

# Two new species of *Begonia* (sect. *Coelocentrum*, Begoniaceae) from limestone areas in Guangxi, China: *B. arachnoidea* and *B. subcoriacea*

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**ABSTRACT.** *Begonia arachnoidea* and *B. subcoriacea*, two new species of *Begonia* sect. *Coelocentrum* from the karst area in Guangxi Zhuangzu Autonomous Region, China, are described and illustrated. *Begonia arachnoidea* is similar to *B. umbraculifolia* in the peltate leaves with the venation in a spider web-like pattern, differing by rhizomes stout, internodes congested, stipules ovate-triangular, leaves adaxially densely shortly setose and hispid-setulose, abaxially densely hispidulous-pilose on all veins, pedicel of carpellate flower longer and with a bracteole. *Begonia subcoriacea* is similar to *B. liuyanii* in the small flowers, differing by smaller habit; leaves adaxially glabrous, abaxially tomentose only on major veins, tertiary leaf venation flat; outer tepals glabrous or subglabrous, and inflorescence a dichasial cyme. Both new species are rare and endemic to Guangxi. A somatic chromosome number of  $2n = 30$  is here reported for *B. arachnoidea*, *B. umbraculifolia* and *B. subcoriacea*.

**Keywords:** *Begonia arachnoidea*; *Begonia liuyanii*; *Begonia subcoriacea*; *Begonia umbraculifolia*; *Begonia umbraculifolia* var. *flocculosa*; Begoniaceae; China; Chromosome number; Guangxi; Limestone flora; New species; Rare species; sect. *Coelocentrum*.

## INTRODUCTION

Renowned for the spectacular scenery of limestone karsts, Guangxi Zhuangzu Autonomous Region of southern China also abounds in marvelous botanical diversity. As the third most species-rich province/region in China, surpassed only by Yunnan and Sichuan, Guangxi is also characterized by extremely high levels of endemism associated with its extensive limestone habitats. In continuation of our research on Asian *Begonia* (e.g., Fang et al., 2006; Gu et al., 2007; Ku et al., 2004, 2006, 2008; Li et al., 2005; Liu et al., 2005, 2007; Peng et al., 2005-a,b,c, 2006-a,b, 2007, 2008), we report two new species from limestone hills in southwestern Guangxi.

## MATERIALS AND METHODS

### Cryo scanning electron microscopy

Fresh leaves of *Begonia arachnoidea*, *B. umbraculi-*

*folia* and *B. subcoriacea* 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 have been deposited at HAST.

### Chromosome preparations

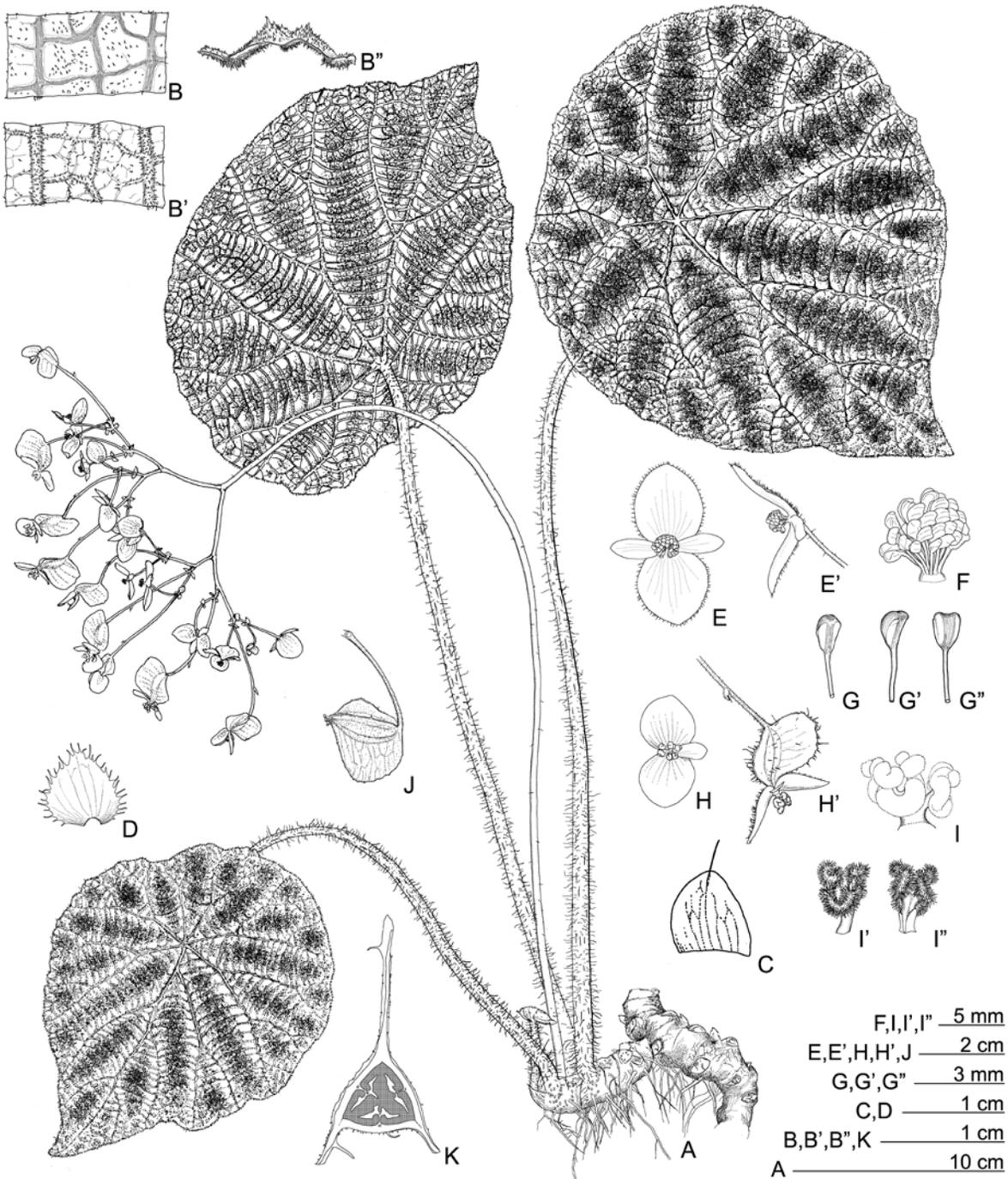
Root tips of *Begonia arachnoidea*, *B. umbraculifolia* and *B. subcoriacea* were pretreated with 2 mM 8-hydroxyquinoline solution at 15-18 °C for about 8 h and fixed in ethanol-acetic acid (3:1) at about 4 °C for more than 24 h. Chromosome preparations were made by the enzyme squash method in an enzyme mixture of 4% Cellulase (Onozuka R-10, Yakult) and 2% Pectolyase Y-23 (Kyowa Chemical Products) at about 37 °C for 1 h. The preparations were stained with 2% Giemsa solution (Merck). Voucher specimens have been deposited at HAST.

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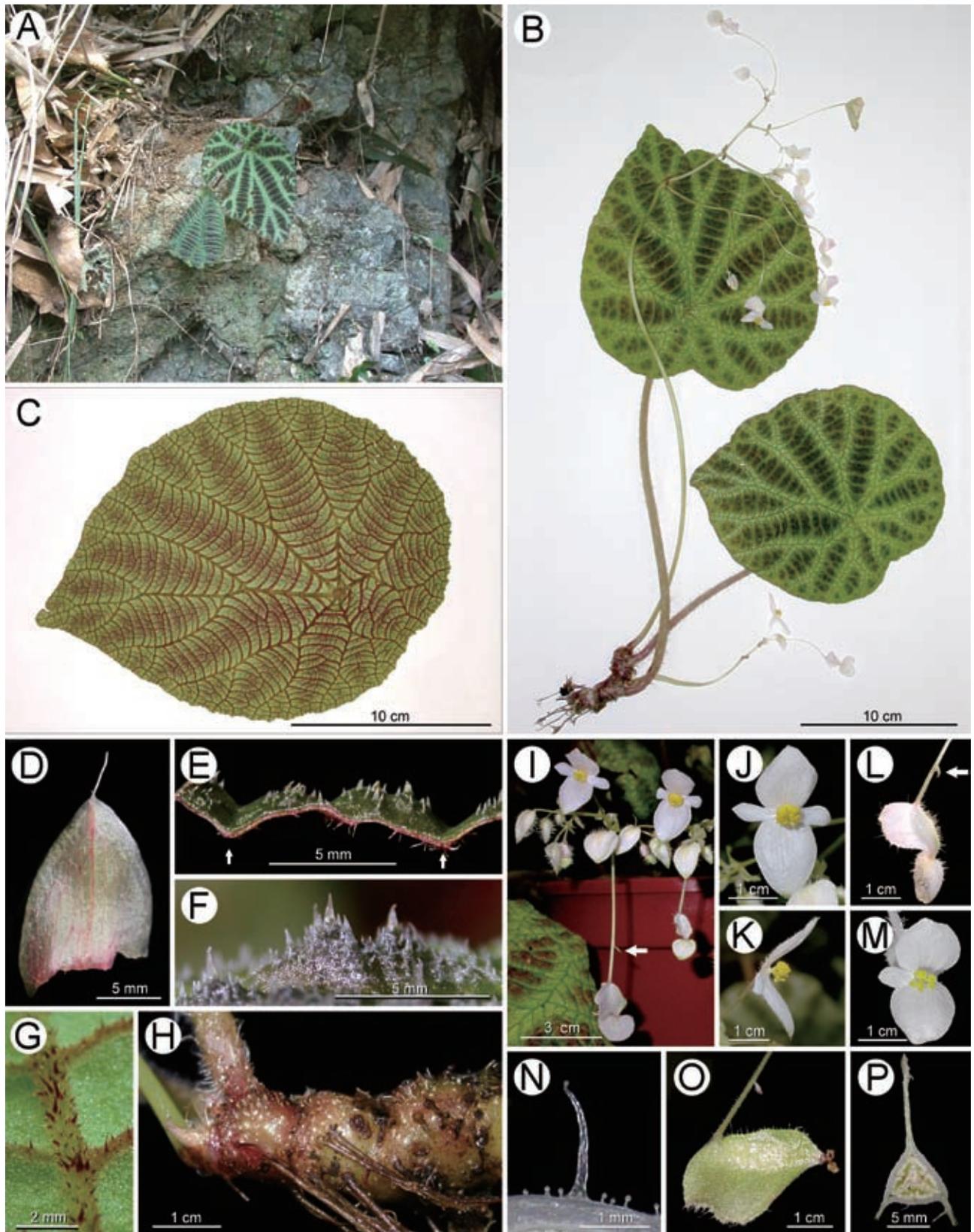
## NEW SPECIES

1. *Begonia arachnoidea* C.-I Peng, Yan Liu & S. M. Ku, sp. nov.—TYPE: CHINA. Guangxi Zhuangzu Autonomous Region, Daxin Xian (County), Encheng Xiang, Encheng Nature Reserve, elev. ca. 200 m, mixed bamboo and scrubby vegetation at foot of limestone

hill, on semishaded rocky slope, occasional. Plant sterile when collected on 27 May 2004. Flowering specimens pressed from cultivated plant on 12 Oct 2005, *Ching-I Peng, Wai-Chao Leong, Shin-Ming Ku & Yan Liu 19762-A* (holotype: IBK; isotype: HAST). 蛛網脈秋海棠 Figures 1, 2



**Figure 1.** *Begonia arachnoidea* C.-I Peng, Yan Liu & S. M. Ku. A, Habit; B, Portion of leaf, adaxial surface, B', abaxial surface, B'', cross section; C, Stipule; D, Bract; E, Staminate flower, face view, E', side view; F, Androecium; G, Stamen, ventral view, G', side view, G'', dorsal view; H, Carpellate flower, face view, H', side view; I, Style and stigma, I', dorsal view, I'', ventral view; J, Fruit; K, Fruit, Middle cross section. (All from the type, *C.-I Peng et al. 19762-A*).



**Figure 2.** *Begonia arachnoidea* C.-I Peng, Yan Liu & S. M. Ku. A, Habit and habitat; B, Habit, at anthesis; C, Leaf, abaxial surface; D, Stipule; E, Portion of leaf, cross section; arrow indicating tertiary veins; F, Portion of leaf, showing trichomes on adaxial surface; G, Portion of leaf, showing trichomes on abaxial surface; H, Rhizome, showing congested internodes; I, Inflorescence with opened staminate flowers and unopened carpellate flowers, showing pendent carpellate flowers with long pedicel, arrow indicating bracteole; J, Staminate flower, face view; K, Staminate flower, side view; L, Carpellate flower bud, arrow indicating bracteole; M, Carpellate flower; N, Trichomes on ovary surface; O, Fruit; P, Cross section of an immature fruit. (All from the type, C.-I Peng et al. 19762-A).

*Possible synonym.* *Begonia umbraculifolia* var. *focculosa* Y. M. Shui & W. H. Chen, Acta Bot. Yunnan. 27(4): 372. 2005.

*Begonia arachnoidea* aspectu similis *B. umbraculifoliae*, sed rhizomatibus crassioribus, internodiis congestis, stipulis ovato-triangularibus, foliis adaxialiter dense breviterque setosis et hispidulo-setulosis, abaxialiter ad venas dense hispidulo-pilosis, pedicellis florum carpellatorum longioribus differt.

Herbs, monoecious, rhizomatous; rhizome stout, creeping, 1.1-2 cm thick, internode 0.5-1 cm long. Leaves peltate, basal; stipules caducous, ovate-triangular, 0.7-0.9 cm long, 0.7-1.1 cm wide; petiole 13-26(-30) cm long, hirsute-villous (the hairs 2-5.5 mm long); leaf blade suborbicular or broadly ovate, 12-26(-35) cm long, 11-19(-27) cm wide, papery, adaxially deeply green or brownish, with white or pale band along major veins (the band often composed of small, dense white spots), densely shortly setose and hispid-setulose (trichomes 0.2-0.9 mm long), abaxially densely hispidulous-pilose on all veins (trichomes reddish with red base, 0.3-0.8 mm long, somewhat unevenly spread and ragged), base rounded, slightly oblique, margin shallowly unequally serrulate or undulate, apex acute to shortly acuminate; venation basally 6- or 7-palmate, tertiary veins percurrent, spiderweb-like. Inflorescences axillary; peduncle 9-31 cm long, moderately hispid-villous; flowers white, 6-24 in dichasial cymes; bracts caducous, ovate or oblong, 5-7 cm long 5-6 mm wide, margin serrate-ciliate, apex obtuse. Staminate flower: pedicel 0.6-3.7 cm, pilose; tepals 4, pink, outer 2 broadly ovate, 1.1-1.9 cm long, 1-1.5 cm wide, base subrounded, apex somewhat acute or obtuse, outside hirsute or hispid-pilose, inner 2 elliptic, 6-8 mm long, 3.5-5 mm wide, apex acute; stamens 26-44; filaments ca. 1.5-2 mm long; anthers obovate-oblong, 1.1-1.4 mm; connective apex emarginate. Carpellate flower: pedicel 4-6 cm, with one bracteole, glandular-hispidulous or sparsely so; tepals 3, pink, outer 2 suborbicular or broadly ovate, 0.9-1.5 cm long, 0.9-1.4 cm wide, apex and base rounded, inner 1 elliptic, 6-8 mm long, 3.5-4 mm wide; ovary oblong, 7-16 mm long, 4-5 mm across, moderately to sparsely glandulose-pilose or glandulose-villous and with some or many small stalked glandular hairs, unequally 3-winged,

1-locular with parietal placentation, each placenta with 2 lamellae; styles 3, ca. 4 mm long, fused at base, stigma spirally twisted and papillose all around. Fruits nodding, 1.3-2.6 cm long, 0.5-0.6 cm across. Somatic chromosome number,  $2n = 30$  (Figure 3A).

*Additional specimens examined.* CHINA. Daxin Xian, Encheng Xiang, Encheng Nature Reserve, elev. ca. 200 m, mixed bamboo and scrubby vegetation, at foot of limestone hill, on rocky slope, semishaded, occasional. (Same locality as the type.) Plant sterile when collected. 27 May 2004, Ching-I Peng, Wai-Chao Leong, Shin-Ming Ku & Yan Liu 19762 (HAST).

*Leaf anatomy and vestiture.* Cross section 0.2-0.35 mm thick. Adaxial surface with many multiseriate trichomes 0.2-1 mm long, the larger trichome surrounded by many smaller trichomes (Figure 4A); upper epidermal cells with slightly conoidal surface. Abaxial surface with intermixed uniseriate and multiseriate trichomes on veins and venlets (Figure 4B). Epidermis single layered on both surfaces, hypoderm absent. Lower stomatal complex single, slightly elevated, helicocytic type, subsidiary cells 5-6 (Figure 4C).

*Phenology.* Flowering from September to October, fruiting from October to December.

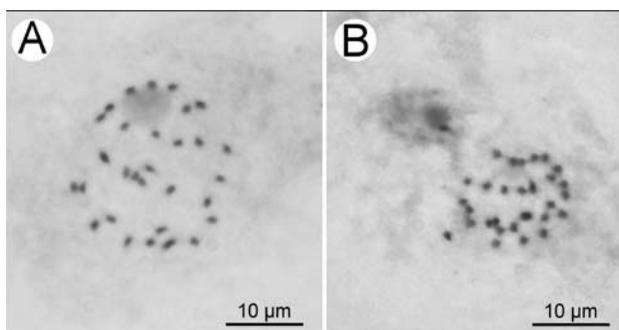
*Distribution.* Daxin Xian, southwestern Guangxi, China (Figure 5).

*Etymology.* The specific epithet indicates that its leaf venation resembles a spiderweb.

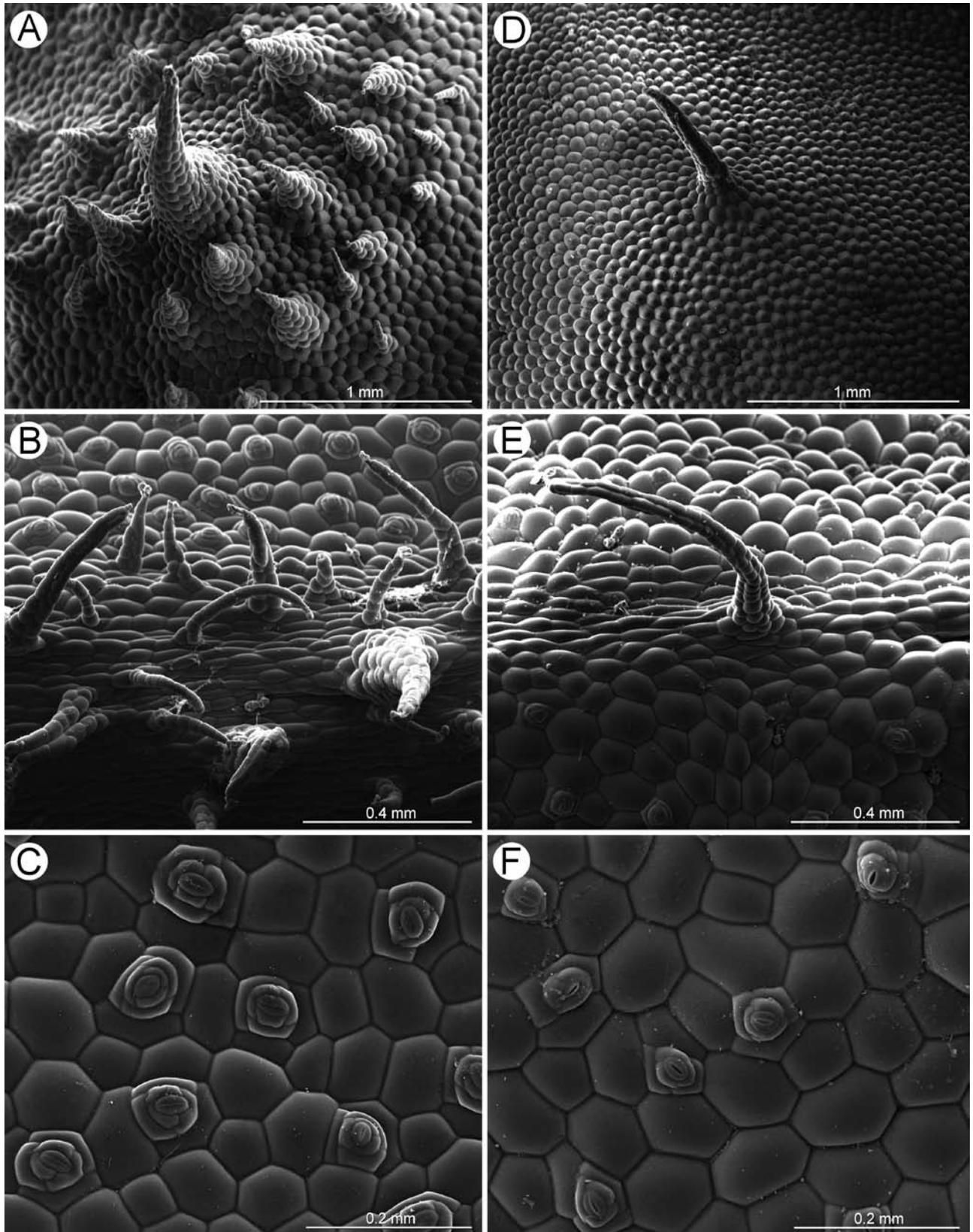
*Notes.* *Begonia arachnoidea* resembles *B. umbraculifolia* (Figures 6, 7) in the peltate leaves and the venation in a spiderweb-like pattern, differing by rhizomes stout, internodes congested, stipules ovate-triangular, leaves adaxially densely shortly setose and hispid-setulose, abaxially densely hispidulous-pilose on all veins, pedicel of carpellate flower 4-6 mm and with a bracteole. In *Begonia umbraculifolia* the rhizomes are slender; stipules are narrowly ovate-triangular to lanceolate; leaves are sparsely pilose on both surfaces; pedicels of carpellate flowers are 3.5-4 cm long and ebracteolate. A detailed comparison of the two species are provided in Table 1.

*Begonia arachnoidea* was collected from the same county (Daxin Xian) as the type collection of *Begonia umbraculifolia* var. *focculosa* Y. M. Shui & W. H. Chen (Shui and Chen, 2005). Shui & Chen's holotype (KUN!), however, is represented merely by a piece of leaf and their sketchy diagnosis does not offer enough information for positive identification. Tentatively, we consider *B. umbraculifolia* var. *focculosa* to be a possible synonym.

**2. *Begonia subcoriacea*** C.-I Peng, Yan Liu, S. M. Ku, sp. nov.— TYPE: China. Guangxi Zhuangzu Autonomous Region, Daxin Xian, between Longhua and Niandi, elev. ca. 250 m, N-facing, broadleaf forest with scattered bamboo groves, on semishady limestone slope, 25 May 2007, Ching-I Peng, Kuo-Fang Chung, Ming-Chao Yu & Hai-Shan Gao 21135 (holotype: IBK; isotype: HAST). 近革葉秋海棠 Figures 8, 9



**Figure 3.** Mitotic chromosome spread of *Begonia*. A, *Begonia arachnoidea* (C.-I Peng et al. 19762); B, *B. umbraculifolia* (C.-I Peng et al. 19694).



**Figure 4.** Scanning electron microscope (SEM) micrographs of foliar trichomes and stomata complexes of *Begonia arachnoidea* (A, B, C) and *B. umbraculifolia* (D, E, F). A, D, Leaf adaxial surface; B, E, Trichomes on vein of leaf abaxial surface; C, F, Stomatal complexes on leaf abaxial surface.

*Begonia subcoriacea* aspectu similis *B. liuyanii*, sed habitu minore, foliis adaxialiter glabris, abaxialiter tantum ad venas majores tomentosus, venis tertiariis planis, tepalis externis glabris vel subglabris, inflorescentia dichasio-cymosa differt.

Plant monoecious; epipetric; perennial; rhizomatous. Rhizome rather stout, 5-15 cm long, 0.6-1.2 cm thick, internodes 0.4-1.2 cm long, brown, villous when young, glabrate when old. Stipules eventually caducous, triangular-ovate or narrowly so, ca. 1-2 cm long, 0.8-1.4 cm wide, brownish, herbaceous, keeled or weakly so, abaxially hairy (sometimes only along midrib), margin usually ciliate or ciliolate, sometimes eciliate on upper margin, apex aristate, arista 3-4 mm long, somewhat horn-like. Leaves 2-6 or more, alternate, simple, asymmetric, unlobed, widely ovate or suborbicular, base strongly oblique cordate, margin inconspicuously irregularly repandly denticulate and ciliolate, apex shortly acuminate, (10-)12-20(-22) cm long (basal lobes included), (8-)10-14(-17) cm wide, adaxially green, with or without white maculation between major veins, abaxially pale green, yellowish green or reddish, sometimes reddish near the major veins, subcoriaceous, flat, adaxially glabrous (sparsely gibbous when young), obviously nitid, abaxially tomentose on major veins, sparsely pilose on tertiary venation; venation basally 6-7-palmate, midrib distinct, pinnate along midrib, with 1-3 major lateral veins on each

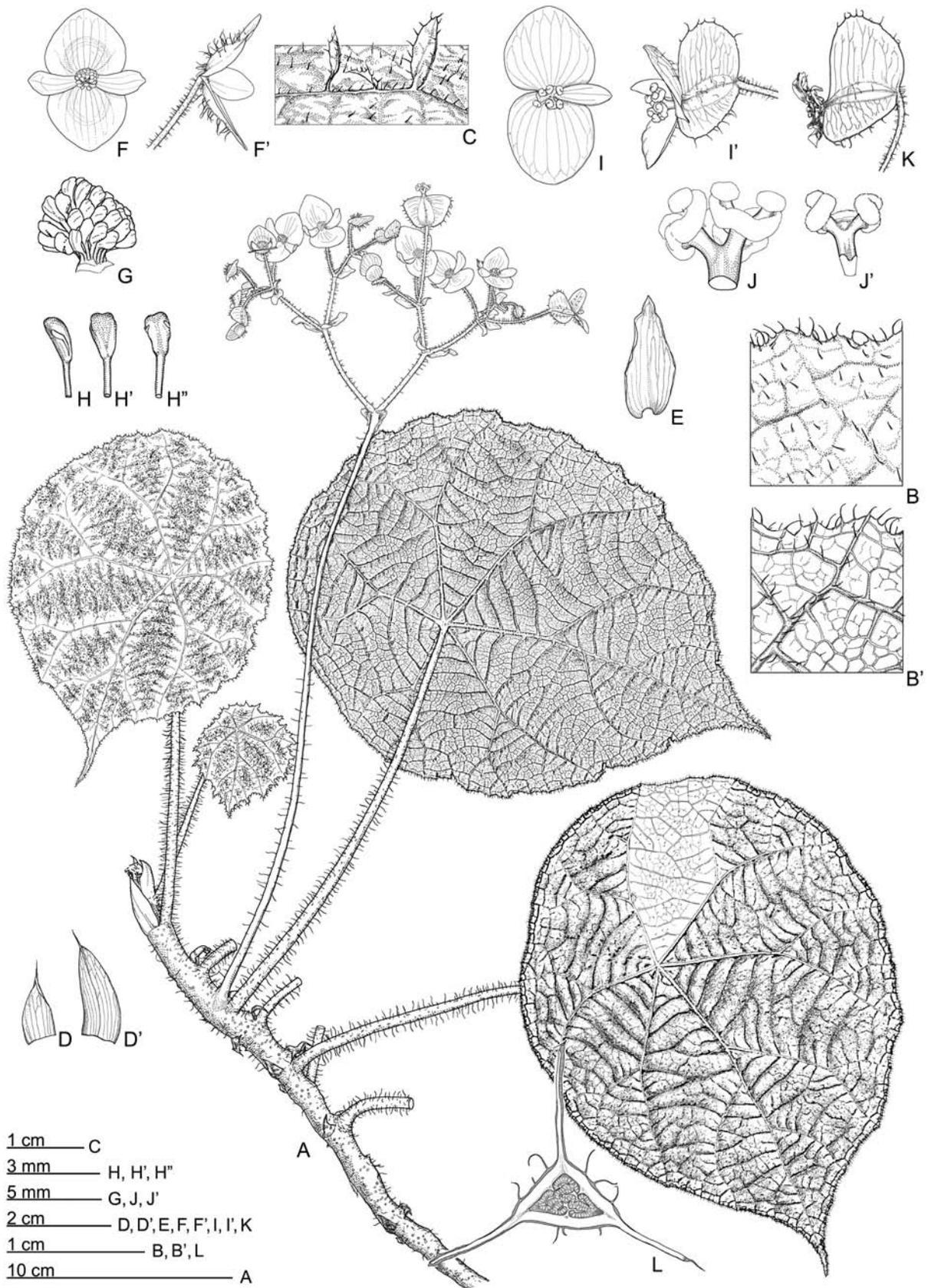
side, other primary veins dichotomously branching or nearly so, tertiary veins reticulate or percurrent, divergence angle 60-85°, minor veins reticulate, major (1° & 2°) veins on abaxial surface prominently raised, minor veins not raised; petiole terete, 9-20 cm long, 3-7.5 mm thick,



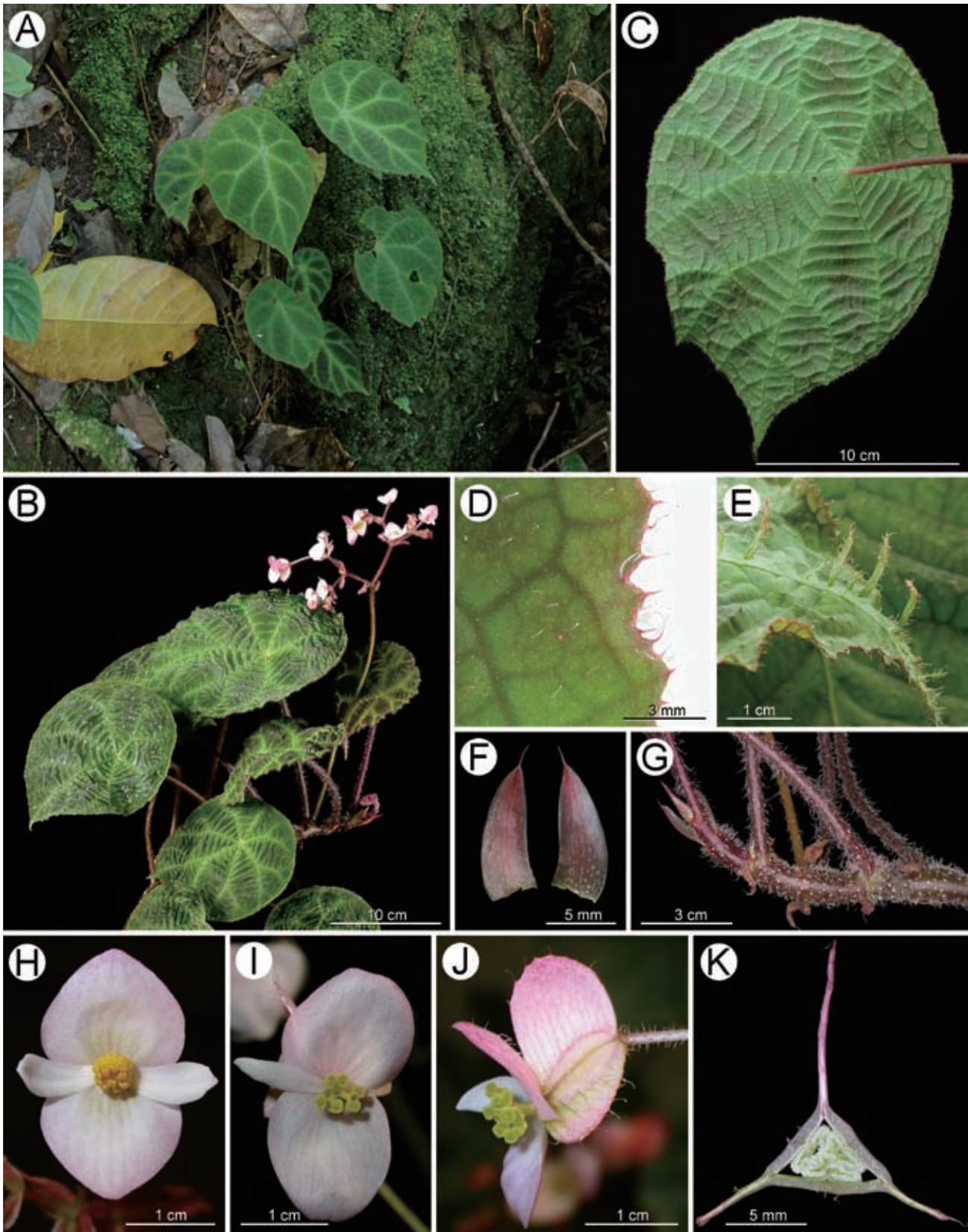
**Figure 5.** Distribution of *Begonia arachnoidea* (⊙), *B. umbraculifolia* (●), *B. subcoriacea* (★), *B. liuyanii* (▲) in Guangxi Zhuang Autonomous Region, China.

**Table 1.** Comparison of *Begonia arachnoidea* and *B. umbraculifolia*.

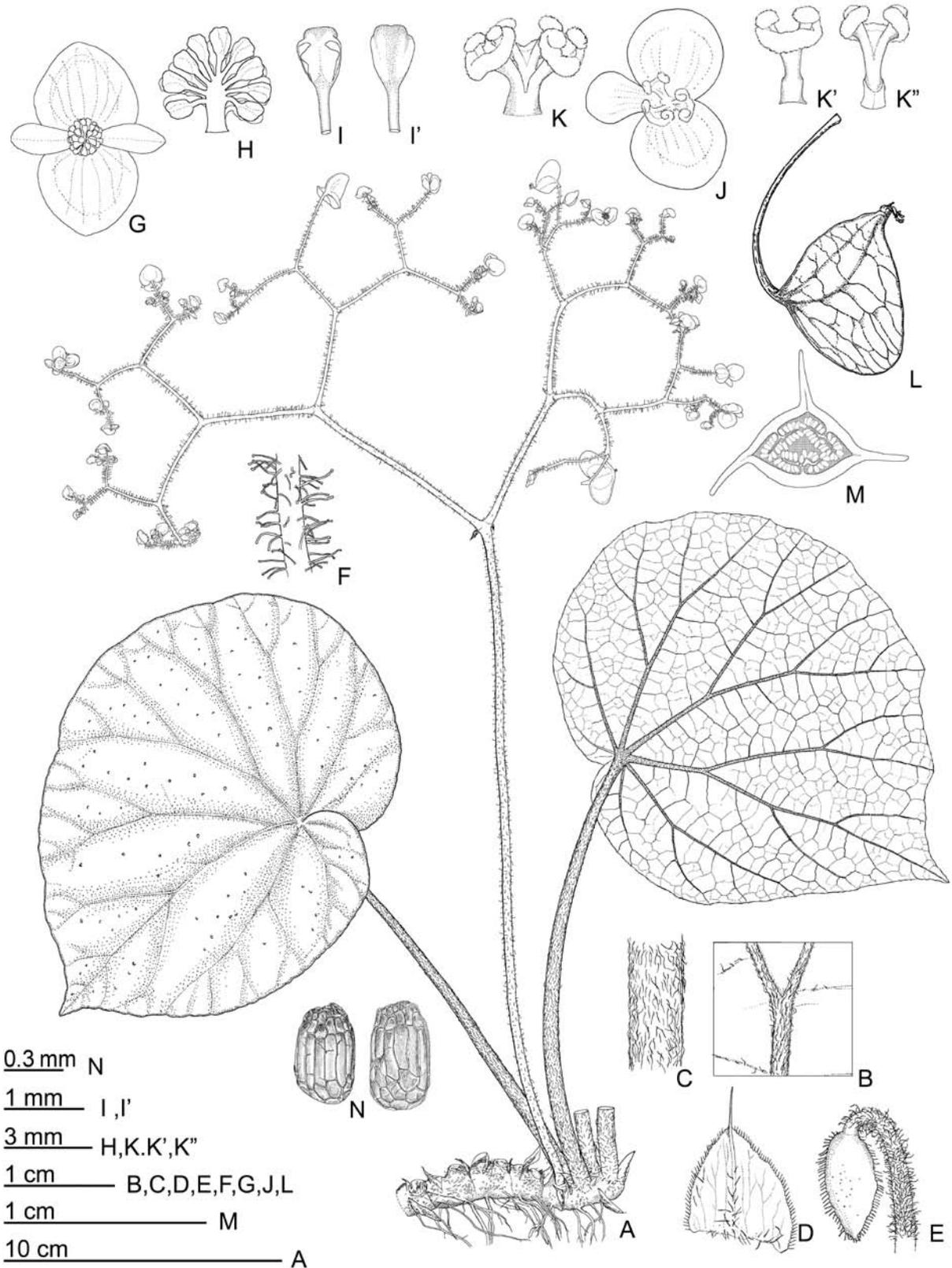
	<i>Begonia arachnoidea</i> (Figures 1, 2)	<i>Begonia umbraculifolia</i> (Figures 6, 7)
Rhizome		
Internode (mm)	5-10	8-14
Diameter (mm)	11-20	10-40
Stipules	Ovate-triangular	Narrowly ovate-triangular to lanceolate
Leaf		
Indumentum	Adaxially densely shortly setose and hispid-setulose (Figure 4A), abaxially densely hispidulous-pilose on all veins (Figure 4B)	Sparsely pilose on both surfaces (Figure 4D, E)
Maculation	With white or pale bands along major veins (the band often composed of dense, small white spots)	Pale green or greenish near the major veins
Adventitious epiphyllous appendages	Lacking	Sometimes on axils of major veins on upper leaf surface
Stomatal complexes on lower surface	Moderately dense; subsidiary cells 5-6, larger (Figure 4C)	Less dense; subsidiary cells 3-5, rarely 6, smaller (Figure 4F)
Outer tepals color	White or slightly pinkish	Pink
Carpellate flower		
Pediceal length (mm)	40-60	27-40
Indumentum on ovary surface	Mixed glandulose-pilose and minute, stalked glandular hairy (Figure 2N)	Sparsely villous or pilose; very sparse, minute, sessile glands not visible by naked eyes



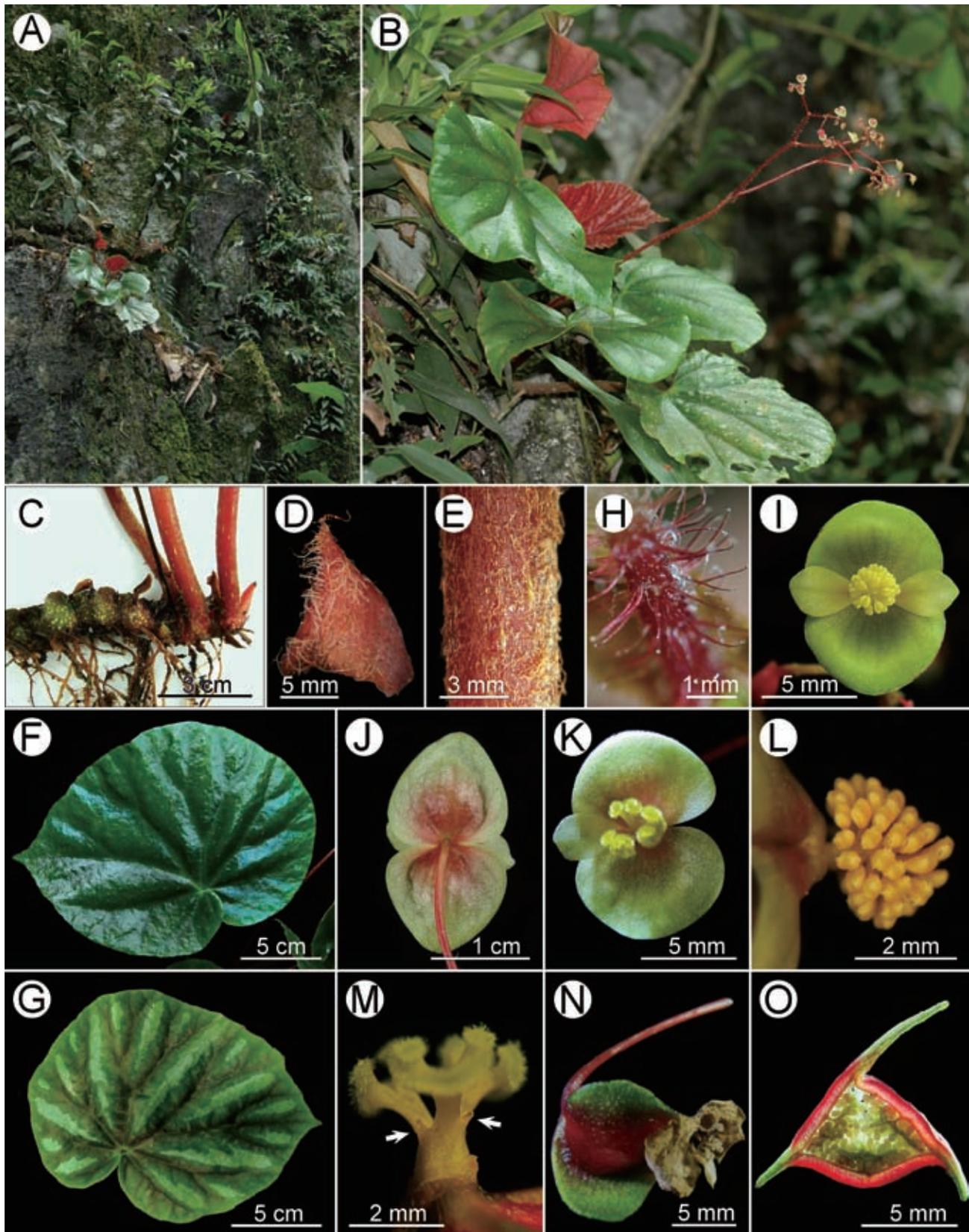
**Figure 6.** *Begonia umbraculifolia* B. N. Chang & Y. Wan. A, Habit ; B, Portion of leaf, adaxial surface, B', abaxial surface; C, Portion of leaf, showing adventitious epiphyllous appendages on major veins; D, D', Stipules; E, Bract; F, Staminate flower, face view, F', side view; G, Androecium; H, Stamen, side view, H', dorsal view, H'', ventral view; I, Carpellate flower, face view, I', side view; J & J', Style and stigmas; K, Capsule; L, Capsule, middle cross section. (All from C.-I Peng et al. 19694).



**Figure 7.** *Begonia umbraculifolia* B. N. Chang & Y. Wan. A, Habit and habitat; B, Habit at anthesis; C, Leaf, abaxial side; D, Leaf margin and adaxial surface; E, Adventitious epiphyllous appendages on major veins; F, Stipules; G, Rhizome; H, Staminate flower; I, Carpellate flower, face view; J, Carpellate flower, side view; K, Middle cross section of ovary. (All from C.-I Peng *et al.* 1969).

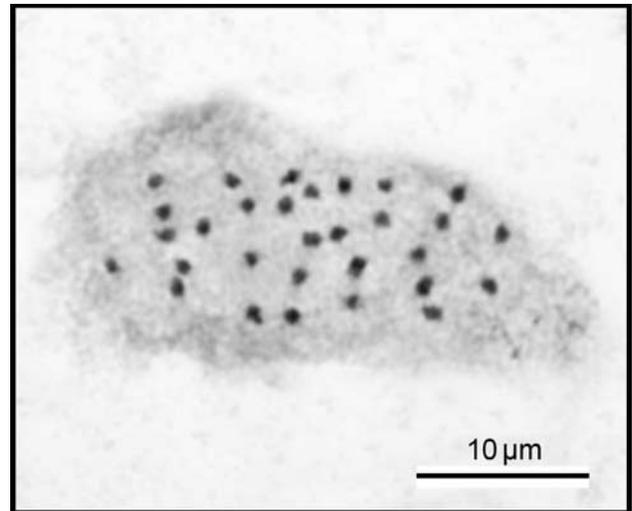


**Figure 8.** *Begonia subcoriacea* C.-I Peng, Yan Liu & S. M. Ku. A, Habit; B, Portion of leaf, abaxial surface; C, Portion of petiole, showing trichomes; D, Stipule; E, Inflorescences bud, showing ciliate bracts; F, Portion of peduncle, showing glandulose-pilose trichomes; G, Staminate flower, face view; H, Androecium, longitudinal section; I-I', Stamen, ventral view and dorsal view; J, Carpelate flower; K, Style and stigma; L, Dry fruit; M, Middle cross section of a young fruit; N, Seeds. (All but D, E and J from Peng et al. 21135, HAST; D, E and J from Peng et al. 20346, HAST).



**Figure 9.** *Begonia subcoriacea* C.-I Peng, Yan Liu, S. M. Ku. A, Habitat; B, Habit; C, Rhizome; D, Stipule; E, Portion of petiole, showing withered trichomes; F, Leaf (adaxial surface) green form; G, Leaf (adaxial surface), maculated form; H, Portion of secondary peduncle, showing glandulose-pilose trichomes; I, Staminate flower, face view; J, Staminate flower, back view; L, Androecium; M, Style and stigmas, arrows indicating minute protrusions between style branches; N, Fruit; O, Middle cross section of a young fruit. (A, B from Peng *et al.* 21135, HAST; C-O from Peng *et al.* 20346, HAST).

greenish or brownish, tomentose (trichomes withered and turning brown when old). *Inflorescences* axillary, 1-6, arising directly from rhizome, diffusely cymose, branched 3-7 times; staminate flowers 20-60, carpellate flowers 10-32; peduncle well developed, terete, erect or ascending, 16-35 cm long, 2-2.5 mm thick, red, covered with reddish glandulose-pilose trichomes (trichomes 1.5-2 mm long); pedicels red, glandulose-pilose with reddish trichomes, ascending to pendent in staminate flowers (0.8-4.3 cm long), horizontal to pendent in carpellate flowers (1-1.6 cm long). Bracts caducous, oblong, margin ciliate (lower bracts) or eciliate (upper bracts), apex acute or obtuse, 1-10 mm long, 0.5-5 mm wide, greenish or reddish. *Staminate flowers*: tepals 4, margin entire, outer two orbicular or widely depressed ovate, base rounded or slightly cordate, apex rounded or obtuse, 6-9 mm long, 7-10 mm wide, greenish-yellow, usually reddish toward the base, abaxially glabrous (rarely with few glandulose-pilose trichomes); inner two tepals obovate, base cuneate, apex obtuse, 4-6 mm long, 3 mm wide, yellowish, glabrous; androecium actinomorphic, spherical, ca. 4 mm across; stamens ca. 40-75, shortly golf-club shaped; filaments fused into a column, subequal, ca. 1.5-2.5 mm long (free part ca. 0.5 mm, column 1.5-2 mm); anthers 2-locular, slightly compressed, obovoid, apex truncate or slightly emarginate, 0.7-0.9 mm long, 0.5 mm wide, yellow. *Carpellate flowers*: tepals 3, margin eciliate, persistent or eventually caducous, not thickened in fruit;

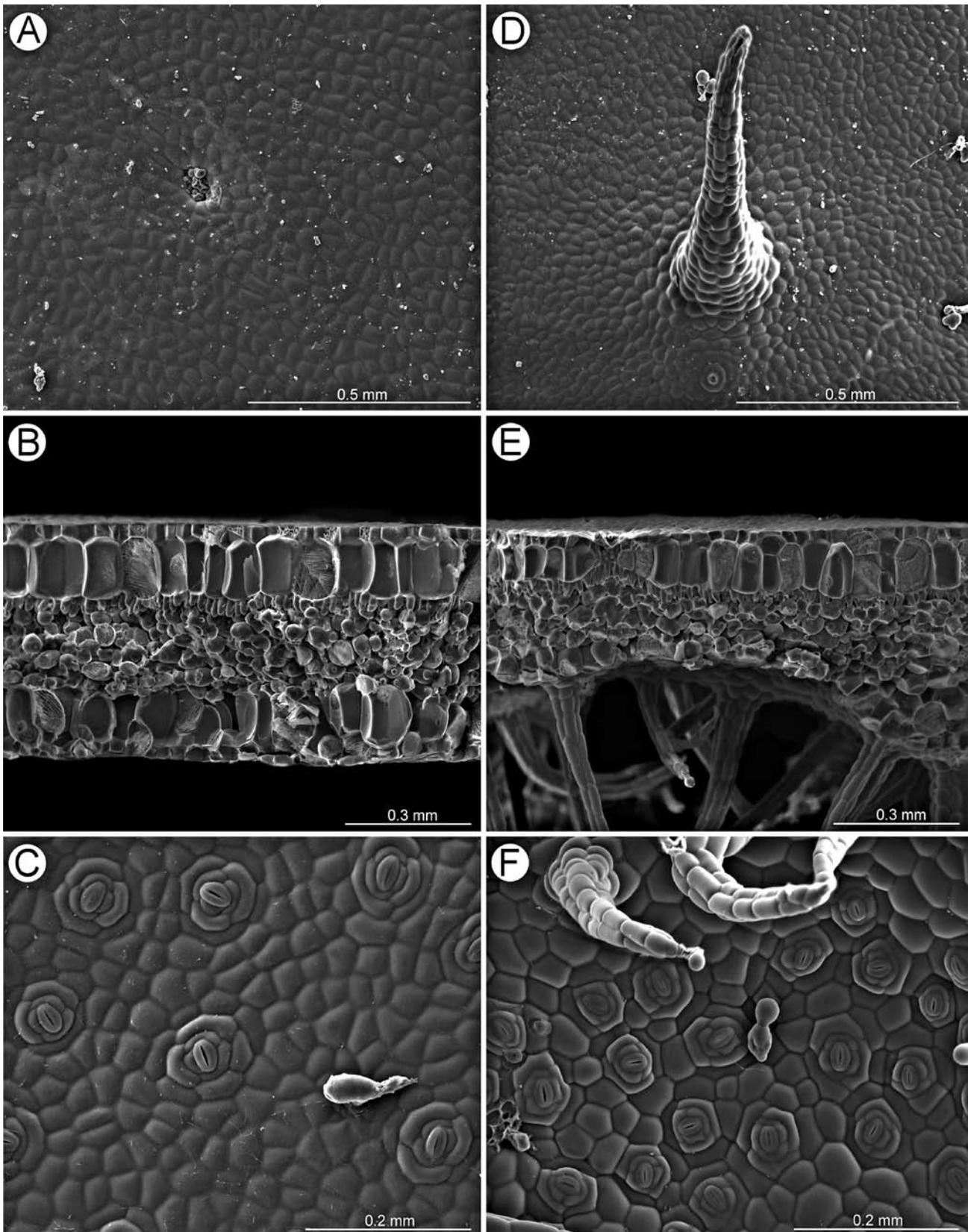


**Figure 10.** Mitotic chromosome spread of *Begonia subcoriacea* ( $2n = 30$ , from Peng et al. 20346, HAST).

outer two tepals widely depressed ovate, 6-8 mm long, 9-10 mm wide, greenish-yellow, usually reddish toward the base, abaxially glabrous (rarely with few glandulose-pilose trichomes); inner tepal obovate, base cuneate, apex rounded, ca. 5-7 mm long, 3-4.5 mm wide, yellowish, glabrous; ovary trigonous-ellipsoid, 6-7 mm long, 4-4.5 mm across, red, glabrous (rarely with few glandulose-pilose trichomes), 3-winged; wings unequal, greenish-

**Table 2.** Comparison of *Begonia subcoriacea* with *B. liuyanii*.

	<i>B. subcoriacea</i> (Figures 8, 9)	<i>B. liuyanii</i> (Peng et al., 2005: Figures 1, 2)
Leaf		
Size (cm)	(10-) 12-20(-22) × (8-)10-14(-17)	(16-)23-38(-50) × (12-)16-32(-40)
Adaxial surface	Glabrous, sparsely gibbous when young; flat; manifestly nitid	Sparsely setose; flat or slightly rugose; weakly nitid
Abaxial surface	Tomentose on major veins, sparsely pilose on tertiary veins	Lanuginous or tomentose throughout
Maculation on adaxial surface	With or without whitish maculation in intercostal areas	Lacking
Tertiary veins	Flat	Elevated
Quaternary veins	Obscure or not seen	Elevated
Epidermis	2-layered on both surfaces	2-layered on adaxial surface; 1-layered on abaxial surface
Cross section	0.45-0.55 mm thick	0.2-0.33 mm thick
No. of stomatal complex /mm <sup>2</sup> on abaxial surface	24-30	32-65
Peduncle	Glandulose-pilose	Glandular-hispid
Inflorescence	Dichasial cymose	Thyrsoid
Outer tepals (abaxial surface)	Glabrous, rarely glandulose-pilose	Glandular-hispid
Fruit		
Color	Fruit body red; wings greenish-yellow, rarely reddish	Fruit body red or reddish; wings reddish
Indumentum	Glabrous, rarely glandulose-pilose	Glandular-hispid



**Figure 11.** Scanning electron microscope (SEM) micrographs of foliar trichomes and stomata complexes of *Begonia subcoriacea* (A, B, C) and *B. liuyanii* (D, E, F). A, D, Leaf, adaxial surface; B, E, Leaf, cross section; C, F, Stomatal complexes and trichomes on leaf abaxial surface.

yellow; lateral wings narrower, ca. 2 mm tall, glabrous; abaxial wing crescent shaped or triangular, ca. 3-5 mm tall, 6-7 mm wide; locule 1; placentation intruded parietal (nearly throughout); placentae 3, each 2-branched; styles 3, fused at base (sometimes with protrusions between style branches), yellow, ca. 3 mm long, apically split into C-form; stigmas in a spiraled band. *Fruit* a dehiscent capsule, nodding, red when fresh, 6.5-11 mm long, 5-6 mm wide (wings excluded), apex with persistent styles; lateral wings 2-3 mm wide; abaxial wing crescent-shaped or triangular, 2.5-5 mm high. *Seeds* many, brown, ellipsoid or ovoid-ellipsoid, ca. 0.4-0.5 mm long, 0.27-0.3 mm across, chalazal end rounded, micropylar end obtuse, outer periclinal walls of mature seeds concave; collar cells elongated, straight, nearly rectangular. Somatic chromosome number,  $2n = 30$  (Figure 10).

*Additional specimens examined.* **CHINA.** Guangxi Zhuangzu Autonomous Region, Chongzuo Shi, Daxin Xian, Shuolong Zhen, between Longhua Cun and Rendu Cun, elev. ca. 250 m, semishaded to shady broadleaf forest, on N-facing limestone rock face, moist to dry, locally frequent, associated with *Tectaria devexa*, *Laportea*, *Mallotus yunnanensis*, *Murraya*, *Pothos*, *Caryota ochlandra*, *Ficus tinctoria* ssp. *gibbosa*, *Fissistigma*, *Cipadessa cinerascens*, *Maesa*, *Piper*, *Smilax* and tall bamboos, 14 Mar 2005, Ching-I Peng, Yan Liu, Shin-Ming Ku & Huan-Yu Chen 20346 (HAST).

*Leaf anatomy and vestiture.* Cross section 0.45-0.55 mm thick. Adaxial surface nearly glabrous (with very sparse, minute, subsessile glands); upper epidermal cells with flat surface; upper epidermis 2-layered, outer layer much smaller than inner layer. Abaxial surface with intermixed uniseriate and multiseriate trichomes on major veins, lower epidermis 2-layered, outer layer much smaller than inner layer. Lower stomatal complex single, nearly flat, helicocytic, subsidiary cells 6(-7).

*Ecology.* Broadleaved forests; on semishady slope of limestone hill, ca. 250 m elevation.

*Etymology.* The specific epithet is derived from the subleathery leaves.

*Distribution.* Very rare; known only from a limestone hill in southwestern Guangxi, China (Figure 4).

*Phenology.* Flowering March to June; fruiting May to March next year.

*Notes.* *Begonia subcoriacea* resembles *B. liuyanii* in the small flowers and the subleathery leaves, differing by the smaller habit; leaves adaxially glabrous, abaxially tomentose only on major veins, tertiary leaf venation flat; outer tepals glabrous or subglabrous, and the inflorescence dichasial cymose. Detailed comparison of salient features of the two species is provided in Table 2.

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## 中國廣西石灰岩地區秋海棠屬側膜組二新種： 蛛網脈秋海棠、近革葉秋海棠

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本文報導中國廣西壯族自治區大新縣石灰岩地區的秋海棠屬側膜組二新種：蛛網脈秋海棠 (*Begonia arachnoidea*) 與近革葉秋海棠 (*B. subcoriacea*)，提供線繪圖與彩色照片以資辨識，並報導此二新種與傘葉秋海棠 (*B. umbraculifolia*) 的染色體數 (皆為  $2n = 30$ )。蛛網脈秋海棠與傘葉秋海棠葉形相似，但根莖粗壯、節間短縮；托葉卵狀三角形；葉片上表面密被粗短剛毛及小直硬毛，下表面於各級脈上密被細硬毛狀柔毛；雌花小花梗較長，具一枚小苞片。近革葉秋海棠與劉演秋海棠 (*B. liuyanii*) 皆具近於革質的葉子，但植株較小，葉上表面光滑無毛，下表面僅一、二級脈具有絨毛，三級脈無絨毛也不凸起；具二歧聚繖花序，外花被片的外側光滑或近於光滑。此二新種皆為稀有植物。

**關鍵詞：**蛛網脈秋海棠；劉演秋海棠；近革葉秋海棠；傘葉秋海棠；簇毛傘葉秋海棠；秋海棠科；中國；染色體數；廣西；石灰岩植物；新種；稀有植物；側膜組。