

Begonia rubinea (sect. *Platycentrum*, Begoniaceae), a new species from Guizhou, China

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Abstract. *Begonia rubinea* (sect. *Platycentrum*), a new species from Guizhou Province, China, is described and illustrated. Its chromosome number ($2n = 22$) and pollen morphology are reported. *Begonia rubinea* was collected from a small damp cliff in Changqiangou, Xishui National Reserve of Evergreen Arbor Forest, in Guizhou. It resembles *B. smithiana* T.T. Yü ex Irmsch. in aspect, but is distinct by the combination of the following characters: leaves thinly coriaceous and glossy, sparsely hispidulous; leaf margin entire or remotely shallowly denticulate; petioles glabrous; androecium zygomorphic, stamens few (15-30), androphore distinct, 2-3 mm long; and ovary glabrous or nearly so. Line drawings of *B. rubinea* and color photographs of both *B. rubinea* and *B. smithiana* are presented to aid in identification.

Key words: *Begonia*; *Begonia rubinea*; *Begonia smithiana*; *Begonia* sect. *Platycentrum*; China; Chromosome number; New species; Pollen morphology; Rare species.

Introduction

The genus *Begonia* (Begoniaceae) consists of ca. 1,400 species distributed mainly in tropical and subtropical regions (Smith et al., 1986; Doorenbos et al., 1998). China is endowed with a rich, diversified assemblage of *Begonia*. About 150 species of *Begonia* were recorded from China and classified into nine sections by Shui et al. (2002). Many new species, however, have been reported in the subsequent years, e.g., Tebbitt and Guan (2002), Shui (2002a, 2002b), Ye et al. (2004), Fang et al. (2004), Ku et al. (2004), Shui and Chen (2004, 2005), Xing et al. (2005), Peng et al. (2005a, 2005b, 2005c), and Liu et al. (2005).

Xishui National Reserve of Evergreen Arbor Forest lies in Xishui Xian, Guizhou Province, China, between 28°07'-28°34' N and 105°50'-106°29' E. It occupies an area of 48,666 ha, of which 89.6% is covered by vegetation. During the field expeditions to Xishui National Reserve of Evergreen Arbor Forest in November, 2002 and September, 2004, the first two authors collected several sterile individuals of a *Begonia*. These plants were brought into cultivation at the Kunming Botanical Garden, where they flowered and set fruits. After consulting local and national floras (Huang, 1989; Ku, 1999), other relevant literature (see

above) and abundant herbarium specimens and failing to find a name for it, we propose it as a new species, *Begonia rubinea* (sect. *Platycentrum*), which is described and illustrated here.

Species Description

Begonia rubinea H. Z. Li & H. Ma, sp. nov.—TYPE: China. Guizhou Province, Xishui Xian, Xishui National Reserve of Evergreen Arbor Forest, Changqiangou, alt. ca. 700 m, on a damp cliff, 8 Nov 2002; type specimens pressed from plants cultivated in Kunming Botanical Garden, H. Z. Li 87 (holotype: KUN; isotype: HAST).

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Figures 1, 2

Haec species nova differt a B. smithiana T.T. Yü ex Irmsch. *foliis tenuiter coriaceis, sparsissime hispidulis (in illa membranaceis vel herbaceis, setoso-pilosis), margine integris vel remote denticulatis (in illa irregulariter duplo serratis vel dentatis), petiolis glabris (in illa piloso-villosis), androecio zygomorpho (in illa actinomorpha), staminibus paucioribus 15-30 (in illa 40-85), androphoro distincto, 2-3 mm longo (in illa 1-2 mm), ovario glabro vel subglabro (in illa piloso vel setoso-villoso).*

Herbs, perennial, acaulescent, monoecious. Rhizomes branched, creeping, internodes short, rooting at nodes. Stipules rose pink, membranous, glabrous, triangular, 5-7 mm long, 4-7 mm wide, margin entire, apex acuminate. Leaves 3 to many, all basal; petiole 13-31 cm long, ruby-red, glabrous; blade thinly coriaceous, obovate, 3-9 cm

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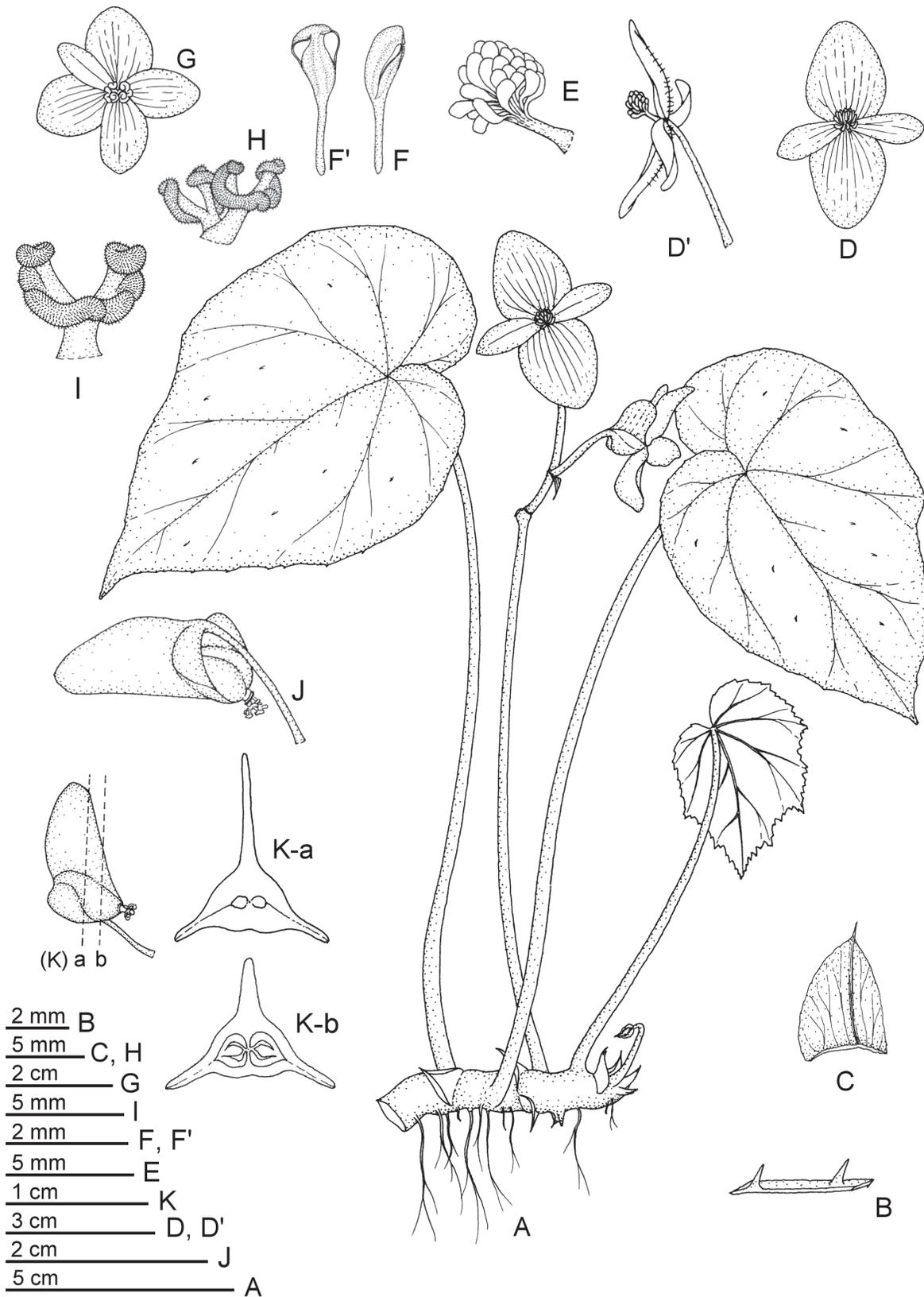


Figure 1. *Begonia rubinea* H. Z. Li & H. Ma. A, Habit; B, Portion of leaf, showing trichomes on adaxial surface; C, Stipule; D, Face view of staminate flower, D', Side view of staminate flower; E, Androecium; F, F', Anthers; G, Carpellate flower; H, I, Style and stigma; J, Capsule; K, Cross sections of capsule (From a living plant of *H. Z. Li 87* in cultivation at HAST).

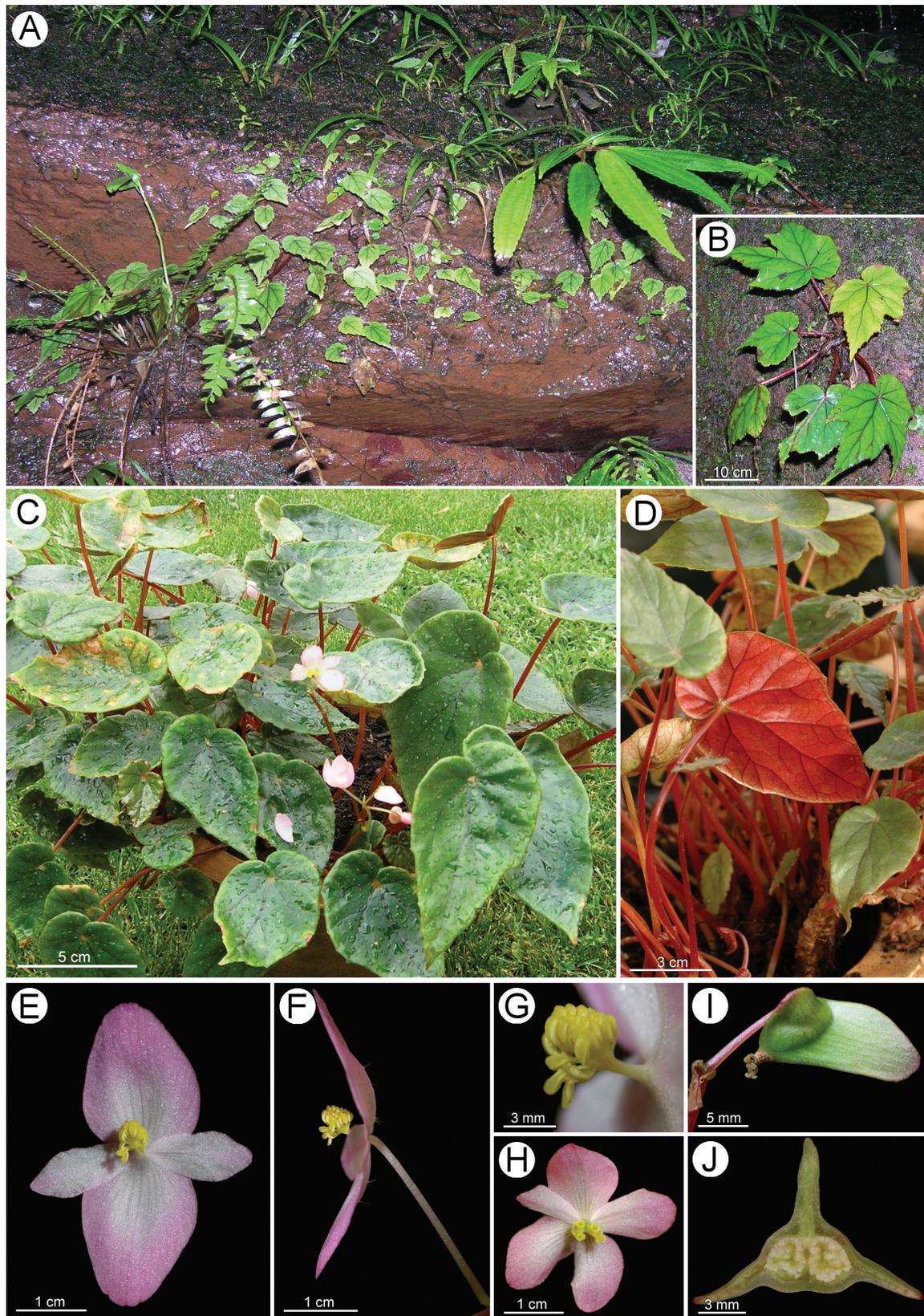


Figure 2. *Begonia rubinea* H. Z. Li & H. Ma. A, Habit and habitat; B, Putative F1 hybrid individual between *Begonia rubinea* and *B. pedatifida* H. Lévl; C, Cultivated plant at early anthesis; D, Leaf abaxial surface, showing rufous color; E, Face view of staminate flower; F, Side view of staminate flower; G, Androecium, showing a distinct androphore; H, Carpellate flower; I, Capsule; J, Middle cross section of capsule.

long, 2-6 cm wide, base obliquely cordate, margin irregularly crenate, apex acuminate, adaxial surface emerald colored, sparsely white tribuloid when young, gradually glabrescent, veins wine colored, abaxial surface rufous, palmately 6-7 nerved, nerves sparsely rufous tribuloid. Inflorescence of symmetric dichasial cyme, flowers 3-5 in the cyme; peduncle 9-14 cm long, ruby-red, nearly glabrous; bract subulate, 10 mm long, 3 mm wide. Staminate flowers: pedicel ca. 7 mm long, pink; tepals 4, pink, in two whorls, outer two broadly ovate, 14-18 mm long, 13-15 mm wide, pilose outside; inner two lanceolate, 12-14 long, 5-6 mm wide; androecium zygomorphic, stamens 15-30, mostly pointing upward, filaments fused below into a distinct androphore 2-3 mm long. Carpellate flowers: pedicel 7-12 mm long, pink; tepals 5, pink, ovate, sparsely pilose outside; styles 2, connate below middle; stigmas bifid, helically contorted, papillate; ovary 2-locular. Capsule obovate-oblong, 7-8 mm long; wings 3, unequal, abaxial one ligulate, apex obtuse, glabrous, other two narrower, crescent-shaped, nearly in one plane. Seeds many, brown.

Ecology. Moist sandstone rocks in evergreen forests on a mountain at about 700 m elevation.



Figure 3. Distribution of *Begonia rubinea* (star) in Guizhou Province, China.

Etymology. The specific epithet '*rubinea*' refers to the ruby-red petioles.

Distribution. Northern Guizhou, China (Figure 3); known only from the type locality.

Phenology. Not observed in the wild. Plants in cultivation in the Kunming Botanical Garden flower from June to August and set fruit from September to November.

Chromosome Cytology. *Begonia rubinea* has a somatic chromosome number of $2n = 22$ (Figure 4: A), which agrees with reports for several other species in *Begonia* sect. *Platycentrum* (Oginuma and Peng, 2002; Shui et al., 2002; Tian et al., 2002; Nakata et al., 2003; Ye et al., 2004; Li et al., 2005) in China. The chromosomes are small, ranging from 0.712 to 1.38 μm in length. The position of the centromeres was not discernible.

Pollen morphology. Pollen is elongate-ellipsoid, ca. 30 μm long, 13 μm in diam., tricolporate (Figure 4: B). Exine with irregular stripes and dotted with foveolae, which are denser in the polar areas.

Notes. The new species resembles *Begonia smithiana* T.T. Yü ex Irmsch. (Figure 5) in aspect, but is distinct in having thinly coriaceous and glossy, sparsely hispidulous leaves, leaf margin entire or remotely shallowly denticulate, glabrous petioles, zygomorphic androecium, stamens few (15-30), androphore distinct, 2-3 mm long, and the ovary glabrous or nearly so. We noted that plants of *B. rubinea* in cultivation produced longer petioles than those in the wild. The morphology of *B. rubinea* and *B. smithiana* is compared in Table 1.

Begonia rubinea is an epipetric species on sandstone rocks. Plants of *B. pedatifida* H. Lév. were abundant in its vicinity. A plant showing intermediate leaf form, presumably representing an F_1 hybrid individual between the two species, was also collected (Figure 2: B). Further studies to verify its putative parentage are in progress.

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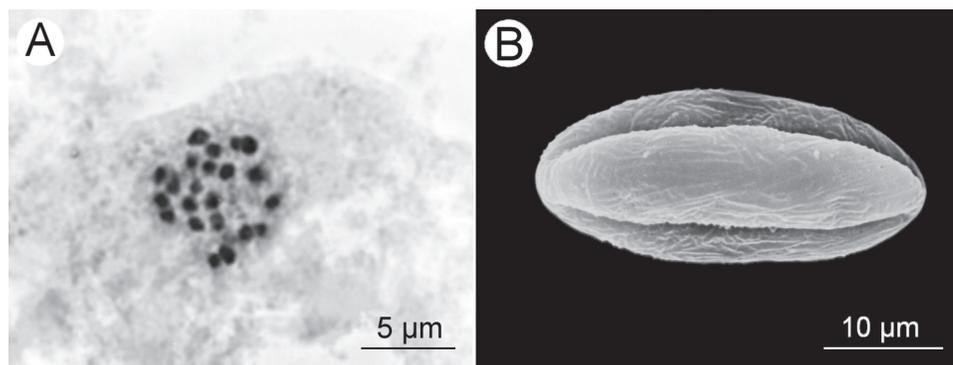


Figure 4. A, Metaphase somatic chromosome of *Begonia rubinea* ($2n = 22$); B, Pollen SEM microphotograph (From H. Z. Li 87, KUN).

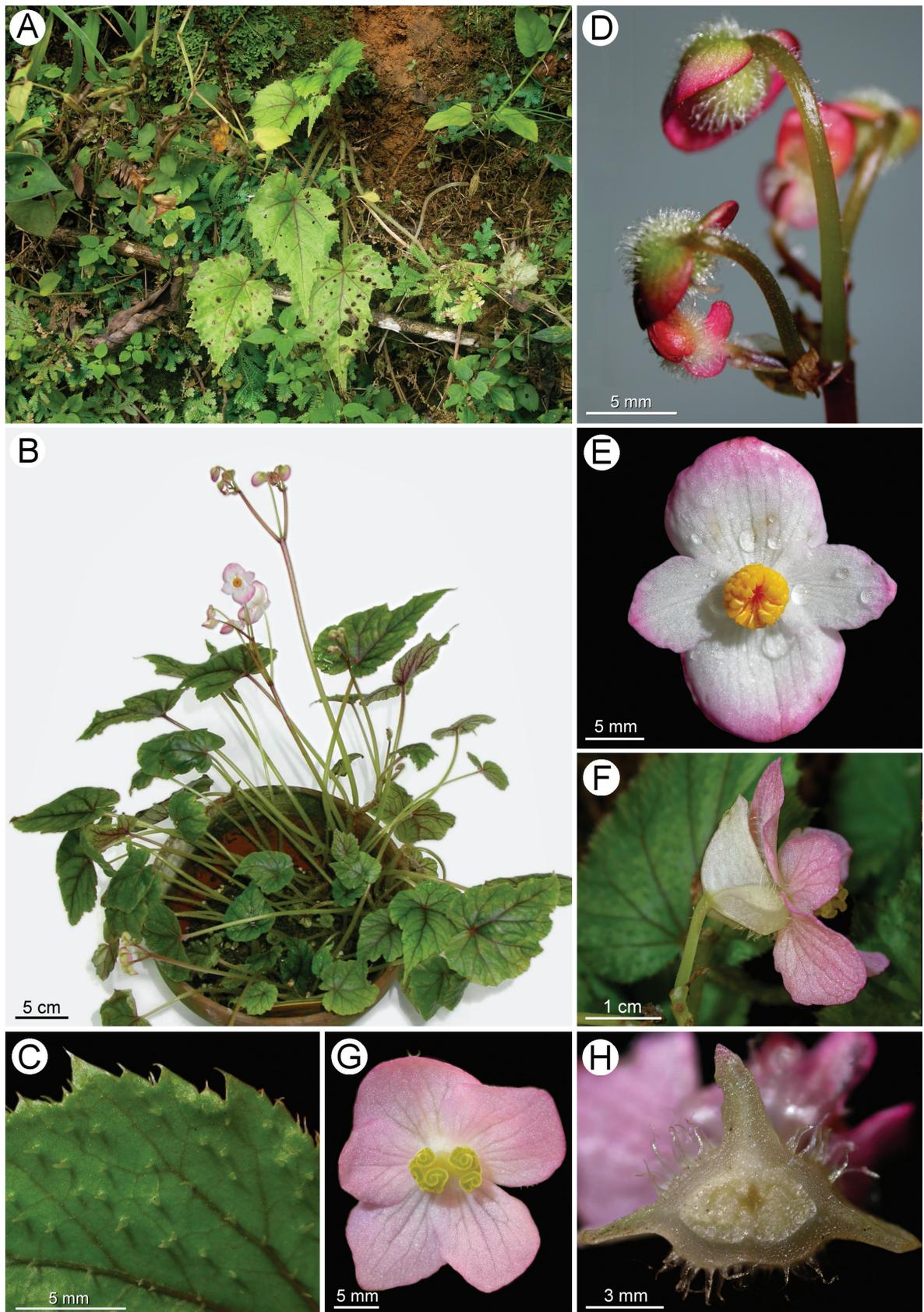


Figure 5. *Begonia smithiana* T.T. Yü ex Irmisch. A, Habit and habitat; B, Cultivated plant at early anthesis; C, Portion of leaf, showing leaf margin and pubescence; D, Early inflorescence; E, Staminate flower; F, G, Carpellate flower, side view and face view; H, Ovary, cross section.

Table 1. Comparison of *Begonia rubinea* with *B. smithiana*.

Characters	<i>Begonia rubinea</i>	<i>Begonia smithiana</i>
Leaf		
Petiole	Glabrous	Pilose-villous
Texture	Thinly coriaceous	Membranous or herbaceous
Blade	Subglabrous	Setose-pilose
Size	3-9 × 2-6 cm	6-9 × 5-8 cm
Margin	Entire or remotely shallowly dentate	Irregularly doubly serrate or dentate
Lobe	Inconspicuously lobed or unlobed	Shallowly lobed
Color of lower surface	Rufous throughout	Red or reddish along veins
Outer tepals	Pilose or sparsely villous-pilose	Villous-pilose
Androecium		
Symmetry	Zygomorphic	Actinomorphic
Androphore length	2-3 mm	1-2 mm
Number of stamens	15-30	40-85
Ovary	Glabrous or subglabrous	Pilose-villous or setose-villous

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中國秋海棠屬一新種：玉柄秋海棠

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本文發表中國產秋海棠屬二室組 (sect. *Platycentrum*) 新種植物—玉柄秋海棠 (*Begonia rubinea*)。該種採自貴州省習水國家級自然保護區，至目前為止，僅發現位於長嵌溝，海拔約 700 公尺陰濕峭壁上的一個居群。此新種與長柄秋海棠 (*B. smithiana*) 略似，但玉柄秋海棠的葉薄革質近無毛，近全緣或疏具微齒緣，葉柄紅玉色，晶瑩剔透幾無毛；雄蕊數目少，僅 15 - 30；雄蕊群朝上、兩側對稱；花絲基部合生為柱狀，長達 2-3 mm；子房幾無毛。長柄秋海棠之葉片為膜質或草質，具不規則重鋸齒或齒牙緣，葉柄被密毛；雄蕊數目較多，40-85，雄蕊群輻射對稱；花絲基部柱狀物長僅 1-2 mm；子房被密毛。這些特徵明顯不同，可資區別。文中一併報導了玉柄秋海棠的染色體數目 ($2n = 22$) 和花粉形態。

關鍵詞：秋海棠屬；二室組；玉柄秋海棠（新擬中名）；新種；中國；染色體數目；花粉形態；稀有植物。