardi and Thomas, 2020). Among the newly collected material, one taxon exhibits morphological characters that do not correspond to any previously described species. It shows affinity to the recently described Sulawesi endemic, *B. ranoposoensis* Saleh, Bandjolu & Ardi (Saleh *et al*., 2023), but differs in some morphological characters, warranting its recognition as a species new to science.

MATERIALS AND METHODS

The morphological description of the species was prepared based on examination of fresh material *in situ*. The herbarium material was prepared using the standardised guidelines from Davies *et al*. (2023). Identification was carried out by comparison with type specimens, either directly at BO, CEB, E, K, L, and SING or digitally through JSTOR Global Plants (https://plants.jstor.org) and GBIF (https://www.gbif.org), as well as by consulting relevant literature (Hughes, 2006; Thomas and Hughes, 2008; Girmansyah *et al*., 2009; Thomas *et al*., 2009a,b, 2011, 2013–onwards, 2018; Wiriadinata, 2013; Ardi *et al*., 2014, 2018, 2019, 2021; Lin *et al*., 2017; Ardi and Thomas, 2019, 2020, 2022; Thomas and Ardi, 2019, 2020; Dayanti *et al*., 2020). A provisional conservation status assessment was conducted following standardised guidelines (IUCN Standards and Petitions Committee, 2024) against criteria in the IUCN (2012). Extent of Occurrence (EOO) and Area of Occupancy (AOO) were calculated using GeoCAT (https://geocat.iucnredlist.org; Bachman *et al*., 2011).

TAXONOMIC TREATMENT

Begonia andariasii Mustaqim & Ardi, ***sp. nov.*** **Fig. 1**

Type: INDONESIA. Sulawesi, Mamasa, Nosu, Batu Papan, 3°09'51.6"S 119°25'58.1"E, 1760 m, 2 Aug 2023, *Mustaqim et al*. 2766 (holo: CEB!, iso: UIDEP!).

Diagnosis: *Begonia andariasii* is similar to *B. ranoposoensis* Saleh, Bandjolu & Ardi but differs in being consistently erect (vs. semi-erect to creeping), longer stipules (14–16 vs. 6–11 mm long), male inflorescences consisting of 1–2 compressed monochasia, with up to 7 flowers (vs. a thyrse composed of up to 18 partial inflorescences, each compressed-subumbellate and bearing 4–12 flowers), male flowers with more anthers (43–47 vs. 21–29), longer female inflorescence peduncle (9–36 mm vs. 1–3 mm), longer fruiting pedicels (5–6 mm vs. up to 4 mm) and a longer capsule (20–22 mm vs. 9–17 mm).

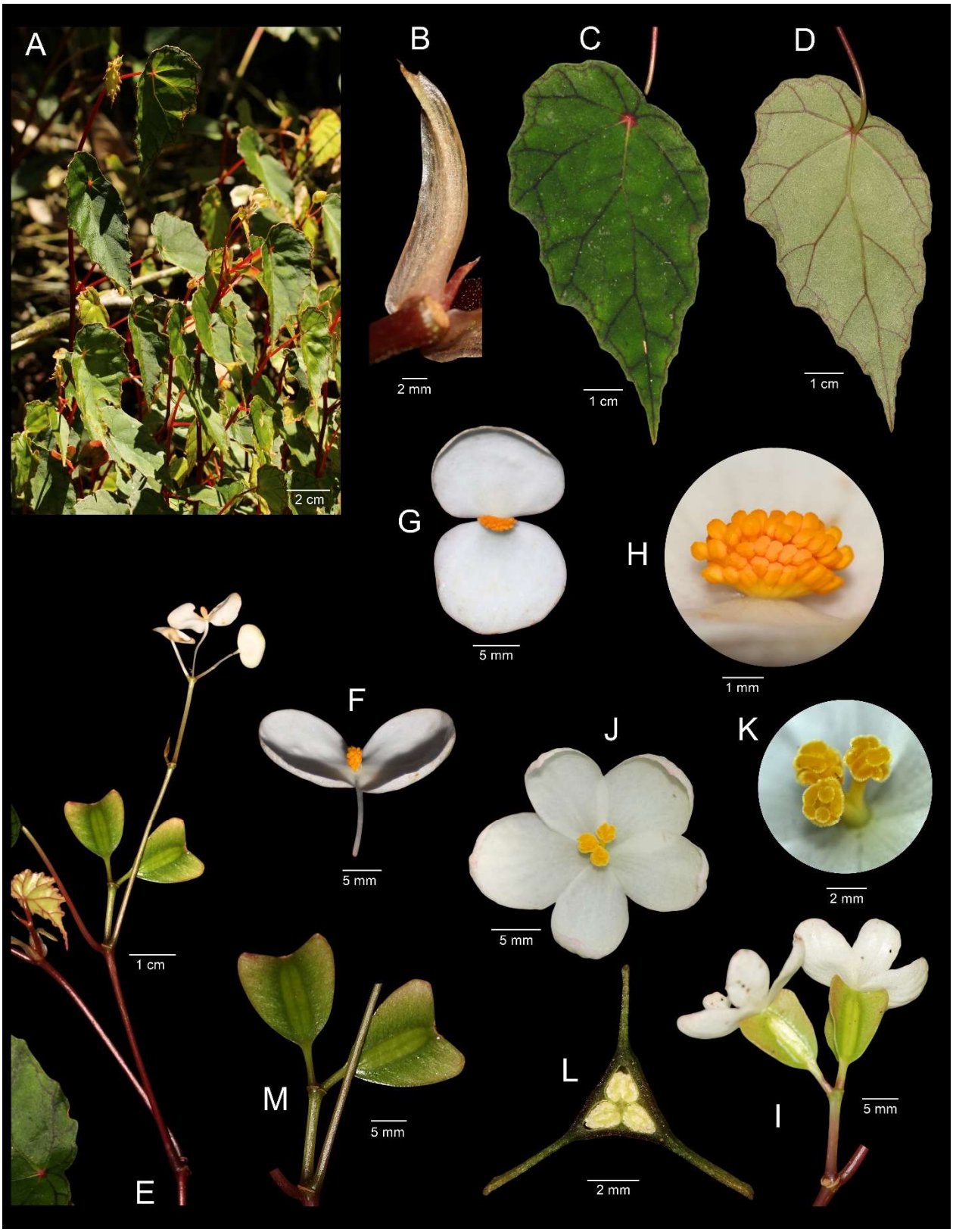

Fig. 1. Morphology of ***Begonia andariasii***. **A.** Wild plants. **B.** Stipule. **C.** Leaf, adaxial. **D.** Leaf, abaxial. **E.** Inflorescence. **F.** Male flower, lateral view. **G.** Male flower, frontal view. **H.** Stamens. **I.** Female flowers. **J.** Female flower, frontal view. **K.** Style and stigmas. **L.** Cross-section of ovary, also showing placentae. **M.** Capsules. Photographs: A–E, F–G by Andarias Sambokaraeng and H–M by Wendy A. Mustaqim,.

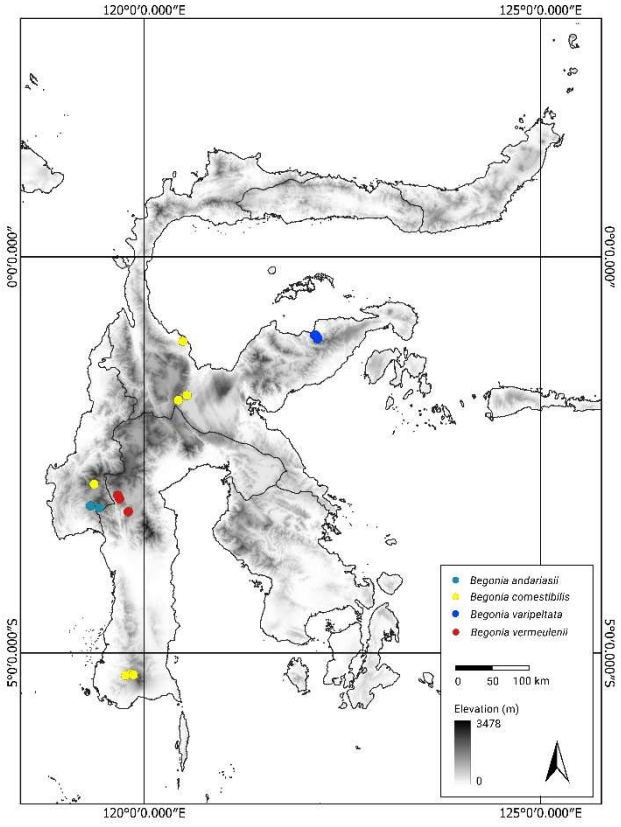

Fig. 2. Geographical distribution of ***Begonia andariasii*** and morphologically similar species. Geographical data derived from Thomas *et al*. (2024) and map created using QGIS.org (2026).

Description: Perennial, erect, monoecious herbs, to 80 cm tall. ***Stem*** flexuose, internodes 1–9 cm long, glabrous. ***Leaves***: alternate, peltate to subpeltate, the petiole attached 4.5–8.5 mm within the lamina margin, apical leaves sometimes basifixed; ***stipules*** caducous, ovate to oblong, slightly asymmetric, 14–16 × 4.5–7 mm, including free 2–2.5 mm long appendix as an elongation of midrib, margin entire, translucent white to pinkish, glabrous; ***petioles*** terete, (1.8–) 4–9.7 cm long, red like the stem, gradually becoming greenish upwards from the middle, glabrous; ***lamina*** asymmetric, ovate, (5–)7.9–12.4 × (2.3–)3.9–6.5 cm, glabrous, margin irregularly sinuate, sparsely dentate, apex attenuate; adaxially green with dark green to red veins, beneath pale green, with red veins, primary veins 4–8. ***Inflorescences*** protogynous; female inflorescence arising below the male, 1 or 2-flowered, peduncle terete, 0.9–3.6 cm long, glabrous, bracts c. 1.4 × 0.5 cm, midrib raised, apex acute, with short c. 0.5 mm long mucro; caducous; male inflorescence 1 or rarely up to 3 compressed monochasia with 6 or 7 flowers, peduncle 3.2–5.3 cm long, terete, red or greenish-red; bracts elliptic, c. 1.4 × 0.7 cm, apex mucronate by projecting midrib, c. 2.5 mm long; caducous. ***Male flowers***: pedicels 12–17 mm long, white, glabrous; tepals 2, white, often tinged with red at apical margin, broadly ovate 10.5–13 × 11.5–17 mm, apex rounded or subobtuse; androecium of 43–47 stamens, stamens aggregated into a flattened cluster, c. 4 × 5 mm wide, yellow, filaments 0.8–1 mm long, marginal stamens with shorter filaments, anthers c. 0.5 mm long, dehiscing by slits, connective not projecting. ***Female flowers***: pedicels 3.5–7 mm long, red at the base, upward greenish, or green at apex only; tepals 5, white, apical margin usually tinged pink, glabrous; two larger outer broadly obovate, 16–21.5 × 11–16 mm, apex concave, rounded; inner three smaller obovate, 11–17 × 8.5–11 mm, apex rounded; ovary (wing excluded) 13–14 × 3–3.5 mm, oblong, pale green, glabrous; placentation axillary, bilamellate, wings 3, cuneate at the base, truncate or broadly retuse, up to 5 mm at the widest point near the apex; style basally fused, 3-branched halfway, c. 3 mm long in total, glabrous, stylodium 2-branched, stigmatic region twisted, style and stylodia pale yellow, stigma yellow. ***Fruits***: peduncle 1.3–3.1 cm long; pedicels 5–6 mm, green, wings reddish especially toward the margin, capsule body also sometimes tinged reddish, 2–2.2 × 0.4–0.5 cm (wings excluded), oblong, wings shaped as in the ovary, widest point near the apex, up to 8 mm wide.

Distribution: Sulawesi endemic: Known from the type locality in Nosu; plants with similar sterile morphology are also known from photographs taken at Sumarorong. Both localities are in Mamasa Regency (Fig. 2).

Habitat and ecology: Terrestrial in lower- to mid-montane tropical rainforest, near a stream or waterfall, from 950 to 1670 m asl.

Etymology: Named in honour of Andarias Sambokaraeng, also known as Andre, a local plant enthusiast and conservationist whose contributions have revealed the plant diversity of Mamasa to the scientific community and the public.

Proposed IUCN conservation status: Based on the extensive survey in the Mamasa Region and surroundings, there are only two populations known for this species. The type population is growing in a small stream very close to the road and within a logged forest, while the second known population is growing in a tourism site. Both are threatened by human activities. Given an AOO of 8 km², occurrence at two locations, and ongoing threats to habitat quality, we propose that this species be assessed as Critically Endangered (CR B2ab(iii)).

***Notes*:** This species belongs to the group of peltate-leaved species in Sulawesi, alongside four other species: *B. ranoposoensis*, *B. varipeltata* D.C.Thomas, *B. comestibilis* D.C.Thomas & Ardi, and *B. vermeulenii* D.C.Thomas. It differs from *B. ranoposoensis* in morphology (see diagnosis) and also distribution. *Begonia ranoposoensis* is also a Sulawesi endemic known from the Poso and Malili areas in central Sulawesi, at lower elevations of 300–500 m (Saleh *et al*., 2023). Compared with the other peltate-leaved species, notable differences include, including: (1) *B. comestibilis* differs

Table 1. Comparison of ***Begonia andariasii*** with other peltate-leaved species in Sulawesi.

Characters	*B. andariasii*	*B. ranoposoensis*	*B. varipeltata*	*B. comestibilis*	*B. vermeulenii*
Habit	Monoecious herb	Monoecious herb	Monoecious herb	Monoecious herb	Dioecious herb
Stem	erect	creeping to semi-erect	erect at base and arching over in the distal part	erect	erect
Stipules					
Size (mm)	14–16 × 4.5–7	6–11 × 3–6	14–23 × 4–10	13–17 x 6–12	8–21 × 5–9
Leaf					
Lamina attachment	excentrically peltate to very rarely basifixed	excentrically peltate	excentrically peltate and/or basifixed	peltate	peltate
Vein color	contrasting with the lamina	not contrasting with the lamina	not contrasting with the lamina	contrasting with the lamina	not contrasting with the lamina
Male Inflorescence	1(-3) compressed monochasia with 6–7 flowers	racemose-cymose (a thyrse)	cymose	paniculate-cymose	composed of 1–3 cymose-subumbellate
Male flowers					
Pedicel length (mm)	12–17	12–14	2–14	15–31	10–19
Number of anthers	43–47	21–29	c. 25–30	76–92	c. 35–44
Female inflorescence					
Peduncle length (mm)	9–36	1–3	20	1–1.5	1
Female flowers					
Wings width (mm)	≤ 5	≤ 6	5–11	≤ 6	-
Tepal size (mm)	11–21.5 × 8.5–16	8–10 × 3–6	9–16 × 3–12	14–18 × 8–11	15–17 × 6–11
Fruit					
Type	dehiscent capsule	dehiscent	dehiscent	indehiscent	indehiscent
Pedicel length (mm)	5–6	≤ 4	≤ 42	≤ 10	≤ 10
Pedicel orientation	upright	upright	pendulous	upright	upright
Capsule length (mm)	20–22	9–17	9–12.5	17–26	44–48
Wings	present	present	present	present	absent
Wings width (mm)	≤ 8	≤ 7	5–11	11–16	-
Elevation (m)	950–1670	300–500	90–200	1020–1040	1500–1700
Reference		Saleh *et al*. (2023)	Thomas & Hughes (2008)	Thomas *et al*. (2011)	Thomas *et al*. (2011)

in having smaller leaves and male flowers with fewer stamens and fruit with narrower wings. *Begonia comestibilis* is known from Mount Lompobatang in the southern tip of Sulawesi at 1020 to 1040 m asl (Thomas *et al*., 2011). It was first described from South Sulawesi on Mount Lompobatang and later also recorded from additional localities including Maros, Maroanging, and Bakaru in South Sulawesi, as well as Parigi Moutong in Central Sulawesi and Mamasa in West Sulawesi (Thomas and Ardi, 2020); (2) *B. varipeltata* has a stem arching in the distal part, differs in having larger floral parts and more stamens. *Begonia varipeltata* is found in the lowland below 200 m asl (Thomas and Hughes, 2008), and (3) *B. vermeulenii* is clearly distinguished from the other peltate species by its wingless fruit and dioecious growth habit. *Begonia vermeulenii* is known from the southern arm of Sulawesi at elevations of 1500–1700 m on limestone. (Thomas *et al*., 2011; Thomas and Ardi, 2020) (see Table 1).

ACKNOWLEDGMENTS

Funding support for the fieldwork was provided by the International Association for Plant Taxonomy (IAPT) through the IAPT Biodiversity Challenge 2022 to WAM and WHA. We also thank Andarias Sambokaraeng, who provided photographs, information, and field assistance, as well as Dominggus and Roy Martin. We thank Roland P.P. Ahmad and Andita Aulia for facilitating specimen deposition in Herbarium Celebense, Universitas Tadulako.

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