



Begonia subfiliformis, a new species of *Begonia* (sect. *Coelocentrum*) from Guangxi of South China

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ABSTRACT: *Begonia subfiliformis* is a new species of *Begonia* section *Coelocentrum* found in the karst region of southwest Guangxi, China. It has yellowish-green flowers and glandular inflorescences. Morphologically, it is similar to *B. filiformis*, but differs mainly by larger stipules with hairy or nearly glabrous dorsal ridge, adaxial leaves sparsely short-hispid and adorned with whitish-green patches or ring-shaped belt, larger basal bracts, larger staminate flower and tepals, and more stamens. Due to the current data, the new species is assigned to Endangered (EN) according to Guidelines for Using IUCN Red List Categories and Criteria.

KEY WORDS: *Begonia daxinensis*, *Begonia filiformis*, *Begonia* sect. *Coelocentrum*, karst region, new taxon, Southwest Guangxi.

INTRODUCTION

Begonia is one of the most famous herbaceous flowers in the world, with a large number of horticultural varieties, currently about 20,000. The introduction, cultivation, and breeding of begonias began in the early 19th century and has a history of about 200 years (Ding and Zhang, 2017). Moreover, the investigation and systematic classification of *Begonia* L. resources have always been one of the key research tasks for scholars. In recent years, dozens of new taxa of *Begonia* have been discovered each year, and 2,166 accepted species have been published worldwide till the end of 2024 (Hughes *et al.*, 2015–Present). *Begonia* is widely distributed in the tropical and subtropical regions of Africa, Asia and America (Moonlight *et al.*, 2018).

Begonia has extremely diverse flower colors, mainly including red or pink, orange, yellow, white, yellowish-green, etc., and in which yellowish-green is one of the uncommon colors. Currently, among nearly 290 species of *Begonia* in China, only a few species such as *B. filiformis* Irmsch., *B. larvata* C.-I Peng, Yan Liu & W.B.Xu, *B. liuyanii* C.-I Peng, S.M.Ku & W.C.Leong, *B. masoniana* Irmsch. ex Ziesenh., and *B. sinofloribunda* Dorr have yellowish-green flowers or nearly so (Hughes *et al.*, 2015–Present). In recent years, we have discovered some new species (Tian *et al.*, 2024; Wang *et al.*, 2024; Zhou *et al.*, 2024; Xi *et al.*, 2025) and unknown taxa of *Begonia* in the karst region of southwest Guangxi. One of unknown taxa with yellowish-green flowers is similar to *B. filiformis* in morphology. Through literature review and follow-up investigation, we confirmed that it is new to science in *Begonia* sect. *Coelocentrum* having the typical characteristics including short rhizomes or long

creeping rhizomes without erect stems, 4 (rarely 2) tepals of staminate flowers and 3 (rarely 2) tepals of pistillate flowers, ovary with placentation parietal, and being endemic to karst habitat. We named it as *Begonia subfiliformis* D.K.Tian & J.Y.Zhou.

TAXONOMIC TREATMENT

Begonia subfiliformis D.K.Tian & J.Y.Zhou *sp. nov.*

拟丝形秋海棠 Figs. 1, 2

Type: China. Guangxi Zhuang Autonomous Region: Chongzuo (崇左) City, Tiandeng (天等) County, Fuxin (福新) Town, under the evergreen broad-leaved forests, 22°53', 106°53', elev. 400–500 m, with flowers and fruits, 12 May 2020, Daiké Tian, Jinye Zhou TDK4061 (holotype CSH! CSH0186846; isotype CSH!).

Diagnosis: *Begonia subfiliformis* is mostly similar to *B. filiformis* Irmsch., but differs mainly by its larger stipules 7–24 × 5–18 mm (*vs.* 5–10 × 5–7 mm) with hairy or nearly glabrous (*vs.* hairy) dorsal ridge, adaxial leaf sparsely short-hispid (*vs.* densely villous) and adorned with whitish-green patches or ring-shaped belt (*vs.* radial patches or spots), abaxial leaf densely villous or villous-hirsute only along veins (*vs.* densely villous whole back), stout and upright inflorescences (*vs.* delicate and drooping), larger basal bracts 4–12 × 3–8 mm (*vs.* 4–7 × 1.1–1.5 mm), larger staminate flowers 16–35 × 10–25 mm (*vs.* 20–25 × 10–15 mm) (Table 1) (Gu *et al.*, 2007; Ku, 2006). In addition, it is similar to *B. daxinensis* T.C.Ku and *B. morsei* Irmsch. in leaf shape and texture, but can be easily distinguished from *B. daxinensis* by indumentums of petiole and abaxial leaf, flower color, androecium shape, number of stamens and capsule indumentum (Table 1) (Wu and Ku, 1997; Gu *et al.*, 2007),

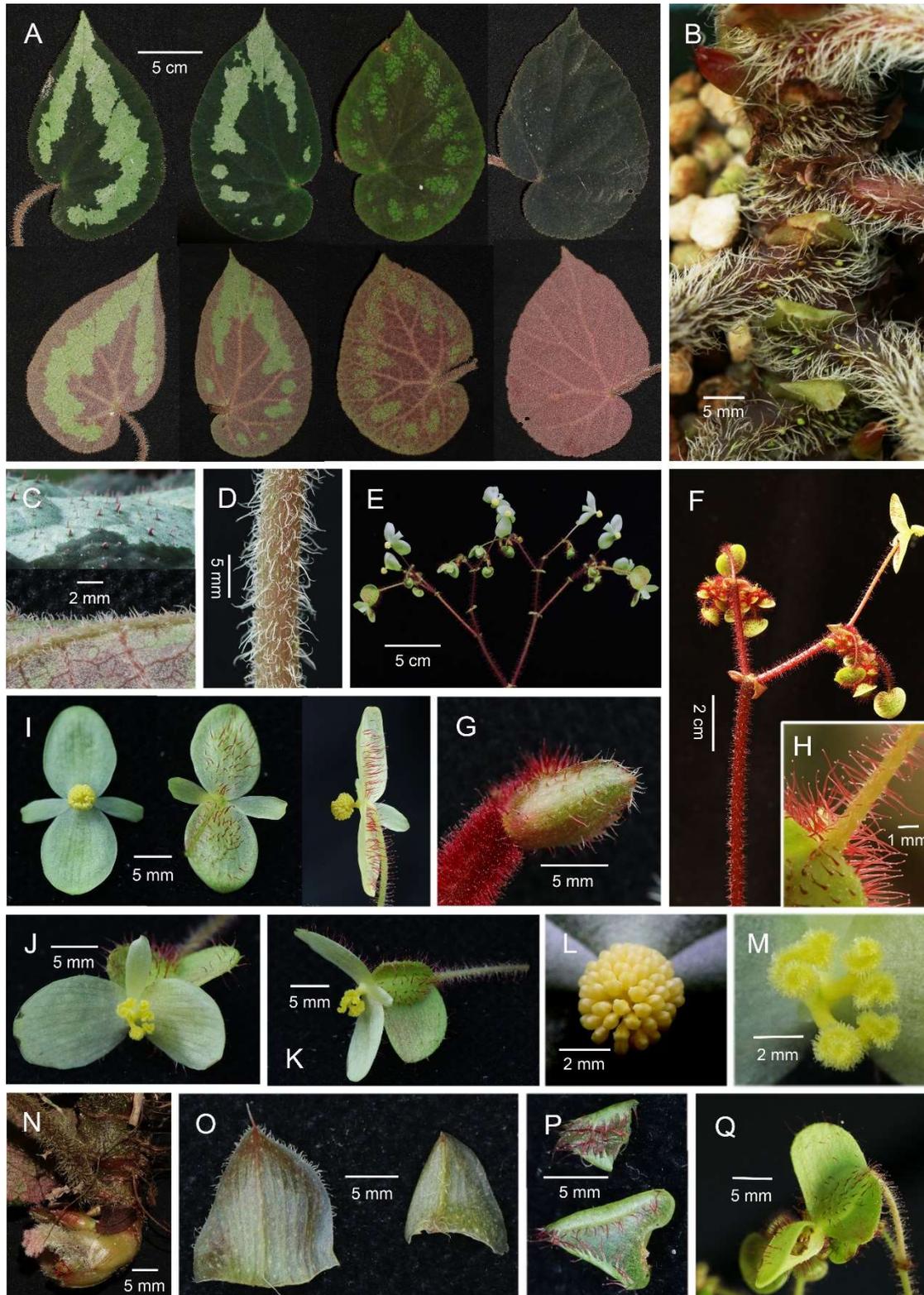


Fig. 1. Morphology of *Begonia subfiliformis* D.K.Tian & J.Y.Zhou. **A.** Leaves showing diversity in variegation patterns of two sides; **B.** Rhizome with grayish-white villous; **C.** Leaf sections showing adaxial and abaxial indumentums; **D.** Petiole section; **E & F.** Inflorescences; **G.** Young inflorescence with bracts; **H.** Pedicel with red glandular villous; **I.** Front (left), back (middle) and side (right) views of staminate flower; **J & K.** Front (left) and side (right) views of pistillate flower; **L.** Top view of androecium; **M.** Top view of stigmas; **N & O.** Stipules showing hairy or nearly glabrous dorsal ridge and margin; **P.** Bracts; **Q.** Side view of young fruit. (Photos by Jinye Zhou)

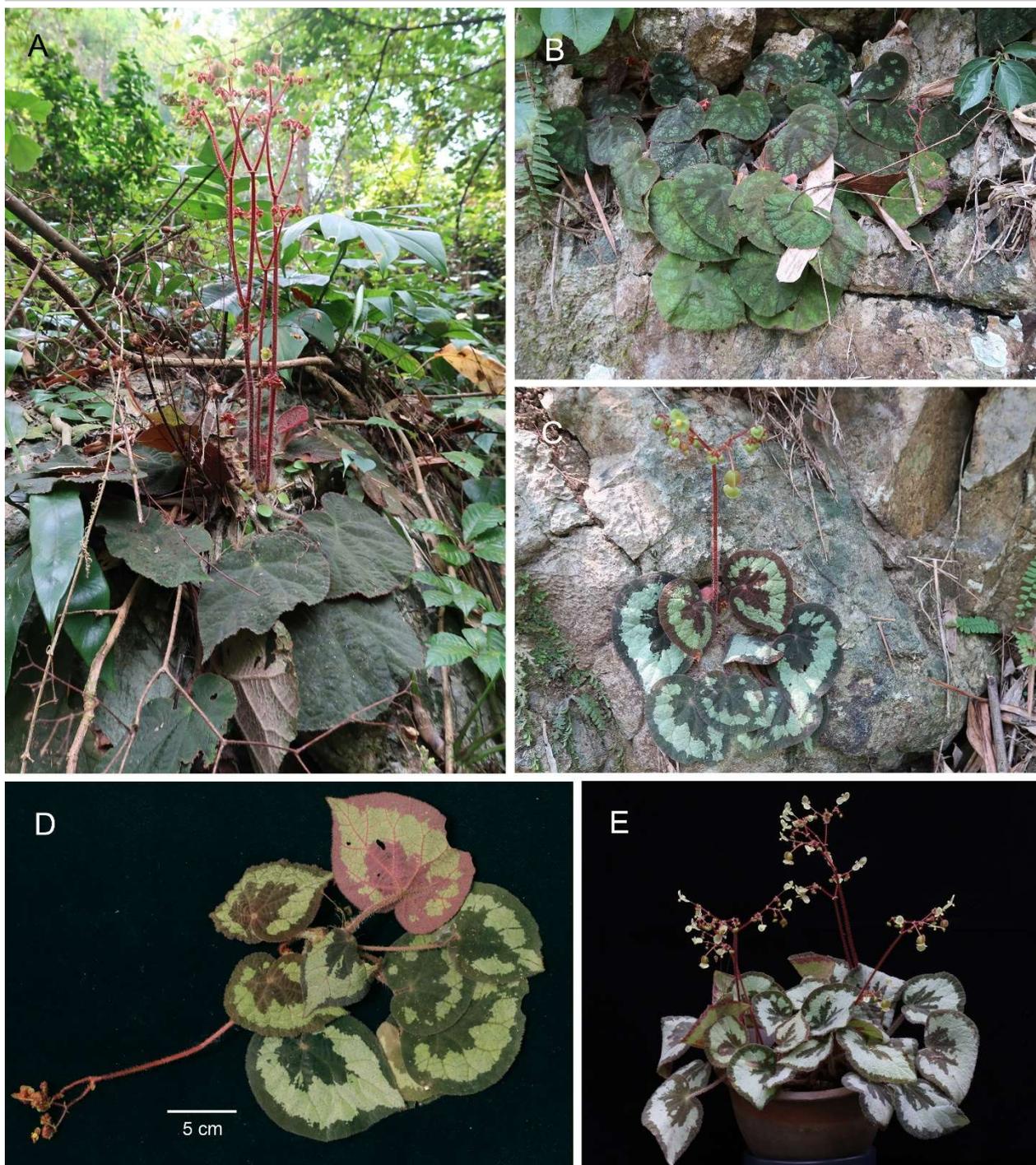


Fig. 2. *Begonia subfiliformis* D.K.Tian & J.Y.Zhou. **A–C.** Habitat and habit, photographed in Tiandeng, China; **D.** Wild plant, photographed in Tiandeng, China; **E.** Cultivated plants. (Photos by Jinye Zhou)

and distinguished from *B. morsei* by leaf size, peduncle length, flower number and color, pedicel and tepal indumentum and phenology (Gu *et al.*, 2007).

Description: Perennial herb, monoecious, rhizomatous, 5–20 cm tall, erect stem absent. **Rhizome** creeping, green when young, gradually grayish-white when mature, unbranched to branched 1 time, usually 5–20 cm and up to

40 cm long, 5–20 mm thick, internodes extremely short, less than 1 cm long, densely grayish-white villous. **Stipules** caducous, seen only at several segments toward shoot apex, yellowish-green or occasionally pale pinkish-green, broadly triangular, 7–24 × 5–18 mm, with dorsal ridge and apex awn, abaxially glabrous, with grayish-white villi at dorsal ridge and margin, rarely glabrous, hairs 3–5 mm at

Table 1. Comparison of *Begonia subfiliformis*, *B. filiformis* and *B. daxinensis*.

Characters	<i>B. subfiliformis</i>	<i>B. filiformis</i>	<i>B. daxinensis</i>
Stipule			
size (mm)	7–24 × 5–18	5–10 × 5–7	6–26 × 4–17
dorsal ridge indumentum	sparsely, rarely glabrous	sparsely	sparsely
Petiole indumentum	densely	densely	sparsely to moderately
Leaf			
adaxial indumentum	sparsely short-hispid	densely villous	sparsely setulose or scaberulose
adaxial maculation	patches or ring-shaped belt, few not obvious	radial patches or spots	ring-shaped belt
abaxial indumentum	densely villous or villous-hirsute along veins	densely villous	villous along veins
Inflorescence			
peduncle	stout, upright, densely glandular hirsute	delicate, drooping, densely glandular villous	stout, upright, pilose or sparsely villous
basal bract size (mm)	4–12 × 3–8	4–7 × 1.1–1.5	unknown
tepal color	yellowish-green	yellowish-green	white or pinkish
Staminate flower			
size (mm)	16–35 × 10–25	20–25 × 10–15	24–38 × 24–28
outer tepal size (mm)	8–18 × 7–15	10–12 × 7–8	12–19 × 10–16
inner tepal size (mm)	6–12 × 2–5	5–7 × 2.5–3	12–14 × 4–5
androecium	nearly actinomorphic, usually capitate or pinecone-shaped	actinomorphic, capitate	bilaterally symmetric, upward curved
number of stamens	(53–)76–107(–123)	45–70	16–27
Capsule indumentum	red glandular hirsute	brown glandular villous	glabrous

dorsal ridge and margin ciliae *ca.* 1 mm long. **Petioles** yellowish-green to reddish-brown, terete, 4–23 cm long, 3–7 mm thick, densely grayish-white villous, hairs *ca.* 5 mm long. **Leaves** 5–10 per plant, papery, ovate, asymmetric, 7–24 × 5–17 cm, decurrent part 1.8–7 cm; adaxially dark green to dark brown, usually adorned with silver-white patches, few not obvious, patches often form ring-shaped belt, sparsely short-hispid, *ca.* 1 mm long; abaxially greyish-green to reddish-brown, densely grayish-white villous or villous-hirsute along veins, hairs 1–3 mm long; margin with serrated protrusions and short cilia, hairs *ca.* 1 mm long, leaf bases nearly valvate or slightly overlapped, apex acute; venation palmate, main veins 7–8, adaxially slightly convex, abaxially conspicuously convex. **Inflorescences** 1–4 per plant, dichasial cymes, 7–48 cm long, branched 2–4 times; peduncle reddish-brown or yellowish-green, 4–35 cm long, 2–5 mm thick, densely red glandular hirsute, hairs 2–3 mm long, 10–70 flowers per inflorescence. **Bracts** yellowish-green or yellowish-pink, ovate to triangular, basal bracts 4–12 × 3–8 mm; upper bracts 3–7 × 2–5 mm; abaxially sparsely red glandular hispid-hirsute when young, nearly glabrous when mature, hairs 1–2 mm long, without dorsal ridge and apex awn; margin red glandular ciliate, hairs 1–2 mm long. **Staminate flower**: pedicel yellowish-green, 8–45 mm long, 0.5–1 mm thick, densely red glandular hirsute; flower 16–35 × 10–25 mm, tepals 4, yellowish-green, entire; outer 2, oval to nearly circular, 8–18 × 7–15 mm, abaxially red glandular hirsute, hairs 1–3 mm long; inner 2, lanceolate, 6–12 × 2–5 mm, glabrous; androecium yellow, nearly actinomorphic, usually capitate or pinecone-shaped, sometimes apex tilts slightly downwards, 2–4 × 2.5–4.5 mm; stamens (53–)76–107(–

123), filaments basally fused, connate part 1–2.5 mm long, 0.5–0.8 mm thick, free part 1–1.5 mm long, anthers *ca.* 1 mm long, apex flattened to slightly concave. **Pistillate flower**: pedicel yellowish-green, 11–30 mm long, *ca.* 1 mm thick, densely red glandular hirsute, hairs 1–3 mm long; flower 17–25 × 9–12 mm, tepals 3, yellowish-green, entire; outer 2, oval to nearly circular, 8–12 × 7–11 mm, abaxially red glandular hirsute, hairs 1–3 mm long; inner 1, lanceolate, 5–7 × 2–3 mm, glabrous; pistils yellowish-green, 3–5 × 3–6 mm; styles 3, basally fused, connate part *ca.* 1 mm long, free part 2–3 mm long, stigma coiled in spiral shape; ovary yellowish-green, sparsely red glandular hirsute, hairs 2–3 mm long, placentation parietal, 1-locular, placentae 3, bilaminar. **Fruit** stalk green to yellowish-green, 10–30 mm long, 1–1.2 mm thick, densely red glandular hirsute; capsules green, 10–15 × 6–10 mm, red glandular villous, outer 2 tepals persistent; unequally 3-winged, abaxial wing ligulate, 6–16 × 8–15 mm; lateral wings narrow, nearly equal, sickle-shaped, 3–8 × 7–12 mm.

Phenology: Flowering Mar.–May, fruiting Apr.–Jul..

Distribution and habitat: The new species is currently known only in Fuxin Town, Tiandeng County, Guangxi of China (Fig. 3). It grows on rocky surface and between gravel under the evergreen broad-leaved forests in karst mountainous, at an altitude of 400–500 m. New populations or subpopulations will be possibly discovered in the surrounding areas in the future.

Etymology: The specific epithet “*subfiliformis*” refers to its similarity to *B. filiformis*, because the two are easily confused by extremely similar flowers. The Chinese name is given as “拟丝形秋海棠”.

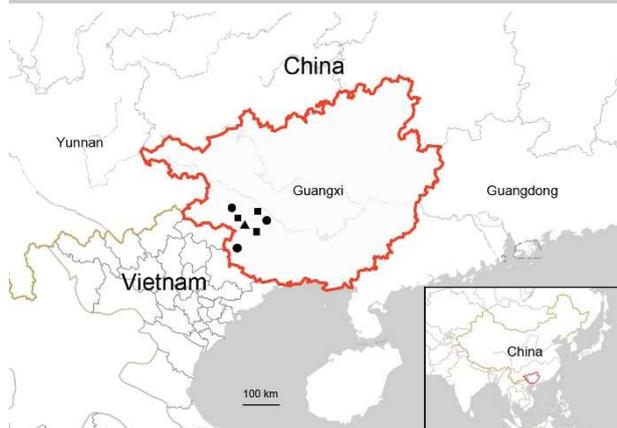


Fig. 3. Distribution map of *Begonia subfiliformis* (▲) and its allied species: *B. filiformis* (●) and *B. daxinensis* (■)

Additional specimens examined: Guangxi Zhuang Autonomous Region: Chongzuo City, Tiandeng County, Fuxin Town, under the evergreen broad-leaved forests, 22°53'N, 106°53'E, elev. 400–500 m, flowering, 1 April 2024, *Jinye Zhou, Haixia Yan & Dayan Tao* ZJY24001 (CSH!, GXMI!).

Provisional conservation assessment: The extent of occurrence of this new species is about 100 km² (< 5000 km²) with two locations, and the area of occupancy is less than 10 km² (< 500 km²). The total number of mature plants is less than 200 (< 250), but predicted to decline in the future because of human disturbance. Therefore, due to narrow distribution range, sparse individuals, and collection by human for ornamental and medicinal uses, the conservation status of this species is considered as Endangered (EN) (B1ab(ii,iii,v)+2ab(ii,iii,v)) following Guidelines for Using the IUCN Red List Categories and Criteria (IUCN, 2024).

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LITERATURE CITED

- Ding, Y.F., Zhang, W.Q. 2017 Cultivation and appreciation of wild Begonias. Phoenix Science Press: Nanjing, China, pp.18–27.
- Gu, C.Z., Peng, C.I., Turland, N.J. 2007 Begoniaceae. *Flora of China* 13: 153–207.
- Hughes, M., Moonlight, P.W., Jara-Muñoz, A., Tebbitt, M.C., Wilson, H.P., Pullan, M. 2015–Present *Begonia* Resource Centre. Online database available from: <http://padme.rbge.org.uk/begonia/> (accessed 31 December 2024).
- IUCN 2024 Guidelines for Using the IUCN Red List Categories and Criteria. Version 16. Prepared by the Standards and Petitions Committee of the IUCN Species Survival Commission. Available from: <https://www.iucnredlist.org/documents/RedListGuidelines.pdf> (accessed 2 December 2024)
- Ku, S.M. 2006 Systematics of *Begonia* sect. *Coelocentrum* (Begoniaceae) of China. Master of Science, National Cheng-Kung University, Tainan.
- Moonlight, P.W., Ardi, W.H., Padilla, L.A., Chung, K.F., Fuller, D., Girmansyah, D., Hollands, R., Jara-Muñoz, A., Kiew, R., Leong, W.C., Liu, Y., Mahardika, A., Marasinghe, L.D.K., O'Connor, M., Peng, C.I., Pérez, A.J., Phutthai, T., Pullan, M., Rajbhandary, S., Reynel, C., Rubite, R.R., Julia S., Scherberich, D., Shui, Y.M., Tebbitt, M.C., Thomas, D.C., Wilson, H.P., Zaini, N.H., Hughes, M. 2018 Dividing and conquering the fastest growing genus: Towards a natural sectional classification of the mega-diverse genus *Begonia* (Begoniaceae). *Taxon* 67(2):267–323.
- Tian, D.K., Zhou, J.Y., Xiao, Y., Wu, Y.N., Hu, R.C., Dong, X., Guan, S.K. 2024 Three new species of *Begonia* (sect. *Platycentrum*) from South China. *Phytotaxa* 675(2): 147–157.
- Wang, S.W., Qin, J.Q., Li, R.K., Peng, Q.Z., Tian, D.K. 2024 *Begonia ornithopedata* (sect. *Coelocentrum*), a new species with the bird-foot shaped leaves from Guangxi of China. *Taiwania* 69(2): 129–132.
- Wu, C.Y., Ku, T.C. 1997 New taxa of the *Begonia* L. (Begoniaceae) from China (cont.). *Acta Phytotax. Sin.* 35(1): 43–56.
- Xi, H.C., Nong, F.Y., Shen, J.Y., Ma, X.D., Jiang, L.J., Wang, W.G. 2025 *Begonia pingxiangensis*, a new species of *Begonia* sect. *Coelocentrum* (Begoniaceae) from Guangxi, China. *Taiwania* 70(1): 1–3.
- Zhou, J.Y., Song, Q., Zhao, F.C., Hoang, T.S., Tao, D.Y., Guan, S.K., Yan, H.X., Tian, D.K. 2024 *Begonia floriprolifera*, a new Species of *Begonia* (Begoniaceae) from Southwestern Guangxi of China and Northern Vietnam. *Taiwania* 69(1): 83–88.