



New *Begonia* species from Ilin Island, Occidental Mindoro Province, Philippines and insights to the coastal species of *Begonia* sect. *Baryandra*

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(Manuscript received 4 July 2025; Accepted 2 December 2025; Online published 6 January 2026)

ABSTRACT: *Begonia ilinensis* is a newly described species of *Begonia* sect. *Baryandra*, first found in the coastal areas of Ilin Island, off the southwestern coasts of Mindoro Island in the Philippines. The species resides in exposed to semi-exposed limestone areas along the coast. The species is notable for its dormancy during the dry months, where it is limited to its minute rhizomes. It only starts growing its foliage and flowers during the wet season of June to November. Morphologically, the species is relatively small compared to most *Baryandra* species in the Philippines, but resembles *Begonia luzonensis*, a resident of nearby Luzon Island, mainly by its leaf margins. However, the species is much smaller compared to *B. luzonensis* specifically in terms of lamina, inflorescences, and capsules, and it lacks the characteristic rusty villous indumentum of *B. luzonensis* on its leaves, peduncles, and petioles. We also documented and mapped other *Begonia* sect. *Baryandra* that we have found thriving on the same habitat as *B. ilinensis* on other portions of the Philippines to shed further insights on the ecology of these coastal *Begonia*s based on their habitat preferences.

KEY WORDS: archipelago, *Begonia ilinensis*, *Begonia luzonensis*, biogeography, karst ecosystems, species radiation.

INTRODUCTION

The Philippines is one of the centers of endemism of the genus *Begonia*, the eighth largest plant genus in the world. In particular, *Begonia* section *Baryandra*, a monophyletic group of 99 *Begonia* species has a center of endemism in the Philippines (Pelser *et al.*, 2011–). Recent expeditions in the country have led to a rapidly growing list of newly described *Begonia* species.

These plants reside on islands of varying sizes. The majority of these are island-endemics such as *B. gitingensis* Elm. (Elmer, 1910), *B. camiguinensis* Elm. (Elmer, 1915), and *B. rubiteae* M. Hughes (Hughes *et al.*, 2010), which are observed solely on relatively smaller islands of Sibuyan (465 km²), Camiguin (255 km²), and Busuanga (890 km²), respectively. The species *B. fenicis* Merr. (Merrill, 1908), while being relatively widespread, also resides in coastal areas of smaller islands such as the recorded population in Philippines' Calayan and Batan islands, Taiwan's Lanyu and Orchid islands, and even reaches further north to islands of Japan's Ryukyu archipelago. Some species found on larger islands are confined to specific locations such as *B. normaaguilariae* M.D. Angeles, Rubite & Tandang (Delos Angeles *et al.*, 2022) and *B. burabod* Rubite, C. Justo, P. Villaseñor &

C.W. Lin (Rubite *et al.*, 2021) in Samar island, *B. palemlemensis* Calaramo, C.W. Lin & Rubite (Calaramo *et al.*, 2019) and *B. droseroides* C.I Peng, Rubite & C.W. Lin. (Rubite *et al.*, 2018) in Luzon. As with these plant's distribution, it occupies "islands within islands" (Hughes *et al.*, 2014).

Mindoro Island, located on the western portion of the Philippine archipelago, is known for its very rich biodiversity and complex geologic history. The island is known to be among the few Philippine islands with portions from continental origin. In particular, the southwest portion of the island is considered part of the Palawan microcontinental block, which is known to be of continental Asian origin (Sarewitz and Karig, 1986; Yumul *et al.*, 2009).

The complex geologic formation of the Mindoro Island also brought its rich biodiversity. The island alone is home to 17 island endemic faunal species, including the Philippine endemic flagship buffalo species, the Tamaraw, *Bubalus mindorensis* Heude (Custodio, 1996). For plants, a compilation of botanical studies starting from the 1900s to 2010s showed that the island hosts 941 plant species, 173 of which are threatened based on the IUCN Red List (Villanueva *et al.*, 2015). In terms of *Begonia* species, 12 species were recorded from Mindoro

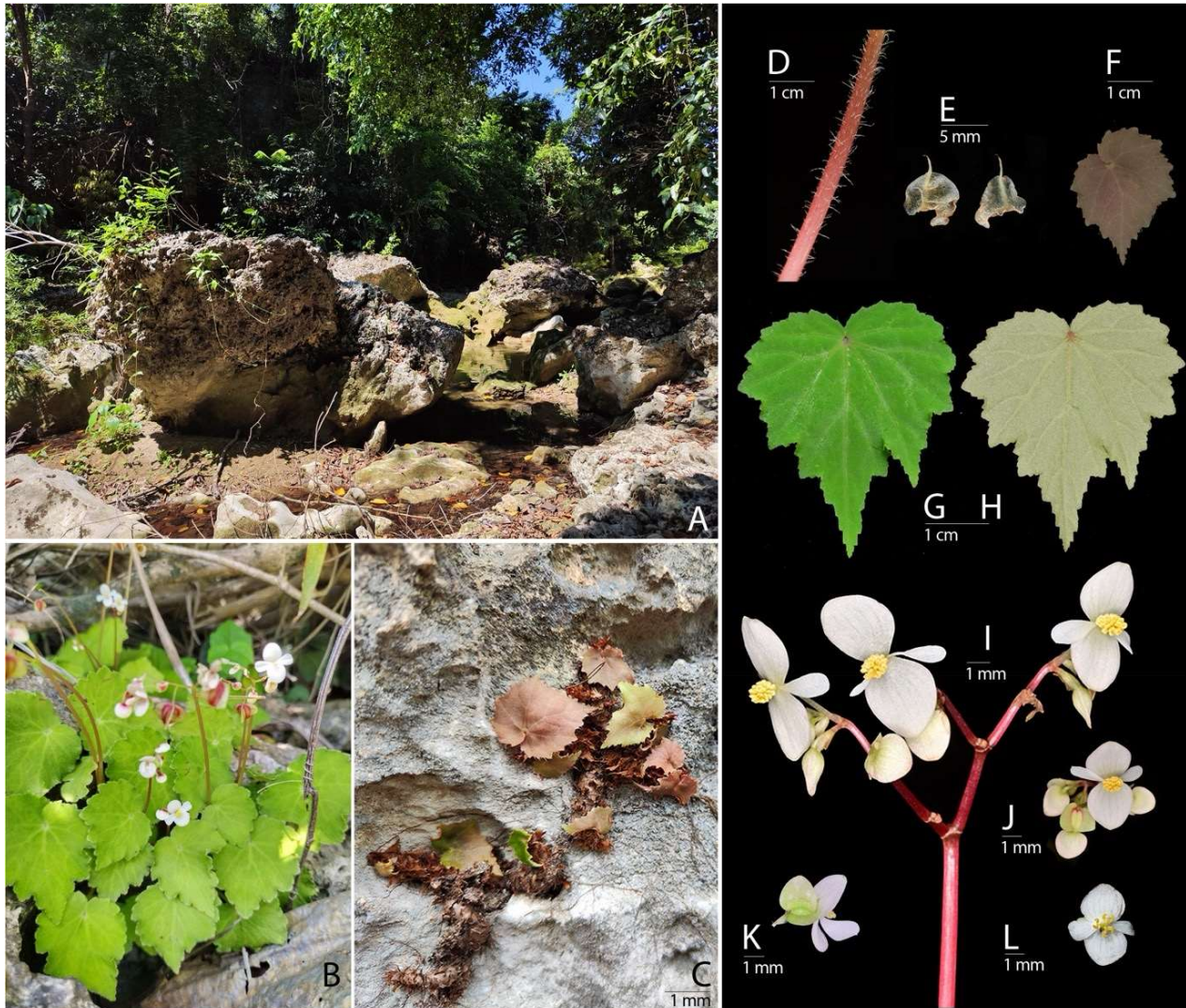


Fig. 1. *Begonia ilinensis* Bucay, Tandang & M.A.Reyes. **A.** Habitat showing limestone formations near the coast; **B.** Habit; **C.** Individual state recovering from dormancy stage, showing young leaves; **D.** petioles; **E.** stipules; **F.** Young leaves; **G-H.** leaves abaxial and adaxial side; **I.** Inflorescences; **J.** Male flowers and some young female flowers; **K.** Ovary; **L.** Female flower.

Island, including one of the only two members of the sect. *Platycentrum* in the Philippines, *B. halconensis* (Moonlight *et al.*, 2018; Espeja *et al.*, 2024), which was observed on the central mountain ranges of the island.

A recent exploration of southern Mindoro Island, including the nearby smaller islands of Ilin and Ambulong, led to the discovery of a new species of *Begonia* sect. *Baryandra*. It resides on the limestone formation along the coast and is observed to exhibit complete dormancy (shedding all foliage) during dry months of the Philippines from December to May and starts growing leaves and flowers during the remaining months of the year. We also present here some insights on other begonias observed in coastal areas during our assessment in different islands of the country.

TAXONOMIC TREATMENT

Begonia ilinensis Bucay, Tandang & M.A.Reyes, *sp. nov.*

Figs. 1, 2

§ *Baryandra*

Type: PHILIPPINES. Ilin Island, Municipality of San Jose, Province of Occidental Mindoro, growing on limestone formations along the coastal area at almost sea level elevation to 10 masl, April 2023, *MACBucay, DNTandang and MAGReyes 0266* (holotype PNH; isotype HAST).

Diagnosis: The plant is observed to be most similar to *B. luzonensis*, particularly on leaf margins; both species of which may exhibit dentate leaves. However, *B. luzonensis* foliage is glabrous on both sides (vs. densely villous). Its peduncles are also glabrous (vs. longer villous), and the petioles are glabrescent (vs. sparsely villous). *B. ilinensis*

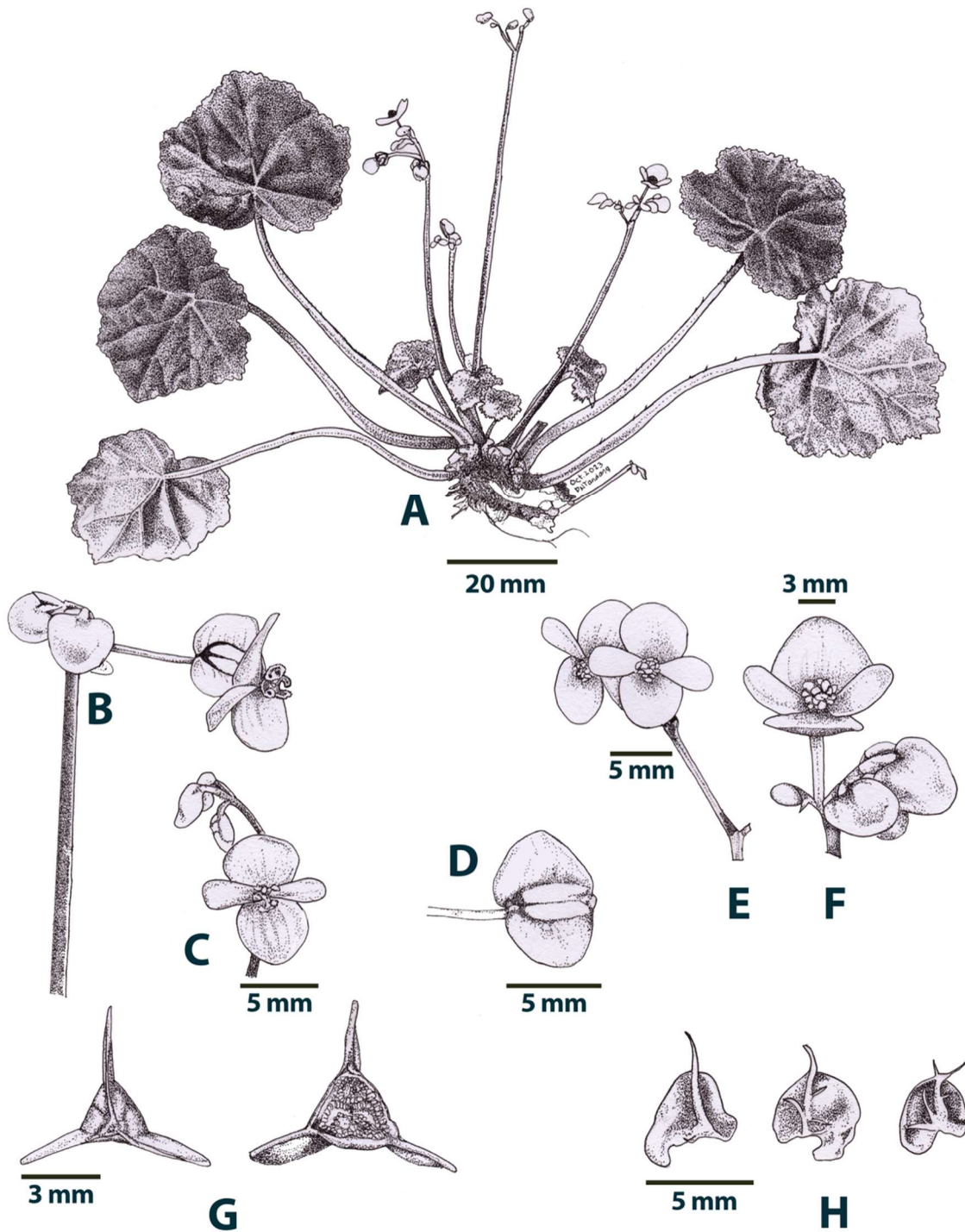


Fig. 2. *Begonia ilinensis* Bucay, Tandang & M.A.Reyes. **A.** Habit; **B.** Pistillate flower showing the ovary; **C.** Pistillate flower showing the stigmas; **D.** Ovary lateral view; **E.** Staminate flower; **F.** Staminate flower with the ventral view of androecium; **G.** Fresh capsules ventral view and cross-section; and **H.** stipules.



Table 1. Key morphological comparison of *B. ilinensis* and *B. luzonensis*. Characters of *B. luzonensis* were taken from its protologue and its type specimen (B100238452).

Character	<i>B. ilinensis</i>	<i>B. luzonensis</i>
Petioles		
indumentum	Glabrescent	Sparsely villous
Leaf		
margin	No evident lobes, crenate to dentate with sparse ciliate hairs	Prominent lobes of around 1 cm, sinuate to dentate, sparsely denticulate
dimension	1–2 cm × 2–5 cm	7–10 × 12–16 cm
surface	Glabrous both sides	Dense rusty villous to ciliate on both sides.
Inflorescence		
dimension	6.5–13.3 cm	17–23 cm
peduncle indumentum	Glabrous	Sparsely long villous
Capsule		
length	1.1–1.2 cm long	2.0–2.5 cm long
wing	Abaxial wing apex acute, both edges obtuse, 1.8–2.3 mm wide Unequally 3-winged, Lateral wings apex rounded	Abaxial wing extended, almost acute with truncated edge, 11 mm wide Unequally 3-winged, Lateral wings rounded, 4 mm wide

is also significantly smaller than the more robust *B. luzonensis* and to most *Begonia* sect. *Baryandra* species. To scale, the range of lamina dimension of *B. ilinensis* is only at 4–6 × 2–5 cm (vs. 12–16 × 7–10 cm in *B. luzonensis*) and its capsules are very minute with lengths of 1.1–1.2 cm (vs. 2–2.5 cm). *B. ilinensis* also has more obtuse base on abaxial wing on the ovaries compared to a more truncated and extended abaxial wing of *B. luzonensis*.

Description: A lithophytic, rhizomatous herb with creeping rhizome. **Rhizome** dark brown to pale green, fleshy, glabrous, and lenticelate, 1–4 cm, internode 1–3 mm. **Stipules** persistent, pale green to translucent, 4–5 × 3–4 mm, glabrous, keeled with light green hairs protruding from the base, acute with arista 1–2 mm long. **Leaves** alternate, *petioles* terete, fleshy, erect, light brown to maroon, length 7.2–11.5 cm, diameter at 0.9–1.3 mm at base; *lamina* glabrescent, mostly asymmetrically ovate, 4–6 cm long from point of attachment to apex, 3–5 cm long from basal lobes to apex, 3–5 cm wide, basal lobes rounded, sometimes overlapping, acute to acuminate in apex, margins crenate to dentate, *adaxial surface* light to dark green, sometimes with scattered white spots, dull texture, glabrous, *abaxial surface* light to dark green but sometimes maroon, dull texture, glabrous, *venations* basally 5–6 palmate, dichotomously branching towards the margin. **Inflorescence** axillary, bisexual, longer than petioles, 6.5–13.3 cm, panicle, dichotomously branched, 2–4 times; peduncle erect, red to light brown, 5.3–10.1 cm long, 1.3–1.7 cm in diameter, glabrous. **Bracts** light green, glabrous, cucullate shape, caducous, 2.2–2.5 mm long, 0.7–0.9 mm wide when expanded, margin entire, apex acuminate. **Bracteoles** light green, ovate shape, glabrous, caducous, 1.5–1.9 mm long, 1.0–1.8 mm wide when expanded, margin entire, apex acuminate. **Staminate flower:** pedicel 3–4 mm long, light green to light red, glabrous. Tepals 4, white both abaxial and adaxial surfaces; 2 outer tepals, orbicular, glabrous, 3.7–

4.3 mm long, 3.6–5.1 mm wide, margin entire, apex rounded; 2 inner tepals, lanceolate, glabrous, 3.5–3.8 mm long, 1.9–2.2 mm wide, margin entire, apex rounded; androecium actinomorphic, orbicular, 2.4–2.5 mm across, stamen yellow, 30–35 filament, yellowish unequal length, 1–2 mm long, united at base; anthers obovoid 0.5–0.7 mm, apex rounded. **Pistillate flower:** pedicel 8.6–9.7 mm long, light green to light red. Tepals 4, white both abaxial and adaxial surfaces; 2 outer tepals, orbicular, glabrous, 5.4–5.5 mm long, 4.5–5.2 mm wide, margin entire, apex rounded; 2 inner tepals, lanceolate, glabrous, 3.7–4.6 mm long, 1.1–1.7 mm wide, margin entire, apex rounded; stigmas spiral and densely setose, light green, oblong in general outline, ca. 0.2 mm wide; ovary oblong, green sometimes with maroon outline, glabrous, 4.7–4.9 mm long, 3.3–3.8 mm wide, 3 carpels, placentae axial bifid, with 3 unequal wings along edge; wings light green, crescent shape, abaxial wing slightly larger and broader than lateral wings, 1.8–2.3 × 5.4–5.5 mm, lateral wings 1.5–1.8 × 4.7–5.8 mm. **Capsule:** pendulous, nodding, glabrous, 8.6–9.3 × 11.0–12.2 mm (wings included), wings rounded, 5.2–5.8 × 7.7–9.2 mm.

Etymology: The epithet “*ilinensis*” came from the name of the island, Ilin, the type locality of the species being described.

Phenology: The plant is observed to be in full dormancy (shedding all vegetative structures and maintaining only the small rhizomes) during the dry months of December to May. They start growing their foliage back on relatively wetter months of July to August and blooms from September to December.

Distribution and ecology: The first and largest observed population of the species is in the coastal areas of Ilin Island, particularly on the exposed limestone formations around 5 masl to almost sea level elevations. Type specimens were collected from this area. Other smaller populations were found on the coasts of the nearby Ambulong Island and main Mindoro Island, all of

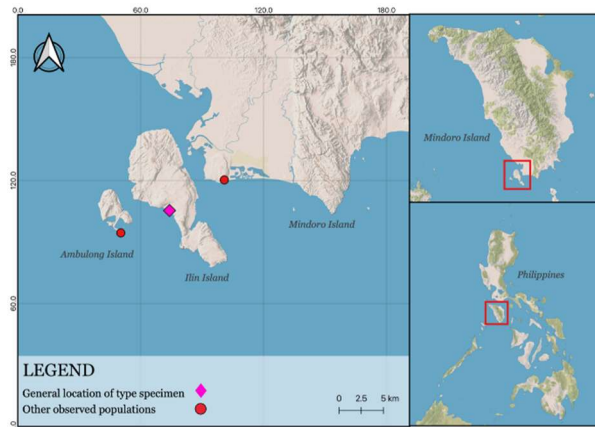


Fig. 3. Map showing the general type locality of *B. ilinensis* in Ilin Island, off the coast of the main Mindoro island and the other observed populations on nearby coastlines. Map created by MACB.

which are in exposed limestone areas. Populations on nearby Caluya islands were also found. Note that the species were not observed to occur on other limestone formation and riverine systems further inland of the islands assessed suggesting possible affinity to semi-exposed coastal environment (Fig. 3).

Conservation status: The species is observed to have around 300 mature individuals from combined counts from four populations. Several established subpopulations within Ilin Island, Ambulong Island and main Mindoro Island were found on this study, and it was documented that nearby Caluya Island also hosts this species on its coasts. The calculated area of occupancy (AOO) based on all population sightings is 16 km², computed using GeoCat (Bachman, 2011).

We recommend the species to be in Vulnerable status (D1D2) based on IUCN Standards and Petitions Subcommittee 2024, as its total mature individual count of <1,000 (D1) is distributed to only four populations in less than 20 km² AOO, and its high affinity with coastal environments make it susceptible to coastal hazards (D2). These observed hazards includes both anthropogenic (burning vegetation over limestone formations for rapid land use change) and natural hazards (rapid sea level rise and typhoon susceptibility).

Notes on coastal species of the Philippine *Begonia* sect.

Baryandra

Begonia ilinensis is among the *Begonia* sect. *Baryandra* species found thriving in exposed to semi-exposed limestone coasts. There are other sect. *Baryandra* species that were observed thriving on areas near the coast with varying affinity to limestone formations and exposure to sunlight as observed during the national conduct of *Begonia* assessment in the Philippine islands last 2023 (Table 1, Fig. 4).

Other species observed thriving on the coasts are the karst-affiliated species such as *B. wadei* Merrill &

Quisumbing (Merrill *et al.*, 1932; Hughes *et al.*, 2010) in Calamian Islands and *B. elnidoensis* C.I Peng, Rubite & C.W.Lin (Hughes *et al.*, 2018) in El Nido town in Palawan main island and satellite islands. Both species are easily distinguishable from other sect. *Baryandra* species by having robust, woody rhizomes. These are the only sect. *Baryandra* species to date that are observed to thrive mainly on habitats under full sunlight exposure.

Another species found in Calamian Islands is *B. coronensis* Merr. (Merrill, 1925), found near the coasts and further inland. *B. coronensis* was also observed to have a dormancy stage on dry periods around February to June. *B. woodii* Merr. (Merrill, 1925), another Palawan-endemic also have an evident dormancy stage but is the only *Baryandra* to date with tubers rather than rhizomes. Several studies already have identified *B. woodii* as one of the earliest diverging members of sect. *Baryandra* (Hughes *et al.*, 2015; Bucay *et al.*, 2025). Despite relative proximity to Ilin Island of the islands of Calamian (~100 kilometers) and Palawan mainland (~189 kilometers), *B. ilinensis* appears very distinct from the species found in these nearby islands.

In the other islands of the archipelago, *Begonia* species thriving on the coasts are also found. The most notable species thriving near coasts may be *B. fenicis* Merr. (Merrill, 1908), many populations of which have strong affinities with lithophytic environments in the northern islands of the Luzon Volcanic Arc. It is well distributed in the islands of northern Philippines (Babuyan and Batanes islands), Taiwan (Green and Orchid Islands) and Japan (Iriomote and Yonaguni Islands). *Begonia fenicis* was observed thriving on both exposed and semi-exposed formations in the coasts, but also a common resident of moist riverine lithophytic habitats further inland of these volcanic islands.

On Mindanao Island, *B. elmeri* Merr. (Merrill, 1918) is one of the most widely distributed species with coastal populations reaching other surrounding islands such as Dinagat, Bucas Grande and even Leyte. However, the type locality of *B. elmeri* is nowhere near the coast but located further inland of Northeast Mindanao mainland. In the southern part of Eastern Mindanao Biodiversity Corridor (EMBC), the species *B. dorisiae* Bucay, Tandang & K.F. Chung (Bucay *et al.*, 2025) and *B. amparoae* F.A.Blasco, Alejandro, Tandang & Rubite (Blasco *et al.*, 2022) were also observed to thrive on limestone cliffs. These two coastal species share the same clades with the species in the EMBC such as *B. elmeri* and even the more inland species *B. medinae* Bucay, Tandang & K.F. Chung (Bucay *et al.*, 2025).

Insights on the ecology of these *Begonia*s that can thrive near the coast can further advance our understanding on these plants' evolution. Of the 99 known sect. *Baryandra* species, an overwhelming majority prefers moist, well-shaded habitat, which is also a shared conserved niche of majority of the current >2000

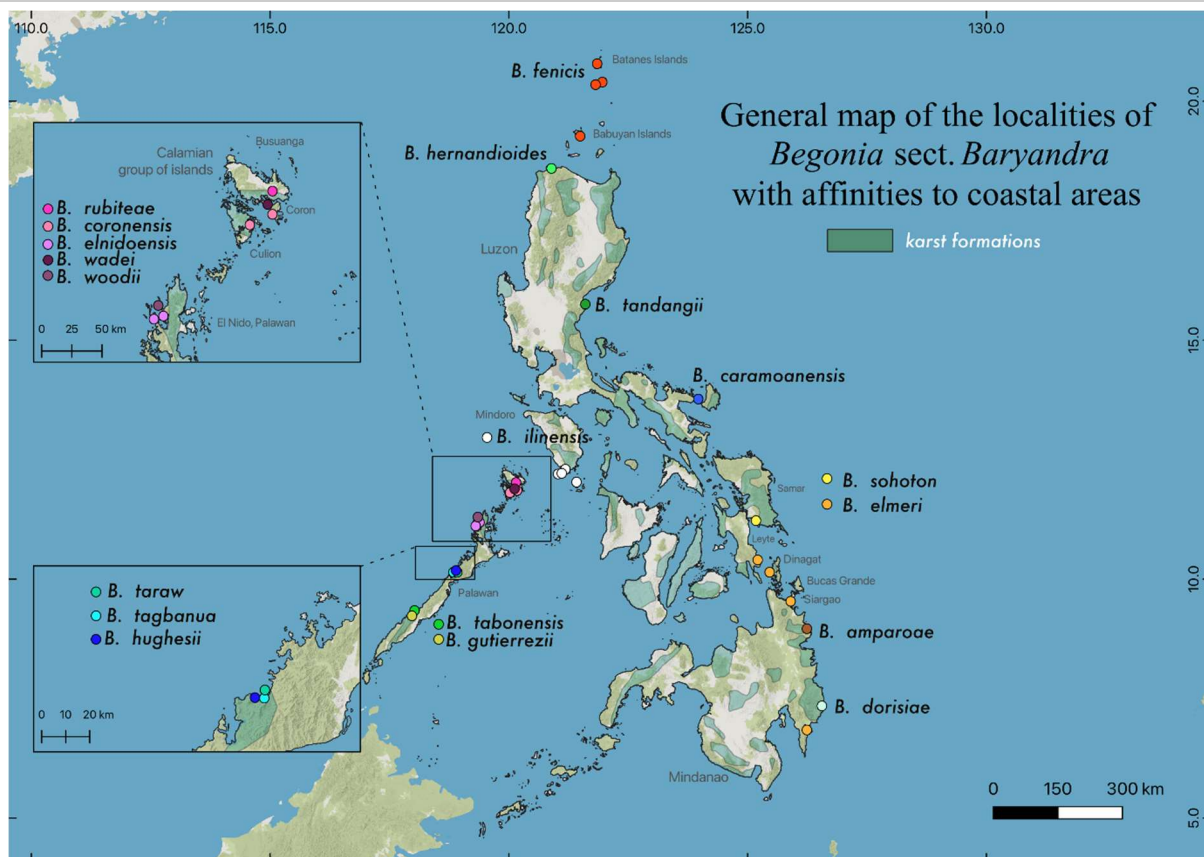


Fig. 4. Map showing the general type locality of *B. ilinensis* in Ilin Island, off the coast of the main Mindoro island and the other observed populations on nearby coastlines. Map created by MACB.

Table 2. Summary of observed *Begonia* sect. *Baryandra* species associated with coasts

Species	Locality	Notes
<i>B. amparoe</i>	Surigao del Sur, Mindanao Island	Affinity to densely vegetated limestone formations
<i>B. caramoanensis</i>	Caramoan, Camarines Sur, Bicol region, Southern Luzon	Affinity to exposed and semi-exposed limestone areas near the coasts and further inland
<i>B. coronensis</i>	Calamian group of islands	Found on limestone formation along coasts but are also observed on inland moist non-limestone lithophytic areas
<i>B. dorisiae</i>	Davao Oriental, Mindanao Island, Philippines	Affinity to densely vegetated limestone formations
<i>B. elmeri</i>	Dinagat Island, Bucas Grande Island, Surigao del Norte, Mindanao Island, Hinundayan, Southern Leyte, Leyte Island	Affinity to densely vegetated limestone formations near the coasts and further inland
<i>B. elnidoensis</i>	El Nido town and satellite islets, Northern Palawan Island	Strict affinity to exposed limestone walls
<i>B. fenicis</i>	Babuyan and Batanes archipelago, Philippines; Orchid and Green Island, Taiwan; Ryukyu archipelago, Japan	Affinity to semi-exposed lithophytic areas, not strictly limited on limestone formations. Can also be found further inland on moist rocky surfaces.
<i>B. gutierrezii</i>	Lipuun Point, Quezon, Western Palawan Island	Affinity to semi-exposed limestone areas
<i>B. hernandioides</i>	Ilocos and Cagayan provinces, Northern Luzon island seaboard	Affinity to semi-exposed limestone and non-limestone understory substrates
<i>B. sohoton</i>	Samar Island	Affinity to densely vegetated limestone formations and understory substrates near the coasts and further inland
<i>B. tabonensis</i>	Lipuun Point, Quezon, Western Palawan Island	Affinity to semi-exposed limestone areas
<i>B. tagbanua</i>	Puerto Princesa, Central Palawan	Affinity to semi-exposed limestone areas
<i>B. tandangii</i>	Aurora, Eastern Luzon island seaboard	Affinity to semi-exposed limestone areas
<i>B. taraw</i>	Puerto Princesa, Central Palawan	Affinity to semi-exposed limestone areas
<i>B. wadei</i>	Calamian group of islands	Strict affinity to exposed limestone walls
<i>B. woodii</i>	Lagen Island, El Nido, Palawan	Affinity to semi-exposed limestone areas



begonias of the world. This preliminary report can be further be used to test several hypotheses on the evolution of these plants away from their usual shaded habitats and potential underlying mechanisms that made this adaptation possible.

ACKNOWLEDGMENTS

The authors would like to thank the Department of Environment and Natural Resources– Biodiversity Management Bureau (DENR–BMB) for the issuance of the Gratuitous Permit No (No. 320) for the collection of the type specimen to MACB. The authors would also like to thank the DENR field office of CENRO–San Jose, and the different Barangay Local Government Units in the Ilin Island for the coordination of the study. The authors would especially want to thank all the Tamaraw Conservation Program staff for facilitating and coordinating the field collection of the new plant species. We also would like to thank the national and local offices of the Bureau of Plant Industry, Department of Agriculture of the Philippine Government, and the Animal and Plant Health Inspection Agency of the Taiwan Government for the assistance with the quarantine and transport clearances. We are also grateful for the support of the Experimental Greenhouse, Academia Sinica, Taiwan. We would also like to thank the National Museum of the Philippines for the deposition of the type specimen. This study was funded by the following research funds: National Science and Technology Council (NSTC) of the government of Taiwan under grant number MOST 111-2621-B-001-004-MY3 awarded to K-FC; International Association for Plant Taxonomy (IAPT) through the Biodiversity Challenge 2022 awarded to MACB; Society of Systematic Biologists (SSB) through the Graduate Student Research Award 2022 awarded to MACB; and the Linnean Society of London and Systematics Association (LinneSys) through the Systematics Research Fund 2023 awarded to MACB.

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