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Begonia wumingensis, a new species of *Begonia* (sect. *Coelocentrum*) with long rhizomes from Central Guangxi of China

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ABSTRACT: *Begonia wumingensis* is a new species of *Begonia* section *Coelocentrum* discovered in the broad-leaved forest of the karst mountainous area in central Guangxi of China. It has extremely long creeping rhizomes, and is similar to *B. longiornithophylla* in morphology, but the main differences lie in its rhizome internodes and petioles usually subglabrous when mature, stipules glabrous and without dorsal ridge, leaves flat and subglabrous, flowers lacking glandular hairs, longer abaxial wings of the fruits, and early flowering time. Based on its small population, narrow distribution range, and continuing decrease in population size due to human's disturbances, it is assessed as Critically Endangered according to Guidelines for Using IUCN Red List Categories and Criteria.

KEY WORDS: *Begonia auritistipula*, *B. longiornithophylla*, *Begonia* sect. *Coelocentrum*, karst landform, long rhizome, new taxon.

INTRODUCTION

China is one of the regions with the most abundant plant resources in the world, with over 40,000 known vascular plant species and infraspecific taxa ranking the second among all countries (The Biodiversity Committee of Chinese Academy of Sciences, 2024; Song *et al.*, 2024). The *Begonia* genus, as one of the largest genera of the vascular plants, is widely distributed in tropical and subtropical regions of Africa, Asia, and Americas (Moonlight *et al.*, 2018). China is an important distribution region for *Begonia* species, with at least 10 new taxa being published annually in the recent two years. To date, over 290 *Begonia* species are known in China, mainly distributed in mountainous areas of southwestern China, such as Yunnan, Guangxi, and Xizang (iBegonia, 2024; Tian *et al.*, 2024abc; Wang *et al.*, 2024; Zhou *et al.*, 2024, 2025). Meanwhile, about 90% of *Begonia* sect. *Coelocentrum* species is found in the karst mountainous areas of Guangxi and northern Vietnam (Hughes *et al.*, 2015–Present), which has become the distribution center of *Begonia* sect. *Coelocentrum*.

Having obvious creeping rhizomes without erect stems is one of the main characteristics of most species in *Begonia* sect. *Coelocentrum*, but generally their rhizomes (about 10–30 cm long) and internodes (usually less than 3 cm long) are short. Only a few species have extremely long rhizomes, such as *B. longiornithophylla* C.I Peng, W.B.Xu & Yan Liu (Liu *et al.*, 2020), *B. auritistipula* Y.M.Shui & W.H.Chen (Shui and Chen, 2005), *B. curvicarpa* S.M.Ku, C.I Peng & Yan Liu (Ku *et al.*, 2004), *B. debaoensis* C.I Peng, Yan Liu & S.M.Ku (Ku *et al.*, 2006), *B. fangii* Y.M.Shui & C.I Peng (Peng *et al.*, 2005), *B. rhynchocarpa* Y.M.Shui & W.H.Chen (Shui and Chen, 2005), *B. tui* T.N.Bon & C.W.Lin (Bon *et al.*, 2023), *B. umbraculifolia* Y.Wan & B.N.Chang (Gu *et al.*, 2007), *B. wiformis* T.S.Hoang & C.W.Lin (Hoang and Lin, 2023). In the recent years, we have conducted many surveys of *Begonia* resources throughout Guangxi. During a survey in the central Guangxi, we discovered an unknown *Begonia* taxon with extremely long rhizomes. It is morphologically similar to *B. longiornithophylla*. Through literature review and continuous observation, we determined that it is new to science in *Begonia* sect. *Coelocentrum* based on its typical characteristics of flowers and the ovary with placentation parietal, and named it as *Begonia wumingensis* J.Y.Zhou, S.K.Guan & D.K.Tian.

TAXONOMIC TREATMENTS

Begonia wumingensis J.Y.Zhou, S.K.Guan & D.K.Tian, ***sp. nov***. **武鸣秋海棠 Fig. 1**

***Type*: China.** Guangxi Zhuang Autonomous Region: Nanning (南宁) City, Wuming (武鸣) District, Luoxu (锣圩) Town, on rock surfaces and among gravel under the canopy of evergreen broad-leaved forests, 23°18'N, 107°52'E, elev. 300–400 m, flowering, 16 December 2024, *Jinye Zhou, Shikai Guan, & Zhanwen Huang ZJY24018* (holotype CSH! CSH0219829; isotypes CSH!, PE!, GXMI!).

Diagnosis: *Begonia wumingensis* is similar to *B. longiornithophylla*. The main differences are that its mature stem internodes are subglabrous or sparsely (*vs.*

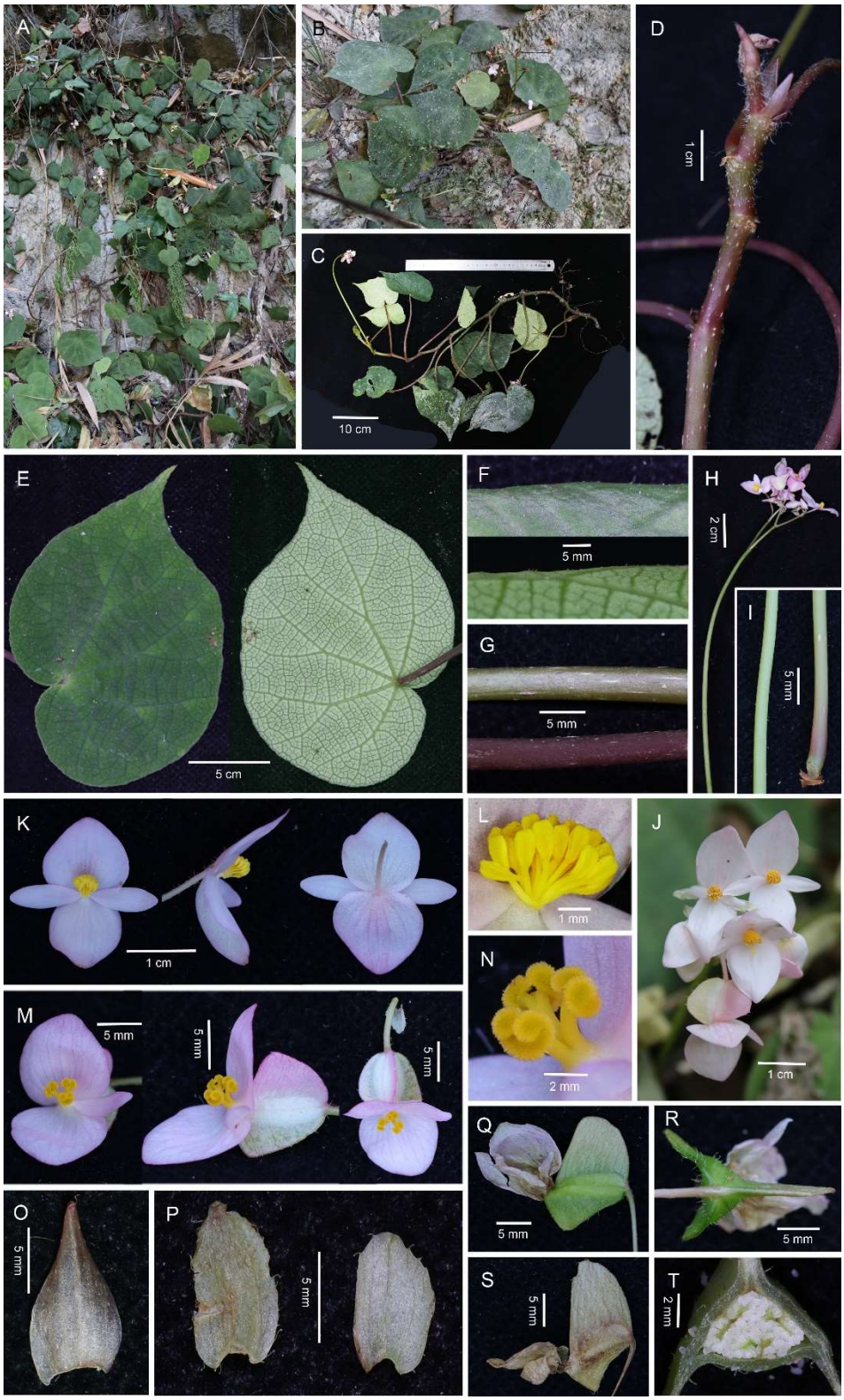

Fig. 1. ***Begonia wumingensis*** J.Y.Zhou, S.K.Guan & D.K.Tian. **A,B.** Habitat and habit, photographed in Wuming, China; **C.** Wild plant; **D.** Rhizome showing stipules only at shoot; **E.** Adaxial (left) and abaxial (right) leaf surfaces; **F.** Leaf sections showing adaxial (upper) and abaxial (lower) indumentums; **G.** Petioles showing different colors; **H, J.** Inflorescences; **I.** Peduncles subglabrous and reddish-brown base; **K.** Front (left), side (middle) and back (right) views of staminate flower; **L.** Side view of androecium; **M.** Front (left), side (right two) views of pistillate flower; **N.** Side view of stigmas; **O.** Stipule; **P.** Bracts; **Q, R.** Side (Q) and back (R) views of young fruits; **S.** Mature fruit with persistent tepals; **T.** Cross-section of ovary. (Photos by Jinye Zhou)

Table 1. Morphological comparison of ***Begonia wumingensis, B. longiornithophylla*** and ***B. auritistipula***.

Characters	***B. wumingensis***	***B. longiornithophylla***	***B. auritistipula***
Rhizome			
length and thickness	up to 1 m long, 4–10 mm thick, internodes 1–8 cm long	*ca*. 0.5 m long, 6–12 mm thick, internodes 3–9 cm long	0.3–0.5 m long, 3–6 mm thick, internodes 2–6 cm long
indumentum	grayish-white villous when young, turning sparse to subglabrous when mature	densely villous	sparsely hirsute-villous
Stipule	caducous, seen only at upper several nodes	persistent	persistent
dorsal ridge	absent	with	with
indumentum	glabrous	villous along dorsal ridge	villous along dorsal ridge
awn	absent	with	with
Petiole			
length (cm)	7–30	3–21	9–12
indumentum	subglabrous, or grayish-white villous when young	villous to tomentose	reflexed hirsute
Leaf			
adaxial surface	subglabrous or very sparsely short bristled, flat	rough,surface with scabrid and glandular punctate	rough, densely covered with setae, setulose
abaxial surface	subglabrous, or sparsely grayish-white short-hispid only along main veins	densely red-scabrous along veins	densely hirsute-pilose along veins
Inflorescence			
peduncle length (cm)	7.5–24	8–20	5–9
peduncle indumentum	subglabrous	glandular villous	subglabrous
Staminate flower			
pedicel	sparsely short-villous	glandular villous	glabrous
outer tepals	subcordate to ovate, abaxially subglabrous or sparsely short-hispid near pedicel	elliptic, abaxilly red-pilose	subcircular, glabrous
androecium	bilaterally symmetric, upward curved; filaments base free	bilaterally symmetric, upward curved; filaments base connate	subcapitate, actinomorphic; filaments base free
Pistillate flower			
pedicel	sparsely short-villous	glandular villous	nearly glabrous
outer tepal	subglabrous	abaxilly red-pilose	abaxially sparsely strigose-hirsute
ovary	sparsely short-villous	glandular-pilose	sparsely strigose-hirsute
Capsule			
abaxial wing length (mm)	7–13	*ca*. 5	2–6
lateral wing length (mm)	3–6	*ca*. 3	1–1.5
Flowering time	Nov.–Feb.	Feb.–May	May–Nov.

densely) villous, stipules caducous (*vs*. persistent) without (*vs*. with) a dorsal ridge, mature petioles subglabrous (*vs*. villous to tomentose), adaxial leaf surface nearly glabrous (very sparsely short bristled) and flat (*vs.* rough surface with scabrid and glandular punctate), abaxial leaf surface subglabrous or sparsely grayish-white short-hispid only along main veins (*vs.* densely red-scabrous along veins), peduncles are subglabrous or sparsely villous (*vs*. glandular villous), pedicels sparsely short-hispid (*vs.* glandular villous), outer tepals of staminate and pistillate flowers subglabrous or sparsely short-hispid near pedicel or ovary (*vs.* obviously red villous), capsules with longer (8–13 mm *vs*. ca. 5 mm long) abxial wings, and earlier flowering (Nov.–Feb. *vs.* Feb.–May) (Liu *et al.*, 2020) (Table 1).

***Description*:** Perennial herb, monoecious, rhizomatous, 10–30 cm tall, erect stem absent. **Rhizomes** creeping, extremely long, up to 1 m long, 4–10 mm thick, unbranched to branched 1 or 2 times, internodes 1–8 cm long, reddish-brown to light green, with grayish-white villous when young, villous hairs 1–5 mm long, turning sparse to subglabrous when mature. **Stipules** caducous, seen only at several upper nodes, yellowish-green to reddish-brown, broadly triangular, 9–14 × 4–7 mm, without dorsal ridge, glabrous, margin entire, apex apical without awn. **Petioles** usually reddish-brown, sometimes yellowish-green, 7–30 cm long, 2.5–5 mm thick, terete, young with grayish-white villous hairs, turning sparse to subglabrous when mature. **Leaves** 5–20 per plant, basal from rhizome, alternate, subcoriaceous, ovate, asymmetric, 9–20 × 5.5–14 cm, decurrent part 1.5–6 cm long; adaxially green, subglabrous or very sparsely short bristled, flat, venation palmate, main veins 7 or 8, slightly convex; abaxially light green, main veins conspicuously convex, other veins dense and cobweb-like, subglabrous, or sparsely grayish-white short-hispid only along main veins; margin nearly entire and ciliate, hairs shorter than 1 mm; leaf bases nearly valvate to slightly separated; apex acute. **Inflorescences** arising from rhizome, dichasial cymes, 1–5 per plant, 10–30 cm long, branched 1 or 2

times; peduncle yellowish-green, gradually transitioning to reddish-brown towards the base, 7.5–24 cm long, 2–3 mm thick, subglabrous or sparsely grayish-white villous, 5–15 flowers per inflorescence. **Bracts** yellowish-green with a faint reddish-brown tinge, narrowly elliptical, basal bracts 6–10 × 3.5–5 mm, upper ones 5–8 × 2.5–4 mm, abaxially subglabrous, without dorsal ridge and apex awn, margin grayish-white ciliate, hairs ca. 1 mm long. **Staminate flower**: pedicel pink to yellowish-green, 5–20 mm long, ca. 1 mm thick, sparsely short-villous; flower 25–32 × 20–26 mm, tepals 4, rarely 3 or 2, pink, margin entire; outer 2, subcordate to ovate, 13–16 × 12–13 mm, abaxially subglabrous or sparsely short-hispid towards base; inner 2, rarely 1 or 0, lanceolate, 10–12 × 3–4 mm, glabrous; androecium yellow, bilaterally symmetric, obviously upward curved, 4–5 × 4–7 mm, stamens 25–40, filaments free, 2–3 mm long, anthers 1–2 mm long, apex obtuse rounded to slightly concave. **Pistillate flower**: pedicel 8–18 mm long, ca. 1 mm thick, sparsely short-villous to subglabrous, flower 19–32 × 12–18 mm, tepals 3, rarely 4, pink, margin entire; outer 2, elliptical to subcircular, 10–16 × 9–10 mm, abaxially subglabrous or sparsely short-hispid towards base; inner 1, rarely 2, lanceolate, 10–11 × 3–4 mm, glabrous; pistils yellow, 2.5–4 × 4–5 mm, style 3, obviously upturned, basally connate, connate part ca. 1 mm, free part 3–6 mm, stigma spirally inverted C-shape twisted. **Ovary** light green, sparsely grayish-white villous, hairs 1–2 mm long, placentation parietal, 1-locular, placenta 3, bilaminate. **Fruits** green to light green, sparsely short-hispid, 10–14 × 5–11 mm, tepals caducous or persistent, evenly thick; stalk yellowish-green to light reddish-brown, sparsely villous to subglabrous, 10–30 mm long, ca. 1 mm thick; capsules with unequally 3-winged, abaxial wing ligulate to wide crescent-shaped, 7–13 × 10–14 mm, lateral wings narrowly sickle-shaped, 3–6 × 9–13 mm.

***Phenology*:** Flowering Nov.–Feb., abnormally in Apr.–Jun.; fruiting Jan.–Apr., abnormally in May–Aug.

***Distribution and habitat*:** *Begonia wumingensis* mainly grows on rock surfaces and among gravel under the evergreen broad-leaved forests at an altitude of 190–400 m. Currently, it is only sporadically found in the mountain forests of Luoxu Town, Wuming District, and Chengxiang (城厢) Town, Longan (隆安) County of Nanning City, Guangxi. In the future, new populations may be discovered in the surrounding areas.

***Etymology*:** The specific epithet "*wumingensis*" refers to the name of Wuming District, Guangxi, where the type specimen of this species was collected. The Chinese name is given as "武鸣秋海棠".

***Additional specimens examined*:** China: Guangxi Zhuang Autonomous Region: Nanning City: Wuming District, Luoxu Town, on rock surfaces and among gravel, 23°18′N, 107°52′E, elev. 300–400 m, without flower or fruit, 25 June 2025, *Jinye Zhou ZJY25148* (CSH!); Longan County, Chengxiang Town, on rock surfaces, 23°14′N, 107°46′E, elev. 200–220 m, with fresh fruits, 16 January 2025, *Jinye Zhou & Shikai Guan, ZJY24019* (CSH!); *ibid.*, few plants abnormally flowering and fruiting, 25 June 2025, *Jinye Zhou ZJY25149* (CSH!); *ibid.*, under the evergreen broad-leaved forests, 23°13′53″N, 107°46′30″E, elev. 197 m, few plants abnormally flowering, 8 May 2013, *Longan Expedition Team 450123130508001LY* (GXMG!, IBK!).

***Provisional conservation assessment*:** The overall occurrence extent of this new species is approximately 80 km^2 with two locations, and the occupied area is less than 10 km^2. Currently, the number of plants in the population discovered through investigation is less than 250. Due to the extensive planting of *Eucalyptus robusta* Sm. in the surrounding areas, the distribution area has been greatly restricted and the habitat is continuously shrinking. Therefore, based on scarcity of the population, narrow distribution range, and further population reduction due to human disturbances such as the planting of artificial forests in the future, we have assessed its conservation status as Critically Endangered (CR B1ab(ii,iii,v)+2ab(ii,iii,v); C1) according to Guidelines for Using the IUCN Red List Categories (IUCN, 2024).

***Notes*:** Among the *Begonia* species which are currently assigned in sect. *Coelocentrum*, *B. wumingensis* is also similar to *B. auritistipula*, *B. curvicarpa* and *B. wiformis*, but can be clearly distinguished from *B. auritistipula* in terms of rhizome morphology, stipule dorsal ridge and indumentum, petiole length and indumentum, leaf flatness and indumentum, peduncle length, pedicel and tepal indumentum, androecium shape, capsule wing size, and florescence (Shui and Chen, 2005) (Table 1), distinguished from *B. curvicarpa* by the dorsal ridge and awn of the stipule, leaf indumentum and the flatness of the adaxial surface, indumentum of ovary and fruit, degree of curvature of the capsule, persistence of tepal and stigma at the tip of capsule (Ku *et al.*, 2004), and distinguished from *B. wiformis* by the dorsal ridge and awn of the stipule, leaf size and patches, leaf apex shape, indumentum of ovary and fruit, and persistence of tepals on which, and phenology (Hoang and Lin, 2023).

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