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***Begonia shenzhenensis*, a new species of Begoniaceae from Guangdong of China**

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Abstract

Begonia shenzhenensis D.K.Tian & Xiao-Yun Wang *sp. nov.*, a new species in *Begonia* sect. *Platycentrum* of Begoniaceae from Shenzhen of Guangdong province, China, is described and illustrated. Morphologically, it is mostly similar to *Begonia coelocentroides* in the same section, but clearly differs by its denser hairs on leaf, petiole and pedicel, obtuse anther apex, hairy ovary and narrower adaxial fruit wing. Based on only one small population ever found so far, its conservation status is assigned to Critical Endangered according to the IUCN Red List Categories and Criteria.

Key words: Conservation status, deciduous, morphology, rhizomatous begonia, southern China, taxonomy.

Introduction

Guangdong province is located at southern China and it borders with Macau and Hongkong, two Chinese special administration regions. In the past, the numerous surveys on plant diversity of this province were widely conducted by a number of botanists mainly from several research institutions, including South China Botanical Garden of Chinese Academy of Sciences, Sun Yat-sen University, Guangdong Academy of Forestry, South China Agricultural University, etc. However, some new species and new records still have been recently discovered (Huang et al., 2020; Zhou et

al., 2020), including two begonia species (Ding et al., 2018; Tu et al., 2020). Here we described and illustrated a new species of *Begonia*, *Begonia shenzhenensis* D.K.Tian & Xiao-Yun Wang, which increased the species number of begonias to 14 in Guangdong province. Other 13 species are *B. circumlobata* Hance, *B. coptidifolia* H.G.Ye, F.G.Wang, Y.S.Ye & C.-I Peng, *B. cucullata* Willd. (naturalized), *B. edulis* Léveil., *B. ehuanzhangensis* Q.L.Ding, W.Y.Zhao & W.B.Liao, *B. firmbristipula* Hance, *B. fordei* Irmscher, *B. grandis* Dryander, *B. guangdongensis* Wen-Hui Tu, Bing-Mou Wang & Yu-Ling Li, *B. handelii* Irmscher, *B. leprosa* Hance, *B. longifolia* Blume, and *B. palmata* D.Don.

Taxonomic treatment

Begonia shenzhenensis D.K.Tian & Xiao-Yun Wang, *sp. nov.* 深圳秋海棠, **Fig. 1 to Fig. 2**

Type: CHINA. Guangdong: Shenzhen (深圳), Pinshan (坪山) District, Tiantou Mountain (田头山) Natural Reserve, on shallow humus soil above the rocky surface under the forest along stream, 22°43'29"N, 114°24'2"E, elev. 70 m, 6 June 2020, Dai-Ke Tian, Xiao-Yun Wang, Bin Chen & Shi-Pin Zhong, TDK4160 (holotype, CSH! CSH0182483).

Specimen examined: Same locality as type, 21 September 2019, Xiao-Yun Wang, TDK3981 (paratype, CSH); Shanghai Chenshan Plant Science Research Center, cultivated plants under 25 °C room temperature, 7 November 2020, Dai-Ke Tian, TDK4832 (paratype, CSH).

Diagnosis: The new species is mostly similar to *B. coelocentroides* Y.M.Shui & Z.D.Wei in the same section, but clearly differs by its densely (vs. sparsely) hairy petioles and blades, hairy (vs. glabrous) ovaries, obtuse (vs. concave) anther apex, and narrower (vs. wider) adaxial fruit wing. It is also close to the small-sized individuals (before mature) of *B. edulis* in appearance, but differs by its short and small (vs. tall and large) and none-stemmed (stemmed) plants, and hairy (vs. glabrous) pedicels, flowers, and fruits (**Table 1, Fig. 2**).

Herb perennial, rhizomatous, 7–15 cm tall, monoecious, epiphytic on rock with moss or humus soil.

Rhizome creeping, 5–10 cm long, internodes unclear to 10 mm long, 5–13 mm thick, unbranched to

rarely branched, greenish brown. aerial stem absent, or occasionally one very short internoded stem at anthesis, **Leaves** simple, basal, alternate, 4–8 each plant, deciduous in winter. **Stipules** persistent, pale pink, long triangular, 5–8 × 4–6 mm, abaxially hairy, apex with short arista. **Petioles**, light-green to pink, 4–18 cm long, 1.5–5 mm thick, grooved in full-length, short greyish pubescent, less than 1.5 mm long, hair tips often curly. **Leaf blades** obliquely oval-cordate, 5–22 × 3.5–16 cm; adaxially green, rarely dark green, rough, short greyish strigose, less than 1 mm long; adaxial veins slightly convex at base, concave upper part; abaxially greyish-green or lightly red-purple, veins convex, with short greyish strigose, 1–1.5 mm long, leaf veins 7 to 6; **Leaf base** shallowly cordate, obtuse to nearly overlapping, decurrent part 1–4 cm long; leaf margins serrate, rarely double serrate, occasionally cleft-teethed, with arista; apex acuminate or short-caudate. **Inflorescences** 2–4, successively growing from leaf axil of stem near shoot, 11–17 cm long; peduncle light green, 8–15 cm long, 2–3.5 mm thick, greyish-white villose, pedicel less hairy, each inflorescence 3–7 flowers, 0–2 pistillate. **Bracts** and bracteoles greenish white, long triangular, bracts 5–12 × 3–7 mm; bracteoles 4–11 × 2–6 mm, both abaxially sparsely white pubescent, ca. 1 mm long, apex acuminate, with sparse cilia. **Staminate flower**: pedicel white or light-green at low part, 1.8–3.4 (4.5) cm long, 1–2 mm thick, short greyish white-pubescent (less than 1 mm long); flower white, 2.5–4.5 × 2.4–3.7 cm; outer 2, ovate, entire, 1.2–2.2 × 1.2–2.1 cm, central part thick and abaxial with short greyish white or pink pubescent, indumentum same as pedicel; inner 2, long obovate–lanceolate, glabrous, 10–19 × 5–9 mm. androecium, 3–4 × 4–5 mm, stamens 50–92, filaments basally connate into stamen column, 2–3 mm × ca. 1 mm, free part 1–2 mm long, anthers yellow, 0.8–1.2 mm long. **Pistillate flower**: a pair of pale green bracteoles persistent near ovary, 3–10 × 1–4 mm; pedicel 9–18 mm long, 1.2–2 mm thick, with extremely short greyish white pubescent, less than 0.5 mm long; flower 30–37 × 25–37 mm, tepals 5 (rarely 6), outer 4 (5), slightly large, 13–18 × 7–15 mm, sparsely greyish white short pubescent, inner 1, small, glabrous, oblanceolate, 11–15 × 5–9 mm wide; gynoecium 3–4 × 3–7 mm, styles 2, stigmas 2, nearly U-shape branched, both sides spirally twisted nearly one circle; ovary greenish-white, short hairy, placentation axile, 2-loculed, each placenta 2-branched; **Peduncles** light-green, hairy, 15–32 cm long, ca 2 mm thick, hairy, a pair of green bracteoles often persistent near ovary; **Fruits** capsule, green, densely short grayish-white pubescent, 6–10 × 5–8 mm, 3-winged, unequal, abaxial wing long rectangular or subtriangular, 18–28 × 8–10 mm; lateral wings narrow, sickle-shaped or cornice or auriculate triangular, ca. 4–8 × 8–10 mm. Flowering June–July Fruiting

July–October

Etymology: The specific epithet refers to the name of Shenzhen, which includes the type locality of the new species.

Table 1 Comparison of *Begonia shenzhenensis* and *B. coelocentroides*

	<i>B. shenzhenensis</i>	<i>B. coelocentroides</i>
Plant height	7–15 cm	5–10 cm
Leaf blade	densely hairy	sparsely pilose to nearly glabrous
Petiole's hair	dense	sparse
Peduncle and pedicel	hairy	glabrous
Outer staminate tepal	hairy	sparsely hairy
Anther apex	obtuse	concave
Fruit	densely hairy	glabrous
Adaxial wing	narrower, 8–10 mm wide	wider, 9–14 mm wide

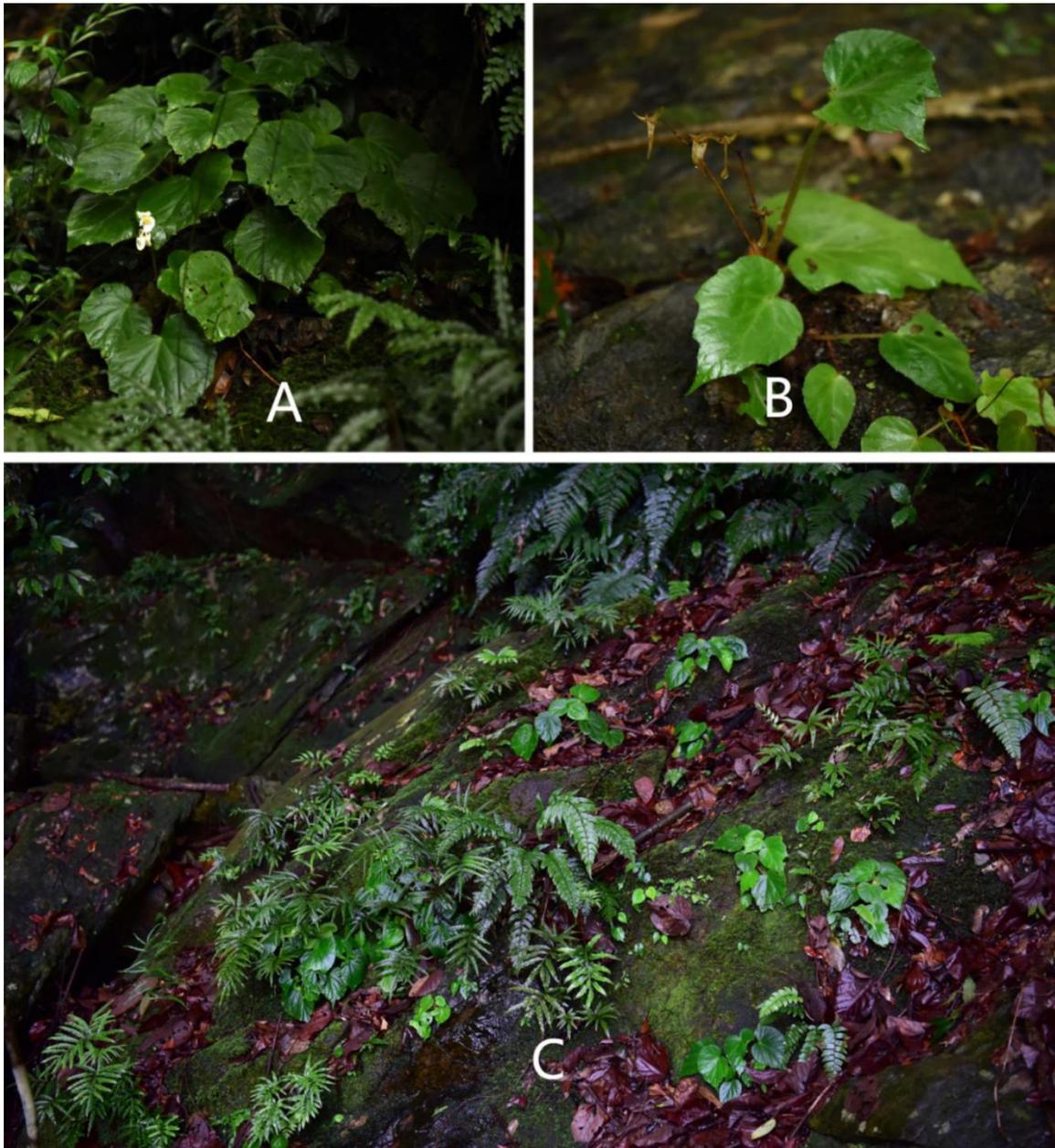


Figure 1 Plants and habitat of *B. shenzhenensis* D.K.Tian & Xiao-Yun Wang

A. Plant at the earliest flowering time (6 June, 2020); B. Plants with the dried fruits matured in the previous year; C. Habitat showing mature plants and seedlings of the new species growing together with mosses and ferns above the rocks. (Photo by Dai-Ke Tian)

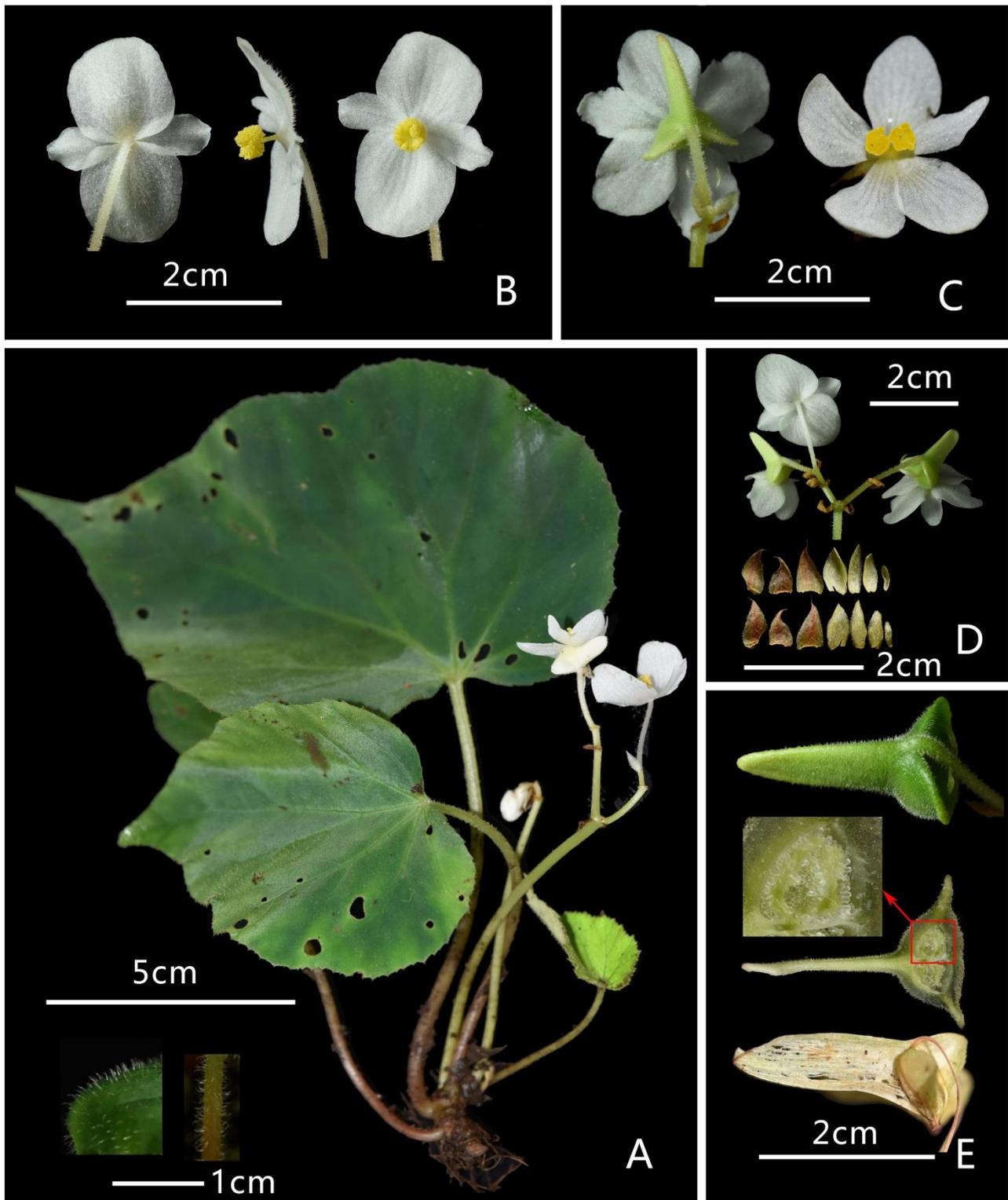


Figure 2 Morphology of *Begonia shenzhenensis* D.K. Tian & Xiao-Yun Wang

A. One of the largest plants with flowers (left corner: sections of leaf and petiole showing hairs); B. Staminate flowers showing in different directions; C. Pistillate flowers, bracts (left: back view of 6-tepalled flower; right: front view of 5-tepalled flower); D. Inflorescence, stipules (left) and bracts (right); E. Fruits (top: fresh, bottom: dried) and ovary dissection. (Photo by Dai-Ke Tian)

Distribution and habitat: The new species is only known from its type locality in Tiantou Mountain

Natural Reserve of Pingshan District of Shenzhen, Guangdong Province, China (**Fig. 3**). It grows together mainly with the mosses, ferns and other herbs on shallow humus soil above the rocks along a small stream under forest.



Figure 3 Distribution of *Begonia shenzhenensis* (red dot) from Shenzhen, Guangdong of China

Conservation status: *Begonia shenzhenensis* is only observed in its type locality with a very small population containing less than 50 individuals. Due to relatively low ornamental value of plants, it is possibly less chance of being collected by plant hunters. However, there are no suitable places nearby for spreading of its population. Therefore, this species should be considered as Critical Endangered (CE) according to the IUCN Red List Categories and Criteria (IUCN, 2019) based on the current data.

Note: The new species was first discovered by Mr. Xiao-Yun Wang, a plant fan working at Hechang Weilai Science and Technology (Shenzhen) Co. Ltd. in Guangdong province of China. On 21 September 2019, Xiao-Yun Wang posted the photos of a wild begonia from Shenzhen of Guangdong

province, China. By the request of Dr. Dai-Ke Tian, the living plants were collected and introduced to Shanghai Chenshan Botanical Garden for further study. The introduced plants grow well in two plastic pots placed in a squared polymethyl box at 25°C room temperature and bloom from November to June. On 6 June of 2020, with the help of Xiao-Yun Wang, Dr. Dai-Ke Tian and Dr. Bin Chen conducted a field survey on this species and further confirmed that it is new to science.

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