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BEGONIA MATILLANOAE (BEGONIACEAE), A NEW SPECIES FROM MALAMPAYA SOUND PROTECTED LANDSCAPE AND SEASCAPE, PALAWAN ISLAND, PHILIPPINES

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A new species, *Begonia matillanoae*, is here described and illustrated from Malampaya Sound Protected Landscape and Seascape, Palawan Island, Philippines. It closely resembles *Begonia cabanillasii* but is distinct in having an ovate leaf with irregularly lobed margin, an acute leaf apex, and a 5-tepalled pistillate flower with the larger wing flat to shallowly cucullate. *Begonia matillanoae* is the latest addition to the Palawan begonias bearing a conspicuously 5-winged ovary. Based on IUCN guidelines, we here propose a Critically Endangered (CR) conservation designation for this species. A revised key to Palawan *Begonia* sect. *Baryandra* bearing five or six conspicuous ovary wings is also provided.

Keywords. Granite, protected area, Sunda, taxonomy, threatened species.
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Introduction

The Malampaya Sound Protected Landscape and Seascape (MSPLS) is a designated protected area located in the Municipalities of Taytay and San Vicente, northwestern Palawan, Philippines (**Figure 1**). It was officially declared a protected landscape in 2000 through Presidential Proclamation No. 342 per Philippine Republic Act 7586 (NIPAS Law) of 1992. It is home to a geographically isolated population of endangered Irrawaddy dolphins, *Orcaella brevirostris* (Jackson-Ricketts *et al.*, 2019). The MSPLS consists of an outer and an inner area, with the inner area featuring several islets surrounded by hills and mountains (Smith *et al.*, 2004). The highest point in MSPLS is Mount Capoas (c.1000 m a.s.l.), located on the western side of the protected area. This mountain is primarily composed of granite which formed during the middle Miocene (Forster *et al.*, 2015).

Our understanding of the floristic composition of the MSPLS remains limited, because the area has been largely unexplored. The first documented floristic exploration of MSPLS

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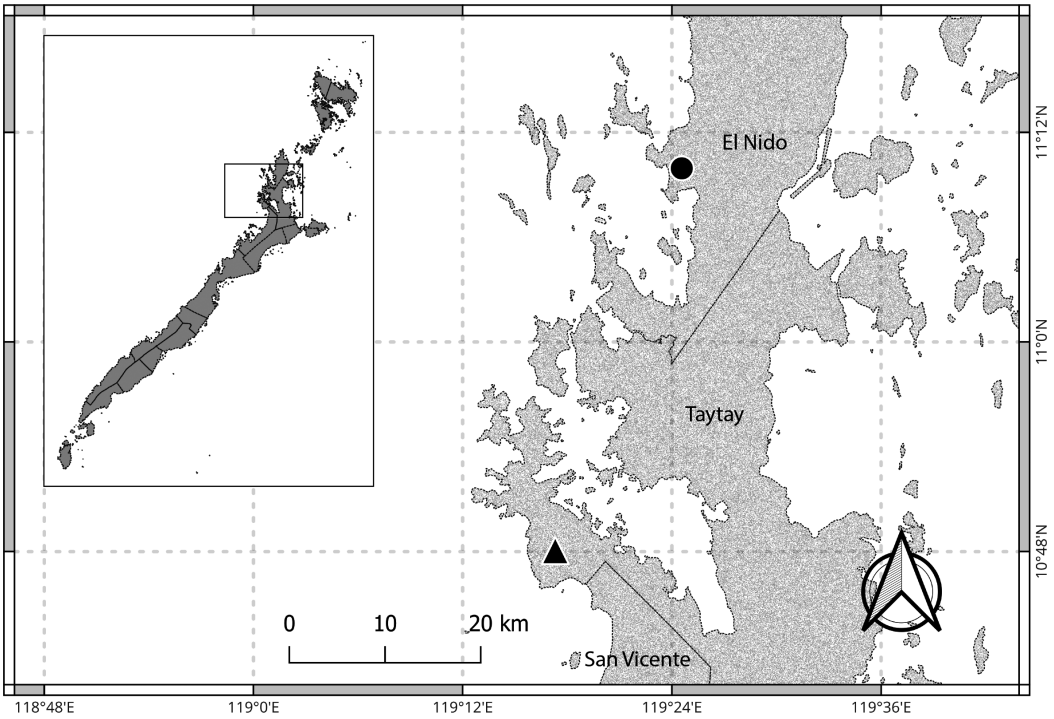

Figure 1. The type localities of the putative new species (triangle) and *B. cabanillasii* (circle) in northern Palawan, Philippines. Inset: Palawan, with the area's location boxed.

was by Elmer Drew Merrill in 1910. His subsequent explorations in the area led to the documentation and collection of several angiosperm species, some of which were later described as new to science. These include a few notable species whose type are described from Merrill's collections, such as *Begonia suborbiculata* Merr. in 1910, *Begonia woodii* Merr. in 1922 (Begoniaceae), *Syzygium capoasense* (Merr.) Merr. (Myrtaceae) in 1915, and *Vaccinium brachytrichum* Sleumer (Ericaceae) in 1961. Since these initial explorations, there have been no other recorded initiatives to study the floristic diversity of MSPLS.

The genus *Begonia* (Begoniaceae) in Palawan is represented by 27 species belonging to two sections: sect. *Baryandra* (25 spp.) and sect. *Petermannia* (2 spp.) (Hughes *et al.*, 2015–). Species from sect. *Baryandra* are widespread and can be found throughout the island, whereas those from sect. *Petermannia* are confined to the south-central region (Camangeg *et al.*, 2021). Palawan *Begonia* are highly endemic, with only two species, namely *Begonia mindorensis* Merr. and *Begonia nigritarum* Steud., also occurring in other islands across the Philippine archipelago. Recent botanical explorations in Palawan have led to the discovery of several species of *Begonia* that are new to science (Hughes *et al*., 2018; Ang *et al.*, 2020a, 2020b; Bustamante *et al.*, 2020; Camangeg *et al.*, 2021), and it is presumed

that more species await discovery, especially in the northern and southern regions of the island.

During a 2024 collaborative botanical survey by researchers from the Philippine Taxonomic Initiative, Inc., and Palawan State University (PSU) to document the flora of Mount Capoas, MSPLS, a putative new species of *Begonia* with a distinctly 5-winged ovary was documented and vouchered. This collection closely resembles *Begonia cabanillasii* Y.P.Ang *et al.* in its overall indumentum, staminate flowers, and a conspicuously 5-winged ovary. However, a literature review and comparison of photographs and herbarium materials revealed morphological differences distinguishing it from *Begonia cabanillasii*; hence, the new species is described in this paper under a morphological species concept (Cronquist, 1978). Additionally, a revised key to the Palawan species in *Begonia* sect. *Baryandra* with a 5 or 6-winged ovary is provided, superseding that of Camangeg *et al*. (2021).

Materials and methods

The species description was initially based on examination of fresh specimens. This was then supplemented by studying the photographs taken *in situ*, dried herbarium specimens and flowers preserved in 70% ethanol. Microscopic details of the indumentum were examined with a stereomicroscope (AmScope SM-3TP; AmScope, Irvine, California, USA) at ×64 magnification. Voucher specimens were collected through Palawan Council for Sustainable Development permit GP No. 2023-18. The conservation status was evaluated in accordance with IUCN criteria (IUCN Standards and Petitions Committee, 2024), following the recommendations of Thomas *et al.* (2024). To ensure the species did not correspond with any previously described taxa, physical specimens at PPC were examined, and digital images of specimens from B, K, L, and UVM (herbarium codes follow Thiers, continously updated).

Taxonomic treatment

Species description

Begonia matillanoae Y.P.Ang & Langbao, **sp. nov.**

Begonia matillanoae resembles *B. cabanillasii* in having white-pilose indumentum on its petioles, leaves and peduncles, a 4-tepalled staminate flower, and a conspicuously 5-winged ovary. However, it differs in having an ovate leaf shape (vs suborbicular) with shallow acutely lobed margin (vs crenate), an acute leaf apex (vs acute, obtuse or rounded), and a 5-tepalled (vs 4-tepalled) pistillate flower with largest wing flat to shallowly cucullate (vs distinctly cucullate). – Type: Philippines, Palawan Island, Palawan Province, Municipality of Taytay, Barangay Banbanan, Malampaya Sound Protected Landscape and Seascape, primary forest, c.560 m a.s.l., 29 vi 2023, *Angiosperms of Mt Capoas 57* (ACAP57) (holotype PNH [accession no: 259231!], isotype PPC [accession no: 2243!]). **Figures 2, 3, 4.**

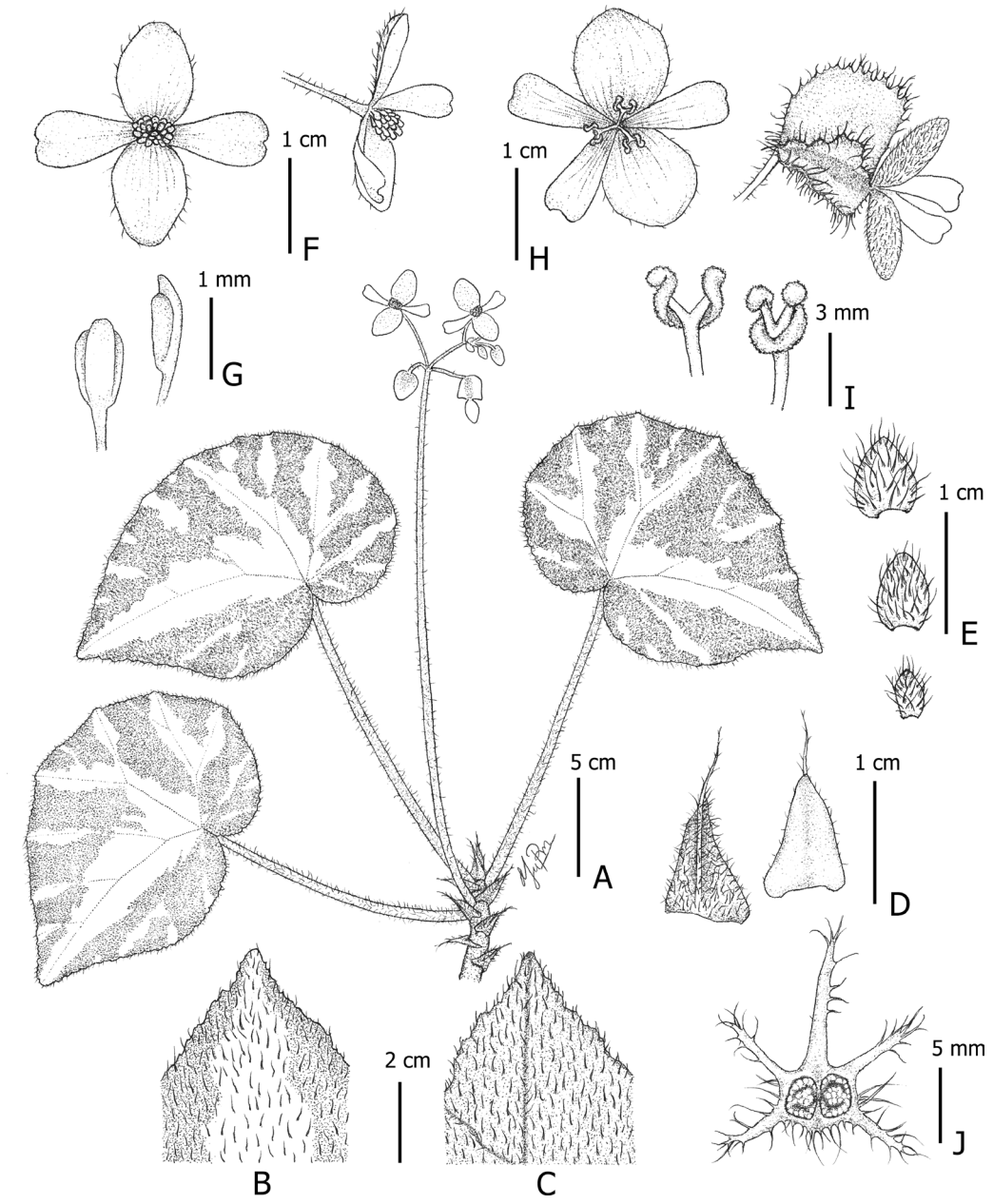

Figure 2. *Begonia matillanoae* Y.P.Ang & Langbao, sp. nov. A, Habit; B and C, leaf adaxial and abaxial surfaces, respectively (close-ups); D, stipule abaxial and adaxial surfaces (left and right, respectively); E, bracts; F, staminate flower (face and side views); G, stamen (dorsal and lateral views); H, pistillate flower (face and side views); I, style (dorsal and angled views on left and right, respectively); J, Ovary (cross section). Drawn from *ACAP57* by Y. P. Ang.

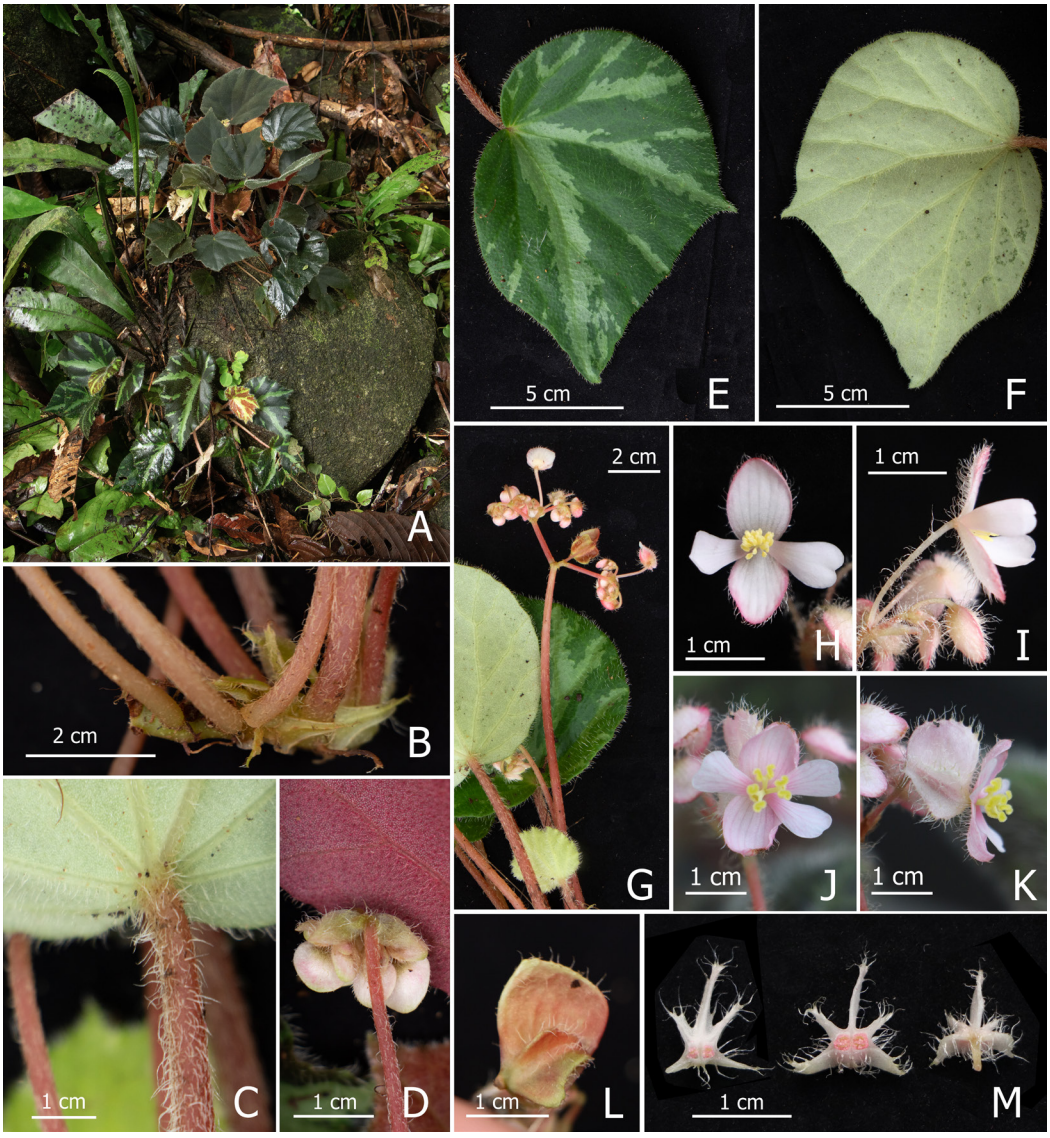

Figure 3. *Begonia matillanoae* Y.P.Ang & Langbao, sp. nov. A, Habitat and habit; B, rhizome, showing details of stipules and base of petioles; C, petiole and leaf base attachment; D, bracts and unopened flowers; E and F, leaf adaxial and abaxial surface, respectively; G, inflorescence; H and I, staminate flower (face and side views, respectively); J and K, pistillate flower (face and side views, respectively); L, immature ovary; M, ovary (cross sections). All photographs from *ACAP57*, taken by Y. P. Ang.

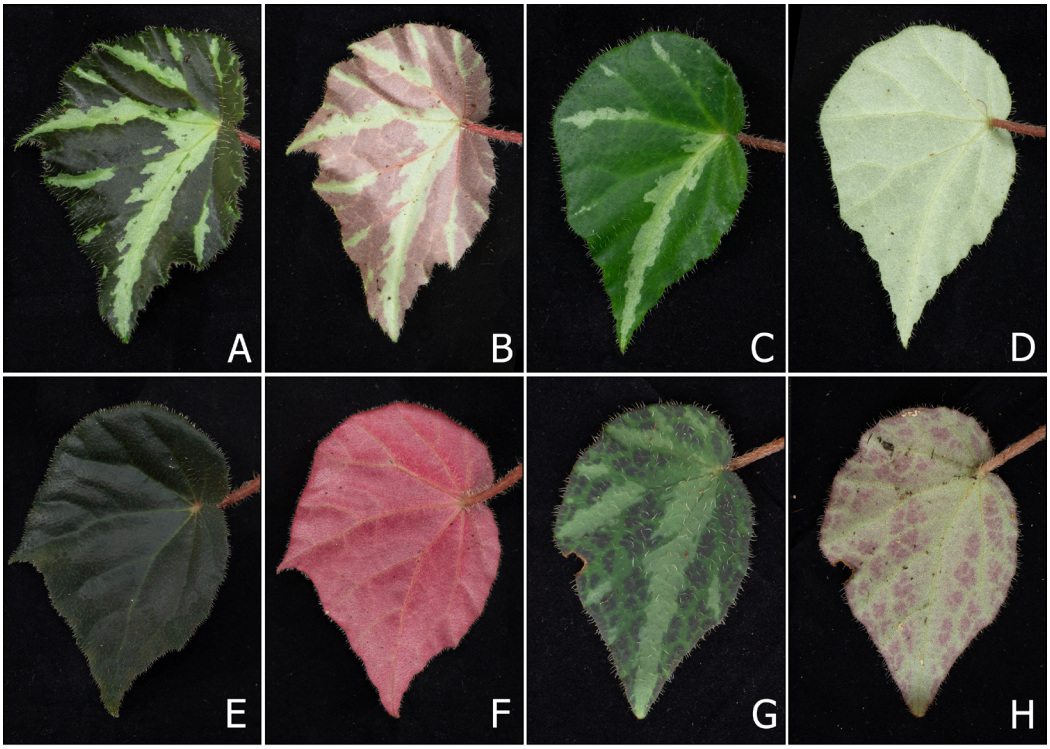

Figure 4. *Begonia matillanoae* Y.P.Ang & Langbao, sp. nov. Leaf colour and maculation variations from different plants of the same population: A, C, E and G show varying leaf adaxial surfaces, and B, D, F and H show their corresponding abaxial surfaces. All photographs taken by Y. P. Ang.

Monoecious, rhizomatous herb. *Rhizome* green to brown, 4–5 mm thick, up to c.12 cm long, white-pilose, internodes 3–5 mm long. *Stipules* hyaline, pale brown, triangular, 8–10 × 7–8 mm, keeled, abaxially white-pilose, (hairs simple, c.3 mm long), adaxially glabrous, apex aristate, arista 5–8 mm long. *Leaves* alternate, petioles terete, pale brown to red, white-pilose (hairs 1–4 mm long), 6–12 cm × 2–3 mm; lamina basifixed, adaxially green to deep brown with pale green patches on primary veins, some individuals lacking leaf variegation (without lighter patches on veins), abaxially pale green to maroon, ovate, asymmetrical, 8–15 × 5–10 cm, broadside 4.5–7 cm wide, abaxially and adaxially pilose (hairs simple, 2–4 mm long), base cordate, sinus ± overlapping, margin shallowly acutely lobed, undulate, ciliate (hairs simple, 1–2 mm long), apex acute; venation palmate pinnate, 5–7 primary veins, branching dichotomously or nearly so, tertiary vein reticulate. *Inflorescence* axillary, protandrous, cymosely branching panicle, 11–15 cm long, peduncle red or green, 8.9–11.6 cm long, white-pilose (hairs simple, 0.5–2 mm long). *Bracts* hyaline, pale green, turning pink towards the apex, ovate, lowest bract 4–6 × 3–3.5 mm, abaxially white-pilose

(hairs simple, 1–2 mm long), apex acute. *Staminate flower* pedicel 15–18 mm long, white-pilose (hairs simple, 0.5–1.5 mm long); tepals 4, outer 2 white on the middle to pink at margins, elliptic, 11–12 × 7–8 mm, abaxially white-pilose (hairs simple, 1–2 mm long), apex rounded, inner 2 oblanceolate, white to pale pink, 10–11 × 5–5.5 mm, glabrous, apex retuse; *androecium* c.2.5 mm in diameter, stamens 30–35, filaments free, 2–4 mm long, anthers yellow, 1–1.5 mm long, narrowly oblong-elliptic, 2 lateral slits run lengthwise, connective extended at apex and bluntly protruding. *Pistillate flower* pedicel 12–15 mm long, pilose; tepals 5, pale pink, outer 2 widely elliptic, 9–10 × c.7 mm, abaxially pink-pilose c.2 mm long, apex rounded, inner 3 oblanceolate 9–10 × 4–4.5 mm, glabrous, apex slightly retuse; ovary white to pale pink, trigonous ellipsoid, 8–10 × c.3 mm (wings excluded), white-pilose; wings 5, unequal, margin fimbriate with white simple hairs, 1–3 mm long, largest wing lunate, proximally rounded, distally truncated, c.8 mm wide, lateral wings narrowly triangular to rhomboidal, c.3 mm wide. *Ovary* bilocular, placentae bifid; *styles* 3, bifid, yellow, c.4.5 mm long, shortly fused at base; stigma c.2.5 mm long, spirally twisted and papillose all around. *Fruit* pendulous, similar in shape to ovary except that the largest wing cucullate, recurved, such that the largest wings point downwards.

Distribution. *Begonia matillanoae* is known only from its type locality on Mount Capoas.

Habitat and ecology. The new species is found in deeply shaded forest, where it grows on large granite boulders along streams. The lowland forest is dominated by tree species such as *Dipterocarpus gracilis* Blume (Dipterocarpaceae), *Pterospermum diversifolium* Blume (Malvaceae), and *Syzygium copelandii* (C.B.Rob.) Merr. (Myrtaceae), and also includes understorey and lianaceous palms (Arecaceae) such as *Areca vidaliana* Becc., *Arenga undulatifolia* Becc., *Korthalsia* sp. and *Raphis* sp. *Begonia matillanoae* was observed flowering in the month of July.

Etymology. The species is named in honour of the late Ms Ma. Victoria D. Matillano, a former member of the World Wide Fund for Nature and notable for her contributions to the conservation of Palawan's coral reefs and the protection of Irrawaddy dolphins. Throughout her career, Ms Matillano devoted herself to environmental conservation and community education in Palawan, particularly within the MSPLS, for which she chaired numerous conservation initiatives.

Proposed IUCN conservation category. *Begonia matillanoae* is currently known only from the lowland forests of MSPLS. Despite being located within a protected area, the species is not locally abundant, comprising an estimated total of fewer than 100 mature individuals. The forest in MSPLS shows signs of timber extraction, which, if left unregulated, may pose a threat to the stream ecosystem which supports the species' population. Between 2001 and 2023, Mount Capoas and its surrounding forest experienced a 10% decline in tree cover compared with 2000 levels (World Resources Institute, 2023). Following IUCN guidelines,

we assess this species as Critically Endangered (CR) C2a(i) (IUCN Standards and Petitions Committee, 2024).

Notes. In addition to the morphological differences between *Begonia cabanillasii* and *B. matillanoae*, it is also noteworthy that their populations do not overlap (see **Figure 1**). In terms of their ecology, *Begonia cabanillasii* grows on limestone boulders, whereas *B. matillanoae* grows on granite boulders.

Key to the species of Begonia *sect.* Baryandra *from Palawan bearing five or six conspicuous ovary wings*

1a. Rhizome internodes visibly elongated (reaching a length of 3 cm or more) _____ 2
1b. Rhizome internodes compact (< 1 cm) _____ 3

2a. Lamina broadly ovate, adaxially dense hirsute, apex acuminate
B. quinquealata C.I Peng *et al.*
2b. Lamina suborbicular, adaxially glabrous to subglabrous, apex rounded __ *B. suborbiculata*

3a. Lamina suborbicular, pistillate flower 4-tepalled _____ 4
3b. Lamina ovate, pistillate flower 5-tepalled _____ **B. matillanoae**

4a. Lamina adaxially red to white-hirsute; stipule triangular, shallowly keeled, abaxially tomentose, apex apiculate, c.1 mm long
B. obscuribracteata Y.P.Ang, W.Caban. & M.N.Tamayo
4b. Lamina adaxially white-pilose; stipule lanceolate, strongly keeled, abaxially white-pilose, apex aristate, 6–7 mm long _____ *B. cabanillasii*

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References

Ang YP, Tandang DN, Agcaoili JMM, Bustamante RAA. 2020a. *Begonia cabanillasii* (section *Baryandra*, Begoniaceae), a new species from El Nido, Palawan, the Philippines. Phytotaxa. 453(3): 244–254. https://doi.org/10.11646/phytotaxa.453.3.6.

Ang YP, Tandang DN, Rubite RR, Bustamante RAA. 2020b. *Begonia beijnenii* (Begoniaceae, section *Baryandra*), a new species of *Begonia* from San Vicente, Palawan, the Philippines. Phytotaxa. 455(3): 196–204. https://doi.org/10.11646/phytotaxa.455.3.2.

Bustamante RAA, Tandang DN, Pranada MAK, Ang YP. 2020. *Begonia truncatifolia* (Begoniaceae, section *Baryandra*), a new species from Palawan Island, the Philippines. Phytotaxa. 458(3): 215–222. https://doi.org/10.11646/phytotaxa.458.3.4.

Camangeg LM, Cabanillas W, Tamayo MN, Mangussad VC, Pranada MAK, Ang YP. 2021. Two endemic new species of *Begonia* (Begoniaceae) from Palawan, Philippines. Gardens' Bulletin Singapore. 73(2): 399–412. https://doi.org/10.26492/gbs73(2).2021-10.

Cronquist A. 1978. Once again, what is a species? In: Knutson LV, editor. Biosystematics in Agriculture. Montclair, New Jersey: Allenheld Osmin; pp. 3–20.

Forster MA, Armstrong R, Kohn B, Lister GS, Cottam MA, Suggate S. 2015. Highly retentive core domains in K-feldspar and their implications for $^{40}Ar/^{39}Ar$ thermochronology illustrated by determining the cooling curve for the Capoas Granite, Palawan, the Philippines. Australian Journal of Earth Sciences. 62(7): 883–902. https://doi.org/10.1080/08120099.2015.1114524.

Hughes M, Moonlight P, Jara-Muñoz A, Tebbitt MC, Wilson HP, Pullan M. 2015–. Begonia Resource Centre. Online database. https://padme.rbge.org.uk/begonia. [Accessed 10 July 2024.]

Hughes M, Peng CI, Lin CW, Rubite RR, Blanc P, Chung KC. 2018. Chloroplast and nuclear DNA exchanges among *Begonia* sect. *Baryandra* species (Begoniaceae) from Palawan Island, Philippines, and descriptions of five new species. PLOS One. 13(5): e0194877. https://doi.org/10.1371/journal.pone.0194877.

IUCN Standards and Petitions Committee. 2024. Guidelines for Using the IUCN Red List Categories and Criteria, version 16. Prepared by the Standards and Petitions Committee. Downloadable from https://www.iucnredlist.org/documents/RedListGuidelines.pdf. [Accessed 8 December 2024.]

Jackson-Ricketts J, Junchompoo C, Hines EM, Hazen EL, Ponnampalam LS, Ilangakoon A, Monanunsap S. 2019. Habitat modeling of Irrawady dolphins (*Orcaella brevirostris*) in the Eastern Gulf of Thailand. Ecology and Evolution. 10(6): 2778–2792. https://doi.org/10.1002/ece3.6023.

Smith BD, Beasley I, Buccat M, Calderon V, Evina R, de Valle JL, Cadigal A, Tura E, Visitacion Z. 2004. Status, ecology and conservation of Irrawady dolphins (*Orcaella brevirostris*) in Malampaya Sound, Palawan, Philippines. Journal of Cetacean Research and Management. 6(1): 41–52. https://doi.org/10.47536/jcrm.v6i1.789.

Thomas DC, Ardi WH, Chong YH, Thomas P, Hughes M. 2024. Conservation status assessments of species-rich tropical taxa in the face of data availability limitations: insights from Sulawesi *Begonia*. Scientific Reports. 14: 14007. https://doi.org/10.1038/s41598-024-64319-7.

Thiers B. Continuously updated. Index Herbariorum: A Global Directory of Public Herbaria and Associated Staff. New York Botanical Garden's Virtual Herbarium. http://sweetgum.nybg.org/science/ih/. [Accessed 6 April 2024.]

World Resources Institute. 2023. Tree cover loss data [data set]. Global Forest Watch. https://www.globalforestwatch.org/. [Accessed 20 March 2025.]