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Begonia coptidifolia (Begoniaceae), a new species from China

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Abstract. *Begonia coptidifolia* H. G. Ye, F. G. Wang, Y. S. Ye & C.-I Peng, a new species from Guangdong province, China, is here described and illustrated. Its chromosome number (2*n*=22) and karyotype are reported. *Begonia coptidifolia* belongs to sect. *Platycentrum* and somewhat resembles *B. hemsleyana* Hook. f., from which it differs by the aerial stems seen only at anthesis (vs. all year round), palmately trisected leaves with pinnately parted lobules (vs. leaves palmately compound with 7-9 petiolulate leaflets) and petioles grooved on adaxial surface (vs. terete). The new species also resembles *Begonia pedatifida* H. Lév., which, however, has much stouter rhizomes (2-6 cm vs. 0.3-0.5 cm thick), leaves palmatifid with triangular lobules, and terete petioles. *Begonia coptidifolia* is rare, known only from a small ravine in Ehuangzhang Nature Reserve, Yangchun, Guangdong Province.

Key words: Begoniaceae; *Begonia coptidifolia*; *Begonia hemsleyana*; *Begonia pedatifida*; China; chromosome number; Ehuangzhang Natural Reserve; Guangdong; karyotype; new species; rare species.

Introduction

Begonia L. is a large genus of about 1,400 species widely distributed in tropical and subtropical areas, especially in Central and South America (Smith et al., 1986; Doorenbos et al, 1998). About 150 species of *Begonia* are indigenous to China, mainly south of the Yangtze River. The distribution center of Chinese *Begonia* is from southeastern Yunnan to southwestern Guangxi (Ku, 1999; Shui et al., 2002; Tian et al., 2002). Shui et al. (2002) in a synopsis of Chinese *Begonia*, divided the Chinese species into nine sections.

Sect. *Platycentrum* (Klotzsch) A. DC. consists of about 110 species that range from India through central China to southeastern Asia. In China, 63 species have been reported from south of Yangtze River, from SE Xizang to Taiwan (Shui et al., 2002).

The Ehuangzhang Natural Reserve lies in Yangchun city in southeastern Guangdong Province, China. It occupies an area of about 15,000 ha, between 21°50'36" and 21°58'40"N and 111°21'29" and 111°36'03"E, and ranges from 50 to 1337.6 m in elevation. It is covered by natural forests and is an important area for biodiversity conservation (Wang et al., 2004a; Wang et al., 2004b). During botanical expeditions to the Ehuangzhang Natural Reserve in 2001-2002, we recorded 1,415 species in 726 genera of vascular plants, including four species of *Begonia*: *B. fimbristipula*, *B. leprosa*, *B. palmata* and the new species *Begonia coptidifolia*, which is described and illustrated here.

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Species Description

Begonia coptidifolia H. G. Ye, F. G. Wang, Y. S. Ye & C.-I Peng, sp. nov. — TYPE: China. Guangdong: Yangchun city, Ehuangzhang Natural Reserve, Honghuatan, alt. ca. 600 m, in a ravine, on rocks at streamside, 8 Sep 2002, *Hua-Gu Ye 7535* (holotype, IBSC; isotypes, HAST, IBSC). Figures 1-2

Haec species affinis *B. hemsleyana* Hook. f., sed folio palmatim trisecto, lobis pinnatifidis, stipulis longi-triangulatis, bracteis angusti-trianglatis distinguitur.

Plants monoecious, rhizomatous, internodes short, indistinct, rooting at nodes. Rhizomes slender and short, unbranched, covered with stipules. Stipules brown, membranaceous, glabrous, persistent, triangular, 5-8 × 3-4 mm, margins entire, apex long cuspidate. Erect stem absent when sterile; stem at anthesis 10-15(-30) cm long, unbranched, subtended by 1-3 leaves. Basal leaves 2-5; petiole 5-13 cm, adaxial surface grooved, sparsely setulose; blade ovate to suborbicular in outline, 10-18 × 8-15 cm, palmately 3-cleft to base, sparsely setulose on upper surface and along midvein and secondary veins on lower surface; lobes ovate-lanceolate, 2.7-10.2 × 1.4-4.1 cm, often 2-cleft again to base; lobules narrowly elliptic-lanceolate, 3-9 × 1.5-3.5 cm, pinnately parted; segments oblong-lanceolate, 1.4-5.1 × 0.4-1.1 cm, apex acute, with 2-4 teeth on each side; cauline leaves smaller than basal leaves. Inflorescence axis 5-15 cm, glabrous. Inflorescence a terminal cyme, flowers 1-4; bract narrowly triangular, 10 × 3 mm, apex acute. Peduncle 3.5-4(-7) cm long at fruiting. Staminate flower: pedicel 13 mm long, white; tepals 4, in two whorls, outer two broadly ovate, ca. 12 × 13 mm, base slightly cordate, apex rounded; inner two ovate, ca. 12 × 8 mm; stamens many, filaments fused below into a column.

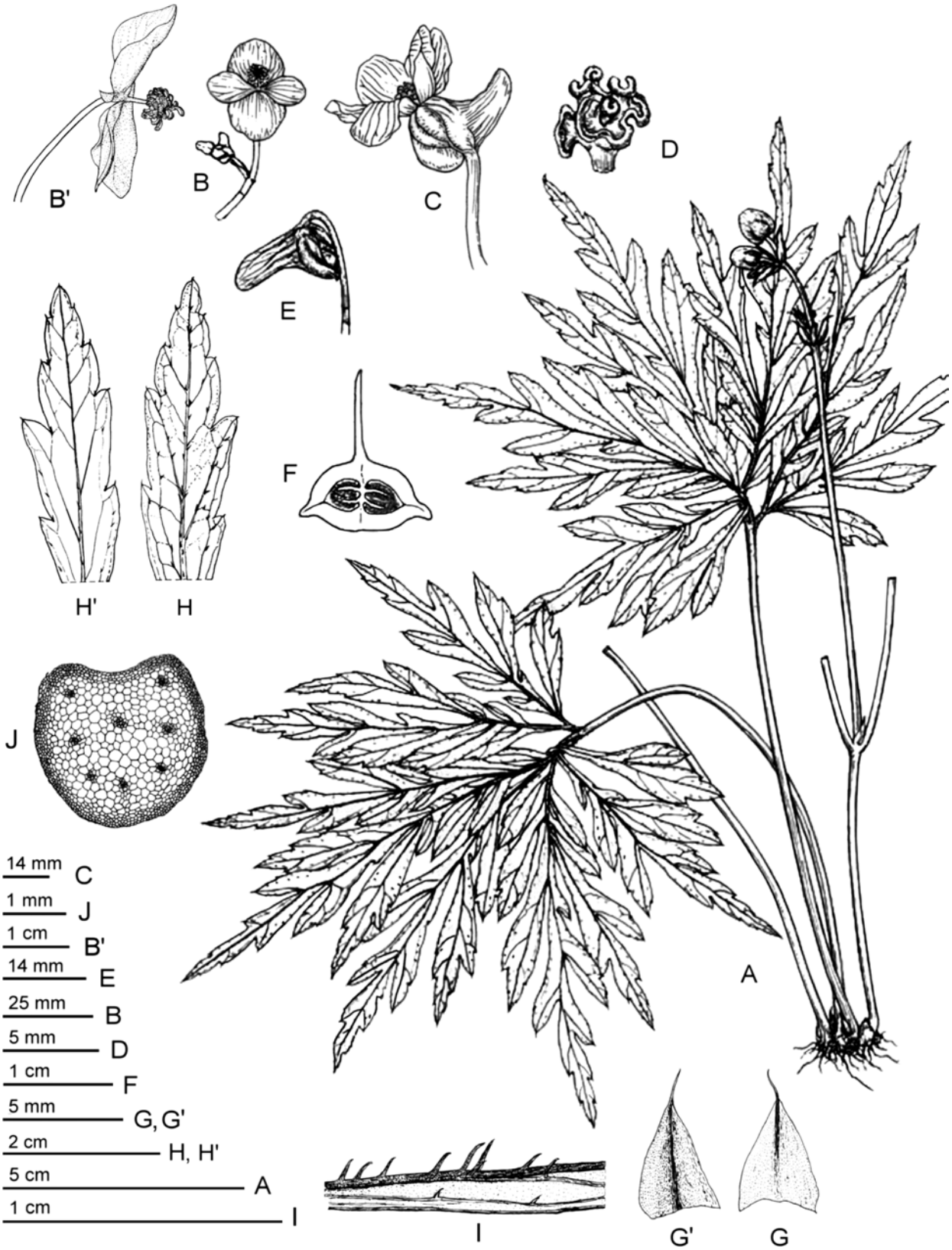

Figure 1. *Begonia coptidifolia* H. G. Ye, F. G. Wang, Y. S. Ye & C.-I Peng. A, Habit; B, Staminate flower, face view, B', Lateral view; C, Carpellate flower; D, Style; E, Capsule; F, Cross section of fruit, G, Stipule, abaxial surface, G', adaxial surface; H, Segment of lobule, abaxial surface, H', adaxial surface, I, Hispidulous abaxial surface of lobule; J, Cross-section of leaf petiole. (All but B' and G-J from *Hua-Gu Ye 7535*, line drawing by Yun-Xiao Liu; B', G-J from *Peng 19456*, line drawing by Shin-Ming Ku)

Figure 2. *Begonia coptidifolia* H.G. Ye, F.G. Wang, Y.S. Ye & C.-I Peng. A, habit, bar = 5 cm; B (inset), staminate flower, bar = 1 cm; C, aerial stem with maturing capsules, bar = 5 cm; D (inset), capsule, bar = 1 cm. All from *Peng 19456*. (Photos by Ching-I Peng)

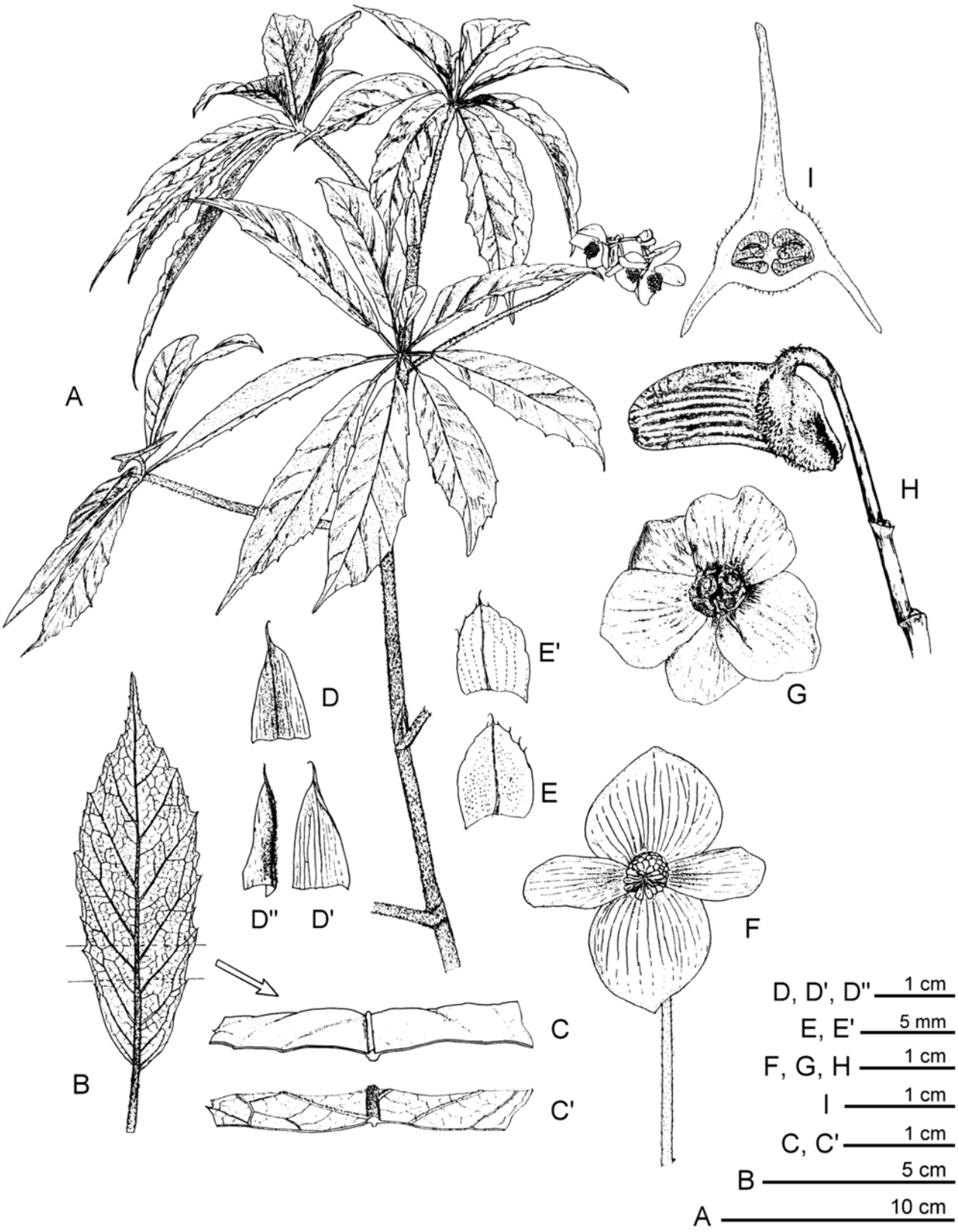

Figure 3. *Begonia hemsleyana* Hook. f. A, Habit; B, Leaflet, abaxial surface; C, Segment of leaflet, adaxial surface, C', abaxial surface; D, Stipule, abaxial surface, D', adaxial surface, D'', lateral view; E, Bract, abaxial surface, E', adaxial surface; F, Staminate flower; G, Carpellate flower; H, Capsule; I, Cross section of ovary. All from *Peng 18681* (HAST) (Line drawing by Shin-Ming Ku)

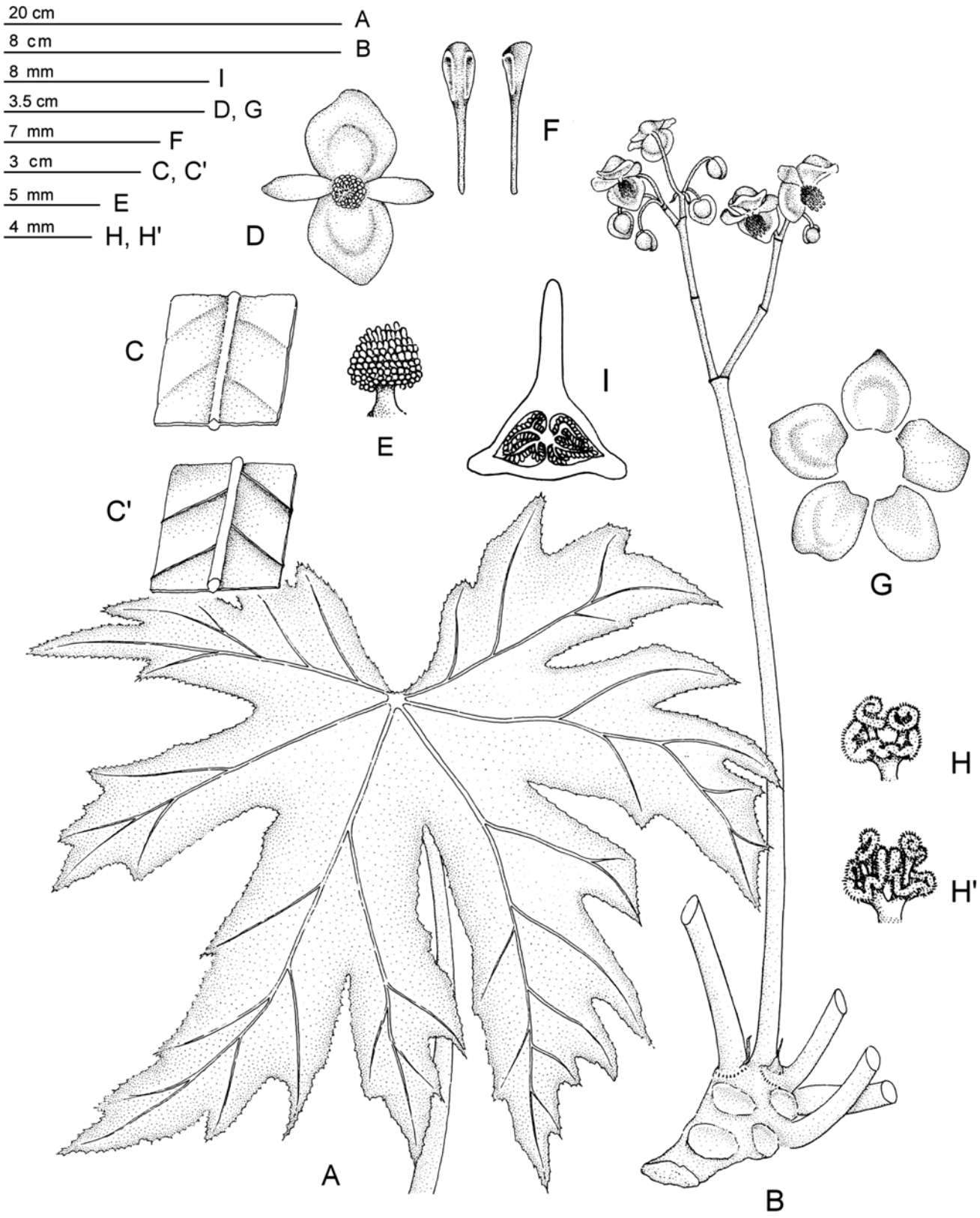

Figure 4. *Begonia pedatifida* H. Lév. A, Leaf; B, Flowering shoot; C, Segment of leaf, adaxial surface, C', abaxial surface; D, Staminate flower; E, Androecium; F, Stamen; G, Tepals of carpellate flower; H, Stigma, dorsal view, H', ventral view; I, Cross section of ovary. All from *Shui 9014* (HAST). (Line drawing by Ya-Wen Hsue)

Table 1. Comparison of *Begonia coptidifolia*, *B. pedatifida* and *B. hemsleyana.*

	Begonia coptidifolia	*Begonia pedatifida*	*Begonia hemsleyana*
Aerial stem	Seen only at anthesis, 20-30 cm tall	Seen only at anthesis, 20-50 cm tall	Seen all year round, 30-60 cm tall
Rhizome diam.	ca. 0.3-0.5 cm	ca. 2-6 cm	ca. 1-2 cm
Leaves	Palmately 3-cleft to the base; lobules pinnately parted, narrowly oblong to oblanceolate	Palmatifid; lobules triangular	Palmately compound, leaflets 7-9, petiolulate
Petiole	Grooved on adaxial surface	Terete	Terete
Tepals	White	White or pink	Pink

Carpellate flowers: pedicel pinkish white, 14-17 mm long, sparsely hispidulous; tepals 5, white, ovate, ca. 10 × 7 mm, apex rounded; ovary obovate-trigonous, 2-locular. Capsule obovate-oblong, ca. 2.5 cm long, 1.3-1.6 cm in diam.; wings 3, unequal, larger one ligulate, 1.7-2.3 cm, apex obtuse, glabrous, other two narrower, ca. 8 mm long, sparsely hairy.

Paratypes. China. Guangdong province: Yangchun city, Ehuangzhang mountain, Honghuatan, alt. ca. 600 m, in a ravine, on rocks at streamside. 10 Nov 2002, *Hua-Gu Ye* s. n. (IBSC); 3 Nov 2003, *Ching-I Peng 19456* (HAST).

Ecology. *Begonia coptidifolia* grows on moist, mossy rocks along streams in evergreen forests on a granite mountain at about 600 m elevation.

Distribution. Known only from the type locality.

Phenology. Flowering Jul to Sep; fruiting Oct to Dec.

Etymology. This unique species of *Begonia* has the leaves palmately divided and the lobes pinnately parted again like those of *Coptis chinensis* Franch. The specific epithet is derived from *Coptis* and *folium*.

Note. Begonia coptidifolia somewhat resembles *Begonia hemsleyana* Hook. f. (Figure 3) and *Begonia pedatifida* H. Lév. (Figure 4). Table 1 shows some of the salient differences among the three species.

Chromosome Cytology. Begonia coptidifolia has a somatic chromosome number of 2*n* = 22 (Figure 5), which is similar to a number of other members of *Begonia* Sect. *Platycentrum* (Oginuma and Peng, 2002; Shui et al., 2002; Tian et al., 2002; Nakata et al., 2003; Peng et al., unpublished data) in China. Length and arm ratio of each pair of chromosomes are listed in Table 2. The chromosomes are small, ranging from 1.36 to 5.43 μm in length. The positions of centromeres of chromosome pairs 9 and 11 are not

Table 2. Chromosome length of *Begonia coptidifolia.*

Chromosome Pair No.	Total length (μm)	Arm ratio (long/short)
1	5.43	1.35
2	4.92	1.33
3	3.67	1.52
4	3.95	1.72
5	3.65	1.89
6	3.82	2.70
7	2.53	1.39
8	2.48	1.85
9	1.86	
10	1.56	2.44
11	1.36	

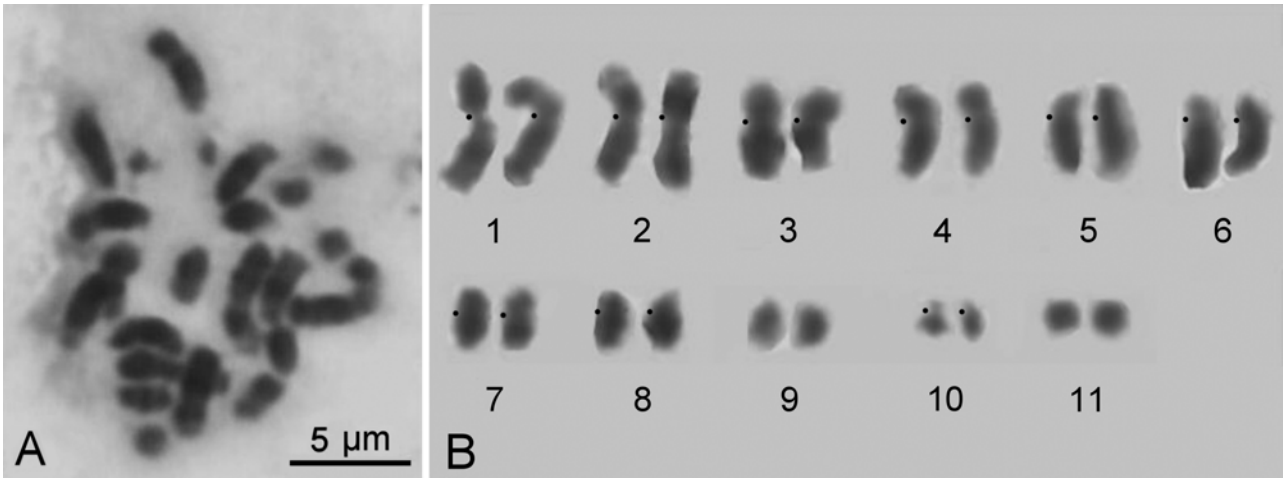

Figure 5. Karyomorphology of *Begonia coptidifolia*. A, Somatic chromosomes at metaphase, 2*n* = 22. B, Karyotype: chromosomes pairs arranged by decreasing order of length, dots indicating positions of centromeres. (From *Peng 19456*)

discernible. All other chromosomes are metacentric, basing on the classification categories of Levan et al. (1964). Chromosome arm ratios (long/short) range from 1.33 to 2.70. Chromosome pairs 9, 10 and 11 are much smaller than the rest of the complement.

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中國秋海棠科一新種－陽春秋海棠

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本文發表中國秋海棠科一新種，陽春秋海棠（*Begonia coptidifolia*）。陽春秋海棠採自廣東省陽春市鵝凰嶂自然保護區，至目前為止，僅發現於鵝凰嶂海拔約600公尺的山谷溪溝陰濕石上，生境脆弱。此新種與掌葉秋海棠（*B. hemsleyana*）略似，但新種葉子掌狀3全裂，裂片再次2全裂，其小裂片羽狀深裂；而掌葉秋海棠具掌狀複葉，小葉具柄。此新種與掌裂葉秋海棠（*B. pedatifida*）亦略似，但後者為掌狀深裂。本文對此三種植物加以比較、提供線繪圖以資辨認，並報導陽春秋海棠之染色體數目（$2n=22$）及核型。

關鍵詞：秋海棠科；陽春秋海棠（新擬中名）；掌葉秋海棠；掌裂葉秋海棠；中國；廣東；鵝凰嶂自然保護區；新種；稀有植物；染色體數；核型。