

## ***BEGONIA LECONGKIETII* (SECT. *PETERMANNIA*), A NEW SPECIES FROM MOUNT DẦU, SOUTH CENTRAL COAST REGION, VIETNAM**

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A new species of *Begonia* (*B. lecongkietii* N.S.Lý & M.Hughes) is described from Mount Dầu in the South Central Coast Region, Vietnam, an area with an abundance of recently described endemic plant taxa. The new species is allied to *Begonia lamxayana* Souvann., which occurs 600 km away in Laos, differing chiefly in having larger villose tepals with an undulate margin and larger androecium with 86–116 (versus 20–30) stamens. *Begonia lecongkietii* is considered Critically Endangered, owing to its small area of occupancy and decline of habitat quality.

*Keywords.* Biodiversity, conservation, endemism, taxonomy.

### INTRODUCTION

There are twelve continental Asian species of *Begonia* sect. *Petermannia* and allies, in great contrast to the diversity of Malesia, which harbours 415 species in the section (Hughes, 2008; Hughes *et al.*, 2015–; Lin *et al.*, 2017). The continental species are found in China (*Begonia hainanensis* Chun & F.Chun, *B. pellionoides* Y.M.Shui & W.H.Chen, *B. sinofloribunda* Dorr, *B. sublongipes* Y.M.Shui), Vietnam (*B. abbreviata* C.-I. Peng, *B. boisiiana* Gagnep., *B. cucphuongensis* H.Q.Nguyen & Tebbitt, *B. eberhardtii* Gagnep., *B. rubrosetosa* Aver.), Laos (*B. lamxayana* Souvann.), Thailand (*B. wrayi* Hemsl.) and Peninsular Malaysia (*B. holttumii* Irmsch., *B. wrayi*) (Hughes *et al.*, 2015–). This group of species is not a natural group, and indeed, some of them are not placed in sect. *Petermannia*, but they share an evergreen caulescent growth form (a creeping rhizome in the case of *Begonia abbreviata* and *B. eberhardtii*), lack tubers, and usually have protogynous inflorescences with a small number of female flowers and many more male flowers. Two of the species from the south of the continent (*Begonia holttumii* and *B. wrayi*) belong to the core *Petermannia* clade, which is most diverse in Malesia (Thomas *et al.*, 2012), whereas the remainder from further north are a phylogenetically disparate group (Chung *et al.*, 2014), although only a few have been sampled to date. *Begonia*

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*sinofloribunda* has been recently assigned to sect. *Coelocentrum* based on molecular data, although it remains morphologically aberrant in the section, and *B. boisiiana* is an early diverging lineage in Asian *Begonia* (Tebbitt *et al.*, 2006; Chung *et al.*, 2014). Here we add a further species to this group of continental sect. *Petermannia*, a group that begs further phylogenetic and biogeographic investigation. This is the latest addition to the endemic flora of Mount Dàu, the scene of many recent discoveries, including an endemic genus of Araceae (Lý *et al.*, 2017). All measurements and descriptions of the new species are based on fresh material collected during field trips.

#### SPECIES DESCRIPTION

***Begonia leongkietii*** N.S.Lý & M.Hughes, **sp. nov.** Sect. *Petermannia*

Most similar to *Begonia lamxayana* Souvann., but differs in having leaves with short fleshy strigose hairs spaced along the veins abaxially (versus dense glandular hairs), densely villose pedicels and tepals (versus glabrous), larger tepals in the male flower (13.5–18 mm long versus 5–8 mm long), with the tepals having an undulate margin (versus flat), more stamens (86–116 versus 20–30) and longer petioles (2–6.3 cm versus 0.5–1 cm). – Type: Vietnam, Quảng Ngãi Province, Nghĩa Hành District, Hành Tín Đông Commune, Khánh Giang Village, Đá Bàn Hill, 14°53.691'N, 108°48.336'E, 489 m elevation, 11 iv 2015, *Ngọc-Sâm Lý Lý* 608 (holo VNM; iso E, P). **Fig. 1.**

Perennial, erect caulescent herb to 85 cm tall. *Stem* slightly woody, glabrescent, internodes (1)–1.5–5(–8) cm long, slightly swollen at nodes, young stem dull green-purple to red-purple with somewhat strigose hairs, becoming greyish and glabrescent. *Stipules* narrowly ovate-lanceolate, 1.2–1.6 cm long, 2.6–3.5 mm at widest point, opaque greenish or green-reddish, outer surface with strigose hairs, inner surface glabrous, with a shortly filiform extension at the tip 2–3 mm long, caducous. *Leaves* alternate; petiole 2–6.3 cm long, red-purple, with rather short strigose hairs; lamina basifixed, 12–24.5 × 4.5–9.5 cm, asymmetrical, somewhat elliptic-lanceolate, thin and chartaceous when dry, base cordate with somewhat overlapping lobes, apex long acuminate, margin irregularly dentate, venation palmate-pinnate, adaxially dark green with fleshy bristles scattered midway between the veins, abaxially maroon or green-maroon, with short fleshy strigose hairs spaced along the veins and minute white bristles scattered between the veins. *Inflorescence* bisexual, axillary and/or terminal; dichasial cymes, peduncle 20–25 mm long, c. 1.5 mm wide, purple, densely villose; 2–5 branches, 5–40 mm long, usually 2 female flowers at base and 2–5 male flowers distally, protogynous; bracts semipersistent, membranous, suborbicular, 5–7 mm long, 4.5–6 mm wide, opaque whitish and rusty brown when aged, with a few strigose hairs on midvein of outer surface, inner surface glabrous, apex attenuate, margin dentate. *Male flowers* on 12–19 mm long, 0.4–0.6 mm thick pedicels, red-purple or greenish, villose; tepals 4: two outer tepals suborbicular, 13.5–18 × 11–14.5 mm, outer surface greenish,

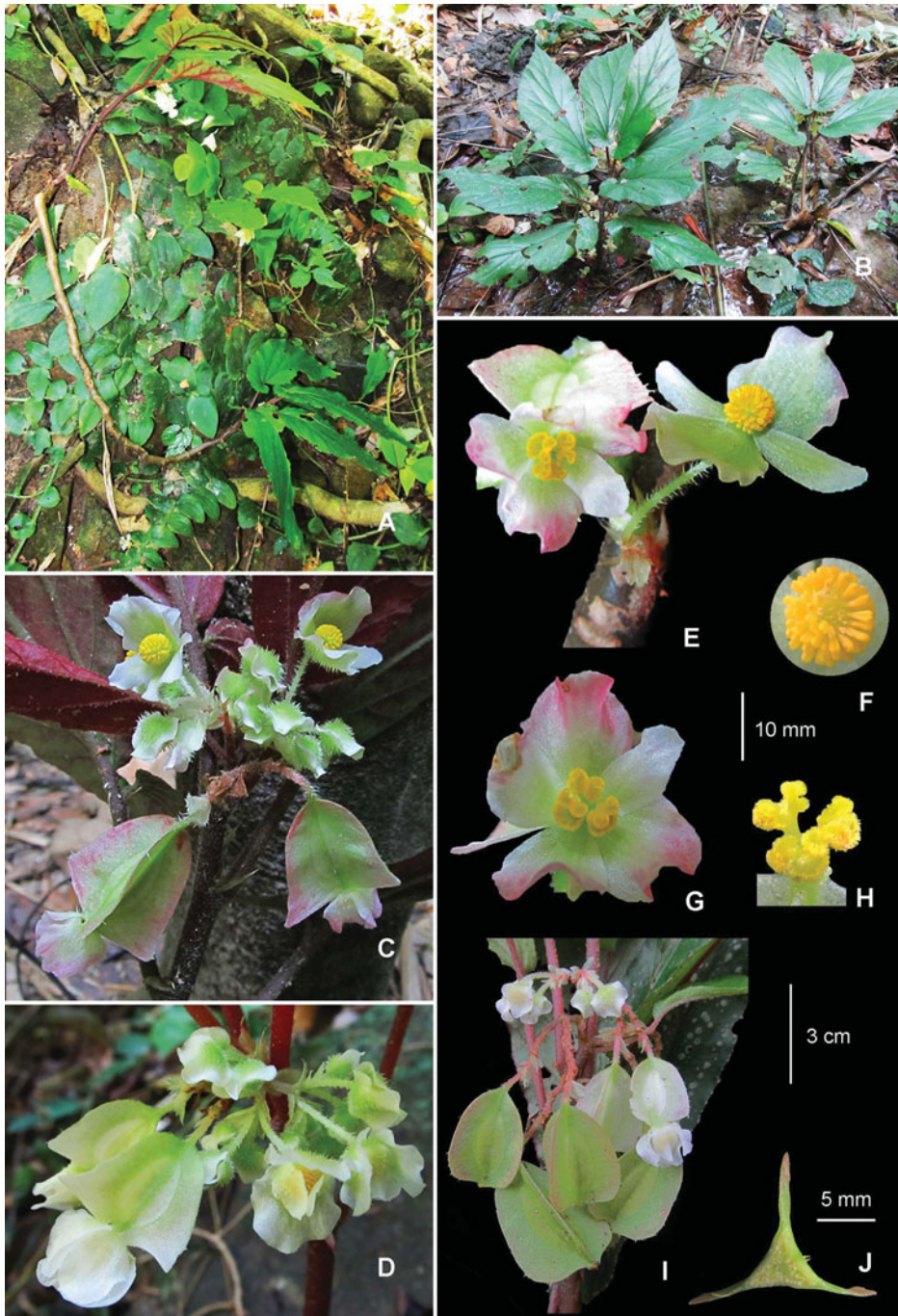


FIG. 1. *Begonia lecongkietii*. A and B, Plants in their natural habit; C and D, inflorescences showing female flowers of different colours; E, detail of male and female flowers; F, top view of androecium; G, close-up of female flower; H, detail of stigma; I, infructescence; J, cross-section of mature fruit. Scale bars: E–H, 10 mm; I, 3 cm; J, 5 mm. Photograph by Ngọc-Sâm Lý: A, Lý 572; B–J, Lý 608.

densely villose from base to three-quarters of tepal, white-pinkish tinge and glabrous in upper third, inner surface paler and glabrous, margin entire, undulate, slightly curved outwards; two inner tepals obovate to oblanceolate, 10–14 × 3.5–5 mm, paler than outer ones, with a few villose hairs at basal third of outer surface, margin somewhat straightened and shallowly crenate; androecium actinomorphic, with 86–116 stamens in a dense capitulum, subglobose, 5–7 mm in diameter, bright yellow, stamen 2–3 mm long; filaments 1–1.2 mm long, fused into a short central column; anther obovate, 0.9–1.2 mm long, dehiscing by longitudinal slits, c.0.5 mm long, connective not extended, apex slightly retuse. *Female flowers* on 19–21 mm long, 0.8–1 mm thick pedicels, angled obliquely downwards, red-purple or greenish, villose; ovary trilocular, obovoid, (15–)22–28 mm long, (14–)20–26 mm at apex including wings, light greenish or pale reddish green, glabrous, wings 3, subequal, 11–15 mm wide, margin with a few strigose hairs; placentas 2 per locule; tepals 5, unequal, outer two suborbicular, 7–7.5 × 7 mm, inner three broadly obovate, c.7 mm long, c.6 mm at widest point, outer surface white or tinged greenish white and villose in basal half, distally tinged white pinkish and glabrous, inner surface paler and glabrous, margin entire, undulate; styles 3, 2–2.5 mm long, shortly fused at base c.0.5 mm long, broadening and flattened towards the apex, yellow-greenish, distally yellow; stigma densely setose-papillose, linear-cristate, lateral sides expanded into short helicoid band. *Infructescence* to 5 cm long; fruit pendent, on 8–12 mm pedicels, mature capsule 2.8–3.2 × 1.2–2.2 cm, wings equal and rounded at base, truncate at apex. *Seeds* ellipsoid, 0.2–0.3 mm long, light brown.

*Additional specimens examined.* VIETNAM: **Quảng Ngãi Province:** Nghĩa Hành District, Hành Tín Đông Commune, Trường Lệ Village, Mount Dầu, Chí Stream, 14°52.702'N, 108°49.121'E, 108 m elevation, 19 v 2015, *Ngọc-Sâm Lý*, *Lý* 649 (VNM); *ibid.*, Hill 48, around 14°51.791'N, 108°48.529'E, 153 m elevation, 8 iv 2015, *Ngọc-Sâm Lý*, *Lý* 572 (VNM); *ibid.*, 14°51.737'N, 108°48.251'E, 108 m elevation, 9 iv 2015, *Ngọc-Sâm Lý*, *Lý* 575 (VNM).

*Distribution and ecology.* *Begonia lecongkietii* is endemic to Quảng Ngãi Province in the South Central Coast Region, Vietnam. It is known only from the type locality, Mount Dầu, in habitats such as stream banks, on shaded steep slopes in secondary evergreen broadleaved forest dominated by dipterocarps and associated with recently described endemic taxa such as *Newmania orthostachys* N.S.Lý & Škorničk. and *Newmania serpens* N.S.Lý & Škorničk. (Leong-Škorničková *et al.*, 2011), *Zingiber skornickovae* N.S.Lý (Lý, 2016), *Aspidistra averyanovii* N.S.Lý & Tillich (Lý & Tillich, 2016) and *Alpinia newmanii* N.S.Lý (Lý, 2017), at elevation c.100–490 m.

*Phenology.* Flowering from April to May and fruiting from late May to June or July.

*Etymology.* Named in honour of Professor Lê Công Kiệt, University of Science, Vietnam National University, Hồ Chí Minh City, for his long-time contribution to Vietnamese botany.



*Preliminary IUCN conservation assessment.* Critically Endangered (CR B2a,b(ii,iii)). Four small populations of *Begonia lecongkietii* occur on Mount Dầu, with fewer than 10 individuals of mature plants in each population, and with a total area of occupancy of 6.5 km<sup>2</sup>. Although this species is under the protection of the local authorities of Khánh Giang and Trường Lệ Villages (Quảng Ngãi Province), these populations are vulnerable and continuing to decline in area, extent and quality of habitat, owing to destruction through human activities, such as harvesting of non-timber forest products (medicinal plants and rattans), forest fires, and especially clearing of forest land for *Acacia* plantations. The first author has surveyed areas around Mount Dầu, but no further populations of this species were found. According to the IUCN Red list criteria (IUCN, 2012), this qualifies it as Critically Endangered (CR B2a,b(ii,iii); severely fragmented, with an inferred decline in the area of occupancy and quality of habitat).

*Begonia lecongkietii* is most similar to *B. lamxayana* and seems likely to be a sister species to that taxon. There is a considerable distance between the two species, with *Begonia lamxayana* restricted to central Laos (Souvannakhoummane *et al.*, 2016), approximately 600 km north-west of the only known populations of *B. lecongkietii*.

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