

## *Begonia shunzhii* (sect. *Reichenheimia*, Begoniaceae), a new species from Guizhou, China

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### Abstract

*Begonia shunzhii*, a new species of *Begonia* sect. *Reichenheimia* from Guizhou Province of China is described and illustrated. It mostly resembles *B. qingchengshanensis* and *B. puerensis* in the same section but considerably differs from the latter two in some characteristics. A detailed morphological comparison of the three species is provided. According to the Guidelines for Using IUCN Red List Categories and Criteria, the conservation status of new species is assessed as Endangered (EN B1ab(i,ii,iii,iv,v)).

**Key words:** *Begonia*, China, Conservation status, Guizhou, Karst landform, Morphology, New taxon

### Introduction

Guizhou province is located in southwestern China and is well known for its huge areas of karst landform. However, unlike Guangxi province as the distribution center of *Begonia* sect. *Coelocentrum* Irmscher (1939: 553), only three species of this section have been so far found in Guizhou, namely *B. cavaleriei* Léveillé (1909: 20), *B. jingxiensis* Fang *et al.* (2004: 172), and *B. porteri* Léveillé (1910: 20). It is noteworthy that, among a total of 27 accepted *Begonia* species in Guizhou, more than half (16 species) belong to the tuberous type, including 13 species in *B.* sect. *Diploclinium* (Lindley 1847: 319) de Candolle (1859: 129), and only 4 species in *B.* sect. *Reichenheimia* (Klotzsch 1855: 124) de Candolle (1864: 385), including *B. henryi* Forbes & Hemsley (1887: 322), *B. parvula* Léveillé (1906: 113), *B. xingyiensis* Ku (1995: 263) and *B. wilsonii* Gagnepain (1919: 281). The other 8 species belong to *B.* sect. *Platycentrum* (Klotzsch) de Candolle (1859: 134), including the recently published *B. auritalata* Tian *et al.* (2024: 93).

On 9 October and 13 October of 2007, Shunzhi He *et al.* collected an unknown tuberous begonia from Nanjiang Grand Valley and Zijiang Difeng Ecological Resort of Guizhou province, respectively. With identification assistance of Dr. Yumin Shui from Kunming Institute of Botany of Chinese Academy of Science, Shunzhi He named it as *Begonia kaiyangensis* Y.M.Shui & S.Z.He *sp. nov. ined.* on 8 December 2007 (Yang, 2009), but the name has not been formally published. Later, Dr. Daike Tian, Dr. Xinxiang Bai, and Prof. Zhiyou Guo, *et al.* conducted field surveys in Guizhou and found more subpopulations of this species in other places. Based on careful reviews of literature and specimens

combining field observations, we confirmed this new species and named it as *Begonia shunzhii* D.K.Tian, Z.Y.Guo & X.X.Bai in honor of Prof. Shunzhi He from Guizhou University of Traditional Chinese Medicine for his great contributions to studying Guizhou’s medicinal plants including *Begonia*.

The new species belongs to *B.* sect. *Reichenheimia* based on its tuberous habit, staminate flower with four tepals, pistillate flower with three tepals, and ovary with unillaminate placenta. It is described and illustrated and compared with allied species. Its conservation status is assigned as Endangered (EN B1ab(i,ii,iii,iv,v)) following the Guidelines for Using IUCN Red List Categories and Criteria (IUCN, 2024). According to our estimates, the total number of *Begonia* species identified in Guizhou is projected to exceed 30 in the near future based on ongoing field surveys and taxonomic study.

Taxonomic treatment

*Begonia shunzhii* D.K.Tian, Z.Y.Guo & X.X.Bai, *sp. nov.* § sect. *Reichenheimia* (顺志秋海棠) (shùn zhì qiū hǎi táng) Fig. 1

**Type:—CHINA.** Guizhou Province, Kaiyang County (开阳县), Nanjiang town (南江乡), Nanjiang Grand Valley (南江大峡谷), 26°58'02.71"N, 106°59'50.44"E, alt. 760 m, river valley, rock cliff, in early flowering, 19 July 2016, *Daike Tian* (田代科), *Xin Tian* (田鑫) TDK2958 (holotype CSH0148858, CSH; isotypes CSH0148856, 0148857, 0148859, CSH).

**Diagnosis:—***Begonia shunzhii* is mostly similar to *B. qingchengshanensis* Li *et al.* (2018: 198) but differs mainly by its smaller (2–3 × 1–1.5 mm *vs.* 3–7 × 2–5 mm) stipules with ciliate (*vs.* entire) margins without keel (*vs.* keeled); shorter (1.5–10.5 cm *vs.* 11–19 cm) petioles, leaves usually greenish-white-spotted (*vs.* very rarely spotted) and adaxially sparsely short-bristled and non-waxy (*vs.* subglabrous and waxy), smaller (2–4 × 0.5–2 mm *vs.* 4.5–5.5 × 3–4.5 mm) bracts, narrowly oblong to sublinear (*vs.* triangular or ovate-triangular), shorter (8–11 mm *vs.* 9–25 mm) pedicels, outer tepals ovate to subcircular (*vs.* narrowly to broadly ovate), smaller (5–9 × 2–3 mm *vs.* 7–12 × 3–5 mm) inner tepals of staminate flowers, and valvate (*vs.* separated) two sides of stigmas (Table 1).

TABLE 1. Morphological comparison of *Begonia shunzhii*, *B. qingchengshanensis* and *B. puerensis*

Character		<i>B. shunzhii</i>	<i>B. qingchengshanensis</i>	<i>B. puerensis</i>
Stipule	size (mm)	2–3 × 1–1.5	3–7 × 2–5	5–8 × 3–5
	vein	absent	absent	with longitudinal veins
	keel	absent	with	absent
	margin	sparsely ciliate	entire	short ciliate
	apex	acute	mucronate apiculate	acuminate
Petiole	length (mm)	1.5–10.5	1.5–19	6–24
Leaf blade	size (cm)	2–11.5 × 1.8–8	3–13.5 × 2.5–10	6–22 × 4–16.5
	shape	ovate-cordate, long ovate-cordate	broadly ovate,	broadly ovate
	maculation	mostly greenish-white-spotted	rarely greenish-white-spotted,	white-spotted in all plants
	adaxial indumentum	sparsely short bristled	waxy, glabrous or very sparsely short bristled	glabrous
Inflorescence	length (cm)	3–16	6–10	6–25
Bract	shape	narrowly oblong to sublinear	triangular or ovate-triangular	ovate-lanceolate
	size (mm)	2–4 × 0.5–2	4.5–5.5 × 3–4.5	5–9 × 4–5
	apex	acuminate to obtuse	mucronate apiculate	obtuse
Staminate flower				

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TABLE 1. (Continued)

Character		<i>B. shunzhii</i>	<i>B. qingchengshanensis</i>	<i>B. puerensis</i>
Pedicel	length (mm)	8–11	9–25	5–13
Outer tepal	shape	ovate to subcircular	narrowly to broadly ovate	broadly ovate-suborbicular
	size (mm)	12–14 × 8–12	8–12 × 8–13	13–15 × 14
Inner tepal	shape	oblanceolate to long-oblong	obovate to oblanceolate	oblong–ovate
	size (mm)	5–9 × 2–3, length >1/2 width of out tepals	7–12 × 3–5, length subequal to width of outer tepals	5–6 × 3, length <1/2 width of outer tepals
Stamen	number	7–18	7–15	16–20
	filament	fused at base	fused at base	free
<b>Pistillate flower</b>				
Pedicel	length (mm)	8–16	5–20	6–20
Outer tepal	shape	ovate, broadly ovate to subcircular	broadly ovate,	suborbicular to broadly ovate-orbicular
	size (mm)	5–11 × 6–9	ca. 10 cross	ca. 10 × 13
Inner tepal	shape	obovate-lanceolate to narrowly oblong	narrowly obovate	oblanceolate
	size (mm)	5–9 × 2–3	ca. 8 × 3	ca. 4 × 2
Ovary		occasionally pink-veined, placenta linear or clavate	veins absent, placenta narrowly ovate-triangular to clavate	pink-veined, placenta triangular or ovate-triangular
Style		fused at base	fused at base	free
Stigma		both sides valvate, not spiraled	both sides separate and not spiraled	both sides separate and slightly spiraled to 1 revolution
<b>Fruit's dorsal wing</b>		irregularly triangular, 12–15 × 5–8 mm	triangular, size unavailable	narrowly triangular, 8–15 × 7–11 mm

It is also similar to *B. puerensis* Wang *et al.* (2020: 2) but differs mainly by its smaller (2–3 × 1–1.5 mm *vs.* 5–8 × 3–5 mm) stipules without (*vs.* with) longitudinal veins, shorter (1.5–10.5 cm *vs.* 6–24 cm) petioles, smaller (2–11.5 × 1.8–8 cm *vs.* 6–22 × 4–16.5 cm) leaves with short-bristled (*vs.* glabrous) adaxial surface, smaller (2–4 × 0.5–2 mm *vs.* 5–9 × 4–5 mm) and narrowly oblong to sublinear (*vs.* ovate-lanceolate) bracts without (*vs.* with) longitudinal pink lines, longer (length >1/2 *vs.* <1/2 width of outer tepals) and oblanceolate to long-oblong (*vs.* oblong–ovate) inner tepals of staminate flowers, filaments fused (*vs.* free) at the base, longer (5–9 mm *vs.* 5–6 mm) inner tepals of pistillate flowers, linear or clavate (*vs.* triangular or ovate-triangular) placentae, styles fused (*vs.* free) at the base, narrowly valvate (*vs.* broadly separate) and not spiraled (*vs.* spiraled nearly one revolution) stigmas, and narrower (5–8 mm *vs.* 7–11 mm wide) dorsal ovary wing (Table 1).

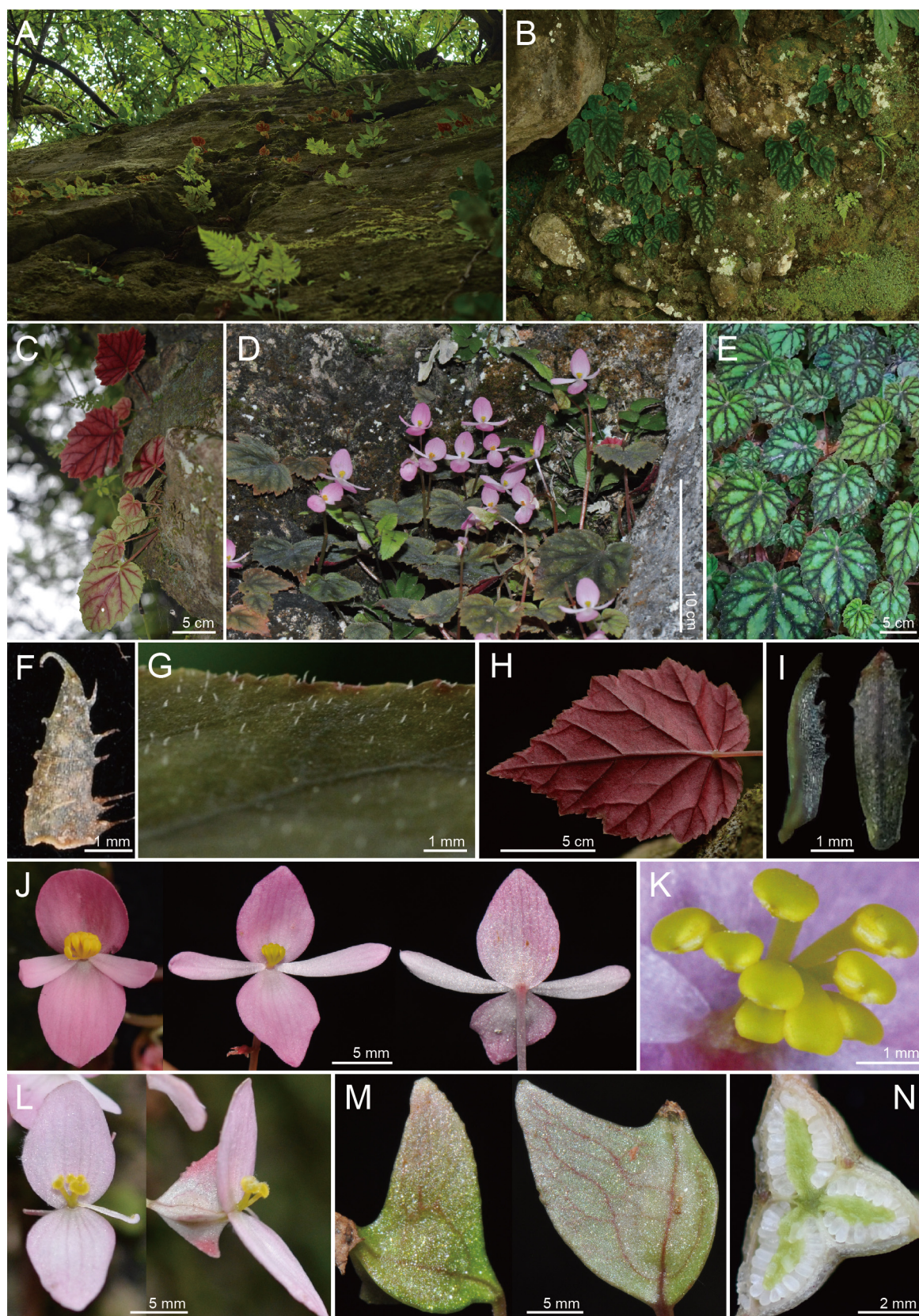
**Description:**—**Herb** deciduous, perennial, monoecious, 4–20 cm tall, stemless or with short erect stem during flowering. **Tuber** spherical, 4–12 mm in diameter, 2–5 arranged linearly or irregularly connected; current-year's tuber white, previous-year's one red. **Stipules** persistent, yellowish-green or greenish-white, triangular or narrowly triangular, 2–3 × 1–2 mm, abaxially glabrous, margins sparsely ciliate with tubercle-based hairs *ca.* 0.5 mm long; apex acute, awned. **Leaves** 1–4 per plant, basal leaves 1–3, occasionally 1 (rarely 2) on the stem at anthesis. **Petiole:** dark red, pink to pinkish-green, or rarely pale green, usually darkest at the base, 1.5–10.5 cm long, 0.8–3 mm thick, with a groove, glabrous or nearly so. **Leaf blade:** subsymmetrical, deltoid-ovate to ovate-cordate, or long ovate-cordate, 1.7–11.5 × 1.8–8 cm; adaxially dark green to green, or yellowish-green, rarely dark red, color darkest along veins, with irregularly sized and distributed light green to white spots or patches between veins (occasionally absent), sparsely covered with very short grayish-white bristles (<0.5 mm); abaxially unevenly purplish-red, rarely uniformly green or

purplish-red, veins darkest in color, glabrous or with extremely sparse short pubescence along veins; base cordate, subsymmetrical to symmetrical, often partially overlapping to nearly valvate; margin dentate to crenate-serrate, rarely shallowly lobed, margins short grayish-white (rarely red) bristled, hairs 0.3–0.6 mm long; apex acute to acuminate, rarely short-caudate; palmate venation, 7 or 9 veins extending to the margin, slightly concave adaxially, convex abaxially. **Inflorescence:** dichotomous cyme, usually 1 (rarely 2) per plant, 3–16 cm long, unbranched to branched 3 times, flowers 1–16; peduncle dark red to pink, 2–14 cm long, 0.6–3 mm thick, glabrous or nearly so. **Bract:** caducous, pale green to pinkish-green, membranous, narrowly elliptic or sublinear,  $2\text{--}4 \times 0.5\text{--}2$  mm, abaxially glabrous, entire or finely toothed with very short hairs on the upper margin, apex acute to subobtusate. **Staminate flower:** pedicel pink to pinkish-white, or pale greenish-white, glabrous, 6–22 mm long, 0.5–0.8 mm thick; tepals 4, glabrous; outer 2 pink to white, base slightly lighter, ovate to broadly ovate or subcircular,  $12\text{--}14 \times 8\text{--}12$  mm, glabrous, margin entire, apex obtuse or rounded; inner 2 pinkish-white, slightly darker at the top, oblanceolate to narrowly obovate,  $7.5\text{--}11 \times 2\text{--}5$  mm, sometimes slightly drooping, base cuneate, apex rounded-obtusate or acute; androecium zygomorphic, slightly ascending; stamens 7–18, filaments *ca.* 0.5 mm long, fused at the base; staminal column 0.5–1 mm long; anthers long obovate-cuneate, *ca.*  $1 \times 0.5$  mm, apex obtuse to subrounded. **Pistillate flower:** pedicel pink or grayish-white, glabrous, 8–22 mm long, *ca.* 0.8 mm thick; flower  $10\text{--}15 \times 10\text{--}12$  mm; tepals 3, glabrous; outer 2 pink to pinkish-white, slightly darker at the top, ovate to broadly ovate or subcircular,  $5\text{--}11 \times 6\text{--}9$  mm, apex obtuse or rounded; inner 1 pinkish-white, obovate-lanceolate to nearly narrowly oblong,  $5\text{--}9 \times 2\text{--}3$  mm, apex obtuse or rounded, base cuneate; styles 3, fused at the base; stigma shallowly narrow-U-shaped, both sides nearly valvate, not spiraled; ovary pale pinkish-white to nearly white, midvein often red, reticulate veins sometimes pink, glabrous, 3-loculed; placentation axile, placenta unilaminar. **Fruit:** stalk pink, glabrous, 12–23 mm long, 0.6–1 mm thick; capsule pale pink, ellipsoid,  $8\text{--}10 \times 5\text{--}8$  mm; unequally 3-winged, dorsal wing asymmetrically triangular, *ca.*  $10\text{--}22 \times 5\text{--}10$  mm; lateral wings narrowly lunate,  $1\text{--}5 \times 8\text{--}11$  mm. **Flowering** July–October.

**Distribution and Ecology:**—The new species is currently known only from five localities restricted to four counties of Guizhou province, in which, two locations in Kaiyang county are very close and only separated by 7 km in distance (Fig. 2). It grows on shady rock surface or rock crevices of valleys.

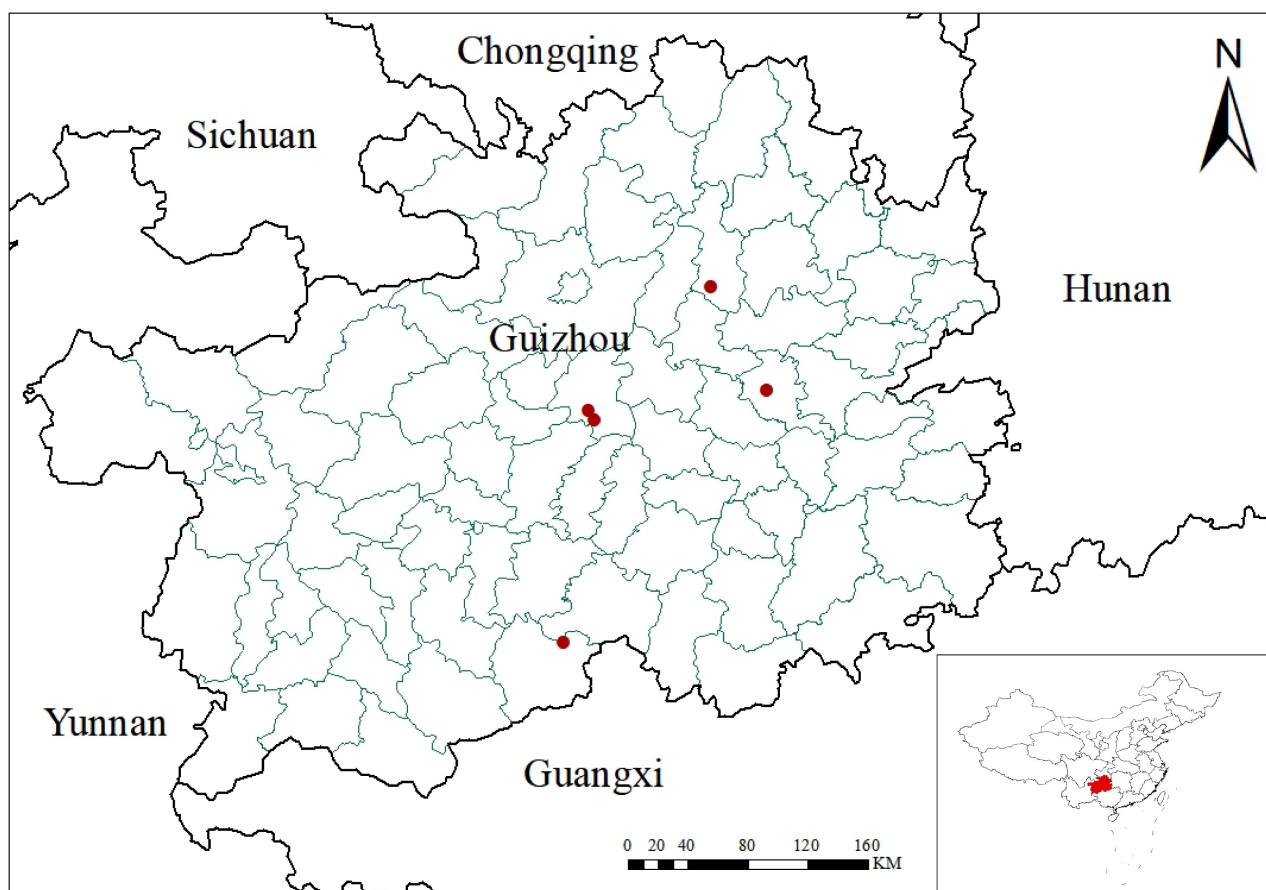
**Etymology:**—The species is named after Prof. Shunzhi He from Guizhou University of Traditional Chinese Medicine in honor of his great contributions to studying Guizhou's medicinal plants including *Begonia*.

**Additional specimens:**—**CHINA: Guizhou: Guiyang city (贵阳市), Kaiyang county (开阳县):** Nanjiang town (南江乡), Nanjiang Grand Valley (南江大峡谷), river valley, on rock cliff of karst landform, in flowering and fruiting, 9 October 2000, *Shunzhi He (何顺志) et al.*, 20838 (GZTM; *ibid.*,  $26^{\circ}57'55.49''\text{N}$ ,  $107^{\circ}00'33.78''\text{E}$ , alt. 760 m, dried fruits 12 January 2016, *Daike Tian (田代科)*, *Junjie Zhang (张俊杰)*, *Zhilin Chen (陈之林)*, *Xin Tian (田鑫)* TDK2876, 2877, 2878 (CSH); *ibid.*,  $26^{\circ}57'47.50''\text{N}$ ,  $107^{\circ}00'43.34''\text{E}$ , alt. 760 m, dried fruits, same day, *Daike Tian*, *Junjie Zhang*, *Zhilin Chen*, *Xin Tian* TDK2879 (CSH); *ibid.*,  $26^{\circ}58'02.71''\text{N}$ ,  $106^{\circ}59'50.44''\text{E}$ , alt. 760 m, dried fruits, same day, *Daike Tian*, *Junjie Zhang*, *Zhilin Chen*, *Xin Tian* TDK2884 (CSH); *ibid.*,  $26^{\circ}57'23''\text{N}$ ,  $106^{\circ}59'58''\text{E}$ , alt. 900 m, river valley, in flowering, 27 August 2019, *Yanci Li (李雁瓷)*, *Xiangjie An (安向婕)*, *Lizhi Tian (田礼志)* TDK3901 (CSH). Longgang town (龙岗镇), Zijiang Difeng Ecological Resort (紫江地缝生态旅游区), on rock surface of river valley, in flowering and fruiting, 13 October 2007, *Shunzhi He et al.* 071013 (GZTM); *ibid.*, moist and shady places of valley,  $26^{\circ}54'20.55''\text{N}$ ,  $107^{\circ}02'15.16''\text{E}$ , alt. 937 m, in flowering, 18 August 2018, *Xinxiang Bai (白新祥)* BXXB20210818b (GZAC). **Shibing county (施秉县):** Yuntai Mountain Nature Resort (云台山风景名胜区), Heicong (黑冲), usually on mossy rock surface or in rocky crevices under secondary forest near mountain top, over 300 mature individuals, locally common,  $27^{\circ}08'44.94''\text{N}$ ,  $108^{\circ}06'27.61''\text{E}$ , alt. 1075 m, in flowering and fruiting, 15 September 2017, *Zhiyu Guo (郭治友)*, *Qingmei Gao (高庆梅)* GZY201709137 (QNUN). **Fenggang county (凤冈县):** Yachuan Town (琊川镇), Wanfo Valley (万佛峡谷), shady and moist rock surface, locally common,  $27^{\circ}40'38.73''\text{N}$ ,  $107^{\circ}48'27.20''\text{E}$ , alt. 533 m, 24 September 2021, *Xinxiang Bai (白新祥)*, *Xinchen Li (李星晨)* BXXB20210924 (GZAC). **Luodian county (罗甸县):** Daxiaoqing (大小井), on rock surface, only one site, *ca.* 30 mature individuals,  $25^{\circ}34'16.50''\text{N}$ ,  $106^{\circ}50'54.18''\text{E}$ , 758 m, only photos by Meng Dang (党梦).



**FIGURE 1.** Habitat, habit and morphology of *B. shunzhii* D.K.Tian, Z.Y.Guo & X.X.Bai

A, B. Habitat; C–E. Habit in different locations; F. Stipule; G. Adaxial leaf surface showing short bristles; H. Abaxial leaf surface; I. Bracts (left: side view, right: back view); J. Front (left two) and back (right) views of staminate flowers; K. Androecium and stamens; L. Front and side views of pistillate flowers; M. Side view of immature fruits; N. Cross-section of ovary showing placentae. (Photos A–C, G, H, J-left, L by Daike Tian; D, J-right two, K, M by Zhiyou Guo, F, I, N by Xinxiang Bai, E by Meng Dong).



**FIGURE 2.** Distribution map of *Begonia shunzhii* in Guizhou of China (red dots).

**Conservation status:**—EN B1ab(i,ii,iii,iv,v), AOO=20 km<sup>2</sup>, EOO=12212 km<sup>2</sup>. Currently, the new species is only observed in the five locations in Guizhou province, although the EOO is relatively large and new distribution locations are possibly to be found in the future. All known locations belong to tourist scenic areas, therefore, potential road maintenance or construction may influence its habitat quality and destroy some individuals. Also, plants are facing the risk of over collection due to its highly ornamental value. The subpopulations in Nanjiang Grand Valley, Yuntai Mountain and Wanfo Valley are relatively large, but the subpopulation in Daxiaojing of Luodian county is very small and has only about 30 mature individuals.

## Acknowledgments

This study was supported by National Natural Science Foundation of China (project code: 31570199), the Fourth National Survey of Chinese Medicinal Plants Resources ([2018]132, [2019]186), and the Special Fund for Innovation Capacity Construction of Guizhou Research Institution (Qiankehefuqi [2024]013). Mr. Xin Tian, Mr. Lizhi Tian, Mr. Junjie Zhang, Ms. Xingchen Li, Ms. Yanci Li, Ms. Xiangjie An, Ms. Meng Dang, and Ms. Qingmei Gao, *et al.*, are thanked for assistance during the field surveys. Ms. Shuying Xu (徐疏影) is thanked for making distribution map.

## References

- de Candolle, A. (1859) Mémoire sur la famille des Bégoniacées. [sér. 4]*Annales Sciences Naturelles Botanique* 11: 93–149.
- de Candolle, A. (1864) Begoniaceae. *Prodromus systematis naturalis regni vegetabilis, pars decima quinta, sectio prior*: Victoris Masson & Filii, Parisiis (Paris), pp. 266–408. [<https://www.biodiversitylibrary.org/page/158147#page/391/mode/1up>]
- Fang, D., Wei, Y.G. & Qin, D.H. (2004) Four new species of *Begonia* L. (Begoniaceae) from Guangxi, China. *Acta Phytotaxonomica Sinica* 42 (2): 170–179. [<https://kns.cnki.net/>]

- Forbes, F.B. & Hemsley, W.B. (1887) An enumeration of all the plants know from China proper, Formosa, Hainan, Corea, the Luchu Archipelago, and the Island of Hongkong, together with their distribution and synonymy. *The Journal of the Linnean Society, Botany* 23: 1–489. [<https://ia904607.us.archive.org/29/items/mobot31753002692298/mobot31753002692298.pdf>]
- Gagnepain, M.F. (1919) Nouveaux Begonia d'Asie; quelques synonymes. *Bulletin du Muséum d'histoire naturelle* 25: 276–283.
- Irmscher, E. (1939) Die Begoniaceen Chinas und ihre Bedeutung für die Frage der Formbildung in polymorphen Sippen. *Mitteilungen aus dem Institut für allgemeine Botanik in Hamburg* 10: 431–557.
- 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. [<https://www.iucnredlist.org/documents/RedListGuidelines.pdf>]
- Klotzsch, J.F. (1854) Begoniaceae. *Bericht über die zur Bekanntmachung geeigneten Verhandlungen der Königlich Preussischen Akademie der Wissenschaften zu Berlin* 121–128. [<https://www.biodiversitylibrary.org/page/29200450#page/197/mode/1up>]
- Léveillé, H. (1906) Novitates Sinenses. In: Fedde, F. (Ed.) *Repertorium Specierum Novarum Regni Vegetabilis, V.2*, Berlin, pp. 113. [<https://www.biodiversitylibrary.org/page/234075#page/378/mode/1up>]
- Léveillé, H. (1909) Decades Plantarum Novarum. XVI. In: Fedde, F. (Ed.) *Repertorium Specierum novarum Regni Vegetabilis, V.7*, Berlin, pp. 20–21.  
<https://doi.org/10.1002/fedr.19090062105>
- Léveillé, H. (1910) Decades Plantarum Novarum. XLVI. *Repertorium Specierum novarum Regni Vegetabilis* 9: 20.  
<https://doi.org/10.1002/fedr.19100090103>
- Li, Z.H., Guan, K.Y., Lin, C.W. & Peng, C.-I. (2018) *Begonia qingchengshanensis* (sect. *Reichenheimia*, Begoniaceae), a new species from Sichuan, China. *Phytotaxa* 349: 197–200.  
<https://doi.org/10.11646/phytotaxa.349.2.12>
- Lindley, J. (1847) Begoniaceae. In: *The Vegetable Kingdom, or, The structure, classification, and uses of plants illustrated upon the natural system*. Bradbury & Evans, London, pp. 318–319.  
<https://doi.org/10.5962/bhl.title.109531>
- Tian, D.K., Wei, H.J., Huang, C.Z., Wu, L., Chen, Z.L., Guo, Z.Y., Sun, X.J., Wang, S.W., Gao, Q.M. & Li, X. (2024) Two new species of Begoniaceae from China mainland. *Taiwania* 69 (1): 89–98.  
<https://doi.org/10.6165/tai.2024.69.89>
- Yang, L. (2009) Studies on Systematics of *Begonia* L. in Guizhou. MS Thesis, Guiyang College of Traditional Chinese Medicine. [<https://kns.cnki.net/>]
- Wang, W.G., Ma, X.D., Li, R.K., Shi, J.P., Zhang, S.Z. & Shen, J.Y. (2020) *Begonia puerensis* sp. nov. (Begoniaceae), a new tuberous species from Yunnan, China. *Nordic Journal of Botany* 2020: e02618.  
<https://doi.org/10.1111/njb.02618>
- Wu, C.Y. & Ku, T.C. (1995) New taxa of the *Begonia* L. (Begoniaceae) from China. *Acta Phytotaxonomica Sinica* 33 (3): 251–280. [<https://www.jse.ac.cn/EN/Y1995/V33/I3/251>]