

Begonia tetralobata (Begoniaceae), a new species from China

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Received 25 Sep. 2005, revised version received 26 Mar. 2006, accepted 15 May 2006

Shui, Y.-M. 2007: *Begonia tetralobata* (Begoniaceae), a new species from China. — *Ann. Bot. Fennici* 44: 76–79.

Begonia tetralobata Y.M. Shui *sp. nova* (Begoniaceae) is described and illustrated from Yunnan, China. It differs from *B. cucurbitifolia* mainly in the 4-palmate and oblique lamina and smaller tepals of male flowers ca. 1 cm long ca. 0.7 cm wide. The two species are a closely related pair, each occurring at a different altitude range.

Key words: *Begonia*, Begoniaceae, new species, taxonomy

In SE Yunnan of China, the Gulingqing Natural Reserve is one of the most famous reserves in China, with typical limestone tropical rain forest. The flora of the reserve was studied over several years and has been found to consist of almost 2000 species of seed plants (M. D. Zhang unpubl. data). According to Shui *et al.* (2002) and Tebbitt (2003a, 2003b), there are about 23 species of *Begonia* (Begoniaceae) recorded in the reserve, e.g. *B. acetosella*, *B. handelii*, *B. cavalariei*, *B. ceratocarpa*, *B. longifolia*, *B. cucurbitifolia*, *B. daweshanensis*, *B. fimbristipula*, *B. gulingqingensis*, *B. hekouensis*, *B. hemsleyana*, *B. laminariae*, *B. maguanensis*, *B. megalophyllaria*, *B. oreodoxa*, *B. palmata*, *B. pedatifida*, *B. pseudodryadis*, *B. psilophylla*, *B. villifolia*, *B. wenshanensis*, *B. zhengyiana*, and an unknown species reported here.

Through careful examination with related species (Smith *et al.* 1986, Ku 1999), the unknown species was confirmed to be a new one. It occurs commonly at 800–1600 m in limestone

forest, and is morphologically very similar to *B. cucurbitifolia*, which occurs at 100–400 m in the same limestone forests.

Begonia tetralobata Y.M. Shui, *sp. nova* (Fig. 1)

Species B. cucurbitifoliae similis, sed foliorum laminae tetralobatis (nec trilobatis), foliorum basibus inaequilateralibus (nec aequilateralibus), tepalis floris staminati ca. 1 cm longis ca. 0.7 cm latis (in illa ca. 2.5 cm longis 1.3 cm latis) differt.

TYPE: China, Yunnan, Hekou County, Nanxi, Anjiahe to Liangzi, 22°40'N, 103°53'E, in the secondary forests on the rock-earthly hill, at alt. 800 m, 21.X.2000 Y. M. Shui, C. X. Pu *et* Z. L. Nie 14537 (holotype KUN; isotypes KUN, PE).

Herbs perennial, usually epiphytic on surface of rock, 0.3–0.5 m tall, glabrous, without erect stems. Rhizomes creeping, 0.6–0.8 cm in

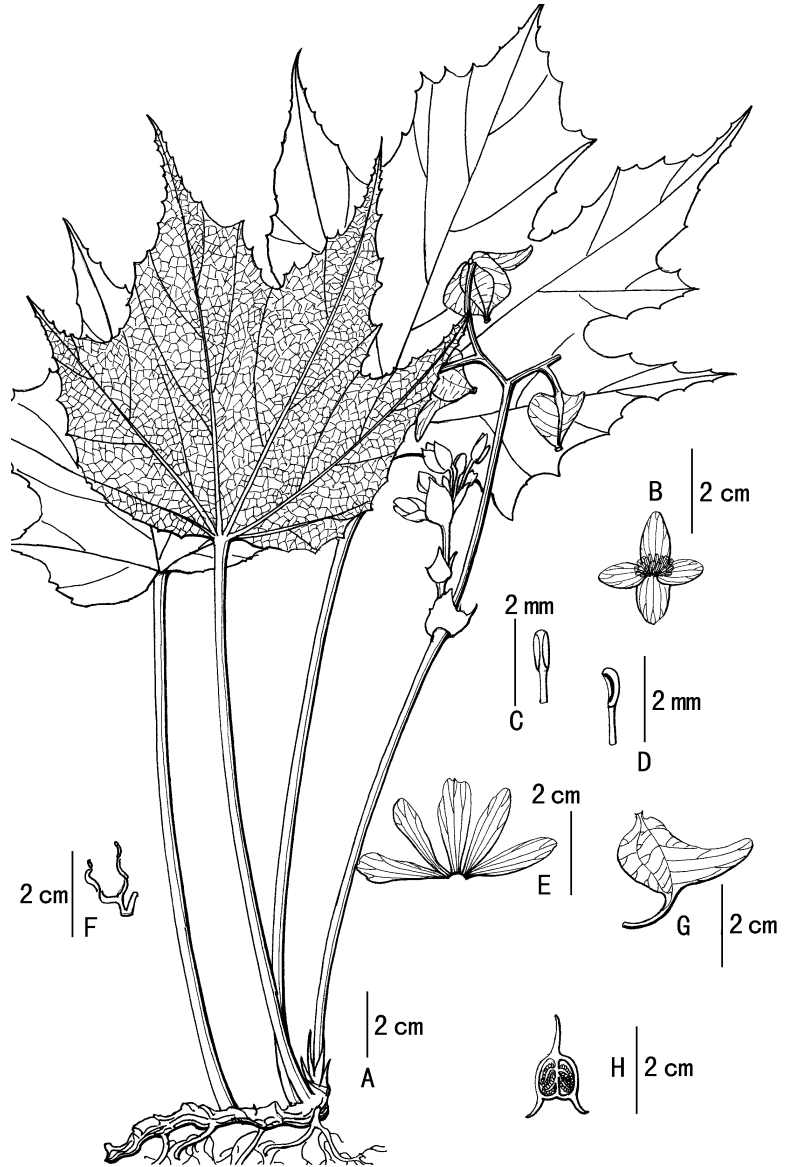


Fig. 1. *Begonia tetralobata* (from holotype, drawn by Ling Wang). — **A:** Habit. — **B:** Male flower. — **C:** Ventral plane of stamen. — **D:** Lateral plane of stamen. — **E:** Female flower. — **F:** Style. — **G:** Mature dry fruit. — **H:** Transverse section of fruit.

diameter, internodes 0.2–0.3 cm long, with a few fibrous roots arising at the nodes; stipules ovate, 1.0–1.2 × 0.6–0.7 cm, apex acuminate, margin entire. Leaves 3–4, basal and cauline; lamina widely ovate, 14–16 × 12–14 cm, 4-palmately lobed, base obliquely cordate, margin serrate; lobes triangular, apex long-caudate; nerves 4–5, palmate, exterior 3, interior 1–2; petioles 19–23 cm long. Inflorescences cymose, 9–25 cm long, 6–8 cm wide, arising from axils of leaves of rhizome apex, usually with 8–20 flowers; peduncles 13–17 cm long; bracts widely ovate to ovate,

1.2–1.3 × 0.8–1.3 cm; bracteoles absent. Male flowers: tepals 4, white, pink or red, free, outer 2 ovate, ca. 1.0 × 0.7 cm, inner 2 elliptic, ca. 0.9 × 0.5 cm; stamens numerous, yellow; filaments free, ca. 1 mm long; anthers oblong, ca. 1 mm long, ca. 0.4 mm wide, dehiscing via longitudinal lateral slits, connective slightly protruding. Female flowers: tepals 5, white, subequal, oblong or oblong-obovate, 1.6–1.7 × 0.4–0.5 cm; styles 2, free and forked once, caducous in fruit; stigmas U-shaped and spiraled in a band covered with papillae; ovaries 2-locules, axile, placentas

2, ovules present on both surfaces. Capsulas nodding, dehiscing near the back of the loculus and near the septa; wings 3, unequal, largest one slightly dropping, 1.5–1.7 cm long, 0.6–0.8 cm wide, smallest 0.3–0.4 cm long, 1.2–1.3 cm wide. Flowering from October to December fruiting from December to March.

HABITAT ECOLOGY AND DISTRIBUTION: In moist places among rocks, alt. 800–1600 m in the forest or under shrubs on limestone hills. Endemic at Maguan and Hekou County of SE Yunnan, China.

Begonia tetralobata is very similar to *B. cucurbitifolia*, but it differs mainly in the 4-palmate and oblique lamina and smaller tepals of male flowers, ca. 1 × 0.7 cm. The species are respectively endemic at 800–1600 m and 100–400 m altitude in the limestone forests of the same area of SE Yunnan, and so may be considered as a pair of closely related species found at different altitudes in the same area.

Begonia tetralobata also resembles *B. maguanensis* in the few leaf lobes. However, the latter differs mainly in its ca. 1.5 cm in diam. rhizome, obscure reticulate nerves, orbicular petals, oblong wings, and longer trichomes on both leaf surfaces, as well as on upper surface of petals and on young fruits.

Species of *Begonia* sect. *Platycentrum* in China, with dissected leaves and obscure stems, can be identified with the following key.

1. Laminae of leaves shallowly lobed, lobes equal to or less than half of leaves 2
1. Laminae of leaves deeply lobed, lobes exceeding half of leaves 10
2. Petiole not covered by triangular squamae 4
2. Petiole covered by triangular squamae 3
3. Middle lobes of leaves not lobed again *B. miranda*
3. Middle lobes of leaves lobed again .. *B. reflexisquamosa*
4. Leaf lobes obtetragonal, upper margin oblique truncate *B. truncatiloba*
4. Leaf lobes triangular or falciform, upper margin not truncate 5
5. Larger fruit wings oblong or triangular, shorter than 2.5 cm 6
5. Larger fruit wings narrowly oblong, 4–5 cm long *B. longialata*
6. Leaf lobes 3, base truncate, not oblique *B. cucurbitifolia*
6. Leaf lobes 4–5(6), base oblique cordate 7
8. Plants densely hairy *B. maguanensis*
8. Plants glabrous or slightly hairy 9

9. Lobes of leaves oblong, shortly lanceolate at top *B. paucilobata*
9. Lobes of leaves triangular, caudate at top *B. tetralobata*
10. Middle lobes of leaves lobed again 12
10. Middle lobes of leaves not lobed again 11
11. Lobes of leaves 7–11, linear-lanceolate ... *B. laminariae*
11. Lobes of leaves 5–6, rhombiform *B. circumlobata*
12. Leaf lobes shallowly lobed again 14
12. Leaf lobes deeply dissected into base again 13
13. Larger wings of fruits nearly tetragonal *B. scitifolia*
13. Larger wings of fruits ligulate *B. coptidifolia*
14. Petioles glabrous, mottled *B. rubropunctata*
14. Petioles hairy, not mottled 5
15. Leaf base not oblique, apex long-caudate *B. algaia*
15. Leaf base oblique, apex acuminate *B. pedatifida*

ADDITIONAL SPECIMENS EXAMINED (paratypes). — **China.** *Yunnan.* Hekou County, Qingcaitang, in limestone seasonal forests, alt. 1000–1200 m, 3.III.2002 *Y. M. Shui et al.* 20575 (KUN), *Y. M. Shui et al.* 20654 (KUN); Maguan County, Gulinqing, Bomushan, along slope in moist forest on rocky hill, alt. 1300–1600 m, 1.IV.2000, *D. K. Tian* 99239 (KUN); same area, Laowangzhai village, 103°59'E, 23°43'N, in evergreen broad-leaved forest of limestone hills, alt. 1000 m, 3.X.2002 *Y. M. Shui, W. H. Chen & J. S. Sheng* 30205 (KUN, PE); same area, Laofangzi, Qinglongshan Mt., 103°58'E, 22°47'N, in the forest at middle of limestone hill, alt. 1400 m, 15.X.2002 *Y. M. Shui, W. H. Chen & J. S. Sheng* 31440 (KUN, PE); same area, Diaoguochangdaqing, 103°58'E, 22°46'N, in montane rain forest, alt. 1200 m, 14.X.2002 *Y. M. Shui, W. H. Chen & J. S. Sheng* 31313 (KUN), *Y. M. Shui, W. H. Chen & J. S. Sheng* 31331 (KUN, PE, IBSC); same area, Arboretum-examining Station, 103°59'E, 22°44'N, in tropical seasonal-rain forest, alt. 800 m, 2.X.2002 *Y. M. Shui, W. H. Chen & J. S. Sheng* 30062 (KUN, PE); same area, Laofangzi, 103°57'E, 22°46'N, in evergreen broad-leaved forests of limestone hills, alt. 1450 m, 11.X.2002 *Y. M. Shui, W. H. Chen & J. S. Sheng* 31126 (KUN, PE, IBSC); same area, between lamber quarantine station and Gulinqing, 103°59'E, 22°44'N, alt. 830 m, in broadleaf forest, on mountain slope, occasional, 7.XII.2001 *C. I. Peng et al.* 18573 (HAST, KUN).

Acknowledgements

I thank Ms. Wen-Hong Chen and Mr. Mei-De Zhang in KUN herbarium for assistance with the manuscript, and Ms. Ling Wang for providing the illustration. This study was supported by The National Natural Science Foundation of China grant no. 30270109 and West Glory Project of CAS in China.

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