

Begonia guaniana (Begoniaceae), a new species from China

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Begonia guaniana H. Ma & H.Z. Li *sp. nova* (Begoniaceae) is described and illustrated. It resembles *B. labordei* H. Lév., differing mainly in that its leaves are almost glabrous, its inflorescence is definite, dichasial cymose, its usually symmetric, carpelate flower pedicel is compressed, and its three tepals and styles are only fused at their bases.

Key words: *Begonia*, Begoniaceae, China

Begonia (Begoniaceae) is a pantropical genus with about 1400 species, comprising nearly all the species of Begoniaceae (Smith *et al.* 1986, Sosef 1994, Doorenbos *et al.* 1998). There are about 150 species in China, classified into nine sections (Shui *et al.* 2002). Most of them are distributed to the south of the Yangtze River, especially in the southeastern Yunnan and southwestern Guangxi (Ku 1999, Tian & Guan 2000 Tebbitt *et al.* 2002, Ye *et al.* 2004, Xing *et al.* 2005).

During our field surveys to Zhaotong City, Yunnan Province in June 2005, we discovered a species of *Begonia* and introduced the specimens to Kunming Botanical Garden. A careful study of plants at anthesis grown in our greenhouse revealed that it was a new species of *Begonia* sect. *Diploclinium*. That section is currently characterized by its members having 3-locule ovaries with axile placenta, each with bifid placenta (Ku 1999), but is otherwise very polymorphous and

does not constitute a natural group (Doorenbos *et al.* 1998). The section contains about 160 species, more than one fourth of which are indigenous to China (Shui *et al.* 2002).

***Begonia guaniana* H. Ma & H.Z. Li, *sp. nova* (section *Diploclinium*) (Figs. 1 and 2)**

Haec species affinis B. labordeo, sed foliis subglabris, inflorescentiis dichotomiis cymis, femineorum tepalis 3 differt.

TYPE: China. Yunnan Province, Zhaotong City, Yanjin County, Miaoba Town, Huangcao Village, on moist cliff beside the highway (Miaoba Town to Yanjin County), soil pH 6.4–6.7, 22°59'22"N, 104°15'09"E, alt. ca. 500 m, 10.VI.2005 *H. Ma* 002 (holotype KUN; isotype, one sheet, KUN). — PARATYPE: China. Kunming Botanical Garden, Kunming Institute of Botany, the Chinese Academy of Sciences, introduced from type locality, 22.VIII.2005 *H. Ma* 008 (KUN).

Tuberous perennial herbs; monoecious; tuber

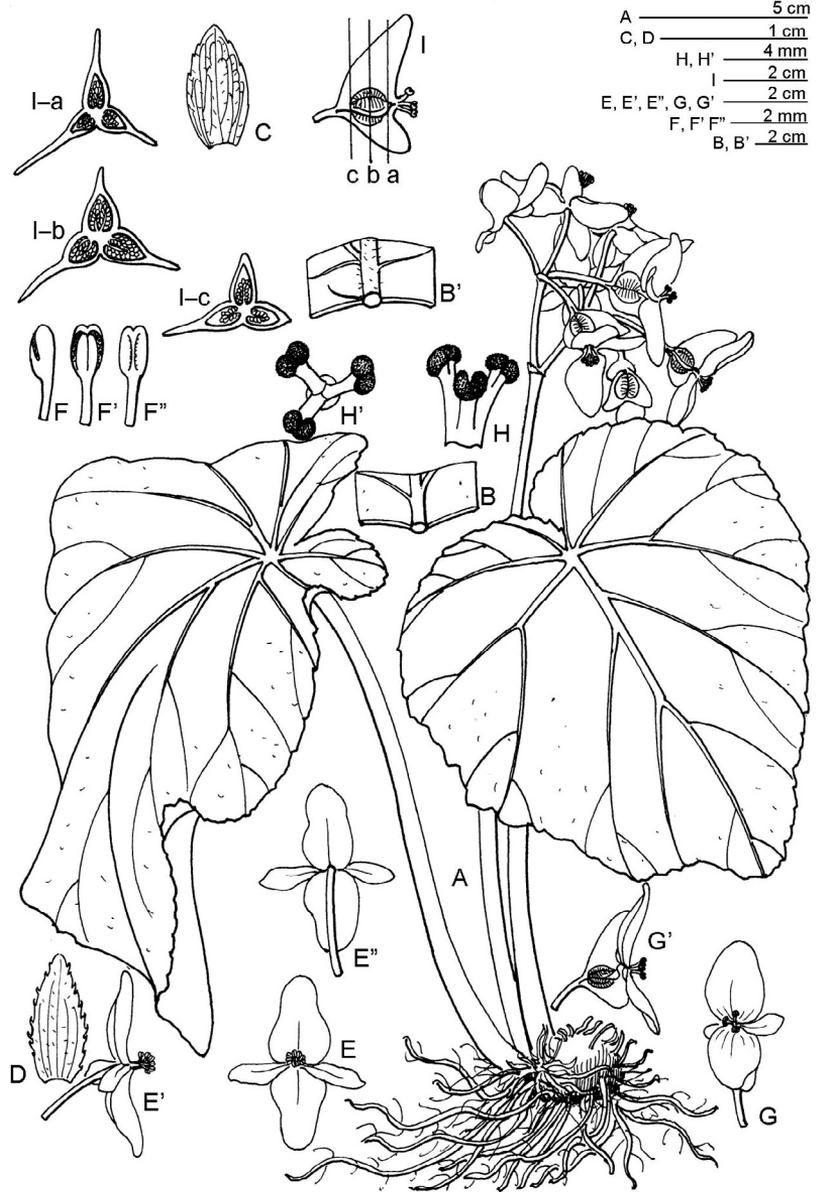


Fig. 1. *Begonia guaniana* (from a living plant cultivated in our greenhouse of KBG, drawn by Wang Ling). — **A:** Habit. — **B–B':** Portion of leaf: adaxial surface, abaxial surface. — **C:** Stipule. — **D:** Bract. — **E–E'':** Staminate flowers: face view, lateral view, back view. — **F–F'':** Stamens: lateral view, ventral view, dorsal view. — **G–G':** Carpellate flowers: face view, lateral view. — **H–H':** Style: lateral view, top view. — **I, a–c:** Upper, middle, basal cross section of an ovary.

subglobose to depressed globose, usually 2–3 connected together, moniliform, whitish, greenish or brownish, covered with fibrous roots, 0.5–3 cm in diameter; stipule caducous, membranous, ovate to broadly lanceolate, slightly asymmetric, sparsely hairy on abaxial surface, greenish to brownish, 0.5–1 × 0.2–0.5 cm, apex acuminate, margin entire or remotely dentate; Leaves 1–4, all basal, alternate, nearly glabrous, with sparse tiny hairs on adaxial surface and sparse tiny hairs along abaxial veins and on

abaxial surface near margin, simple, asymmetric, obliquely ovate to broadly ovate, rarely broadly cordate, thin but fleshy, adaxial surface often waxy, pale green to dark green, abaxial surface offwhite, pale green, or reddish to purplish, 5.5–17 cm long, 3.8–19 cm wide, apex acute, seldom obtuse, base cordate, often overlapped, margin crenate, irregularly serrate or shallowly repand, venation 5–7 palmate, with 2–3 major lateral veins on each side of main vein, veins directly up to margin, prominent on abaxial sur-



Fig. 2. *Begonia guianiana* (photos taken by Ma Hong). — **A:** Habit and habitat. — **B:** Cultivated plants at anthesis. — **C:** Inflorescence at early phase of flowering. — **D:** Inflorescence at maturity. — **E:** Bracts. — **F:** Carpellate flowers, face view. — **G:** Carpellate flowers, lateral view. — **H:** Staminate flowers, lateral view. — **I:** Middle cross of an ovary. — **J:** Dry capsule.

face; petiole greenish, sometimes reddish near base, or brownish, terete, glabrous, sometimes with sparse tiny hairs near apex, 3–20 cm long, 2–4.5 mm in diameter. Inflorescence arising from tuber, dichasial cymose, branched 1–3 times, flowers three to many, peduncle well developed, seldom branched, greenish to reddish, 3–19 cm long, 2–5 mm in diameter, erect, glabrous; bract caducous, herbaceous, triangular, lanceolate to filiform, greenish to reddish, becoming brown at maturity, 0.4–1.1 × 0.1–0.3 cm, apex acute to acuminate, with sparse short hairs on abaxial surface, margin ciliate-serrate or entire; tepals glabrous, margin entire; staminate flowers: scented, pedicel white to pink, terete, 0.5–3.7 cm long, erect or ascending, tepals 4, outer 2 white to pink, broadly ovate, apex obtuse, often revolute, ca. 1–2 cm long, 0.9–1.5 cm wide, inner 2 white

to pink, oblanceolate to obovate, apex obtuse to acute, ca. 0.7–1.5 cm long, 4–6 mm wide; androecium zygomorphic, compressed, stamens 21–33, golf-club shaped; filaments free, nearly equal in length, ca. 1–1.2 mm long, attached to a torus; anthers yellow, 2-locular, longitudinal dehiscence, apex emarginated, ca. 1–1.5 mm long; carpellate flowers: slightly scented, pedicel white to pink, compressed, 0.5–1.6 cm long, pendent, tepals 3, outer 2 white to pink, broadly ovate to ovate-orbulate, often slightly revolute, ca. 1.4–1.6 cm long, 1.3 cm wide, inner one white to pink, oblanceolate, narrowly obovate to oblong, apex acute, ca. 7–9 mm long, 3.5–4.5 mm wide; ovary glabrous, ovate to broadly elliptic, greenish, 3-winged, locule 3; placenta axile, with one bifid placenta in each locule at upper and middle parts, and one entire placenta in basal part; styles

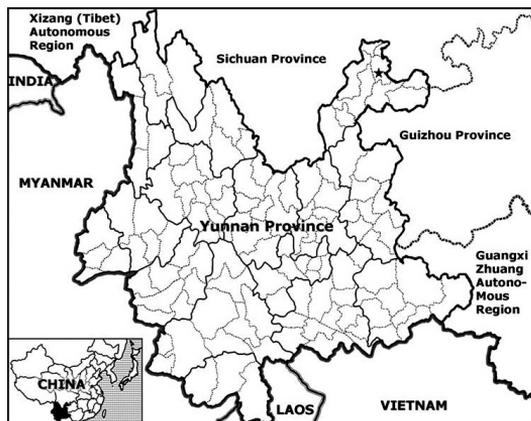


Fig. 3. Distribution of *Begonia guaniana* in Yunnan Province, China.



Fig. 5. Scanning electron micrograph showing pollen morphology of *Begonia guaniana*.

3, yellowish, ca. 2 mm long, fused at base; stigma U-form and somewhat spiraled; fruit a dehiscent capsule, glabrous, broadly elliptic, nodding, ca. 0.7–1.3 cm long, 0.6–1.1 cm wide (not including wings), with persistent styles, wings 3, unequal, larger one obliquely triangular, ca. 0.5–2.2 cm long, apex obtuse, superior margin horizontal to ascending, inferior margin ascending, minor 2 obliquely triangular, crescent-shaped or arched, ca. 1–5 mm long. Seeds many, brown. Flowering from July to September.

ETYMOLOGY: The epithet of the new species comes from “Guan”, in honor of Prof. Kai-Yun Guan, Kunming Botanical Garden, Kunming Institute of Botany, the Chinese Academy of Sciences, for his contribution to our knowledge of Chinese *Begonia*.

ECOLOGY AND DISTRIBUTION: Grows on moist cliff under bamboo forest with *Begonia gagnepainiana*, *Elatostema quinquecostatum*, *Melastoma*

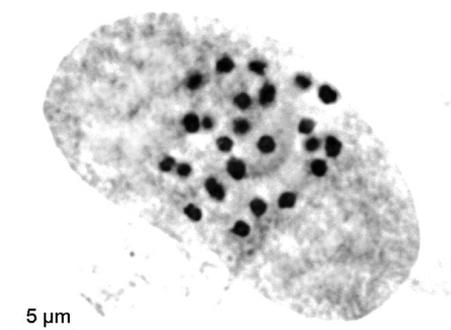


Fig. 4. Somatic metaphase chromosomes of *Begonia guaniana* ($2n = 24$).

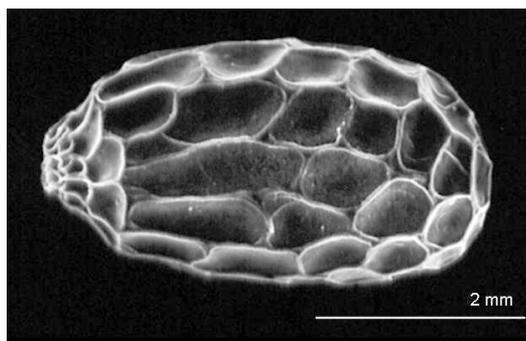


Fig. 6. Scanning electron micrograph showing seed morphology of *Begonia guaniana*.

candidum, *Pyrrhosia lingua*, *Setaria plicata*, etc. Known only from the type locality in Zhaotong City, Yunnan Province (Fig. 3).

CYTOLOGY: The somatic chromosome number is $2n = 24$. Absolute length of chromosomes is 0.844–1.604 μm and the range of relative length is 2.93–5.57. The chromosomes are too small to observe its centromere. The largest chromosome is twice as large as the smallest one (Fig. 4).

Pollen morphology: Long-ellipsoid, tricolporate, ca. $32 \times 12 \mu\text{m}$, exine sculpture is irregular-striped, and dotted with sparse foveolae, which are slightly denser in the polar areas (Fig. 5).

SEED MORPHOLOGY: Ellipsoid to ovoid-ellipsoid, ca. $0.35\text{--}0.5 \times 0.3\text{--}0.35 \text{ mm}$, chalazal end contracted, micropylar end obtuse, outer periclinial walls of mature seeds concave, collar cells elongated, nearly rectangular, testa cell nearly isodiametric-polygonal (Fig. 6).

Begonia guaniana resembles *B. labordei* (sect. *Diploclinium*), especially in its tuberous,

Table 1. Morphological differences between *Begonia guaniana* and *B. labordei*.

	<i>B. guaniana</i>	<i>B. labordei</i>
Maculation	lacking	usually reddish or purplish maculation or bands on peduncles, petioles and main veins on abaxial surface of leaves
Leaf		
Texture	thin but fleshy, adaxial surface often waxy	sometimes chartaceous
Indumentum	nearly glabrous, hairs sparse, tiny	conspicuously hispid
Apex	usually acute	usually acuminate indefinite, cyme-botrys,
Inflorescence	definite, dichasial cymose, usually symmetric, 3- to many flowered	asymmetric, many-flowered
Staminate flowers		
Shape of inner tepals	oblanceolate to obovate	usually narrowly obovate
Carpellate flowers		
Shape of pedicels	compressed	terete
Number of tepals	3	4
Styles	nearly free, only fused at base	about half fused

stemless habit. Table 1 summarizes the main morphological differences between *B. guaniana* and *B. labordei*.

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References

- Doorenbos, J., Sosef, M. S. M. & de Wilde, J. J. F. E. 1998: The Sections of *Begonia* including descriptions, keys and species lists (Studies in Begoniaceae VI). — *Wageningen Agric. Univ. Pap.* 2: 1–11.
- Ku, T. C. 1999: Begoniaceae. — In: Ku, T. C. (ed.), *Flora Reipublicae Popularis Sinicae* 52 (1): 126–129. Sci. Press, Beijing.
- Shui, Y. M., Peng, C. Y. & Wu, C. Y. 2002: Synopsis of the Chinese species of *Begonia* (Begoniaceae), with a reappraisal of sectional delimitation. — *Bot. Bull. Acad. Sin.* 43: 313–327.
- Smith, L. B., Wasshausen, D. C., Golding, J. & Karegeannes, C. E. 1986: Begoniaceae, Part 1: Illustrated Key; Part 2: Annotated Species List. — *Smithson. Contr. Bot.* 60: 1–584.
- Sosef, M. S. M. 1994: Studies in Begoniaceae V: Refuge Begonias, taxonomy, phylogeny and historical biogeography of *Begonia* sect. *Loasibegonia* and sect. *Scutobegonia* in relation to glacial rain forest refuges in Africa. — *Wageningen Agric. Univ. Pap.* 1: 1–13.
- Tebbutt, M. C. & Guan, K. Y. 2002: Emended circumscription of *Begonia silletensis* (Begoniaceae) and description of a new subspecies from Yunnan, China. — *Novon* 12: 133–136.
- Tian, D. K. & Guan, K. Y. 2000. Three new species of *Begonia* from Yunnan. — *Acta Bot. Yunnanica* 22: 129–134.
- Xing, F. W., Wang, F. G., Chen, H. F. & Chau, L. K. C. 2005: *Begonia hongkongensis* (Begoniaceae), a new species from Hong Kong. — *Ann. Bot. Fennici* 42: 151–154.
- Ye, H. G., Wang, F. G., Ye, Y. S. & Peng, C. I. 2004: *Begonia coptidifolia* (Begoniaceae), a new species from China. — *Bot. Bull. Acad. Sin.* 45: 259–266.