

Begonia ×breviscapa (Begoniaceae), a new intersectional natural hybrid from limestone areas in Guangxi, China

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(Received November 13, 2008; Accepted October 30, 2009)

ABSTRACT. A new natural hybrid, *Begonia ×breviscapa* C.-I Peng, Yan Liu & S. M. Ku, from northwestern Guangxi, China, is described and illustrated. A somatic chromosome number of $2n = 30$ was determined. Based on morphological features, geographical range, pollen stainability and seed set we conclude that *B. ×breviscapa* is a natural hybrid between *B. variifolia* Y. M. Shui & W. H. Chen [sect. *Coelocentrum* Irmsch.] and *B. leprosa* Hance [sect. *Leprosae* (T. C. Ku) Y. M. Shui]. This is the first documentation of natural hybridization between begonias of two different sections in mainland China.

Keywords: *Begonia ×breviscapa*; *Begonia leprosa*; *Begonia setulosopeltata*; *Begonia variifolia*; Begoniaceae; China; Chromosome number; Guangxi; Limestone flora; Natural hybrid.

INTRODUCTION

In recent years many botanical novelties were reported from limestone areas in southern China and northern Vietnam, e.g., Acanthaceae (Chen et al., 2009), Asteraceae (Zhang et al., 2008), Balsaminaceae (Yu et al., 2009), Begoniaceae (Fang et al., 2006; Ku et al., 2006, 2008; Liu et al., 2005, 2007; Peng et al., 2006, 2007, 2008a,b; Shui and Chen, 2005), Berberidaceae (Wu et al., 2009), Gesneriaceae (Wen et al., 2009), Ranunculaceae (Yuan and Yang, 2009), Rubiaceae (Wang et al., 2010), Ruscaceae (Hou et al., 2009) and ferns (Wang et al., 2010; Zhang and He, 2009a,b; Zhang et al., 2010), to name a few. During our survey of limestone caves in Guangxi, China, we discovered a *Begonia* that was neither identifiable to any of the species reported in the Flora of China (Gu et al., 2007) nor to any congeners that were published thereafter. Based on detailed comparisons of salient morphological and anatomical features, geographical range, pollen stainability and seed set, we concluded that it represents a new intersectional natural hybrid, which we name *Begonia ×breviscapa* C.-I Peng, Yan Liu & S. M. Ku. Its putative parents are *B. variifolia* Y. M. Shui & W. H. Chen [sect. *Coelocentrum* Irmsch.] and *B. leprosa* Hance [sect. *Leprosae* (T. C. Ku) Y. M. Shui].

MATERIALS AND METHODS

Cryo scanning electron microscopy

Fresh leaves of *Begonia ×breviscapa*, *B. variifolia* Y. M. Shui & W. H. Chen, *B. leprosa* Hance and *B. setulosopeltata* C. Y. Wu were dissected and attached to a stub. The samples were frozen with liquid nitrogen slush, then transferred to a sample preparation chamber at -160°C . After 5 min, when the temperature rose to -130°C , the samples were fractured. The samples were etched for 10 min at -85°C . After coating at -130°C , the samples were transferred to the SEM chamber and observed at -160°C with a cryo scanning electron microscope (FEI Quanta 200 SEM/Quorum Cryo System PP2000TR FEI). Voucher specimens (*Begonia ×breviscapa*: Peng et al. 20727; *B. leprosa*: Peng et al. 18737; *B. setulosopeltata*: Peng et al. 19830; *B. variifolia*: Peng et al. 20729) have been deposited at HAST.

Chromosome preparations

Root tips of *Begonia ×breviscapa* were pretreated with 2 mM 8-hydroxyquinoline solution at $15\text{--}18^{\circ}\text{C}$ for about 8 h and fixed in ethanol-acetic acid (3:1) below 4°C for over 24 h. Chromosome preparations were made by the enzyme squash method in an enzyme mixture of 4% Cellulase Onozuka R10 (Yakult Honsha, Tokyo, Japan) and 2% Pectolyase (Sigma, St. Louis, MO, USA)

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at about 37°C for 1 h. The preparations were stained with a 2% Giemsa solution (Merck, Darmstadt, Germany). Classification of the chromosome complements based on centromere position at mitotic metaphase follows Levan et al. (1964). A voucher specimen (Peng et al. 20727) has been deposited in HAST.

NEW HYBRID

Begonia* × *breviscapa C.-I Peng, Yan Liu & S. M. Ku, *hybr. nov.* —TYPE: CHINA. Guangxi Zhuangzu Autonomous Region, Donglan Xian (County), Sanshi Zhen, Naying Village, on the way to Wuzhuan, SE-facing limestone cave, elev. ca. 320 m. Plants sterile

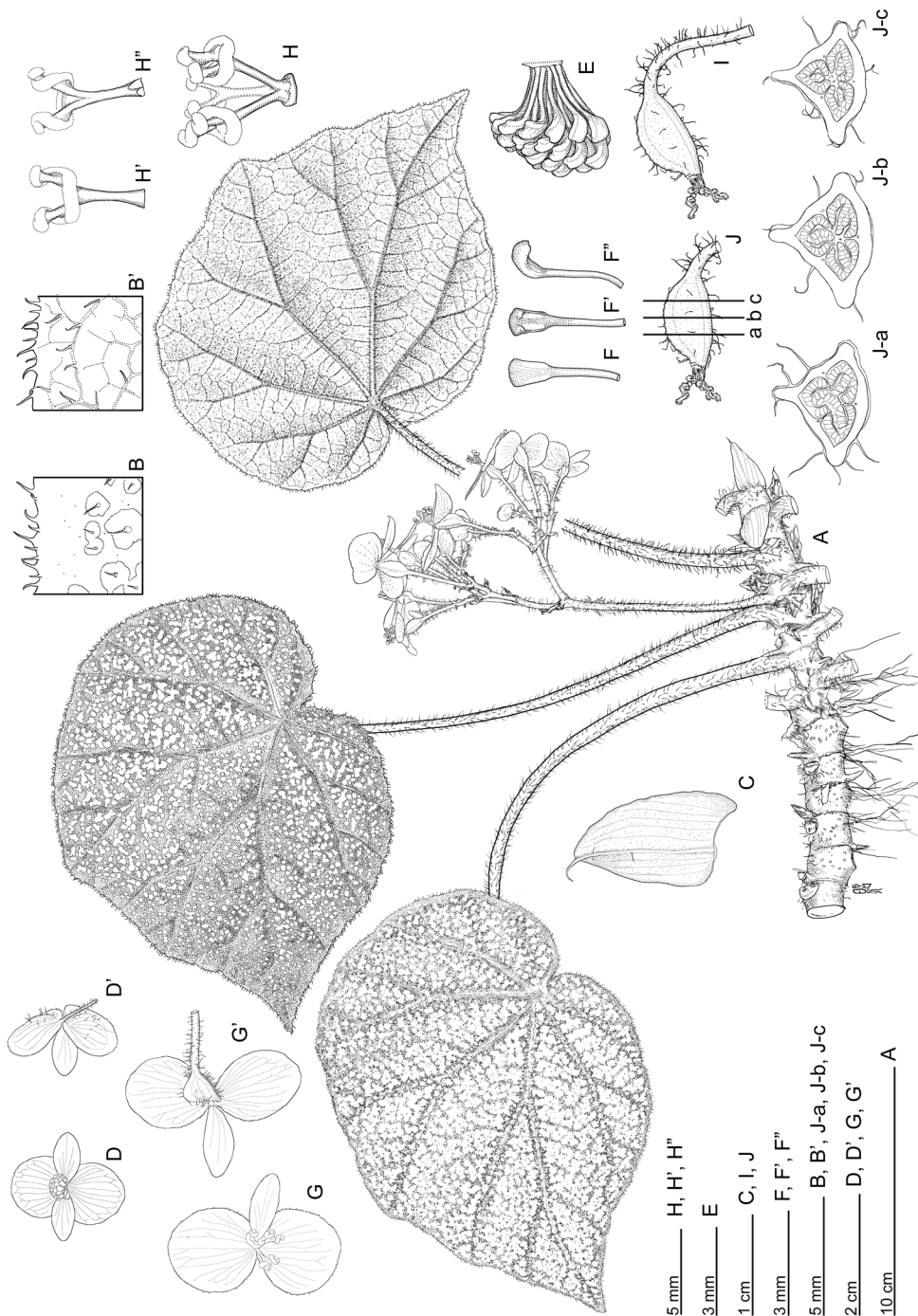


Figure 1. *Begonia* × *breviscapa*. A, Habit; B, Portion of leaf margin, adaxial surface, B', abaxial surface; C, Stipule; D, Staminate flower, face view, D', back view; E, Androecium; F, Stamen, abaxial view, F', adaxial view, F'', lateral view; G, Carpellate flower, face view, G', back view; H, Styles and stigmas, H' abaxial view, H'', adaxial view; I, Undeveloped fruit; J, Serial cross sections of undeveloped fruit. [All from C.-I Peng et al. 20727 (HAST)]

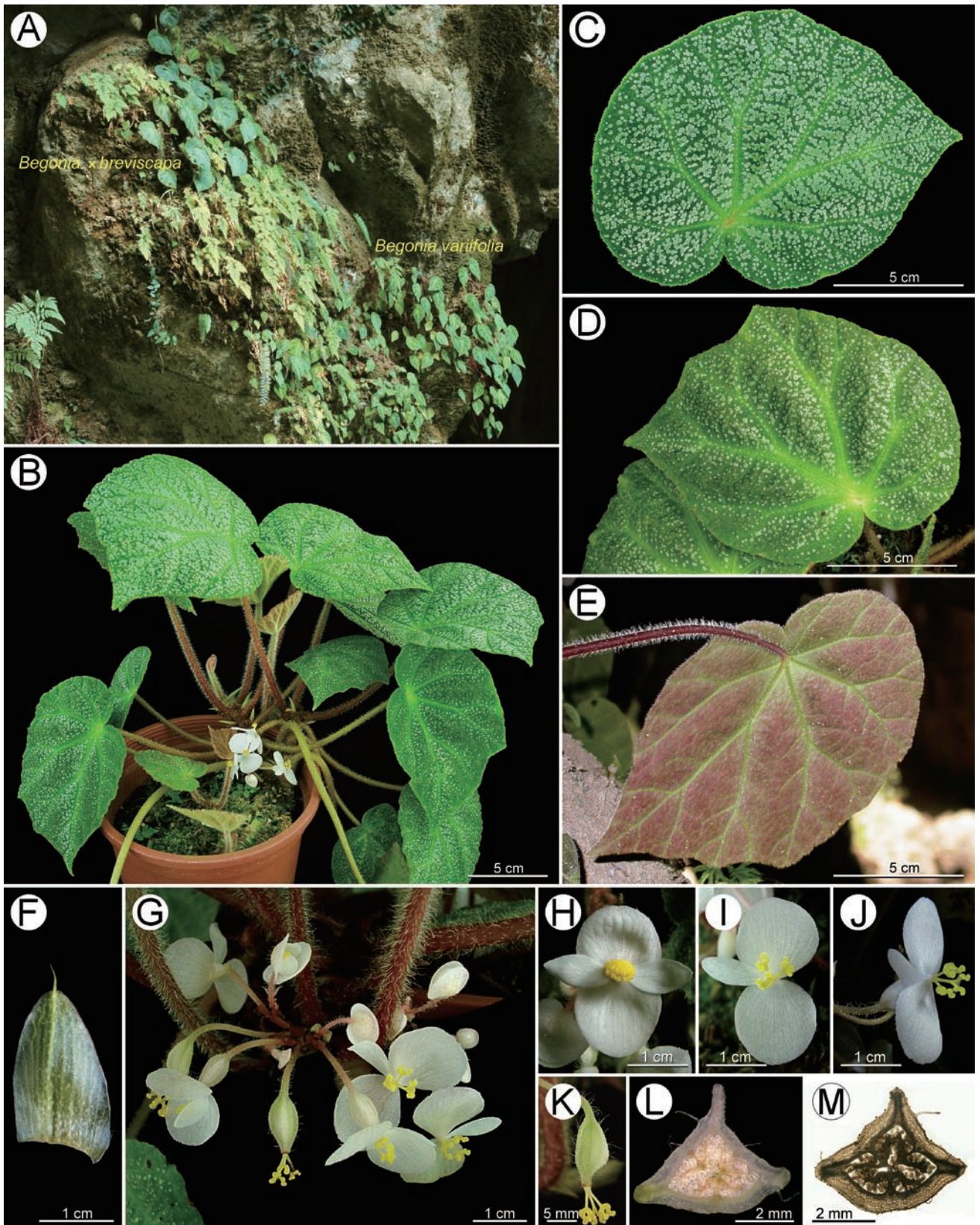


Figure 2. *Begonia ×breviscapa*. A, Habitat, co-occurring with *B. variifolia* on limestone rock in cave; B, Habit; C, D, Leaf, adaxial surface; E, Leaf, abaxial surface; F, Stipule; G, Inflorescence; H, Staminate flower; I, Carpellate flower, face view; J, Carpellate flower, side view; K, Undeveloped fruit; L, Middle cross section of ovary, viewed under dissecting microscope; M, Middle cross section of ovary, viewed under light microscope. [C.-I Peng et al. 20727 (HAST)]

when collected on 18 Dec 2005. Flowering specimens pressed on 11 May 2008 from plants brought back for cultivation, *Ching-I Peng et al. 20727a* (holotype: IBK; isotype: HAST) 短葶秋海棠 Figures 1, 2

Begonia ×breviscapa aspectu similis Begoniae setulosopeltatae, sed inflorescentiis brevibus pubescentibus, pollinis granis et ovariis abortivis; hybrida naturalis e B. variifolia et B. leprosa.

Herbs, monoecious. *Rhizome* creeping, 6-13 mm thick, internodes 5-11 mm long, pilose. *Stipules* caducous, ovate-triangular, asymmetric, 7-24 mm long, 6-14 mm wide, weakly keeled, margin entire, apex aristate, arista hair-like. *Leaves* alternate; petiole 9-26 cm long, 3-5 mm thick, villous (hairs 2-4.5 mm long); blade obliquely broadly ovate, peltate or subpeltate, sometimes basifixed with cordate base, 8-15 (-23) cm long, 6-11 (-16) cm wide, papery, adaxially with white spots all over, moderately setulose (trichomes 0.5-1 mm long), abaxially brownish-reddish or green, pilose on veins (trichomes whitish, 0.5-1.2 mm long), margin shallowly unequally minutely serrulate or crenate, apex acute, mucronate, cuspidate, or shortly acuminate; venation basally 7-8-palmate, tertiary veins loosely reticulate or pinnate-reticulate. *Inflorescences* axillary; peduncle (scape) 1.5-5 cm long, pilose or villous-pilose; flowers 5-8 in dichasial cymes; bracts caducous, ovate or oblong, 3-6 mm long, 3-5 mm wide, margin serrate-ciliate, apex obtuse. *Staminate flower*: pedicels 1.5-3 cm, pilose; tepals 4, white, outer 2 broadly obovate, 0.9-1.5 cm long, 0.9-1.3 cm wide, base broadly cuneate or subrounded, apex rounded, outside pilose, inner 2 elliptic to oblanceolate, 8-10 mm long, 3.5-5 mm wide, apex obtuse; stamens 30-40; filaments ca. 1.5-2.8 mm long; anthers obovate-oblong, 0.8-1.1 mm; apex of connective ± emarginate. Pollen grains irregular, shriveled and unstainable. *Carpellate flowers*: pedicel 1.3-1.7 cm, pilose or sparsely so; tepals 3, outer 2 suborbicular or broadly obovate, 1.3-1.7 cm long, 1.3-1.6 cm wide, base broadly cuneate or rounded, apex rounded, inner 1 oblanceolate or elliptic, 10-15 mm long, 5-6 mm wide; ovary trigonous-ellipsoid, 9-13 mm long, 4-5 mm across, pilose or sparsely so, subequally weakly 3-winged; placentation parietal in upper half, axile in lower half, each placenta with 2 lamellae; styles 3, ca. 7 mm long, nearly free, stigma spirally twisted, papillose all around. Fruits not seen. Somatic chromosome number, $2n = 30$ (Figure 3).

Additional specimen examined. CHINA. Guangxi Zhuangzu Autonomous Region, Donglan Xian (County), Sanshi Zhen, Naying Village, on the way to Wuzhuan, SE-facing limestone cave, elev. ca. 320 m, 18 Dec 2005, *Ching-I Peng et al. 20727* (original sterile collection of the type material; HAST).

Phenology. Flowering from February to May in cultivation.

Distribution. Donglan Xian, northwestern Guangxi, China (Figure 4). *Begonia ×breviscapa* was found inside a limestone cave on the same rock face with *B. variifolia*,

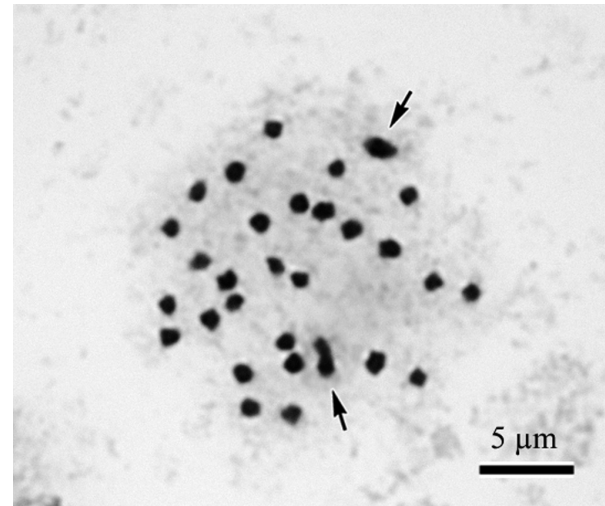


Figure 3. Somatic chromosomes at metaphase of *Begonia ×breviscapa* ($2n = 30$), arrows indicating a pair of long, metacentric chromosomes (From *C.-I Peng et al. 20727*, HAST).



Figure 4. Distribution of *Begonia ×breviscapa* (★), *B. variifolia* (○), *B. setulosopeltata* (▲), and *B. leprosa* (shaded area) in Guangxi Zhuangzu Autonomous Region, China.



Figure 5. Microphotograph of abortive pollens of *Begonia ×breviscapa*. [From *C.-I Peng et al. 20727*, HAST]

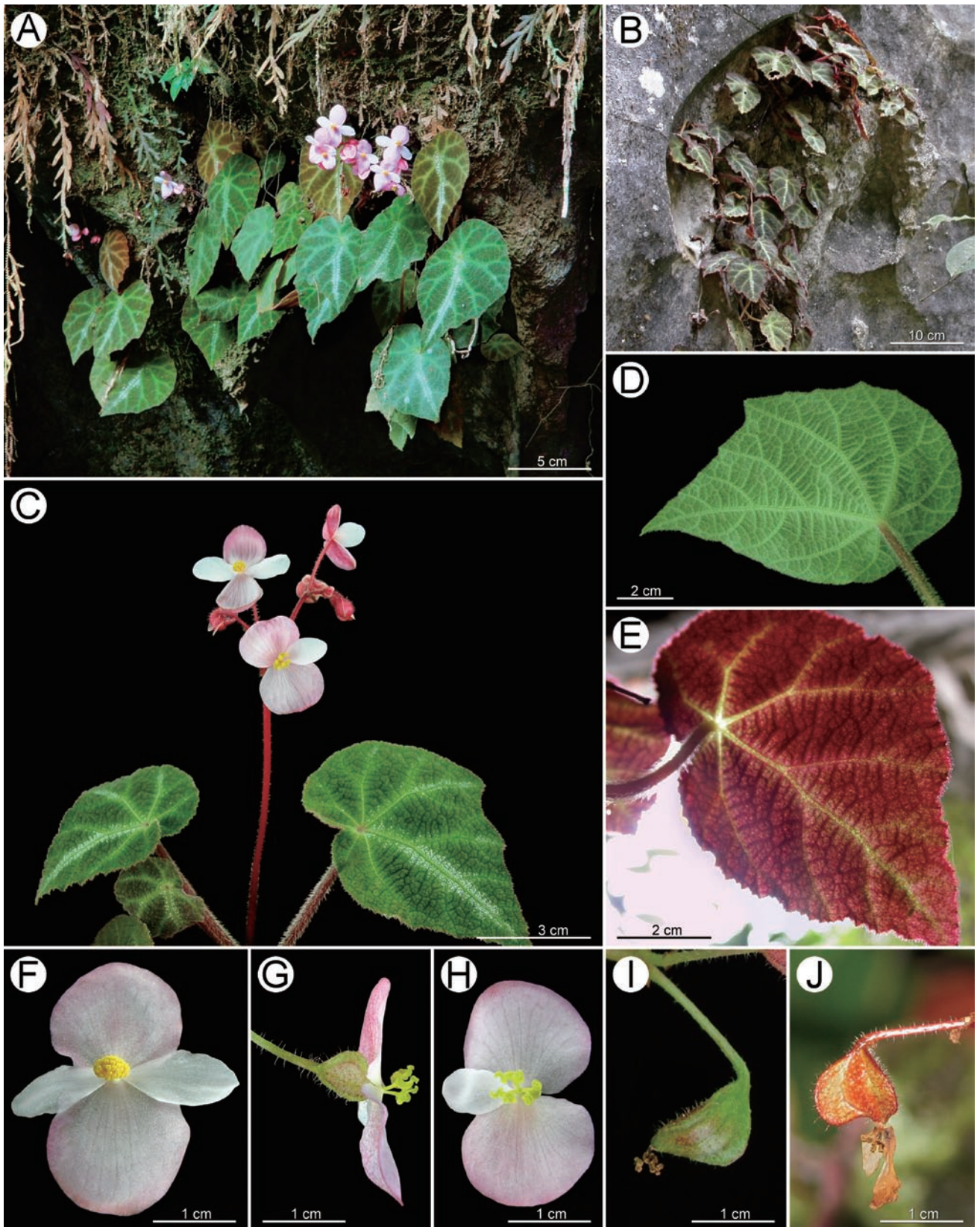


Figure 6. *Begonia variifolia* Y. M. Shui & W. H. Chen. A, B, Habit and habitat; C, Habit; D, Leaf, abaxial surface, green form; E, Leaf, abaxial surface, red form; F, Staminate flower; G, Carpellate flower, side view; H, Carpellate flower, face view; I, J, Fruits. [A from *C.-I Peng et al.* 21063 (HAST); B, C, E, J from *C.-I Peng et al.* 20734 (HAST); D, F-I from *C.-I Peng et al.* 20728 (HAST)]

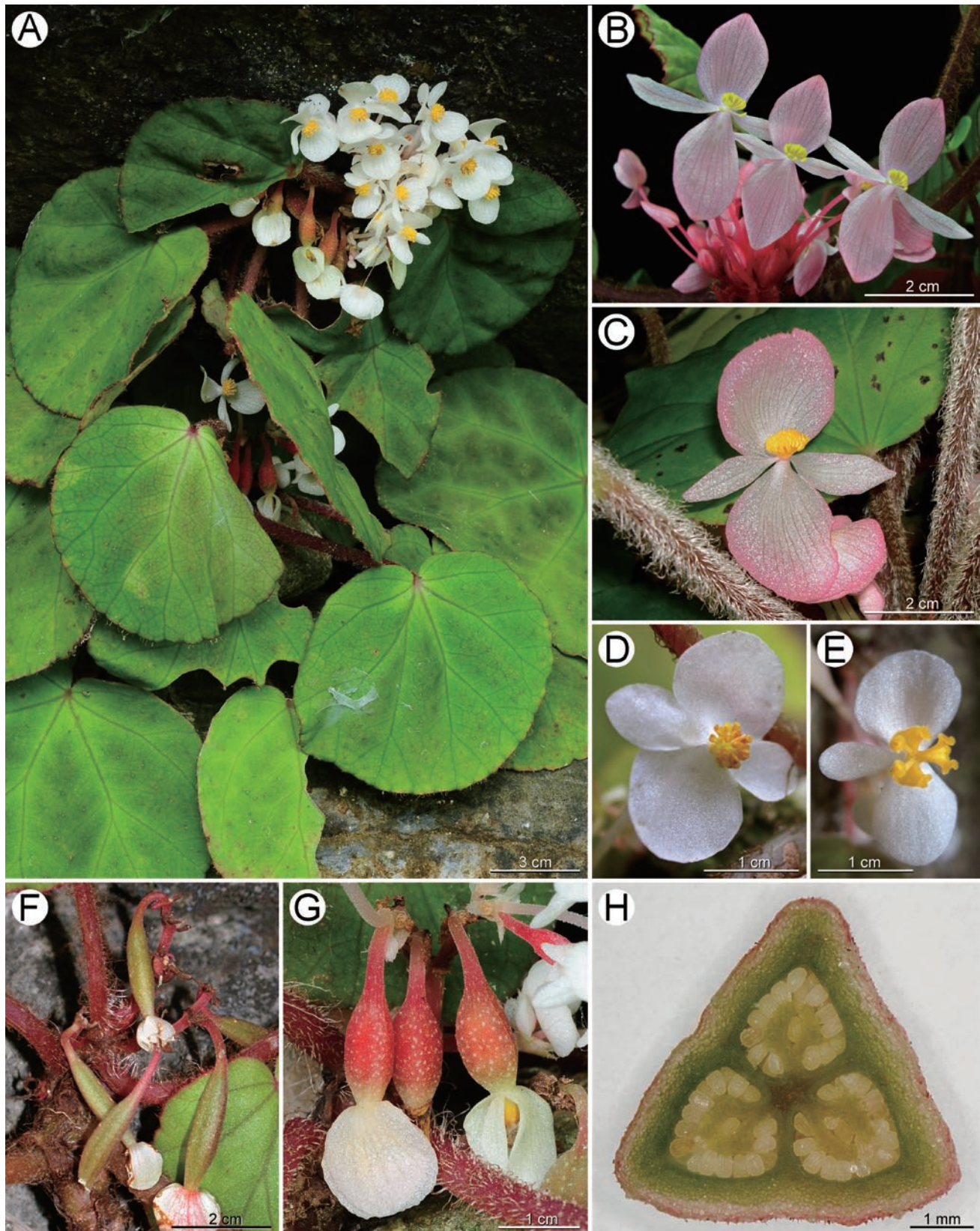


Figure 7. *Begonia leprosa* Hance. A, Habit; B, Inflorescence; C, Staminate flower with larger, pink tepals and zygomorphic androecium; D, Staminate flower with smaller, white tepals and actinomorphic androecium; E, Carpellate flower, face view; F, G, Fruits; H, Middle cross section of a young fruit. [A, G from *S.M. Ku et al. 2074* (HAST); B from *C.-I Peng et al. 20333* (HAST); C from *W.C. Leong et al. 3416* (HAST); F from *C.-I Peng et al. 19474*; H from *C.-I Peng et al. 18737* (HAST)]

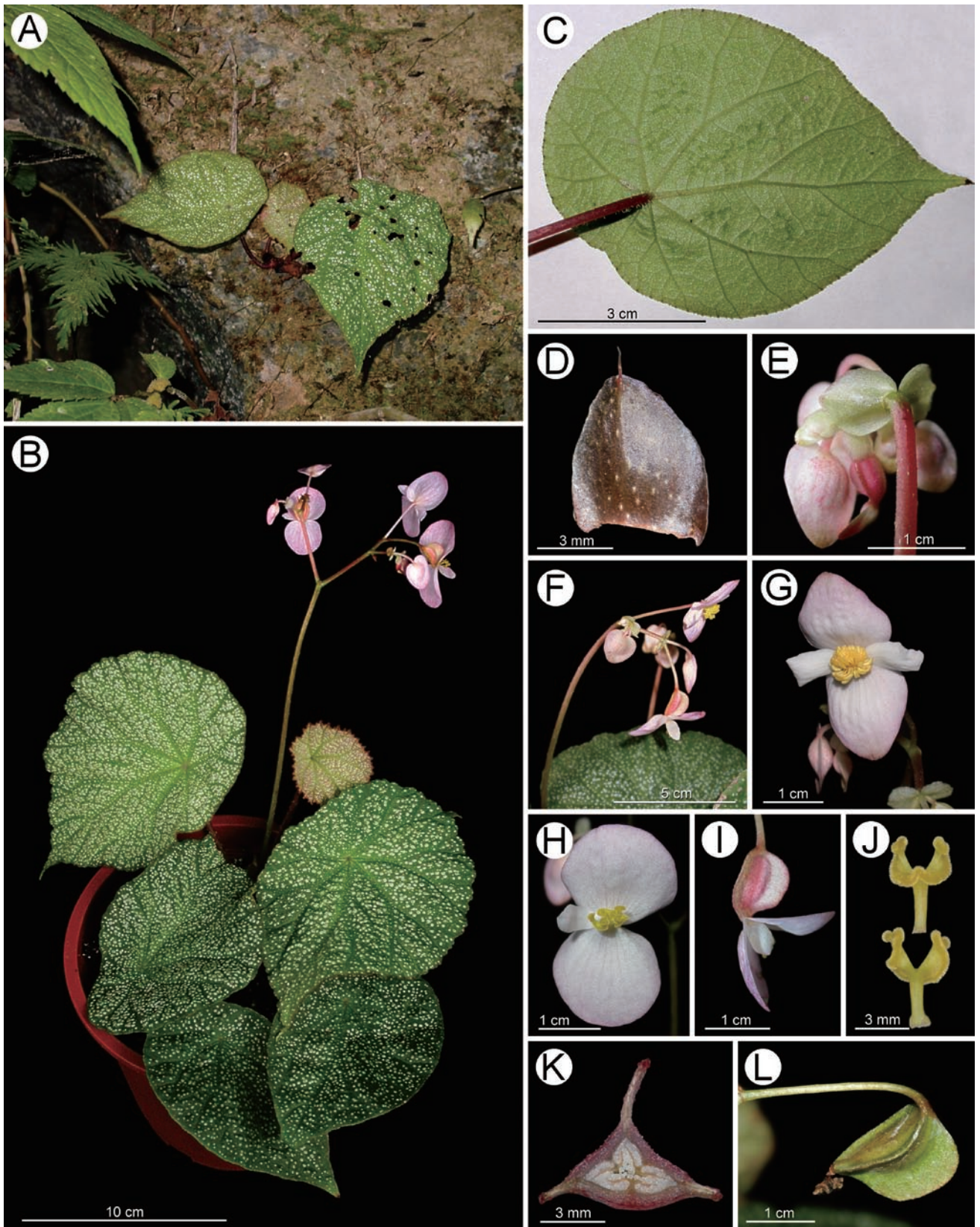


Figure 8. *Begonia setulosopeltata* C. Y. Wu. A, Habit and habitat; B, Habit; C, Leaf, abaxial surface; D, Stipule; E, A developing inflorescence with a pair of bracts at base; F, Inflorescence; G, Staminate flower; H, Carpellate flower, face view; I, Carpellate flower, side view; J, Styles and stigmas; K, Middle cross section of ovary; L, Fruit. [All from C.-I Peng et al. 19830 (HAST)]

one of the putative parents (Figure 2A). *Begonia leprosa*, the other putative parent, was growing on the sunlit rocky entrance of the cave. *Begonia asteropyrifolia* was also nearby. It is rare for several species of *Begonia* to co-occur in this way.

Etymology. The specific epithet refers to the shortness of the scape.

Chromosome cytology. Somatic chromosomes at mitotic metaphase of *Begonia × breviscapa* were determined to be $2n = 30$ (Figure 3). The chromosome

Table 1. Comparison of *Begonia × breviscapa*, *B. setulosopeltata*, *B. variifolia*, and *B. leprosa*

	<i>Begonia × breviscapa</i> (Figures 1, 2)	<i>Begonia variifolia</i> (Figure 6; Ku et al., 2008: Figure 3B)	<i>Begonia leprosa</i> (Figure 7)	<i>Begonia setulosopeltata</i> (Figure 8)
Leaf blade				
Size (cm)	7-24 × 6-14	5-10 × 3.5-7.2	4.5-21 × 4-17	7-14.6 × 4.5-10
Base	Peltate or subpeltate, sometimes basifixed with cordate base	Peltate or subpeltate, sometimes basifixed with cordate base	Basifixed, shallowly to deeply cordate	Peltate
Indumentum	Adaxially moderately setulose; abaxially pilose on veins	Adaxially villous-setulose; abaxially villose-pilose, particularly pronounced on veins	Adaxially with few short-setose hairs; abaxially pilose or villose-hirsute on major veins	Adaxially sparingly hispidulous or setulose; abaxially sparingly hirsute on major veins
Maculation on adaxial surface	With white spots all over	With or without a white band along midrib, pale green along major veins and major lateral veins; green or brownish between major veins	Lacking	With white spots all over
Tertiary venation	Loosely reticulate, veins at acute oblique angles	Reticulate and percurrent, veins at perpendicular or obtuse angles	Usually not reticulate, veins at acute angles	Reticulate, veins at acute angles
Upper epidermal cells	40-80 μm across, protuberant; smooth (Figure 9A)	80-140 μm across; conical and sub-papillate; smooth (Figure 9D)	38-80 μm across; nearly flat to slightly protuberant; scaberulous (Figure 9G)	45-80 μm across, protuberant; smooth (Figure 9J)
Cross section	250-280 μm thick; epidermis 1-layered (Figure 9B)	240-260 μm thick; epidermis 1-layered (Figure 9E)	500-600 μm thick; epidermis 2-layered (Figure 9H)	220-230 μm thick; epidermis 1-layered (Figure 9K)
Stomatal complex	Elevated; singular (Figure 9B, C)	Elevated; singular (Figure 9F)	Nearly flat; in groups of 2 or 3 (Figure 9I)	Nearly flat; singular (Figure 9L)
Scape				
length (cm)	1.5-5	7.5-21	(0.3-)1-1.5 (-7)	14-20.5
Indumentum	Pilose or villous-pilose	Pilose or villous	Glabrous or puberulent	Glabrous
Pedicel	Pilose	Pilose	Minutely puberulent	Glabrous
Outer staminate tepals (mm)	9-15 × 9-13	11-16 × 12-18	7-27 × 8-21	12-17 × 10-16
Outer carpellate tepals (mm)	13-17 × 13-16	9-16 × 9-15	5.5-17 × 6-13	14-21 × 18-21
Ovary				
Indumentum	Pilose	Villous	Minutely puberulent	Glabrous
Wings	Weakly 3-winged	3-winged	Lacking	3-winged
Placentation	Parietal in upper half, axile in lower half	Parietal	Axile	Parietal

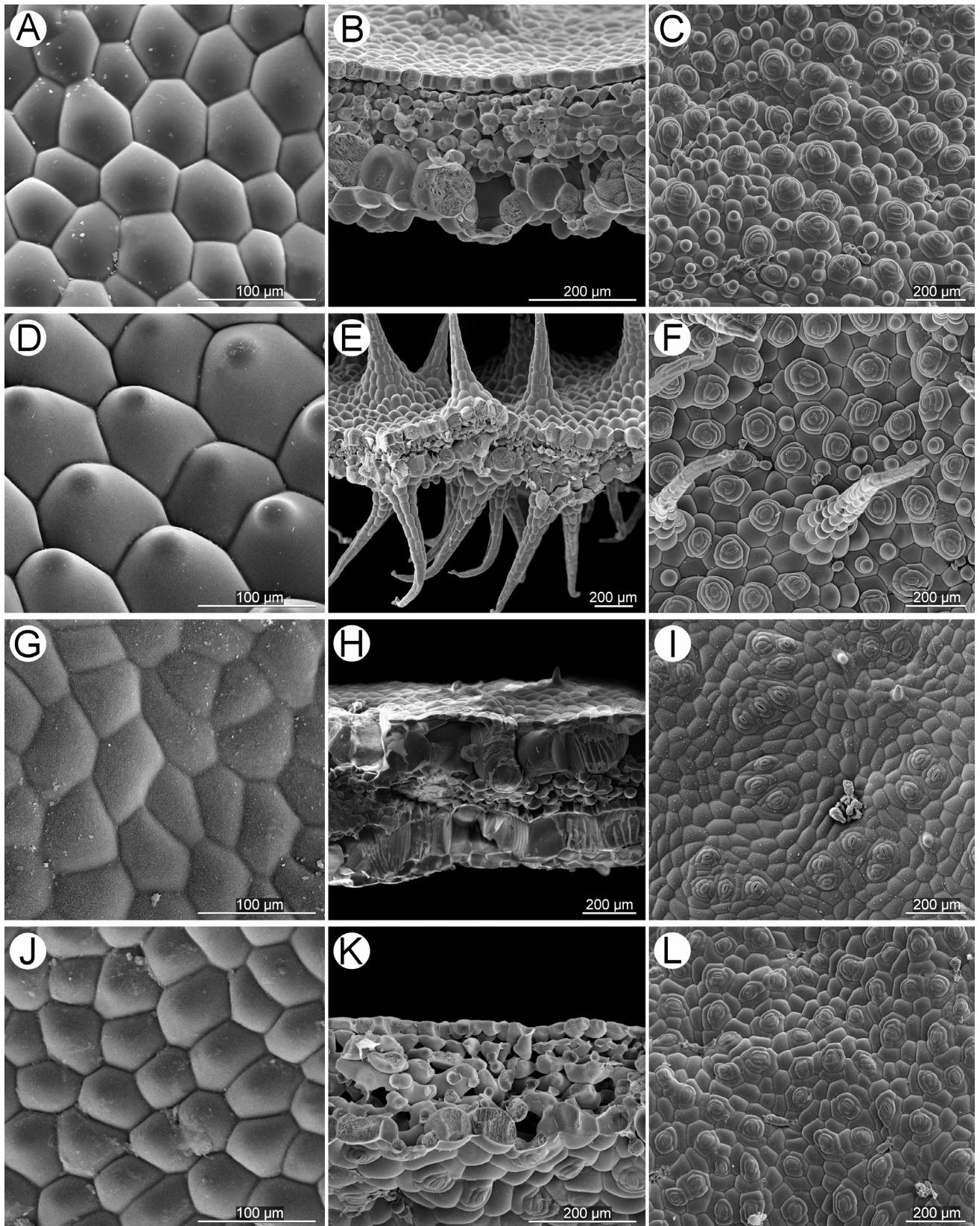


Figure 9. Cryo SEM microphotographs of *Begonia* leaves. A-C, *Begonia ×breviscapa*; D-F, *B. variifolia*; G-I, *B. leprosa*; J-L, *B. setulosopeltata*. A, D, G, J, Adaxial epidermis; B, E, H, K, Leaf cross section; C, F, I, L, Abaxial epidermis. (A-C from C.-I Peng et al. 20727; D-F from C.-I Peng et al. 20729; G-I from C.-I Peng et al. 18737; J-L from C.-I Peng et al. 19830)

complement showed bimodal variation in length. Among the 30 chromosomes, two were longer, about 1.9-2.1 μm long (Figure 3: arrows), and the remaining 28 were shorter, about 0.8-1.2 μm long. The position of the centromere of some of the shorter chromosomes could not be determined. The two longest chromosomes, however, were clearly metacentric. Satellites were not observed. The somatic chromosome number of all 17 taxa of *Begonia* in sect. *Coelocentrum* that are known is, without exception, $2n = 30$ (Fang et al., 2006; Ku et al., 2004, 2006, 2008; Liu et al., 2005; Peng et al., 2005a, 2005b, 2007, 2008a, 2008b). Among them, four taxa, namely *B. ningmingensis* var. *bella*, *B. kui*, *B. pengii* and *B. arachnoidea*, have a bimodal karyotype with two long, metacentric chromosomes and 28 short chromosomes (Fang et al., 2006; Ku et al., 2008; Peng et al., 2007, 2008b).

Notes. Based on a comparison of salient morphological features (Table 1) and pollen stainability (Figure 5), we conclude that the unusual plant from Donglan Xian (County) represents natural hybrids between *B. variifolia* Y. M. Shui & W. H. Chen (Figure 6) and *B. leprosa* Hance (Figure 7) that co-occur with it in the same limestone cave. *Begonia leprosa* belongs to the small section *Leprosae* that comprises four species, three in southern China (Shui et al., 2002) and one in Vietnam (Tam et al., 2005). Section *Leprosae* is characterized by having peculiar pendulous, sausage-shaped, indehiscent fruits. Hybrids involving *B. leprosa* had not been documented at the time Tebbit (2005) published his book 'Begonias: Cultivation, Identification, and Natural History.'

Begonia \times *breviscapa* also bears a superficial resemblance to *B. setulosopeltata* C. Y. Wu (Figure 8) in aspect, differing markedly in the short peduncle and pubescent inflorescences. A detailed comparison of the four species is provided in Table 1. It is noteworthy that *B. breviscapa* has unique unicellular (globose) or bicellular (globose-headed) hairs on the abaxial leaf epidermis (Figure 9C). Such hairs are known only in few species in *Begonia* sect. *Coelocentrum*, such as in *B. variifolia* (one of the putative parents; Figure 9F), *B. pengii* (Ku et al., 2008; Figure 6E) and *B. asteropyrifolia* (unpublished data), suggesting their close affinities.

Acknowledgments. We thank David E. Boufford (A/GH), Qiner Yang (IBSC) and Thomas G. Lammers (OSH) for improving the manuscript; Qiner Yang (IBSC) for providing the Latin diagnosis; and Ming-Chao Yu (HAST) for the line drawings. This study was supported in part by funding from the Personnel Training Plan of West Light Foundation of the Chinese Academy of Sciences (2007) to Yan Liu and National Science Council, Taiwan and the National Geographic Society (Grant # 8358-07; Botanical Exploration of Limestone Karsts of Southern Guangxi, China) to Ching-I Peng.

LITERATURE CITED

- Chen, W.H., Y.M. Shui, Y.K. Sima, R.M. Zhang, and Z.D. Wei. 2009. *Pararuellia glomerata* (Acanthaceae), a new species from Yunnan, China. *Bot. Stud.* **50**: 261-267.
- Fang, D., S.M. Ku, Y.G. Wei, D.H. Qin, and C.-I Peng. 2006. Three new taxa of *Begonia* (sect. *Coelocentrum*, Begoniaceae) from limestone areas in Guangxi, China. *Bot. Stud.* **47**: 97-110.
- Gu, C.Z., C.-I Peng, and N.J. Turland. 2007. Begoniaceae. In Z.Y. Wu, P.H. Raven, and D.Y. Hong (eds.), *Flora of China*, Vol. 13. Science Press, Beijing and Missouri Botanical Garden Press, St. Louis, pp. 153-207.
- Hou, M.F., Y. Liu, Y. Kono, and C.-I Peng. 2009. *Aspidistra daxinensis* (Ruscaceae), a new species from limestone areas in Guangxi, China. *Bot. Stud.* **50**: 371-378.
- Ku, S.M., C.-I Peng, and Y. Liu. 2004. Notes on *Begonia* (sect. *Coelocentrum*, Begoniaceae) from Guangxi, China, with the report of two new species. *Bot. Bull. Acad. Sin.* **45**: 353-367.
- Ku, S.M., Y. Liu, and C.-I Peng. 2006. Four new species of *Begonia* sect. *Coelocentrum* (Begoniaceae) from limestone areas in Guangxi, China. *Bot. Stud.* **47**: 207-222.
- Ku, S.M., Y. Kono, and Y. Liu. 2008. *Begonia pengii* (Sect. *Coelocentrum*, Begoniaceae), a new species from limestone areas in Guangxi, China. *Bot. Stud.* **49**: 167-175.
- Liu, Y., S.M. Ku, and C.-I Peng. 2005. *Begonia picturata* (sect. *Coelocentrum*, Begoniaceae), a new species from limestone areas in Guangxi, China. *Bot. Bull. Acad. Sin.* **46**: 367-376.
- Liu, Y., S. M. Ku, and C.-I Peng. 2007. *Begonia bamaensis* (sect. *Coelocentrum*, Begoniaceae), a new species from limestone areas in Guangxi, China. *Bot. Stud.* **48**: 465-473.
- Levan, A., K. Fredga, and A.A. Sandberg. 1964. Nomenclature for centromeric position on chromosomes. *Hereditas* **52**: 201-220.
- Mou, F.J. and D.X. Zhang. 2010. *Rubovietnamia nonggangensis* (Rubiaceae), a new species from China. *Bot. Stud.* **51**: 119-126.
- Peng, C.-I, Y.M. Shui, Y. Liu, and S.M. Ku. 2005a. *Begonia fangii* (sect. *Coelocentrum*, Begoniaceae), a new species from limestone areas in Guangxi, China. *Bot. Bull. Acad. Sin.* **46**: 83-89.
- Peng, C.-I, S.M. Ku. and W.C. Leong. 2005b. *Begonia liuyanii* (sect. *Coelocentrum*, Begoniaceae), a new species from limestone areas in Guangxi, China. *Bot. Bull. Acad. Sin.* **46**: 245-254.
- Peng, C.-I, W.C. Leong, S.M. Ku, and Y. Liu. 2006. *Begonia pulvinifera* (sect. *Diploclinium*, Begoniaceae), a new species from limestone areas in Guangxi, China. *Bot. Stud.* **47**: 319-327.
- Peng, C.-I, T.Y. Hsieh and Q.H. Ngyuen. 2007. *Begonia kui* (sect. *Coelocentrum*, Begoniaceae), a new species from Vietnam. *Bot. Stud.* **48**: 127-132.

- Peng, C.-I., Y. Liu, and S.M. Ku. 2008a. *Begonia aurantiflora* (sect. *Coelocentrum*, Begoniaceae), a new species from limestone areas in Guangxi, China. *Bot. Stud.* **49**: 83-92.
- Peng, C.-I., S.M. Ku, Y. Kono, K.F. Chung, and Y. Liu. 2008b. Two new species of *Begonia* (sect. *Coelocentrum*, Begoniaceae) from limestone areas in Guangxi, China: *B. arachnoidea* and *B. subcoriacea*. *Bot. Stud.* **49**: 405-418.
- Shui, Y.M. and W.H. Chen. 2005. New data of sect. *Coelocentrum* (*Begonia*) in Begoniaceae. *Acta Bot. Yunnan.* **27**: 355-374.
- Tam, T.Q., R. Kiew, and J.J. Vermeulen. 2005. *Begonia bataiensis* Kiew, a new species in Sect. *Leptosae* (Begoniaceae) from Vietnam. *Gard. Bull. Singapore* **57**: 19-23.
- Tebbutt, M.C. 2005. *Begonias: Cultivation, Identification, and Natural History*. Timber Press, Inc.
- Wang, F.G., D.M. Liu, and F.W. Xing. 2010. Two new species of *Hypodematium* (Hypodematiaceae) from limestone areas in Guangdong, China. *Bot. Stud.* **51**: 99-106.
- Wen, F., Y. Wang, W.F. Fan, L.F. Guo, and Q.X. Zhang. 2009. *Chirita leei* (Gesneriaceae), a new species from Guangxi, China. *Guihaia* **29**: 719-723.
- Wu, J.Y., M. Ogisu, H.N. Qin, and S.N. Lu. 2009. A new species of *Mahonia* Nutt. (Berberidaceae). *Bot. Stud.* **50**: 487-492.
- Yu, S.X., Y.T. Hou, Y.L. Chen, and H.N. Qin. 2009. *Impatiens lobulifera* (Balsaminaceae), a new species from limestone areas in Guangxi, China. *Bot. Stud.* **50**: 365-370.
- Yuan, Q. and Q.E. Yang. 2009. *Anemone xingyiensis* (Ranunculaceae), a new species from Guizhou, China. *Bot. Stud.* **50**: 493-498.
- Zhang, L.B. and H. He. 2009a. *Polystichum peishanii* (sect. *Haplopolystichum*, Dryopteridaceae): a new fern species from a limestone area in Guizhou, China. *Bot. Stud.* **50**: 101-106.
- Zhang, L.B. and H. He. 2009b. *Polystichum minutissimum* sp. nov. (sect. *Haplopolystichum*, Dryopteridaceae): The smallest *Polystichum* found in a karst cave in China. *Bot. Stud.* **50**: 353-358.
- Zhang, L.B., H. He, and Q. Luo. 2010. *Polystichum puteicola*, sp. nov. (sect. *Haplopolystichum*, Dryopteridaceae) from a karst sinkhole in Guizhou, China based on molecular, palynological, and morphological evidence. *Bot. Stud.* **51**: 127-136.
- Zhang, D.G., Y. Liu, and Q.E. Yang. 2008. *Sinosenecio jishouensis* (Compositae), a new species from north-west Hunan, China. *Bot. Stud.* **49**: 287-294.

中國廣西石灰岩地區秋海棠屬新組間雜交種：短葶秋海棠

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本文報導中國廣西壯族自治區石灰岩地區秋海棠屬一新雜交種：短葶秋海棠 (*Begonia × breviscapa*)，提供線繪圖與彩色照片以資辨識，並報導其染色體數目 ($2n = 30$)。由於該植物與數種秋海棠屬植物共域分布，且花粉可染性極低，人工授粉後不著果，經觀察比較其形態特徵後我們推斷其為生長在同一石灰岩洞穴的側膜組 (sect. *Coelocentrum*) 之多變秋海棠 (*B. variifolia*) 與棒果組 (sect. *Leptosae*) 的癩葉秋海棠 (*B. leprosa*) 之天然雜交種。此為中國大陸秋海棠屬組間天然雜交之首次報導。

關鍵詞：短葶秋海棠；癩葉秋海棠；刺盾葉秋海棠；多變秋海棠；秋海棠科；中國；染色體數；廣西；石灰岩植物；天然雜交。

