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Begonia ornithopedata (sect. *Coelocentrum*), a new species with the bird-foot shaped leaves from Guangxi of China

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ABSTRACT: China is highly rich in diversity of *Begonia*, and in which Guangxi Zhuangzu Autonomous Region, following Yunnan province, has the second highest number of *Begonia* species. As a distribution center of *Begonia* sect. *Coelocentrum*, Guangxi already had 58 species recognized in this section. In this paper, *Begonia ornithopedata*, a new taxon of *B.* sect. *Coelocentrum* from southwestern Guangxi is described. With the bird-foot-shape lobed leaves, the new species is easily distinguished from any of other taxa, excepting few similarities only in leaf morphology of *B. laminariae* Irmsch. and *B. circumlobata* Hance. Its conservation status is assigned as the Endangered according to The Guidelines for Using the IUCN Red List Categories.

KEY WORDS: *Begonia circumlobata*, *Begonia fangii*, *Begonia laminariae*, *Begonia leipingensis*, karst region, *Platycentrum*.

INTRODUCTION

China is highly rich in diversity of *Begonia* (Tian *et al*., 2018) and has 264 recognized species till now based on our literature review. There are still many new species and natural hybrids waiting for further exploration and description, and by estimate, the total number of species will possibly reach 350 and even more. Guangxi Zhuangzu Autonomous Region, following Yunnan province, has the second highest number of *Begonia* species in China, with 84 species being recognized so far according to our data review to March 19, 2024, and by estimate the species number of begonias in this region will be definitely over 100 species in the very near future. The majority of which belong to *B.* sect. *Coelocentrum* (58 species till now, including *B. barosma* X.X.Feng, Y.N.Huang & Z.X.Liu, Feng *et al.*, 2023, and *B. floriprolifera* J.Y.Zhou & D.K.Tian, Zhou *et al.*, 2024), followed by *B.* sect. *Platycentrum* (20 species). The karst region of Guangxi and northern Vietnam is definitely the distribution center of *B.* sect. *Coelocentrum*, which possibly has more than 100 species by Daike Tian's prediction after the extensive field surveys by him and other researchers in the recent years. Based on the field surveys in southwestern Guangxi, literature review, and specimen examination, we confirmed a new species (*B.* sect. *Coelocentrum*) with the unique foliage and described here with the information on morphology, distribution, and conservation status evaluation. The drawing figures and color-photo plates of its plant are also provided.

TAXONOMIC TREATMENT

Begonia ornithopedata D.K.Tian & R.K.Li, ***sp. nov.*** **鸟足叶秋海棠 Figs. 1, 2 & S1**

Type*:** CHINA. Shanghai Botanical Garden, greenhouse cultivated plants (introduced from Longzhou county of Guangxi), 21 April 2020, *Daike Tian & Jiaqi Qin, TDK4030* (holotype***: CSH0186723, CSH!, ***isotypes***: CSH!) (Fig. S1).

***Diagnosis*:** *Begonia ornithopedata* is very easily recognized by its unique leaf morphology with three to five deeply incised lobes like a bird foot, and no other species with such deep lobed leaves have been ever found in *B.* sect. *Coelocentrum*.

In the same section, the leaflet shape and texture of *B. fangii* Y.M. Shui & C.I Peng (Peng *et al.*, 2005) and *B. leipingensis* D.K.Tian, L.H.Yang & C.Li (Li *et al.*, 2016) have somewhat similarity to the lobes of new species, but the leaves of the former two are palmately compound. Although the leaves of *B. laminariae* Irmsch. (Irmscher, 1951) and *B. circumlobata* Hance (Hance, 1883) are also deeply incised with a similar lobe pattern, but these species belong to sect. *Platycentrum* with remarkably different morphology in blade texture, flowers and fruits, and therefore are easily distinguished from the new species.

Description: Herb, evergreen, 17–25 cm tall, monoecious; rhizome 10–20 cm long, 10–15 mm thick, internodes very short to nearly absent; aerial stem absent; stipule large, only few visible near the shoot top, pink, triangular, 17–22×16–18 mm, with whitish-pink pilosity along abaxial midrib (middle to upper position), margin, and apex arista. **Leaves** 2–4, blade waxy, glossy, relatively thick and rigid, purplish-red at the youngest stage, then turning greenish-yellow, and finally green when mature, 8.5–27×10–26 cm, palmately 3–5 (often 4) lobed to 2/3–3/4, lobe nearly lanceolate to slightly falcate, usually long-tailed, mid-lobe 5.5–17.5×1.3–4.7 cm, adaxially sparsely short-hispid (< 0.5 mm long), abaxially

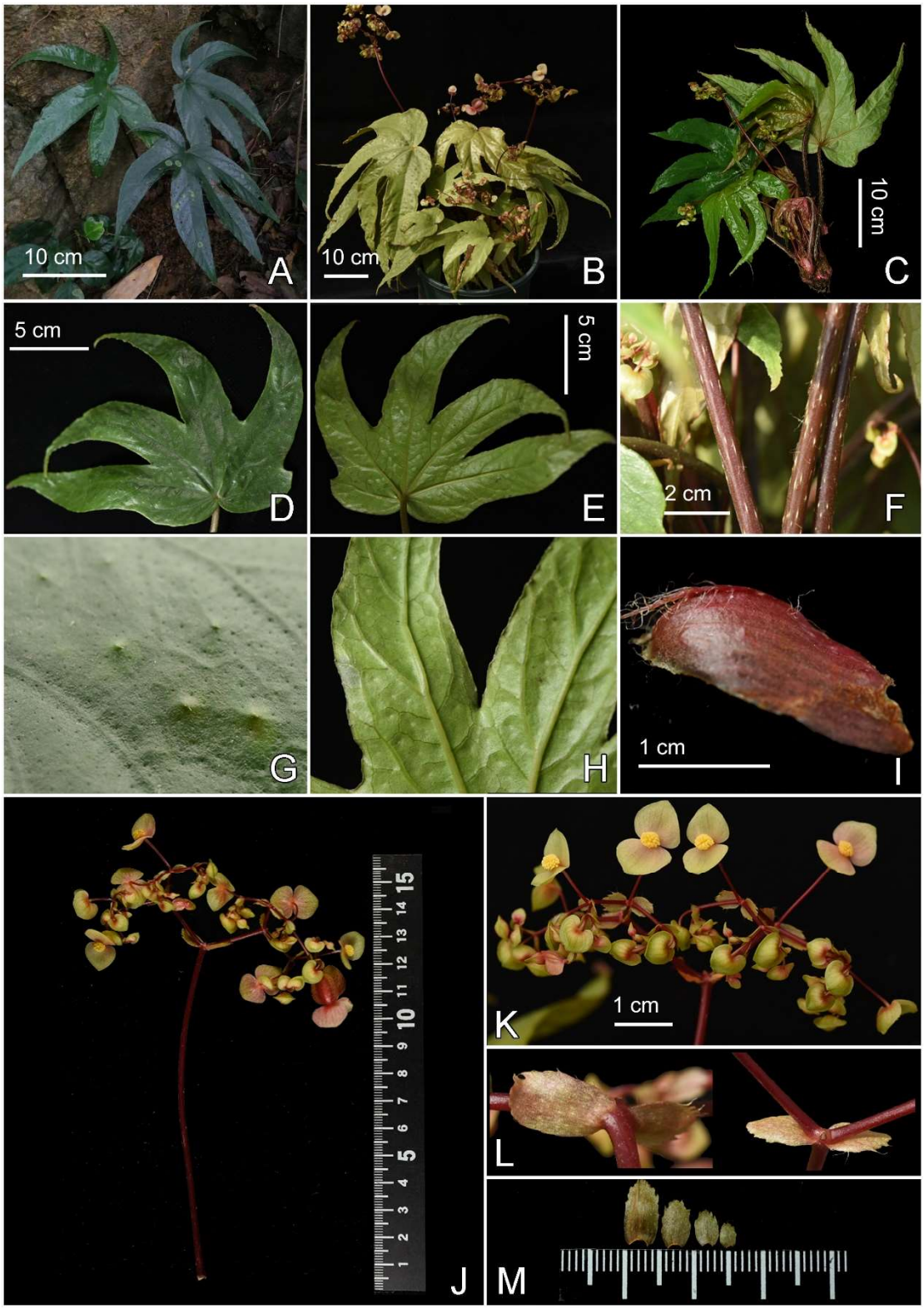

Fig. 1. Habit and morphology of ***Begonia ornithopedata.*** **A.** Habit; **B.** Potted plant in blooming with young yellowish-green leaves; **C.** Flowering plant with different colored leaves in several growth stages; **D.,G.** Adaxial leaf surface showing very sparse and short rigid hairs (G) ; **E.,H.** Abaxial leaf surface showing waxy glabrous texture and raised veins; **F.** Petioles with white fusiform spots; **I** Stipule showing midrib and hairs; **J** Inflorescence showing bracts and flowers; **K.** Inflorescence showing male flowers and bractlets; **L** Bracts**; M.** Bract (left one) and bracteoles (right three) showing size variation and toothed margin on upper-position and apex. (Photos A by Renkun Li and B–M by Daike Tian)

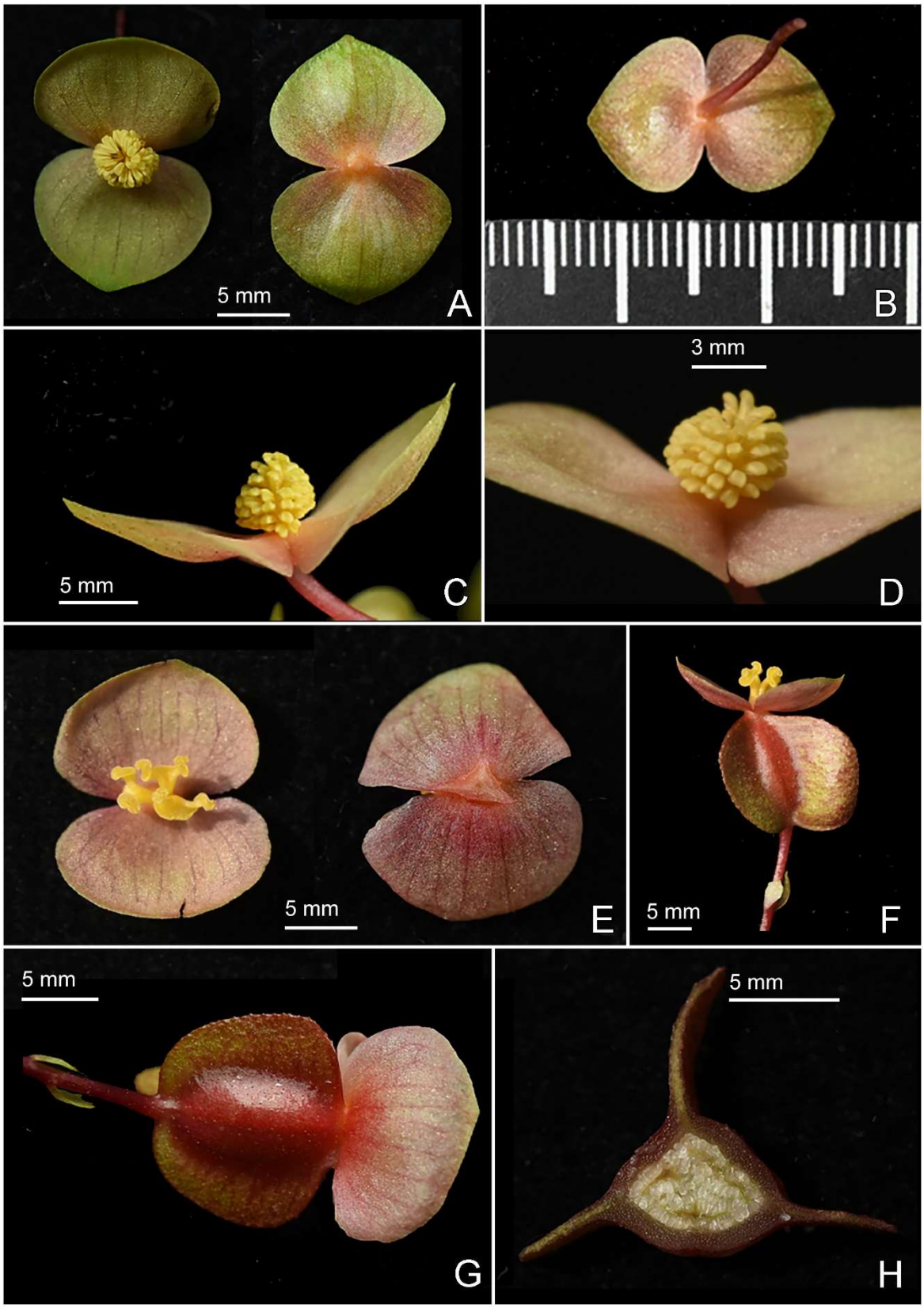

Fig. 2. Detailed morphology of ***Begonia ornithopedata.*** **A.** Front and dorsal views of staminate flower; **B.** Dorsal view of staminate flower; **C.** Lateral view of staminate flower; **D.** Lateral view of androecium; **E.** Front and dorsal views of pistillate flower; **F.** Lateral view of pistillate flower with 2 bracteoles on pedicel); **G.** Adaxial view of ovary; **H.** Dissected ovary showing parietal placenta. (Photos by Daike Tian)

glabrous; base valvate to nearly detached; lobe apexacuminate; adaxial veins shallowly impressed but slightly convex at base, base veins usually purplish-red when young, abaxial veins remarkably raised; petiole reddish-brown, 7–35 cm long, 2–7 mm thick, ungrooved, sparsely white pilose (to 6 mm long) when young, glabrescent, fusiformly whitish-spotted. **Inflorescence:** axillary near rhizome top, 2–4 (often 2) per rhizome branch, 13–31 cm long, dichotomous, branched 2–5 times, peduncle dark red, glabrous, 11–27 cm long, 1.5–3 mm thick, 9–77 flowers per inflorescence. **Bracts** nearly persistent, dark red to reddish-green, triangular, 4–10×3–6.5 mm, middle-upper position of margin toothed; bracteoles 3–8×2–5 mm, upper margin toothed. **Staminate flower**: 15–22×10–14 mm, tepals 2, pinkish-green to pink (two days after flower opening), glabrous, broadly ovate or diamond-shaped, 8–20×10–14 mm, apex rounded, sometimes short-pointed; androecium nearly capitate, 2.5–3.5×3–5 mm; stamens 31–67, filaments free, ≤1 mm long, anther 0.8–1 mm long, apex usually retuse or nearly so; pedicel dark red, glabrous, 8–24 mm long, 0.6–1 mm thick. **Pistillate flower**: 18–22×12–15 mm, tepals 2, persistent, glabrous, greenish-pink or pink, oblate, 9–11×12–15 mm; gynoecium 3–5×3.5–7 mm; ovary dark red, glabrous, 1–loculed, placenta parietal; pedicel 16–24 mm long, 1 mm thick, dark red, glabrous, with a pair of small bracteoles on upper or middle position, light green, nearly obovate, 1.5–3×1–3 mm. **Fruit** dark red, elliptic, 9–10×7–8 mm (excluding fruit wings); abaxial wing ca. 8×12–13 mm, lateral wings ca. 3×9–11 mm.

***Etymology*:** The specific epithet refers to the lobed leaf blade which is similar to a bird's foot.

***Phenology*:** The plants bloom between April and June, the fruits ripen from May to July.

***Distribution and ecology*:** The new species is endemic to Guangxi of China, and currently it is only known from Yuyang village of Zhubu town in Longzhou county (Fig. S2). The plants grow on rock rocky surface or crevices under the forest of karst mountain at 280–600 meters altitude.

***Conservation status*:** Critically Endangered (CR) (B1B2ab(i to v)) (IUCN, 2022). The new species is only found in a village of Guangxi, China, and has only three minor subpopulations (< 200 mature individuals in total, and few seedlings) included in one subpopulation in a very narrow distribution area. Due to its attractive foliage with unique lobes, one of three populations has been already over-collected and the individual number of this species is predicated for a continuing decline. Therefore, *B. ornithopedata* should be suggested to be included in the future list of China National Protected Plants. However, further investigation is necessary on its actual distribution area and the number of populations and individuals.

***Note*:** The plants of this new species were originally collected by a local resident of Longzhou of Guangxi in October of 2016, and then introduced by Jiaqi Qin to Shanghai Botanical Garden in the same time. The morphological data and photos are mainly taken from the living plants cultivated in greenhouse of Shanghai Botanical Garden. In October of 2020 and June of 2023, respectively, Renkun Li found the wild plants of this species in Longzhou of Guangxi with three minor subpopulations during a field plant survey.

***Additional specimens examined*:** CHINA, Guangxi, Longzhou county, Zhubu (逐卜) town , Yuyang (峪阳) village, Fupai (伏排), 22°29'N, 107°1' E (Fig. S2), elev. 200–300 m, 18 June 2023, *Renkui Li, TDK5328* (CSH!).

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