Begonia picturata (sect. Coelocentrum, Begoniaceae), a new species from limestone areas in Guangxi, China

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(Received April 1, 2005; Accepted September 19, 2005)

Abstract. Begonia picturata, a new species of sect. Coelocentrum from the limestone areas in southwestern Guangxi Zhuangzu Autonomous Region, is described and illustrated. A somatic chromosome number of 2n = 30 was determined. Begonia picturata resembles B. cirrosa in having villous peduncles and the pedicels, outer tepals (abaxial surface), ovaries and capsules villous-setose or hispid-setose with red trichomes. Begonia picturata, however, is distinct in that the leaves are maculate (vs. maculation absent) and densely villous-setose or tomentose-setose (vs. sparsely to moderately pilose or pilose-setose) on the upper surface.

Keywords: Begonia cirrosa; Begonia masoniana var. maculata; Begonia morsei; Begonia picturata; Begonia sect. Coelocentrum; Begonia variegata; Begoniaceae; China; Chromosome number; Guangxi; Limestone flora; Medicinal plant; New species; Rare species.

Introduction

In continuation of our taxonomic studies of Chinese Begonia (Shui et al., 2002; Ye et al., 2004; Ku et al.; 2004; Peng et al., 2005a; Peng et al., 2005b; Peng et al., 2005c), we report another handsome new species of Begonia sect. Coelocentrum. The plant with remarkably attractive foliage was first observed by the first author at an annual medicinal herb market held at the ‘Dragon Boat Festival’ in Jingxi, Guangxi Zhuangzu Autonomous Region. According to the vender, it is effective in “alleviating fever, disintoxicating, invigorating blood vessels and dispersing stasis.” The plant, which was brought into cultivation, is a distinct new species in Begonia sect. Coelocentrum. We were able to follow the medicinal herb vender’s directions to the plant’s native locality, where we observed the species in the wild and collected Begonia picturata in its native habitat. Worthy of note, our local field guide informed us that this rare, new species has been gathered as food for pigs by village farmers. Conservation of this stunning species is worthy of special attention.

Species Description


Haec species nova B. cirrosae pedunculis villosis, pedicellis et tepalis exterioribus (abaxialiter) et ovarii et capsulis villosa-setosis vel tomentoso-setosis et in trichomatis rubris similis, sed in foliis maculatis (in illa non maculatis), supra dense villosa-setosis vel tomentoso-setosis (in illa sparse moderateve pilosis vel setoso-pilosis) differt.

Plant monocoeic, epipetric, perennial, rhizomatous. Rhizome stout, 5-15 cm long, 0.6-1.2 cm thick, internodes 0.8-2(-3) cm long, brown or reddish brown, villous. Stipules caducous, ovate-triangular to lanceolate-triangular, ca. 10-23 mm long, 6-10 mm wide, greenish or reddish hyaline, herbaceous, weakly to strongly keeled, abaxially villous (midrib more densely so), margin ciliate, apex aristate, arista 1-3 mm long, hair-like. Leaves 2-8, alternate, simple, asymmetric, unlobed, ovate to widely ovate, rarely suborbicular, base strongly oblique-cordate, margin inconspicuously denticulate and ciliate, apex shortly acuminate, (7-)10-15(-20) cm long (basal lobes included), (5.5-)7-11 (-14) cm wide, adaxially dark green or brown (abaxially red), adorned with a wide white, greenish-white, or pale green ring (abaxially pale green) in the middle (Figure 2: D) or with digitate dark brown bands along main veins and at leaf margin, pale green, yellowish green to whitish else-

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Figure 1. *Begonia picturata* Yan Liu, S. M. Ku, & C.-I Peng. A, Habit; B, Leaf margin, also showing some abaxial surface; C, Leaf, cross section, showing trichome types on both surfaces; C’, Leaf adaxial surface; C”, Leaf abaxial surface; D, D’, Stipules, adaxial and abaxial surface; E, Bracts, abaxial surface; E’, Bracts, abaxial surface; F, F’, F”, Staminate flower, face view; F’, back view; F”, side view; G, Stamen, dorsal view; G’, ventral view; G”, side view; H, Carpellate flower; I, Fruit; J, J-e, Serial cross sections of an immature fruit; K, Seeds [A-G, K from Peng et al. 20387 (HAST); H from Liu L1199 (IBK); I, J from Liu L1019 (IBK)].
Figure 2. *Begonia picturata* Yan Liu, S. M. Ku & C.-I Peng. A. Habit; B, C, D, Leaves, showing variation in the maculation pattern; E, Leaf, cross section; F, Stipule; G, Staminate flowers; H, Androecium, showing yellow anthers with red margins; I, Carpellate flower; J, Middle cross section of an immature fruit, showing parietal placentation; K, L, Fruits; M, Seed, SEM microphotograph [A, D, G, I, L from *Liu L1199* (IBK); J, K from *Liu L1019* (IBK); B, C, E, H, M from *Peng et al. 20387* (HAST)].
where (Figure 2: B), sometimes only maculate in intercostal areas (Figure 2: C), texture thickly chartaceous, surface somewhat rugose, adaxially villous-setose or tomentose-setose (trichomes 1-2 mm long, whitish-hyaline or reddish, with a swollen base), abaxially short villous, particularly so on veins; venation basally 6-7-palmate, midrib distinguishable, veins pinnate along midrib, with 1-3 major lateral veins on each side, other primary veins branching dichotomously or nearly so, tertiary veins weakly percurrent or reticulate, divergence angle 60°-85°, minor veins reticulate, all veins on abaxial surface prominently raised; petioles terete, 7-17 cm long, 3-6 mm thick, brownish, villous. Inflorescences axillary, 1-3, arising directly from rhizome, dichasial cymes, branched 2-4 times, flowers 5-16 per cyme; staminate flowers 3-9, carpellate flowers 1-8; peduncle well developed, terete, erect, 10-16 cm long, 2-4 mm thick, reddish brown or greenish, villous (trichomes 3-4 mm long, white or pinkish); pedicels hispid-villous (trichomes 2-3 mm long, reddish), ascending in staminate flowers (1-3 cm long), horizontal to pendent in carpellate flowers (1-1.7 cm long). Bracts caducous, ovate, oblong or rounded, margin ciliate, apex acute, obtuse or rounded, 4.5-15 mm long, 4.5-8 mm wide, greenish or reddish, herbaceous. Staminate flowers: tepals 4 (rarely 6), margin entire or nearly so, outer 2 suborbicular to oblong, based rounded or slightly cordate, apex rounded, 14-18 (-22) mm long, 14-17 mm wide, abaxially pinkish or whitish, villous-setose, adaxially pinkish or white; inner 2 (rarely 4) tepals obovate, oblong or oblongoate, base cuneate, apex obtuse or rounded, ca. 10-15(-19) mm long, 4.5-5.5 mm wide, white, glabrous; androecium zygomorphic, subspherical, stamens ca. 20-40, golf club shaped; filaments subequal, ca. 1-2 mm long, shortly fused at base; anthers 2-locular, slightly compressed, oblong-obovoid, apex slightly emarginate, ca. 1.3-1.6 mm long, 0.8-1 mm wide, yellow with red margin along anther sacs. Carpellate flowers: tepals 3, margin entire, usually caducous (if persistent, not thickened in fruit); outer 2 tepals suborbicular to widely ovate, 13-16 mm long, 14-18 mm wide, adaxially pinkish or whitish, red villous-setose or hispid-setose; inner tepal obovate, base cuneate, apex obtuse or rounded, ca. 9-11 mm long, 4-6 mm wide, white, glabrous; ovary trigonous-ellipsoid, ca. 7-11 mm long, 5-7 mm across (wings excluded), greenish, red villous-setose or hispid-setose (trichomes conically thickened), 3-winged; wings unequal, sparsely red villous-setose; lateral wings narrower, ca. 2-4 mm tall; abaxial wing crescent shaped, suborbicular or subrectangular, ca. 5-7 mm tall, 7-12 mm wide; locale 1, placentation intruded parietal (axile near base); placentae 3, each 2-branched; styles 3, fused at base, yellow, ca. 3-3.5 mm long, apically split and C shaped; stigmas in a spiral band and papillose all around. Fruit capsules, dehiscent, nodding, greenish when fresh, 10-15 mm long, 6-8 mm across (wings excluded), apex with persistent styles; lateral wings 2-6 mm tall; abaxial wing crescent shaped, suborbicular or subrectangular, 6-9 mm tall. Seeds numerous, brown, usually widely ellipsoid or sometimes ellipsoid, 0.45-0.55 mm long, 0.3-0.35 mm thick, chalazal end rounded, micropylar end obtuse, outer periclinal walls of mature seeds concave; collar cells elongated, straight, nearly rectangular, 11-13 cells in a ring, 1/3-1/2 as long as seed; anticlinal walls between collar cells raised, straight or slightly undulate; testa cell nearly isodiametric-polygonal. Somatic chromosome number, 2n = 30 (Figure 3).

Additional specimens examined. CHINA. Guangxi Zhuang Autonomous Region, Baise Shi, Jingxi Xian, Dizhou Xiang, Dizhou Cun, 23°00'42''N, 106°21'40''E, elev. ca. 720 m, plant high on shaded, moist limestone rock face just inside a N-facing cave, rare, plant in fruit, 23 July 2004, Yan Liu L1019 (IBK, HAST); same locality, plant at early anthesis, 16 March 2005, Ching-I Peng, Yan Liu, Shin-Ming Ku & Huan-Yu Chen 20386 (HAST).
Figure 5. *Begonia cirrosa* L. B. Smith & D. C. Wasshausen. A, Habit; B, Rhizome; C, Portion of leaf, adaxial surface, C', abaxial surface; D, Stipule, abaxial surface, D', adaxial surface, D'', side view; E, Bract, abaxial surface, E', adaxial surface; F, Staminate flower, face view, F', back view; G, Stamen, dorsal view, G', ventral view, G'', side view; H, Carpellate flower, face view, H', side view; I, Style, top view, I' side view; J, Style and stigmatic band, dorsal view, J', ventral view; K, Fruit; L: a-d, Serial cross sections of fruit; M, Seeds [All from living plant (Peng 18826, HAST) cultivated in the experimental greenhouse].
Figure 6. *Begonia cirrosa* L. B. Smith & D. C. Wasshausen. A, Habit and habitat; B, Cultivated plant at anthesis; C, Stipule; D, Staminate flower; E, Carpellate flower; F, Carpellate flower, side view; G, Fruit; H, Middle cross section of ovary; I, Seed SEM microphotograph (A from Peng 20518, B-I from Peng 18826; both at HAST).
Figure 7. Syntypes of Begonia morsei Irmsch. A, Morse 197 (K); B, Morse 574 (K).
Figure 8. *Begonia variegata* Shui & W. H. Chen [= *B. masoniana* Irmsch. ex Ziesenh. var. *maculata* S. K. Chen, R. X. Zheng & D. Y. Xia]. A, Habit; B, Leaves; C, Leaf, portion; D, Peduncle, showing glandular hispid vestiture; E, Inflorescence; F, Staminate flower; G, Carpellate flower, face view; H, Carpellate flower, side view (All from a cultivated plant in Kunming Botanical Garden, Yunnan, China).
as the type, on N-facing limestone rock face or at base of the trunk; associated with *Acer*, *Myrsine kwangsiensis*, *Bauhinia*, *Garcinia*, *Paraboea*, *Pseudochirita guangxiensis* var. *glauca*, *Pilea*, *Hoya*, *Sinosideroxylon pedunculatum*, *Aster*, *Tirpitzia ovoidea*, *Nephrolepis*, *Lepisorus*, *Epipremnum pinnata*, *Asplenium*, *Sterculia*, *Smilax*. 16 March 2005, Ching-I Peng, Yan Liu, Shin-Ming Ku and Huan-Yu Chen 20387 (HAST).

**Ecology.** On shaded rocky limestone slopes in broadleaved forests and on barren limestone rock faces in caves near villages; ca. 700-800 m elevation.

**Etymology.** The specific epithet ‘picturata’ refers to the leaves, which are marked with different colors as if they were painted.

**Distribution.** Southwestern Guangxi, China; rare (Figure 4).

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

**Notes.** The somatic chromosome number of *Begonia picturata* is 2n = 30 (Figure 3), which agrees with that of all other members of *Begonia* sect. *Coelocentrum* thus far reported (*B. masoniana*: Legro and Doorenbos (1969); *B. curvicarpa*, *B. louchengensis*: Ku et al. (2004); *B. fangii*: Peng et al. (2005a); *B. liuyanii*: Peng et al. (2005b)).

*Begonia picturata* is similar to *B. cirrosa* (Figure 5, 6) in having villous peduncles and villous-setose or hispid-setose pedicels and outer tepals (abaxial surface), and the ovary and fruit covered with red trichomes (these conically thickened). *Begonia picturata* is distinguishable by its markedly maculated leaves (vs. maculation absent) and villous-setose or tomentose-setose (vs. sparsely to the moderately pilose or pilose-setose) upper surface of the leaves. *Begonia picturata* somewhat resembles *B. morsei* (Figure 7) in leaf maculation pattern, but is distinguishable by the villous (vs. glabrous) peduncle and villous-setose or hispid-setose (vs. glabrous) capsules. *Begonia picturata* also bears a striking superficial resemblance in leaf maculation pattern to *B. variegata* (Figure 8) [formerly as *B. masoniana* var. *maculata* (cf. Shui and Chen, 2005)]. However, *B. picturata* is sharply distinct by the villous (vs. glandular hispid) peduncle, large, white or pinkish (vs. small, greenish-yellowish) tepals, zygomorphic (vs. actinomorphic) androecium, and villous-setose or hispid-setose (vs. glandular hispid) capsules. *Begonia picturata* is unique in sect. *Coeloecentrum* in having yellow anthers

### Table 1. Comparison of *Begonia picturata*, *B. cirrosa*, *B. morsei* and *B. variegata*.

<table>
<thead>
<tr>
<th>Characters</th>
<th><em>B. picturata</em> (Figures 1, 2)</th>
<th><em>B. cirrosa</em> (Figures 5, 6)</th>
<th><em>B. morsei</em> (Figure 7)</th>
<th><em>B. variegata</em> (=<em>B. masoniana</em> var. <em>maculata</em>) (Figure 8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stipule apex</td>
<td>Hair-like</td>
<td>Hair-like</td>
<td>Hair-like</td>
<td>Horn-like</td>
</tr>
<tr>
<td>Leaf Shape</td>
<td>Ovate, broadly ovate to suborbicular (7-)10-15(-20) × (5.5-)10(-14)</td>
<td>Broadly ovate to suborbicular ca. 11-19 × 9-14</td>
<td>Broadly ovate to suborbicular ca. 5-9 × 4-7</td>
<td>Suborbicular</td>
</tr>
<tr>
<td>Size (cm)</td>
<td>Rugose or rugulose</td>
<td>Flat or slightly rugose</td>
<td>Rugose or rugulose</td>
<td>Densely strongly conically bullate</td>
</tr>
<tr>
<td>Upper surface</td>
<td>Adorned with a wide white, greenish-white, or pale green ring in the middle or with digitate dark brown bands along main veins and at leaf margin, pale green, yellowish green to whitish elsewhere</td>
<td>Lacking</td>
<td>Adorned with a wide white ring in the middle</td>
<td>Adorned with dark brown wide band along main veins and around leaf, yellowish green elsewhere</td>
</tr>
<tr>
<td>Indumentum on adaxial surface</td>
<td>Tomentose-setose or villous-setose, trichomes ca. 1 mm long</td>
<td>Pilose or pilose-setose, trichomes ca. 1 mm long</td>
<td>Shortly villous-setose, trichomes ca. 0.5 mm long</td>
<td>Villous-setose or hirsute, trichomes 1-2 mm long</td>
</tr>
<tr>
<td>Peduncle</td>
<td>Villous</td>
<td>Villous</td>
<td>Glabrous</td>
<td>Glandular hispid</td>
</tr>
<tr>
<td>Tepals color</td>
<td>Pinkish or white</td>
<td>Pinkish or white</td>
<td>Unknown (probably pinkish or white)</td>
<td>Greenish or greenish-yellowish</td>
</tr>
<tr>
<td>Androecium</td>
<td>Zygomorphic</td>
<td>Zygomorphic</td>
<td>Unknown (probably zygomorphic)</td>
<td>Actinomorphic</td>
</tr>
<tr>
<td>Anthers</td>
<td>Yellow with red margins along anther sacs</td>
<td>Yellow</td>
<td>Yellow</td>
<td>Yellow</td>
</tr>
<tr>
<td>Capsule</td>
<td>Villous-setose or hispid-setose</td>
<td>Villous-setose or hispid-setose</td>
<td>Glabrous</td>
<td>Glandular hispid</td>
</tr>
</tbody>
</table>
with red margins along anther sacs (Figure 2:H). A comparison of the salient characters of the four species in sect. *Coelocentrum* is shown in Table 1.

**Acknowledgments.** We thank Hidetoshi Nagamasu (KYO) for assistance with the Latin diagnosis; Hong-Zhe Li and Hong Ma (KUN) for providing handsome images (Figure 8: B, D) and useful literature; Dave Boufford (A/GH) and Hidetoshi Nagamasu for improving the manuscript; and the curators of GXMI, K and KUN for facilitating our examination of herbarium collections. This study was supported in part by the Guangxi Natural Science Foundation (GKJ0448089) to Yan Liu (IBK) and grants from the Research Center for Biodiversity, Academia Sinica and the National Science Council, Taiwan, to Ching-I Peng (HAST).

**Literature Cited**


