

# Notes on *Begonia* (sect. *Coelocentrum*, Begoniaceae) from Guangxi, China, with the report of two new species

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**Abstract.** *Begonia curvicarpa* and *B. luochengensis*, two new species of sect. *Coelocentrum* from the karst area in northern Guangxi Zhuangzu Autonomous Region, China are described and illustrated. Their somatic chromosome numbers, both  $2n = 30$ , are reported. *Begonia curvicarpa* resembles *B. porteri*, from which it differs in having longer (1.5-5.5 cm vs. 0.8-1.7 cm) internodes on the rhizome, fewer hairs on upper leaf surface, and remarkably curved capsules. *Begonia luochengensis* is similar to *B. luzhaiensis*, but differs from the latter in having ovate (vs. orbicular to broadly ovate) leaves with a characteristic white band along midrib. *Begonia yishanensis* is treated as a synonym of *B. porteri*, and *B. zhangii* is treated as a synonym of *B. daxinensis*.

**Keywords:** Begoniaceae; *Begonia cirrosa*; *Begonia curvicarpa*; *Begonia luochengensis*; *Begonia luzhaiensis*; *Begonia porteri*; *Begonia yishanensis*; *Begonia daxinensis*; *Begonia zhangii*; China; Chromosome number; Guangxi; New species; sect. *Coelocentrum*.

## Introduction

*Begonia* sect. *Coelocentrum*, characterized by a unilocular capsule with parietal placentation, was first delineated by Irmscher (1939) for four Chinese species (*B. lanternaria* Irmsch., *B. morsei* Irmsch., *B. ornithophylla* Irmsch. and *B. porteri* H. Lév. & Vaniot). All other sections of Chinese *Begonia* have axile placentation with two or more locules. In this paper Irmscher published *Begonia filiformis* Irmsch., a member of sect. *Coelocentrum*, but he erroneously assigned it to sect. *Reichenheimia* (Shui et al., 2002). In Irmscher's 1951 paper two other new species of sect. *Coelocentrum* in China were added: *B. obsolescens* Irmsch. (transferred to sect. *Diploclinium* by Shui and Huang, 1999) and *B. crispula* Yu ex Irmsch. The latter is a later homonym of *B. crispula* Brade and a new name, *B. cirrosa*, was published for it by Smith and Wasshausen (1983). Irmscher (1959a, b) published yet another new species of sect. *Coelocentrum*, *B. masoniana* Irmsch. ex Ziesenh. It is a very handsome plant of great ornamental value, previously known as *Begonia* 'Iron Cross' in the horticultural trade. The name *B. masoniana* Irmsch. was not validated until 1971 when Ziesennehenne made the appropriate typification.

More new species of *Begonia* sect. *Coelocentrum* became known in recent decades from China: *B. umbraculifolia* Y. Wan & B. N. Chang (Wan and Chang,

1987); *B. pseudodryadis* C. Y. Wu (Wu and Ku, 1995, as sect. *Platycentrum*; see Shui and Huang, 1999); *B. biflora* T. C. Ku, *B. daxinensis* T. C. Ku, *B. guangxiensis* C. Y. Wu, *B. setuloso-peltata* C. Y. Wu (Wu and Ku, 1997); *B. obliquefolia* S. H. Huang & Y. M. Shui (Shui and Huang, 1999); *B. yishanensis* Ku, *B. luzhaiensis* Ku (Ku, 1999); *B. zhengyiana* Y. M. Shui (Shui, 2002). In their synopsis of Chinese *Begonia*, Shui et al. (2002) listed 18 species for sect. *Coelocentrum*, including *B. bonii* Gagnep. and *B. filiformis* Irmsch. that were erroneously assigned to sect. *Reichenheimia* in the past.

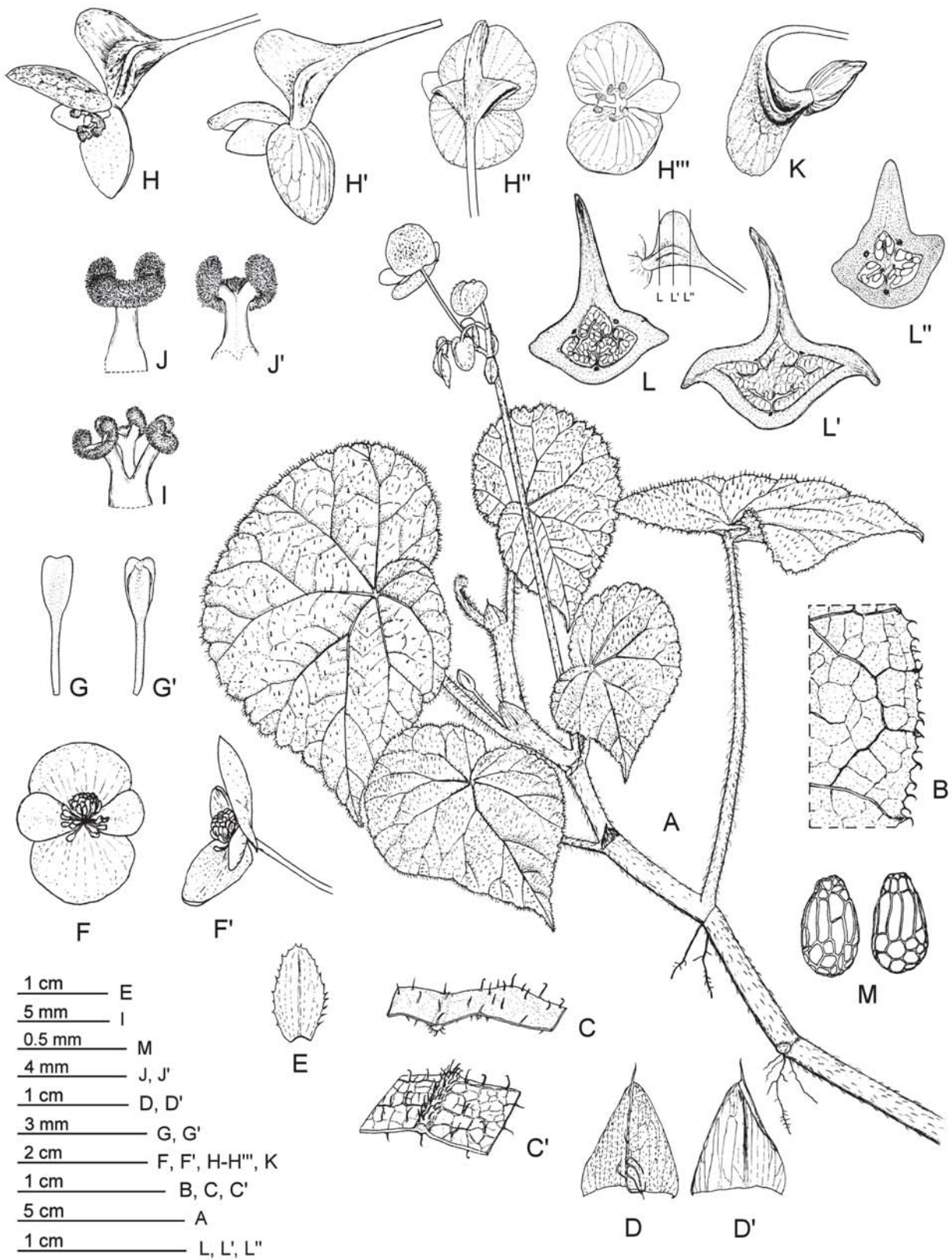
Very recently, Fang et al. (2004) added one more species to sect. *Coelocentrum*: *B. zhangii* D. Fang & D. H. Qin. After careful examination of the type materials (GXMI, PE) and a field trip to recollect it, we conclude that it is synonymous with *B. daxinensis* T. C. Ku. Similarly, *Begonia yishanensis* T. C. Ku is hereby synonymized with *B. porteri* H. Lév. & Vaniot. During our intensive field surveys to Guangxi, China in recent years, we discovered two species of *Begonia* sect. *Coelocentrum* heretofore unknown to science, which are described below.

**1. *Begonia curvicarpa*** S. M. Ku, C.-I Peng & Y. Liu, sp. nov. —TYPE: China. Guangxi: Yongfu Xian, Baishou Zhen, Baishouyuan, 19 Oct 2003, Yan Liu L0896 (holotype: IBK; isotypes: HAST, IBK). 彎果秋海棠

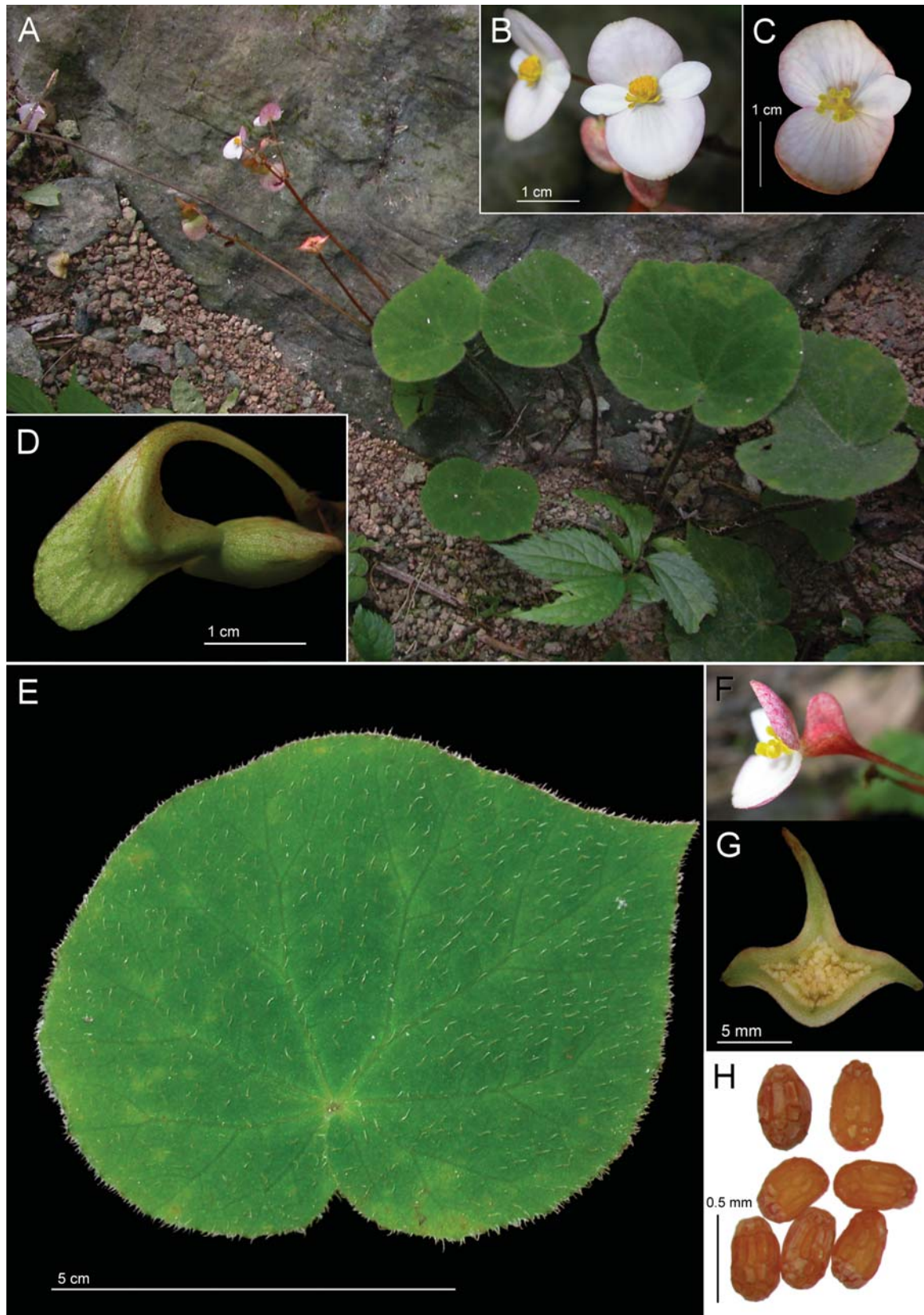
Figures 1, 2

*Haec species affinis B. porteri* H. Lév. & Vaniot, sed rhizomate internodiis longioribus (1.5-5.5 cm; 0.8-1.7 cm in *B. porteri*), et fructibus curvatis differt.

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**Figure 1.** *Begonia curvicarpa* S. M. Ku, C.-I Peng & Y. Liu. A, Habit; B, Leaf margin; C, Portion of leaf, adaxial surface, C', abaxial surface; D, Stipule, abaxial surface, D', adaxial surface; E, bract; F, Staminate flower, face view, F', lateral view; G, Stamen, dorsal view, G', ventral view; H & H', Carpellate flower, lateral view, H'', posterior view, H''', face view; I, Pistil; J, Style, dorsal view, J', ventral view; K, Fruit; L, Cross section of ovary, upper, L', middle, L'', basal; M, Seeds. (From W. C. Leong 3431; line drawing by S. M. Ku)



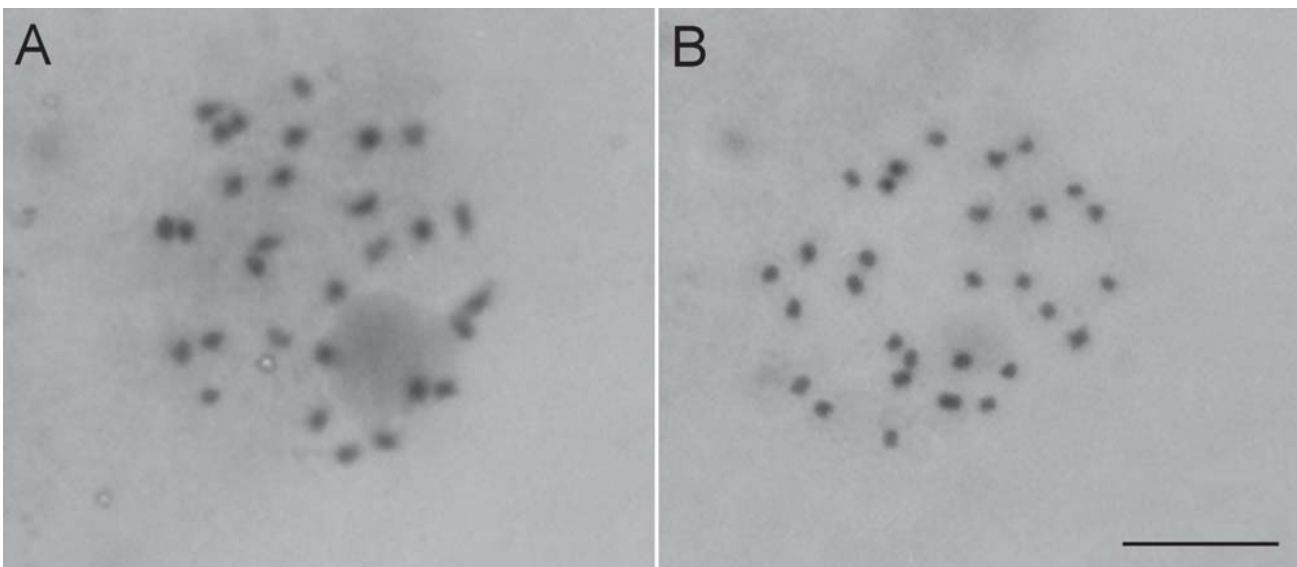
**Figure 2.** *Begonia curvicarpa* S. M. Ku, C.-I Peng & Y. Liu. A, Habit; B, Staminate flowers; C, Carpellate flower, face view; D, Fruit; E, Leaf blade; F, Carpellate flower, lateral view; G, Cross section of ovary; H, Seeds. (From *Leong 3431* (HAST); photos by S. M. Ku)

Plant monoecious; epipetric; perennial; rhizomatous, rooting at nodes. Rhizome succulent, creeping, elongate, somewhat zigzag, brown, sparsely hairy, 4-9 mm in diameter, internodes 1.5-5.5 cm long. Stipules often persistent, triangular, sparsely hairy along midrib, soon glabrescent on abaxial surface, thickly herbaceous, brownish to reddish brown, ca. 10 mm long, 9 mm wide, apex aristate, margin entire. *Leaves* alternate, sparsely pilose on adaxial surface and villous on abaxial surface, densely hairy along major veins on abaxial surface, simple, asymmetric, obliquely broadly ovate to orbiculate, thin chartaceous, green above, green to reddish beneath, (4-) 6-10 (-19) cm long (basal lobes included), (3-) 4-9 (-12) cm wide, apex acute to acuminate, rarely obtuse, base cordate, margin denticulate or ciliate-dentate, sometimes crenate; venation basally 6-7-palmate, pinnate along the midrib, with 2-3(-4) major lateral veins on each side; petioles brown, terete, 7-12 (-17) cm long, 2-4 mm in diameter, slightly reflexed crisp-hairy. *Inflorescences* axillary, arising from the rhizome, cymose, 1-3 branched, flowers 3-5; peduncles well developed, brown to brownish-green, to 9-12 cm long, 2-3 mm in diameter, erect or ascending; pedicel reddish to brownish with many red flecks, ascending in staminate flowers, horizontal to pendent in carpellate flowers. Bracts caducous, oblong, elliptic to ovate, herbaceous, green to reddish, to 4-8 (-10) mm long, 3-4 (-6) mm wide, apex obtuse, margins ciliate-serrate. Tepals glabrous, margins entire. *Staminate flowers*: tepals 4, outer 2 white to pinkish on adaxial surface and pink on abaxial surface with reddish flecks, broadly ovate to ovate-orbiculate, base slightly cordate, apex rounded, 13-15 mm long, 15-17 mm wide, inner 2 white, oblanceolate, apex obtuse, ca. 12 mm long, 6 mm wide; androecium zygomorphic, stamens 35-40, golf-club shaped; filaments free, nearly equal in length, ca. 2 mm long; anthers 2-locular, slightly compressed, oblong, apex slightly emarginate, yellowish, ca. 1.2 mm long. *Carpellate flowers*:

tepals 3, outer two white to pinkish on adaxial surface and pink on abaxial surface with reddish flecks, occasionally white on both surfaces, broadly ovate to ovate-orbiculate, apex rounded, 14-17 mm long, 15-17 mm wide, inner one obovate to oblanceolate; ovary glabrous, pinkish and with many red flecks, somewhat curved, 3-winged; wings unequal; lateral wings much narrower, curved, thick, 3-4 mm high; abaxial wing elliptic or nearly triangular, 6-7 mm high, 7-8 mm wide; locule 1; placentation intruded parietal; placentae 3, branches 2-4 per placenta; styles 3, fused in the lower 1/3, yellow, 4-5 mm long, the top split into a rounded U-shape; stigmas U-form and somewhat spiraled. *Fruit* a dry capsule, nodding, greenish when fresh and brownish when dry, manifestly crooked, 11-14 mm long, ca. 8-9 mm wide (wings excluded), glabrous; lateral wings 4-5 mm high; abaxial wing 8-8.5 mm high, apex with persistent tepals and styles. *Seeds* many, brown, ellipsoid or broadly ellipsoid, 0.5-0.6 mm × 0.3-0.35 mm, chalazal end rounded, micropylar end somewhat constricted, outer periclinal walls collapsed in mature seeds; collar cells elongated, straight, nearly rectangular, 10-12 cells in a ring, occupying 1/2 to 1/3 of the seed length; anticlinal walls between the collar cells raised, straight, rarely slightly undulated; testa cell nearly isodiametric-polygonal, mostly pentagonal and hexagonal, those adjacent to collar cells rarely slightly elongated. Somatic chromosome number,  $2n = 30$  (Figure 3A).

*Paratypes*. CHINA. Guangxi Zhuangzu Autonomous Region: Guilin Region, Youngfu Xian, Baishou Zhen, Baishouyuan. 109°46' 50'' E, 25°10' 10'' N, elev. ca. 240 m, at base of limestone rock, semishaded, occasional. *W. C. Leong 3431* (HAST), *W. C. Leong 3707* (HAST), *C.-I Peng 19850* (HAST); Rongan, Siding, *Y. C. Wei and X. M. Chen 52990* (GXMI).

*Ecology*. Growing on limestone rocks or at entrance of semishady to shady, slightly moist caves.



**Figure 3.** Mitotic chromosome spreads of *Begonia*. A, *Begonia curvicarpa* ( $2n = 30$ ); B, *Begonia luochengensis* ( $2n = 30$ ). Scale bar = 5  $\mu\text{m}$ . (A from *W. C. Leong 3431*, B from *W. C. Leong 3419*; both vouchers at HAST)

*Distribution.* Southern China.

*Phenology.* Flowering Aug to Nov; fruiting Oct to Dec.

*Etymology.* Named for the strikingly curved fruit.

*Notes.* *Begonia curvicarpa* is characterized by long-creeping rhizomes and crooked fruits. It resembles *B. porteri* H. Lév. & Vaniot, differing mainly in the much longer internodes of the rhizome, sparser pubescence on adaxial leaf surface and the remarkably curved fruits. However, its vestiture is similar to that of *B. cirrosa* L. B. Smith, which has a villous inflorescence and hirsute fruits. Table 1 summarizes the morphological differences between *Begonia curvicarpa* and four other somewhat similar species.

The leaves of *B. curvicarpa* are green on both surfaces or reddish-brown on upper surface and reddish to red beneath. Plants with reddish-brown leaves typically occur in exposed habitats, whereas the green-leaved individuals are usually found in shade.

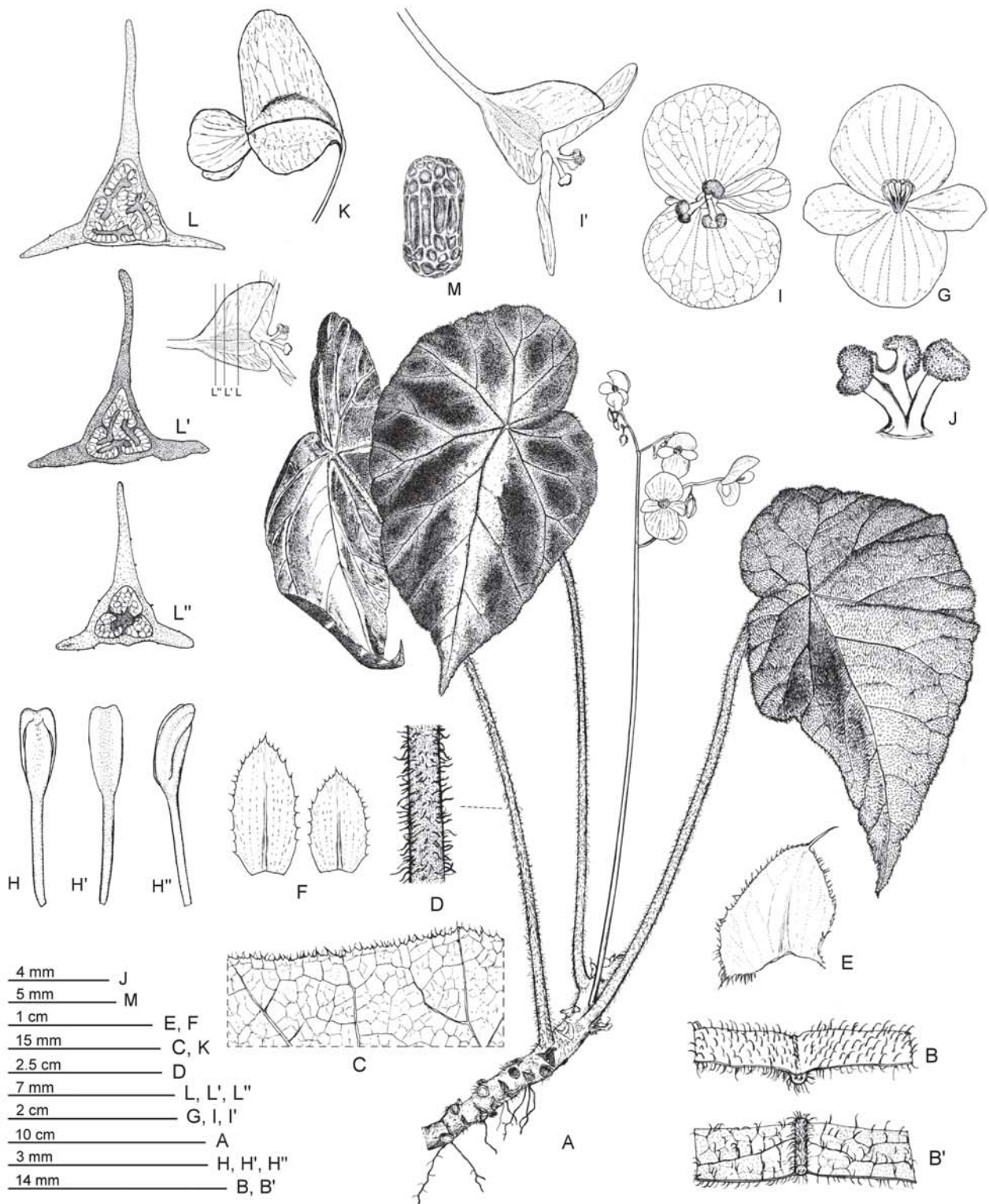
**2. *Begonia luochengensis*** S. M. Ku, C.-I Peng & Y. Liu, sp. nov. —TYPE: China. Guangxi: Luocheng, Baotan Xiang, Cen Cun, *Yan Liu L0899* (holotype: IBK; isotypes: HAST, IBK). 羅城秋海棠 Figures 4, 5

*Haec species affinis B. luzhaiensis* T. C. Ku, sed foliis ovatis, costa albovittata differt.

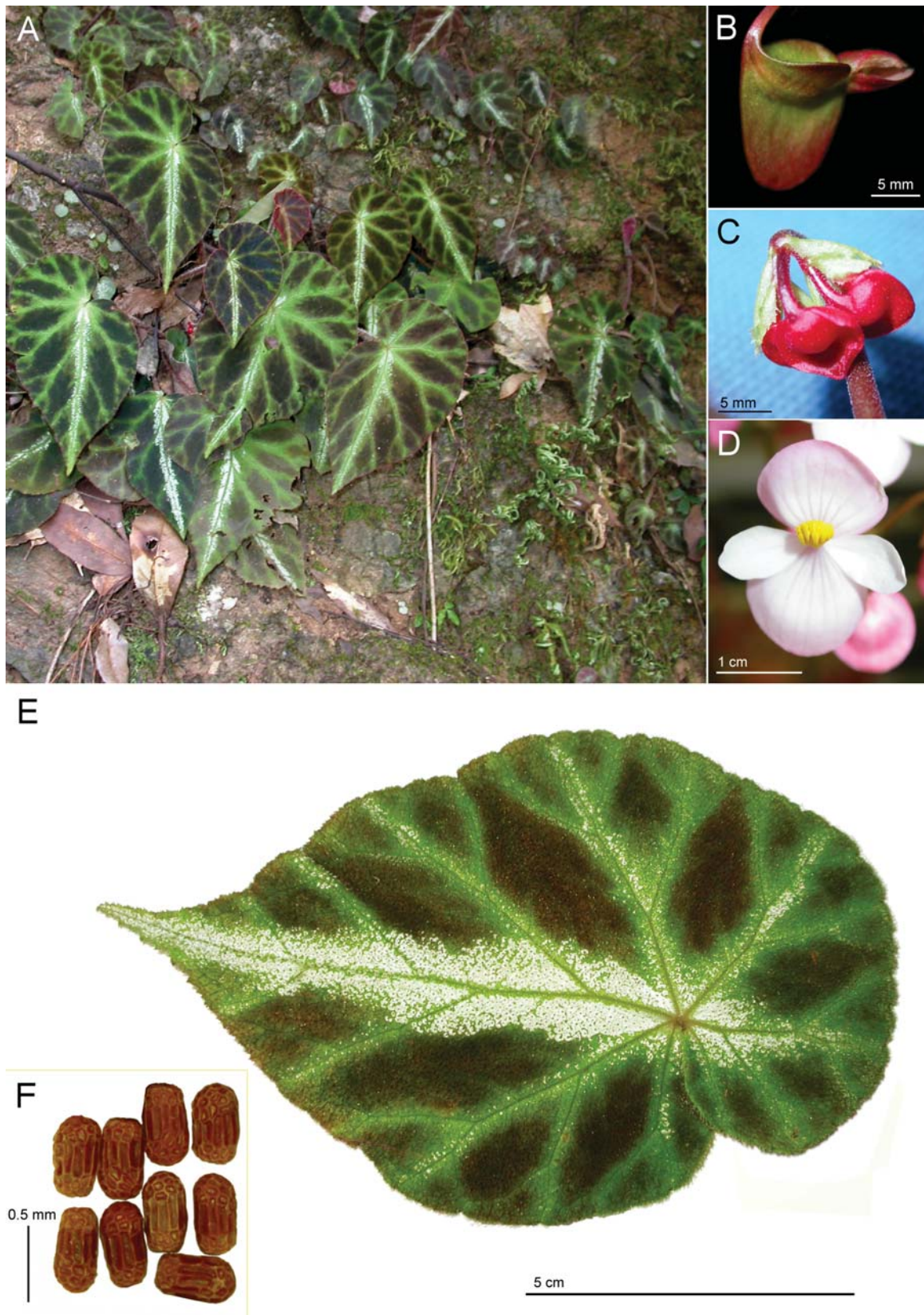
Plant monoecious; epipetric; perennial; rhizomatous. Rhizome succulent, creeping, brown, sparsely hairy near the petiole base or scar, 8–20 mm in diameter, internodes 8–12 mm long. Stipules persistent, triangular-ovate, sparsely villous to glabrous on abaxial surface, herbaceous, greenish-hyaline, ca. 7–10 mm long, 7–9 mm wide, apex aristate, margin ciliate-dentate or long-ciliate. *Leaves* alternate, tomentose on adaxial surface, hairs reddish, erect or slightly ascending, curved at tips; densely hairy along major veins and moderately along veinlets on abaxial surface; simple, asymmetric, obliquely ovate, chartaceous, with beautiful maculations on adaxial surface, often along the midrib,

**Table 1.** Comparison of *Begonia curvicarpa*, *B. luochengensis*, *B. porteri*, *B. cirrosa*, and *B. luzhaiensis*.

	<i>B. curvicarpa</i>	<i>B. luochengensis</i>	<i>B. porteri</i>	<i>B. cirrosa</i>	<i>B. luzhaiensis</i>
Rhizomes	Elongated, 4–9 mm in diam., internode 15–55 mm long	8–20 mm in diam., internode 8–12 mm long	Somewhat elongated, 5–11 mm in diam., internode 8–17 mm long	15–21 mm in diam., internode 10–35 mm long	5–15 mm in diam., internode 3–5 mm long
Leaf shape	Broadly ovate to orbiculate, unlobed	Ovate, unlobed	Ovate to orbiculate, rarely shallowly angularly lobed	Broadly ovate to orbiculate, unlobed	Broadly ovate to orbiculate, often shallowly angularly lobed
Leaf size	ca. 6–10×4–9 cm	ca. 15–20×7–12 cm	ca. 3.5–9×2.5–8 cm	ca. 11–19×9–14 cm	ca. 7–18×6–12 cm
Upper leaf surface	Pilose (loosely pubescent; hairs whitish); rarely slightly rugose	Tomentose (densely pubescent, hairs often reddish); not rugose	Tomentose (densely pubescent, hairs whitish); not rugose	Pilose (loosely to moderately pubescent; hairs white); slightly rugose	Sparsely scaberulous, hirtellous to tomentose (very sparsely to rather densely pubescent), hairs whitish or reddish; not rugose
Leaf maculation	Absent, sometimes pale green along major veins	Often with a white band along midrib, pale green along major veins and major lateral veins, dark brownish to purplish red between major veins and major lateral veins	Absent	Absent	Often pale green to white at junction between veins, dark green to dark brownish elsewhere
Peduncle	Glabrous	Glabrous	Glabrous or sparsely villose	Villose	Glabrous
Outer tepals	13–17×15–17 mm	11–14×12–17 mm	7–12×7–10 mm	9–20×9–22 mm	12–15×12–15 mm
Tepals	Persistent in fruit	Persistent in fruit	Persistent in fruit	Caducous in fruit	Persistent in fruit
Styles	Fused in the lower 1/3	Nearly free	Nearly free	Fused in the lower 1/5 to 1/4	Fused in the lower 1/5 to 1/2
Fruits	Curved; glabrous	Not curved; glabrous	Not curved; glabrous	Not curved; covered with red conical hairs	Not curved; glabrous



**Figure 4.** *Begonia luochengensis* S. M. Ku, C.-I Peng & Y. Liu. A, Habit, the leaf to the right of inflorescence showing vestiture, those to the left showing maculation; B, Portion of leaf, adaxial surface, B', abaxial surface; C, Leaf margin; D, Vestiture of leaf petiole; E, Stipule; F, Bracts; G, Staminate flower, face view; H, Stamen, ventral view, H', dorsal view, H'', lateral view; I, Carpelate flower, face view, I', lateral view; J, Pistil; K, Fruit; L-L'', Cross sections of ovary; M, Seed. (From W. C. Leong 3419 (HAST); line drawing by S. M. Ku)



**Figure 5.** *Begonia luochengensis* S. M. Ku, C.-I Peng & Y. Liu. A, Habit; B, Fruit with persistent tepals; C, Staminate flower buds; D, Staminate flower; E, Leaf blade; F, Seeds. (From W. C. Leong 3419; photos by S. M. Ku)

forming a white zone (often composed of many little white spots), pale green near the major veins and major lateral veins, dark brownish to purplish red between major veins and major lateral veins, reddish on abaxial surface, (10-) 15-20 (-25) cm long (including basal lobes), (5-) 7-12 (-18) cm wide, apex acuminate to caudate, base cordate, margin denticulate or ciliate-dentate; venation basally 7-palmate, pinnate along the midrib, with 3-5 major lateral veins on each side; petioles brown, terete, 8-20 (-30, when cultivated in pot) cm long, 5-7 mm in diameter, villous, hairs whitish, dense, straight to curly, somewhat reflexed. *Inflorescences* axillary, arising directly from the rhizome, cymose, 2-4-branched, flowers 7-14; peduncles well developed, brownish, 8-22 cm long, 3-4 mm in diameter, nearly glabrous; pedicel reddish, ascending in staminate flowers and horizontal to pendant in carpellate flowers. Bracts caducous, oblong, herbaceous, green to reddish, 6-9 mm long, 4-5 mm wide, apex acute to obtuse, margin sparsely ciliate-serrate. Tepals glabrous, margin entire. *Staminate flowers*: tepals 4, outer 2 pinkish on adaxial surface and reddish on abaxial surface, ovate-orbiculate, base slightly cordate, apex rounded, 11-12 mm long, 12-13 mm wide, inner 2 pinkish, broadly oblanceolate, apex obtuse, ca. 12 mm long, ca. 6.5 mm wide; androecium zygomorphic, stamens 20-27, golf-club shaped; filaments free, nearly equal in length, ca. 1.6 mm long; anthers 2-locular, slightly compressed, oblong, apex slightly emarginate, yellowish, ca. 1.4 mm long. *Carpellate flowers*: tepals 3, outer 2 pinkish on adaxial surface and pink on abaxial surface, broadly ovate-orbiculate, apex rounded, 13-14 mm long, 15-17 mm wide, inner one obovate, apex rounded; ovary glabrous, pinkish at anthesis, 3-winged; wings unequal; lateral wings much narrower, 3-4 mm high; abaxial wing oblong to nearly triangular, ca. 6 mm high, 8-9 mm wide; locule 1; placentation intruded parietal; placentae 3, each 2 (-4) branched; styles 3, nearly free (slightly fused at base), yellow, ca. 4 mm long, the summit U-shaped; stigmas U-form or nearly reniform. *Fruits* a dehiscent capsule, nodding, greenish to reddish when fresh and brownish when dry, 11-17 mm long, ca. 6-7 mm wide (wings excluded); lateral wings 3-4 mm high; abaxial wing to 10-12.5 mm high, apex with persistent tepals and styles. *Seeds* many, brown, ellipsoid or broadly ellipsoid, the chalazal end rounded, the micropylar end slightly constricted or not, outer periclinal walls collapsed in mature seeds; collar cells elongated, straight, nearly rectangular, 10-12 cells in a ring, occupying 1/2 to 1/3 of the seed length; anticlinal walls between the collar cells raised, straight, rarely slightly undulate; testa cell nearly isodiametric-polygonal, mostly pentagonal and hexagonal, those adjacent to collar cells rarely slightly elongated. Somatic chromosome number,  $2n = 30$ . (Figure 3B)

*Paratype*. CHINA. Guangxi Zhuangzu Autonomous Region: Hechi Diqu, Luocheng Mulaozu Zizhixian, Huaqun Zhen, 180°34' 12" E, 24°50' 35" N; elev. ca. 250 m, *W. C. Leong 3419* (HAST).

*Ecology*. Growing on semishaded, dry or slightly moist limestone hills.

*Distribution*. Southern China.

*Phenology*. Flowering Aug to Nov; fruiting Sep to Dec.

*Etymology*. Named for the Luocheng minority county where it was collected.

*Notes*. *Begonia luochengensis* is characterized by ovate leaves that are densely pubescent and with a remarkable white band along the midrib on upper surfaces. It resembles *B. luzhaiensis* T. C. Ku, which, however, has broadly ovate to orbiculate leaves that are usually shallowly angularly lobed. In addition, the leaves of *B. luzhaiensis* do not form a white band along the midrib. It is also similar to *B. porteri* H. Lév. & Vaniot in the vestiture of the leaf upper surface, but that species is smaller and has much slenderer rhizome than *B. luochengensis*. For comparison of characteristics see Table 1.

**3. *Begonia porteri*** H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 9: 20. 1910 et Fl. Kouy-Tcheou 46. 1914; Gagnep. in Lecomte, Fl. Gen. Indo-Chine 2: 1108. 1921; Irmscher, Mitt. Inst. Allg. Bot. Hamburg 10: 554. 1939; Lauener, Notes Roy. Bot. Gard. Edinburgh 31(3): 435. 1972; Ku, Fl. Reipubl. Popul. Sin. 52(1): 142, pl. 30: 1-2. 1999. 羅甸秋海棠 Figures 6-8

*Begonia bellii* H. Lév., Fl. Kouy-Tcheou 45. 1914, "bellii"; Irmscher, Mitt. Inst. Allg. Bot. Hamburg 10: 54. 1939.

*Begonia yishanensis* T. C. Ku, Acta Phytotax. Sin. 37(3): 285, pl. 1. figs. 3, 4. 1999 et Fl. Reipubl. Popul. Sin. 52(1): 136. 1999. syn. nov.

*Specimens examined*. CHINA. Guizhou ("Kouy-Tcheou"): Lo-Fou, Oct 1908, *J. Cavalerie 3607* (holotype: E; isotype: UPS).—Guangxi: Yishan, Gulong, 12 Dec 1987, *Exped. Yishan 16426* (holotype of *B. yishanensis*: GXEM; isotype of *B. yishanensis*: GXMI); Guangxi Zhuangzu Autonomous Region (exact locality unknown), 28 May 2002, *Y. M. Shui 9009c* (HAST); Guangxi Zhuangzu Autonomous Region: Luocheng Mulaozu Zizhixian, Qiaoshan Xiang, 24°52'40" N, 108°44' 14" E, 160 m alt., NW-facing limestone slope, 1 Jun 2004, *C.-I Peng 19840* (HAST).

*Ecology*. Growing on semishaded, slightly moist limestones and caves.

*Distribution*. Southern China.

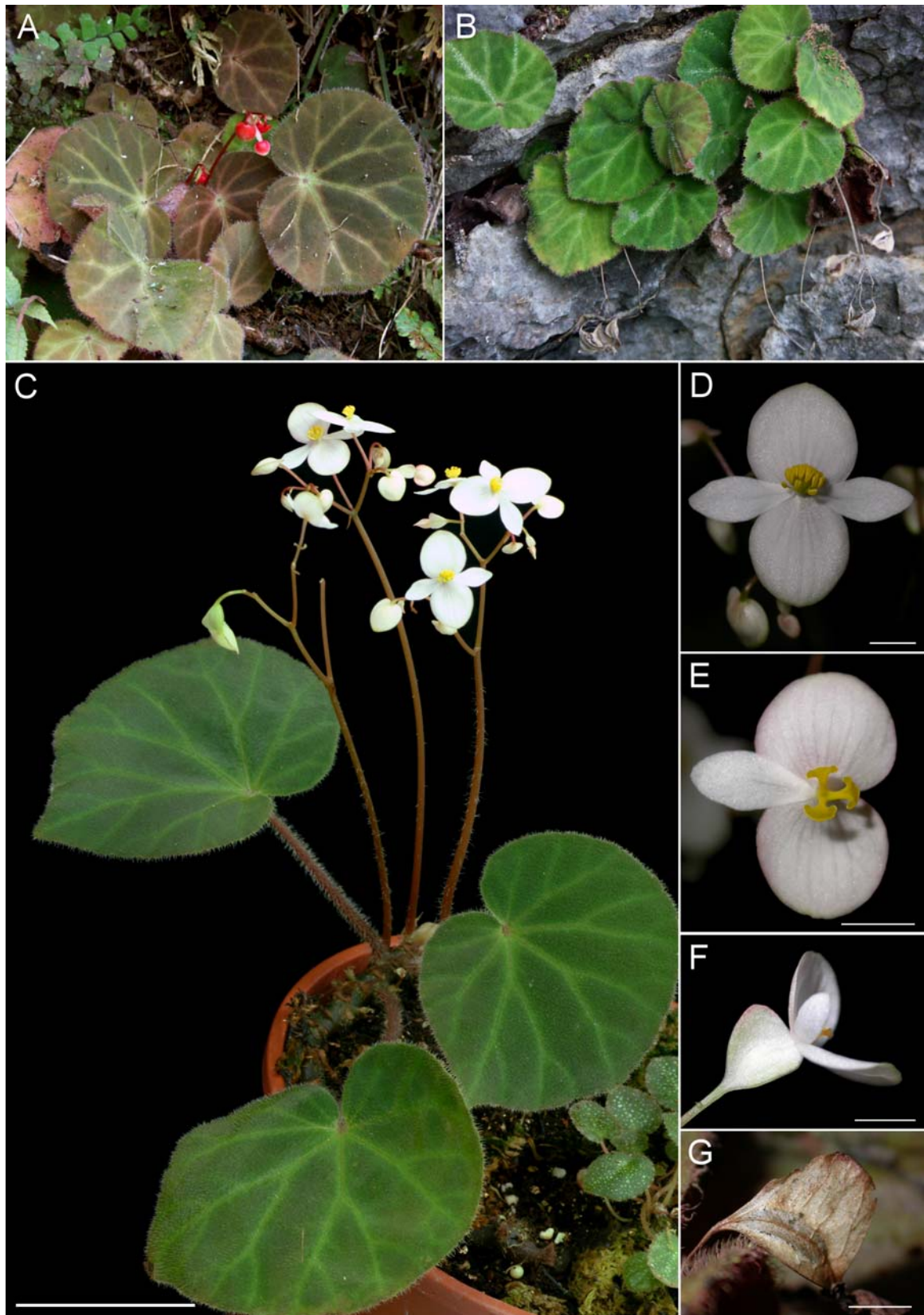
*Phenology*. Flowering Aug - Nov; fruiting Sep - Dec.

*Notes*. We examined type materials of *B. porteri* at E (holotype) and UPS (isotype), and found that although many leaves are ovate, some are nearly orbiculate (Figure 7B, F) and cannot be distinguished from *B. yishanensis*. The leaf vestiture of *B. porteri* and *B. yishanensis* also cannot be distinguished from each other. We agree with the annotation made by Yu-Min Shui on the holotype specimen of *B. yishanensis* (Figure 8A) that the two taxa are conspecific.

**4. *Begonia daxinensis*** T. C. Ku, Acta Phytotax. Sin. 35(1): 45, fig. 26. 1997. 大新秋海棠 Figures 9, 10

*Begonia zhangii* D. Fang & D. H. Qin, Acta Phytotax. Sin. 42(2): 170, fig. 1. 2004. syn. nov.





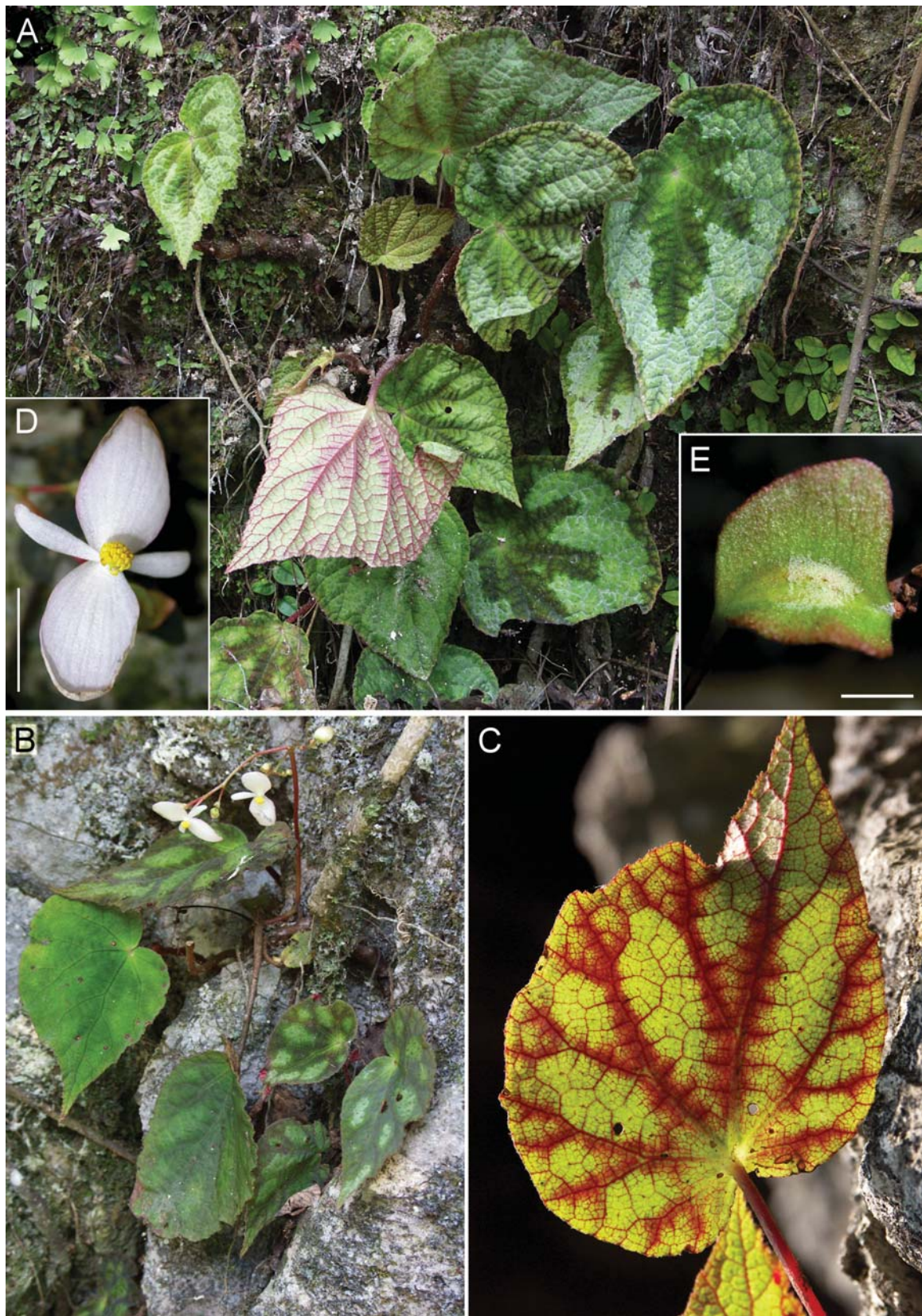
**Figure 6.** *Begonia porteri* H. Lévl. & Vaniot. A, Habit: plant with flower buds; B, Habit: plant with dried capsules from previous season; C, Cultivated plant at anthesis; D, Staminate flower; E, Carpellate flower, face view; F, Carpellate flower, lateral view; G, Dry capsule. Scale bar = 5 cm in C; 5 mm in D-G. (All but F from *C.-I Peng 19840*, F from *Y. M. Shui 9009c*; photos A, B by *C.-I Peng*, C by *M. L. Weng*, D-G by *S. M. Ku*)



**Figure 7.** Types specimens of *Begonia porteri* H. Lévl. & Vaniot. A-E. Holotype at Royal Botanic Garden, Edinburgh (E): A, Specimen; B, A leaf in fragment envelope; C, Leaf margin and vestiture; D, Fruit and abaxial side of leaf; E, Rhizome; F-H, Isotype at Herbarium of Uppsala Botanical Museum, Uppsala University (UPS): F, Specimen; G, Fruit with persistent tepals; H, Fruiting specimen. (Kouy-Tcheou: Lo-Fou, *Cavalerie* 3607) (Photos A, B, C, E by S. M. Ku, D; F-H by C.-I Peng)



**Figure 8.** Type specimens of *Begonia yishanensis* T. C. Ku. A-D: A, Holotype at GXEM; B, Leaf; C, Close-up image of the type; D, Materials in fragment envelope; E-F, Isotype at GXMI. (Guangxi: Yishan, Gulong, *Exped. Yishan 16426*). (Photos A-D by C.-I Peng; E-F by S. M. Ku)



**Figure 9.** *Begonia daxinensis* T. C. Ku. A, B, Habit; C, Leaf, abaxial surface; D, Staminate flower; E, Fruit. Scale bars: D = 1 cm, E = 5 mm. (From C.-I Peng 19695; photos A-C by C.-I Peng, D-E by S. M. Ku)



**Figure 10.** A-B. Holotype of *Begonia daxinensis* T. C. Ku. (*H. N. Qin* 17, PE): A, Specimen; B, Rhizome; C-D, Holotype of *B. zhangii* D. Fang & D. H. Qin, (*C. L. Zhang et al.* 033, GXMI); C, Specimen; D, Inflorescence; E, Paratype of *B. zhangii* D. Fang & D. H. Qin, *C. L. Zhang et al.* 73310 (GXMI). (Photos by S. M. Ku)

*Specimens examined.* CHINA. Guangxi: Daxin, in shady places of limestone hills, 4 Apr 1981, *H. N. Qin 17* (PE, holotype); Longan, Dujie, in forests, limestone hill, 29 Mar 1984, *C. L. Zhang et al. 033* (GXMI, holotype of *B. zhangii*), *C. L. Zhang et al. 042* (GXMI, paratype of *B. zhangii*); same locality, alt. ca. 300 m, 4 Apr 2002, *C. L. Zhang et al. 73310* (GXMI, IBK, PE, paratypes of *B. zhangii*); locality unknown, 29 Mar 1984, *X. H. Lu 12317* (GXMG); Guangxi Zhuangzu Autonomous Region: Chungzuo Shi, Tiandeng Xian, Bahe Xiang, 1 km S of Duoda Cun, 580 m, 106°47' 34''E, 23°10' 23''N, at base of a steep limestone hill, on N-facing rocky slope face or at base of limestone rocks, shaded, 25 May 2004, *C.-I Peng 19695* (HAST).

*Ecology.* Growing on slightly moist semishaded, limestone hillside.

*Distribution.* Southern China.

*Phenology.* Flowering Mar - May; fruiting Mar - May.

*Notes.* *Begonia daxinensis* bears a superficial resemblance with *B. rex* Putz. (sect. *Platycentrum*), particularly in leaf shape and maculation. *Begonia rex* Putz., however, has axile placentation with 2 locules and carpellate flowers with 5 tepals (vs. parietal placentation with 1-locule and 3 tepals in carpellate flowers). Morphological distinction between *B. zhangii* D. Fang & D. H. Qin and *B. daxinensis* T.C. Ku are simply not available. We are thus synonymizing *B. zhangii* with *Begonia daxinensis*.

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## 中國廣西秋海棠屬側膜組小誌：兩個新種

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本文處理中國秋海棠屬側膜組的幾個分類群，發表兩個新種—彎果秋海棠 (*Begonia curvicarpa*) 與羅城秋海棠 (*B. luochengensis*)，提供了線繪圖與照片以資辨識，並報導其染色體數 (皆為  $2n = 30$ )。彎果秋海棠與羅甸秋海棠 (*B. porteri*) 相似，但根莖節間較長 (15-55 mm vs. 8-17 mm)、葉上表面毛被較稀疏、果實明顯彎曲而可區別。羅城秋海棠與鹿寨秋海棠 (*B. luzhaiensis*) 相似，主要不同在於羅城秋海棠葉為卵形 (後者葉圓形至廣卵形)、沿著中肋有一條白色條帶，以及葉緣不分裂。本文將側膜組五種相似的秋海棠重要特徵表列加以比較。另將宜山秋海棠 (*B. yishanensis*) 處理為羅甸秋海棠 (*B. porteri*) 的同物異名；張氏秋海棠 (*B. zhangii*) 處理為大新秋海棠 (*B. daxinensis*) 的同物異名。

**關鍵詞：**秋海棠科；彎果秋海棠；卷毛秋海棠；羅城秋海棠；鹿寨秋海棠；羅甸秋海棠；宜山秋海棠；大新秋海棠；張氏秋海棠；中國；廣西；染色體數；新種；側膜組。