Five new species of *Begonia* (Begoniaceae) from Taiwan

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**Abstract.** Five new species of *Begonia*, namely *B. bouffordii*, *B. pinglinensis* and *B. wutaiana* (sect. *Platycentrum*) and *B. chuyunshanensis* and *B. tengchiana* (sect. *Diploclinium*), all endemic to Taiwan, are described and illustrated. A total of 17 species of *Begonia* are now recognized in Taiwan. A key to the species of *Begonia* in Taiwan is provided.

**Key words:** *Begonia bouffordii; Begonia chuyunshanensis; Begonia pinglinensis; Begonia tengchiana; Begonia wutaiana; Begoniaceae; New species; Taiwan; Plant taxonomy.*

**Introduction**

The genus *Begonia* L. comprises about 1,400 species (Smith et al., 1986). More than 600 species in 19 sections occur in Asia. The majority of the species are assignable to three sections, namely sect. *Petermannia*, sect. *Platycentrum* and sect. *Diploclinium* (Doorenbos et al., 1998; Shui et al., 2002). *Begonia* sect. *Petermannia* contains nearly 200 species concentrated in the Malesian region. Sect. *Platycentrum* contains ca. 110 species ranging from India and central China to SE Asia. Sect. *Diploclinium* contains ca. 160 species in Asia to as far north as 45°N latitude. In China, there are ca. 150 species of *Begonia*, of which about 45 species belong to Sect. *Diploclinium*; 64 species belong to Sect. *Platycentrum*; and only three species belong to sect. *Petermannia* (Shui et al., 2002; Shui and Chen, 2004). In Taiwan, about a dozen species of *Begonia* have previously been recognized (Chen, 1993; Peng and Sue, 2000; Shui et al., 2002). Except for two named hybrids resulting from natural hybridization between members of different sections, the remaining Taiwanese species are classified under three sections: sect. *Diploclinium* (4 species), sect. *Platycentrum* (5 species) and sect. *Sphenanthera* (1 species) (Peng and Chen, 1991; Peng and Sue, 2000; Peng and Chiang, 2000; Shui et al., 2002). Here we report the discovery of five new species of *Begonia*, two in sect. *Diploclinium* and three in sect. *Platycentrum* from Taiwan.

**Description**

1. *Begonia bouffordii* C.-I Peng, sp. nov. (sect. *Platycentrum*)—TYPE: TAIWAN. Nantou Hsien: Tsatou Town, Chiuchiafu (mountain peaks), along dry, shaded rocky slope, 24°00′21″N, 120°46′33″E, elev. ca. 360 m, 8 Jul 1995, type specimen pressed from cultivated plant on 5 Feb 2005, Ching-I Peng 16305-A (holotype, HAST). 九峰秋海棠  Figures 1, 2

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much narrower, 3-5 mm long. Seeds numerous, chalazal end rotund, lip of seed nipple-shaped, micropylar end constricted. Chromosome number, \( n = 19 \) (Figure 3); \( 2n = 38 \) (Oginuma and Peng, 2002).

Additional specimens examined. TAIWAN. Nantou Hsien: Tsao-tun Town, Chi-chiufeng (mountain peaks), Kou-kushan, on rocky slope, 24°00’22” N, 120°46’35” E, elev. 350-470 m, 12 Nov 1994, Ching-I Peng 15991 (HAST); same loc., 12 Nov 1994, Ching-I Peng 15999 (HAST).

Distribution. Rare, known only from Chi-chiufeng, central Taiwan, on dry, semi shaded to shaded, heavily eroded gravel slopes in steep ravines, at 350-470 m elevation (Figure 4).

Notes. Begonia bouffordii somewhat resembles B. chitoensis T. S. Liu & M. J. Lai, but it is distinct in having subcoriaceous and ovate (vs. herbaceous and broadly ovate) leaves and usually lacking an aerial stem [when present, 8 (-15) cm (vs. 40-95 cm) tall]. The two species occupy different ecological niches: B. bouffordii is a rare, localized species, found only at Chi-chiufeng on gravel slopes in steep ravines between 350 and 470 m elevation; whereas B. chitoensis, a widespread species in central Taiwan, is frequently found in shaded forests and on semi shaded forest margins between 360 and 2,200 m (Figure 4). A comparison of the two species and two other similar taxa is presented in Table 1. The specific epithet is named in honor of Dr. David E. Boufford, Harvard University Herbaria, for his contribution to the botanical inventory and floristic studies of eastern Asia.

2. Begonia chuyunshanensis C.-I Peng & Y. K. Chen, sp. nov. (sect. Diploclinium)—TYPE: TAIWAN. Kaohsiung Hsien: Taoyuan Hsiang, Laonung Forest Recreation Area, Chuyunshan, in broadleaf forest, 23°03’22” N, 120°44’36” E, elev. ca. 1,450 m, 22 May 1997, Ching-I Peng 16855 (holotype, HAST; isotype, TNM)

Table 1. Comparison of Begonia chitoensis, B. bouffordii, B. pinglinensis and B. tengchiana.

<table>
<thead>
<tr>
<th>Characters</th>
<th>Begonia chitoensis</th>
<th>Begonia bouffordii</th>
<th>Begonia pinglinensis</th>
<th>Begonia tengchiana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerial stem</td>
<td>40-95 cm long</td>
<td>Lacking, when present 8 (-15) cm long</td>
<td>35-50 cm long</td>
<td>38-80 cm long</td>
</tr>
<tr>
<td>Leaf</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texture</td>
<td>Herbaceous</td>
<td>Subcoriaceous</td>
<td>Herbaceous</td>
<td>Herbaceous</td>
</tr>
<tr>
<td>Shape</td>
<td>Broadly ovate</td>
<td>Ovate</td>
<td>Narrowly ovate to</td>
<td>Broadly ovate</td>
</tr>
<tr>
<td></td>
<td>to suborbicular</td>
<td></td>
<td>ovate</td>
<td>to suborbicular</td>
</tr>
<tr>
<td>Indumentum</td>
<td>Glabrous to subglabrous</td>
<td>Glabrous</td>
<td>Pilose to pilose-sericeous</td>
<td>Glabrous to subglabrous</td>
</tr>
<tr>
<td>Bracts</td>
<td>Entire</td>
<td>Entire</td>
<td>Entire</td>
<td>Serrate</td>
</tr>
<tr>
<td>Bracteoles on carpellate</td>
<td>Lacking</td>
<td>Lacking</td>
<td>Lacking</td>
<td>Present</td>
</tr>
<tr>
<td>flowers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Styles</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Ovary</td>
<td>2-locular</td>
<td>2-locular</td>
<td>2-locular</td>
<td>3-locular</td>
</tr>
<tr>
<td>Abaxial wing of capsule</td>
<td>Rotund to obricular, 19-32 mm long</td>
<td>Rotund to obricular, 18-25 mm long</td>
<td>Triangular to ligulate, 13-28 mm long</td>
<td>Shallowly triangular, to 5 mm long</td>
</tr>
<tr>
<td>Chromosome number (2n)</td>
<td>38</td>
<td>38</td>
<td>38</td>
<td>82</td>
</tr>
</tbody>
</table>
Herbs, erect, perennial, succulent. Rhizomes poorly developed, sometimes entirely lacking, creeping. Stems often zigzag, glabrous, 40-85 cm tall, to 18 mm across. Stipules glabrous, caducous, lanceolate to ovate, to 21 mm long, 16 mm wide, margins entire, apex acuminate. Leaves sparingly scaberulous on both surfaces, oblique, ovate to narrowly ovate, 12-27 cm long, 5-14 cm wide, base cordate, margins irregularly serrulate or denticulate, often slight undulate, apex acuminate to cuspidate; venation palmate-pinnate, veins 7-9; petiole glabrous, 6-30 cm long, 4 mm thick, flowers pendulous. Tepals white or very faintly pinkish. Staminate flowers: tepals 4, decussate, outer 2 broadly obovate to orbicular, 9-24 mm long, 7-21 mm wide, inner 2 obovate to oblanceolate to narrowly obovate, 7-18 mm long, 4-8 mm wide; stamens 98-137, yellow, clavate, anthers narrowly oblong to obovate obovate, 7-18 mm long, 4-8 mm wide; styles 3, yellow, 4.9-5.3 mm long, 17-21 mm wide. Carpellate flowers: tepals 4 (or 6), unequal to subequal, narrowly obovate to broadly obovate, largest 9-21 mm long, 8-18 mm wide, smallest 8-19 mm long, 4-9 mm wide; styles 3, yellow, 4.9-5.3 mm long, fused ca. 1 mm at base, each bifid; ovary nodding or somewhat pendulous, ellipsoid, locules 3, longitudinally shallowly grooved between locules, 3-winged; placenta axile, bilamellate. Infructescence to 19 cm long, fruit-bearing stipes 12-25 mm long; capsules nodding, trigonous, unequally 3-winged, abaxial wing triangular, 18-24 mm long, 17-21 mm wide, lateral wings much narrower, 4-7 mm long, 17-21 mm wide. Seeds numerous, broadly ellipsoid, 0.32-0.34 mm long, 0.22-0.24 mm thick, chalazal end rotund, lip of seed nipple-shaped, micropylar end constricted. Chromosome number, 2n = 52 (Oginuma and Peng, 2002).

Additional specimens examined. TAIWAN. Kaohsiung Hsien: Maolin Hsiang, Shanping Station, Liukuei Branch, Taiwan Forestry Research Institute, between luncheon room and the 2nd watershed area, elev. ca. 700 m, mixed broadleaf forest and Cunninghamia plantation, slope base along trail, moist places, Ching-I Peng 14730 (HAST); Maolin Hsiang, ca. 100 m off Shanping Station (Liukuei Branch of Taiwan Forestry Institute), slope base along road to Liukuei, elev. ca. 650 m, associated with Begonia palmata and B. taiwaniana locally, Ching-I Peng 14751 (HAST); Maolin Hsiang, Shanping, elev. ca. 750 m, Yung-Kuan Chen 102 (HAST); Maolin Hsiang, Shanping, elev. ca. 800 m, Yung-Kuan Chen 521 (HAST); Taoyuan Hsiang, Tengchih, elev. 1,570 m, Ching-I Peng 14795-a (HAST); Pingtung Hsien: Laiyi Hsiang, at ca. 5.7 km on Laiyi Forest Road, 22°31′17″ N, 120°41′12″ E, elev. ca. 530 m, disturbed broadleaf forest, at base of rocky/soil slope, semi shaded, moist, locally frequent, Ya-Yi Huang 530 (HAST); Santimen Hsiang, at ca. 10.6 km on Shahsi Forest Road, 22°49′03″ N, 120°38′45″ E, 730 m, mixed broadleaf forest and Miscanthus grassland, at base of moist rocky/soil slope, semi shaded, locally frequent, Ya-Yi Huang 541 (HAST); Santimen Hsiang, at ca. 10.6 km on Shahsi Forest Road, 22°49′03″ N, 120°38′45″ E, 730 m, mixed broadleaf forest and Miscanthus grassland, at base of moist rocky/soil slope, semi shaded, locally frequent, Ya-Yi Huang 541 (HAST); Santimen Hsiang, at ca. 10.6 km on Shahsi Forest Road, 22°49′03″ N, 120°38′45″ E, 730 m, mixed broadleaf forest and Miscanthus grassland, at base of moist rocky/soil slope, semi shaded, locally frequent, Ya-Yi Huang 541 (HAST); Santimen Hsiang, at ca. 10.6 km on Shahsi Forest Road, 22°49′03″ N, 120°38′45″ E, 730 m, mixed broadleaf forest and Miscanthus grassland, at base of moist rocky/soil slope, semi shaded, locally frequent, Ya-Yi Huang 541 (HAST); Santimen Hsiang, at ca. 10.6 km on Shahsi Forest Road, 22°49′03″ N, 120°38′45″ E, 730 m, mixed broadleaf forest and Miscanthus grassland, at base of moist rocky/soil slope, semi shaded, locally frequent, Ya-Yi Huang 541 (HAST); Santimen Hsiang, at ca. 10.6 km on Shahsi Forest Road, 22°49′03″ N, 120°38′45″ E, 730 m, mixed broadleaf forest and Miscanthus grassland, at base of moist rocky/soil slope, semi shaded, locally frequent, Ya-Yi Huang 541 (HAST); Santimen Hsiang, at ca. 10.6 km on Shahsi Forest Road, 22°49′03″ N, 120°38′45″ E, 730 m, mixed broadleaf forest and Miscanthus grassland, at base of moist rocky/soil slope, semi shaded, locally frequent, Ya-Yi Huang 541 (HAST); Santimen Hsiang, at ca. 10.6 km on Shahsi Forest Road, 22°49′03″ N, 120°38′45″ E, 730 m, mixed broadleaf forest and Miscanthus grassland, at base of moist rocky/soil slope, semi shaded, locally frequent, Ya-Yi Huang 541 (HAST); Santimen Hsiang, at ca. 10.6 km on Shahsi Forest Road, 22°49′03″ N, 120°38′45″ E, 730 m, mixed broadleaf forest and Miscanthus grassland, at base of moist rocky/soil slope, semi shaded, locally frequent, Ya-Yi Huang 541 (HAST); Santimen Hsiang, at ca. 10.6 km on Shahsi Forest Road, 22°49′03″ N, 120°38′45″ E, 730 m, mixed broadleaf forest and Miscanthus grassland, at base of moist rocky/soil slope, semi shaded, locally frequent, Ya-Yi Huang 541 (HAST); Santimen Hsiang, at ca. 10.6 km on Shahsi Forest Road, 22°49′03″ N, 120°38′45″ E, 730 m, mixed broadleaf forest and Miscanthus grassland, at base of moist rocky/soil slope, semi shaded, locally frequent, Ya-Yi Huang 541 (HAST); Santimen Hsiang, at ca. 10.6 km on Shahsi Forest Road, 22°49′03″ N, 120°38′45″ E, 730 m, mixed broadleaf forest and Miscanthus grassland, at base of moist rocky/soil slope, semi shaded, locally frequent, Ya-Yi Huang 541 (HAST); Taitung Hsien: Peinan Hsiang, along Lichia Forest Road, at road mileage sign 14.2 km, evergreen broadleaf forest, elev. ca. 1,200 m, Yui-Ching Kao 159 (HAST).

Distribution. Known from Kaohsiung Hsien, Pingtung Hsien and Taitung Hsien in southern Taiwan, between 530-1,570 m elevation (Figure 7).

Notes. Begonia chuyunshanensis is similar to B. lukuana Y. C. Liu & C. H. Ou, differs by having the leaves green on both surfaces (vs. deeply purple-red beneath) and anthers 2.9-3.2 mm (vs. 1.9-2.2 mm) long (Table 2). Geographically, the two species are also separable. Begonia chuyunshanensis occurs south of the Tropic of Cancer in southern Taiwan, whereas B. lukuana grows north of the range of B. chuyunshanensis. The specific epithet is derived from the type location Chuyunshan (‘Above-the-cloud Mountain,’ literally).

3. Begonia pinglinensis C.-I Peng, sp. nov. (sect. Platycentrum)—TYPE: TAIWAN. Taipei Hsien: Pinglin Hsiang, Peishihhsi (a river), Tsuku Landslide Area #2 at Chinkualiao, 24°55′27″ N, 120°40′30″ E, elev. ca. 320 m, disturbed broadleaf forest with tea plantation on mountain slope, NE-facing rocky slope with dripping water, associated with Miscanthus, Alocasia macrorrhiza, Goodyera, Curculigo capitulata, Villebrunea pedunculata, Woodwardia prolifera, Maesa japonica, Morus australis, and Mallotus.

Figure 7. Distribution of B. chuyunshanensis (●), B. wutaiana (○) and B. lukuana (□) in Taiwan.
Table 2. Comparison of Begonia lukuana, B. chuyunshanensis, B. wutaiana and B. tengchiana.

<table>
<thead>
<tr>
<th>Characters</th>
<th>Begonia lukuana</th>
<th>Begonia chuyunshanensis</th>
<th>Begonia wutaiana</th>
<th>Begonia tengchiana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhizomes</td>
<td>Absent or poorly developed</td>
<td>Absent or poorly developed</td>
<td>Absent or poorly developed</td>
<td>Creeping and elongated</td>
</tr>
<tr>
<td>Leaf Color</td>
<td>Dark green above, sanguineous beneath</td>
<td>Green on both surfaces</td>
<td>Green on both surfaces</td>
<td>Green on both surfaces</td>
</tr>
<tr>
<td>Shape</td>
<td>Lanceolate to narrowly ovate</td>
<td>Lanceolate to ovate</td>
<td>Lanceolate to narrowly ovate</td>
<td>Broadly ovate to suborbicular</td>
</tr>
<tr>
<td>Bracts</td>
<td>Entire</td>
<td>Entire</td>
<td>Entire</td>
<td>Serrate</td>
</tr>
<tr>
<td>Bracteoles on carpellate flowers</td>
<td>Lacking</td>
<td>Lacking</td>
<td>Lacking</td>
<td>Present</td>
</tr>
<tr>
<td>Anther length (mm)</td>
<td>1.9-2.2</td>
<td>2.9-3.2</td>
<td>2.4-2.9</td>
<td>1.9-2.4</td>
</tr>
<tr>
<td>Styles</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Ovary</td>
<td>3-locular</td>
<td>3-locular</td>
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<tr>
<td>Chromosome number (2n)</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>82</td>
</tr>
</tbody>
</table>

paniculatus, Ching-I Peng 17765 (holotype, HAST; isotypes, CAS, E, GH, HAST, K, KUN, MO, PE, TAI, TAIF, TNM, US). 坪林秋海棠

Herbs perennis rhizomatibus repentibus, 35-50 cm altis. Folia obliqua, late ovata ad ovata, 7-16 (-25) cm longae et 5-9 (-14) cm lata, pubescentae. Flores masculi: tepalis 4; staminis 46-81, antherae anguste obovatae, 0.8-1.4 mm longae, 0.5-0.7 mm crassae. Flos foeminei: tepalis 5, subaequalis; ovarii bioculare, inaequalibus 3-alatis; placentae axiales; styli 2. Fructus maturus capsularis, trigonus aliis 3 inaequalibus praeditus, ala abaxiali 13-28 mm longa, alis lateralibus 3-4 mm longis.

Herbs, perennial, rhizomatous. Rhizomes creeping, to 1 cm thick. Stems 35-50 cm long. Stipules glabrous, caducous, narrowly ovate to ovate, to 9.7 mm long, 3.6 mm wide, margins entire, apex acuminate. Leaves basal and cauline, pilose to pilose-sericeous on both surfaces, oblique, narrowly ovate to ovate, 7-16 (-25) cm long, 5.9 (-14) cm wide, base obtuse, margins irregularly serrulate to denticulate, apex acuminate to cuspidate; venation palmate, veins 7-10; petiole often reddish, hispid or villosulous, to 16 (-20) cm long, 4.5 mm across. Bracts in pairs, papery, glabrous, caducous, narrowly ovate, to 7.5 mm long, 3.5 mm wide, margins entire, apex acuminate. Inflorescence to 25 cm long, peduncle erect to ascending, hispid, to 15 cm long, 6 mm across. Tepals white or pinkish, glabrous. Staminate flowers: tepals 4, decussate, outer 2 broadly ovate to ovate, 7-20 mm long, 6-17 mm wide, inner 2 oblanceolate to narrowly obovate, 8-17 mm long, 4-9 mm wide; stamens 46-81, yellow, clavate, anthers narrowly oblong to oblanceolate, 0.8-1.4 mm long, 0.5-0.7 mm across, filaments free, 0.7-1.6 mm long. Carpellate flowers: tepal 5, unequal to subequal, narrowly ovate to broadly obovate, largest 10-19 mm long, 9-17 mm wide, smallest 6-19 mm long, 5-14 mm wide; styles 2, yellow, 4-5 (-5.7) mm long, fused at base ca. 1 mm, each bifid; ovary ellipsoid, locules 2, longitudinally grooved, 3-winged, hispidulous; placenta axile, bilamellate. Inflorescence to 25 cm long, fruit-bearing stipes 1.2-5.5 cm long; capsules nodding, trinerved, unequally 3-winged, abaxial wing triangular to ligulate, 13-28 mm long, 9-19 mm wide, lateral wings 3-4 mm long, 9-18 mm wide. Seeds numerous, chalazal end round, lip of seed nipple-shaped, micropylar end constricted. Chromosome number, n = 19 (Figure 10), 2n = 38 (Oginuma and Peng, 2002).

Additional specimens examined. TAIWAN. Taipei Hsien: Pinglin Hsiang, from Taiyuchueh via Pinglinshanchuang to Tsukutsun, broadleaf forest, occasional on forest floor or moist, heavily shaded, N-facing slope, often on rocks with shallow soil and abundant leaf litter. 24°57'17" N, 121°41'12'' E, elev. ca. 300 m, 24 Nov 2000, Ching-I Peng 18189 (HAST); Chinhsing village, Chinkualiao, broadleaf forest by Chinkualiaohsi (a stream), shady slope, elev. ca. 250 m, Ching-I Peng 14705 (HAST); same loc., on slope along trail, in shade, elev. ca. 250 m, Ching-I Peng 13853 (HAST); same loc., en route from the police station to Taiwan Keteleeria Nature Preserve, mixed broadleaf forest and tea plantation, Ching-I Peng 15189 (HAST); Shihatsao, Kupoliaohsi (a stream), SE of Provincial Hwy 9 at road mile-age ca. 44.2 km, ca. 100 m S of Sihhtsao Police Station, then hiking down for ca. 3 km, 24°53'43" N, 121°42'47'' E, Ficus-Machilus forest, S of the river, on slope along trail, semi shaded, abundant, Ching-I Peng 17814, 17815, 17816, 17817, 17818, 17819, 17820, & 17821 (HAST); same loc., N of the river, elev. ca. 270 m, on heavily shaded rocky slope, Ching-I Peng 17822 (HAST); Taiyuku, ca. 2 km S of Pinglin, crossing Talin Bridge to the left of Pei-I Road, at mountain foot of Taoliaoaling, elev. ca. 300 m, Ching-I Peng 13849 (HAST); same loc., en route from Chinkualiaohsi (a stream) to Taiwan Keteleeria Nature Preserve, elev. 210-300 m, beside railway, adjacent to a stream, Chi-Cheng Liao 512 (HAST); same loc., on for-
est floor, *Chi-Cheng Liao 511* (HAST); same loc., on semi shaded slope trail, *Chi-Cheng Liao 517, 519* (HAST); Talin village, Taiyuku, mt. foot of Taotiaoling, slope by a small creek in broadleaf forest, elev. ca. 330 m, *Ching-I Peng 17861* (HAST); Talin village, Taiyuku, mt. foot of Taotiaoling, slope by a small creek in broadleaf forest, elev. ca. 330 m, *Ching-I Peng 17858, 17860* (HAST); same loc., on semi shaded slope, *Ching-I Peng 18192* (HAST).

**Distribution.** Rare, known only in Pinglin Hsiang, Taipei Hsien (Figure 4); broadleaved forests and forest margins, 210-320 elevation.

**Notes.** This species is somewhat similar to *B. chitoensis* and *B. bouffordii* in habit. All three species also have the same somatic chromosome number of 2n = 38 (Oginuma and Peng, 2002). *Begonia pinglinensis* is notably distinct from either species in its combination of pilose (vs. glabrous or subglabrous) leaves and other characters (Table 1). *Begonia pinglinensis* is a rare species found only in the Peishihhsi river basin in northern Taiwan. It is distributed well north of *B. chitoensis* and *B. bouffordii* (Figure 4). The specific epithet is derived from the type locality “Pinglin Hsiang.”

**4. Begonia tengchiana** C.-I Peng & Y. K. Chen, sp. nov. (sect. *Diploclinium*)—TYPE: TAIWAN. Kaohsiung Hsien: Fengkang Forest Road, at road marker 12 km, broadleaf forest on mountain slope, on semi shaded soil slope at road cut, a very large population (ca. 4 × 5 m²) by a steep brook with running water, 23°00’17” N, 120°42’40” E, elev. ca. 1,630 m, 16 Sep 2000, *Ching-I Peng 17858, 17860, 17861 & 17862* (HAST); by the sign of Pinglin Taiwan Keteleeeria Nature Reserve, near entrance, broadleaf forest, at trailside along a small stream, heavily shaded, moist, locally abundant, elev. ca. 250 m, *Ching-I Peng 18192* (HAST).

**Notes.** This species is somewhat similar to *B. bouffordii* and *B. chitoensis* in habit. All three species also have the same somatic chromosome number of 2n = 38 (Oginuma and Peng, 2002). *Begonia pinglinensis* is notably distinct from either species in its combination of pilose (vs. glabrous or subglabrous) leaves and other characters (Table 1). *Begonia pinglinensis* is a rare species found only in the Peishihhsi river basin in northern Taiwan. It is distributed well north of *B. chitoensis* and *B. bouffordii* (Figure 4). The specific epithet is derived from the type locality “Pinglin Hsiang.”

**Figures 11, 12**

*Herbs perennis rhizomatibus repentibus. Caulis 38-80 cm alti. Folia obliqua, late ovata ad ovata, 9-25 cm longae et 7-18 cm lata. Flores masculi: tepalis 4; stamina 39-68, antherae late oblanceolatae ad anguste obovatae, 1.9-2.3 mm longae, 0.9-1.2 mm crassae. Flos foeminei: tepalis 5 (or 6), subaequilis; ovarii trilocularis, fere sine alis; placentae axiales; styli 3. Fructus maturus capsularis, trigonus fere alis, ala abaxiali ad 5 mm longa, alis lateralibus ad 3 mm longis. Herbs, erect, perennial, with creeping rhizomes. Rhizomes to 2.1 cm thick. Stems 38-80 cm tall, to 1.8 cm thick. Stipules caducous, ovate to broadly ovate, to 24 mm long, 19 mm wide, apex acuminate, margin entire. Leaves sparsely scaberulous on upper surface, lower surface glabrous, oblique, ovate to suborbicular, 9-25 cm long, 7-18 cm wide, base cordate, margin remotely irregularly serrate or denticulate, apex acuminate; venation palmate to palmate-pinnate, veins 6-9; petiole glabrous, 7-23 cm long, to 1.1 cm thick. Bracts in pairs, thickly papery, glabrous, caducous, ovate to broadly ovate, 7-18 mm long, 4-13 mm wide, margin serrate, apex acute. Inflorescence 10-24 cm long, in upper leaf axils; peduncle erect or ascending, to 18 cm long, 0.5 cm thick. Sepals white or sometimes pinkish, margin slightly irregularly dentate, more or less strigillose. Staminate flowers: tepals 4, decussate, outer 2 broadly rovotund to orbicular, 11-23 mm long, 9-22 mm wide, inner 2 oblong to narrowly obovate, 10-21 mm long, 5-11 mm wide. Stamens 39-68, yellow, golf-club shaped, anthers broadly oblanceolate to narrowly obovate, 1.9-2.3 mm long, 0.9-1.2 mm across, filaments 1.2-2.6 mm long. Carpellate flowers: bracteoles in pairs, ca. 1 cm long, narrowly lanceolate, on pedicel 5-7 mm beneath ovary; tepals 5 (or 6), unequal or subequal, narrowly obovate to very broadly obovate, largest 9-19 mm long, 6-17 mm wide, smallest 7-16 mm long, 3-9 mm wide; styles 3, yellow, 4.2-5.1 mm long, bifid; ovary ellipsoid, locules 3, longitudinally shallowly grooved between locules, shallowly 3-winged; placenta axile, bilamellate. Inflorescence to 28 cm long, fruit-bearing stipes 12-39 mm long; capsules nodding, trigonous, shallowly 3-winged, abaxial wing shallow triangular, to 5 mm long, 12-21 mm wide, lateral wings to 3 mm long, 10-18 mm wide. Chromosome number, 2n = 38 (Oginuma and Peng, 2002).

**Additional specimens examined.** TAIWAN. Kaohsiung Hsien: Taoyuan Hsiang, Paoshan Village, Tengchi Forest Recreation Area, 1,500 m, *Yung-Kuan Chen 725* (HAST); Taoyuan Hsien, Paoshan Village, Tengchi Forest Recreation Area, broadleaf forest dominated by Lauraceae and Fagaceae, en route from the guesthouse along trail to the peak, elev. 1,560-1,800 m, *Ching-I Peng 14776* (HAST); same loc., *Ching-I Peng 14792* (HAST); same loc., elev. ca. 1,570 m, *Ching-I Peng 14794, 14795* (HAST).

**Distribution.** Rare, known only from Kaohsiung Hsien, in broadleaved forests and at forest margins at the southern end of the Central Mountain Range, elev. 1,550-1,800 m (Figure 4).

**Notes.** In *Begonia*, bracteoles on the carpellate flowers are common in the New World but occur rarely in Asia.
(Doorenbos et al., 1998). The pair of distinct bracteoles below the base of the ovary in Begonia tengchiana is unique in Taiwan. This species resembles B. chitoensis in habit, differing by the ovary with 3 locules (vs. 2 locules); bracteoles present (vs. lacking) on carpellate flowers; serrate (vs. entire) bracts; and the abaxial wing of the capsule shallowly triangular, 5-10 mm long (vs. broadly elliptic bracts; and the abaxial wing of the capsule shallowly triangular, 5-10 mm long (vs. broadly elliptic to orbicular, 19-32 mm long) (Tables 1, 2). Notably, Begonia tengchiana has the highest chromosome number (2n = 82: Oginuma and Peng, 2002) known for the genus in eastern Asia (cf. Doorenbos et al., 1998; Nakata et al., 2003; Peng et al., 1988; Peng and Chen, 1990, 1991; Peng and Sue, 2000; Peng and Chang, 2000; Oginuma and Peng, 2002; Ye et al., 2004; Ku et al., 2004; Peng et al., 2005a, b; Tien et al., 2002). The specific epithet is derived from the type locality, Tengchi, in southern Taiwan.


霧台秋海棠

Herba perennis. Caulis erecti, 40-70 cm altis. Folia obliqua lanceolata ad ovata, 18-24 cm longae et 12-15 cm lata. Flores masculi: tepalis 4; stamina 41-53, antherae anguste oblongae ad oblongae, 2.4-2.9 mm longae, 0.7-0.9 mm crassae. Flores floeminei: tepalis 5 (or 6), subaequalis; ovarii bilocularis, inaequalibus 3-alatis; placentae axiales; styli 2. Fructus maturus capsularis, trigonus, ala abaxiali 15-25 mm longa, alis lateraliibus 2.5-4 mm longis.

Herbs, erect, perennial, with poorly developed rhizome. Stems 40-70 cm tall, to 14 mm thick. Stipules glabrous, caducous, lanceolate to ovate, 18-24 mm long, 12-15 mm wide, margin entire, apex acuminate. Leaves occasionally with white spots on upper surface, oblique, lanceolate to narrowly ovate, 9-18 cm long, 4-7 cm wide, glabrous on both surfaces, base cordate, margin irregularly serrulate, apex acuminate; venation palmate-pinnate, veins 6-9; petiole glabrous, 5-14 cm long, to 6 mm thick. Bracts in pairs, thickly papery to succulent, glabrous, caducous, narrowly ovate to ovate, 9-21 mm long, 15-25 mm wide, margin entire, apex acuminate. Inflorescence 6-14 cm long, in upper leaf axils; peduncle ascending, to 11 cm long, 4 mm thick; flowers pendulous. Tepals white or pinkish. Staminate flowers: tepals 4, decussate, outer 2 rotund to orbicular, 11-18 mm long, 8-18 mm wide, inner 2 oblanceolate to narrowly obovate, 9-16 mm long, 4-9 mm wide. Stamens 41-53, yellow, clavate, anthers narrowly oblong, 2.4-2.9 mm long, 0.7-0.9 mm across, filaments 2-2.8 mm long. Carpellite flowers: tepals 5 (or 6), unequal, narrowly obovate to orbicular, largest 9-16 mm long, 7-15 mm wide, smallest 6-13 mm long, 4-7 mm wide; styles 2, yellow, fused ca. 1 mm at base, bifid; ovary ellipsoid, locules 2, longitudinally shallowly grooved between locules, 3-winged; placenta axile, bilamellate. Infructescence to 18 cm long, fruit-bearing stipes 15-28 mm long; capsules trigonous, unequally 3-winged, abaxial wing 15-25 mm long, 15-23 mm wide, lateral wings much narrower, 2.5-4 mm long, 15-22 mm wide. Seeds numerous, rostrate, 0.28-0.3 mm long, 0.23-0.24 mm thick, apex round, lip of seed nipple-shaped, micropylar end constricted. Chromosome number, 2n = 52 (Oginuma and Peng, 2002).

Additional specimens examined. TAIWAN. Chiayi Hsien: Alishan Hsiang, at entrance of Tatungshan, virgin broadleaf forest, 23°09'73'' N, 120°42'16'' E, elev. ca. 1,500 m, on somewhat shaded floor of Cunninghamia plantation, Chi-Cheng Liao 1669 (HAST). Kaohsiung Hsien: Taoyuan Hsiang, Paoshan Village, Tengchi Forest Recreation Area, on route from the guesthouse along trail to the peak, elev. 1,560-1,800 m, broadleaf forest dominated by Lauraceae and Fagaceae, Ching-I Peng 14784 (HAST). Pingtung Hsien: Wutai Hsiang, en route from Wutai to Ali, elev. 800-1,200 m, Yang-Kuan Chen 386 (HAST); same loc., elev. 1,000-1,100 m, Ching-I Peng 10225 (HAST).

Distribution. Known from Chiayi Hsien, Kaohsiung Hsien and Pingtung Hsien; around the southern end of the Central Mountain Range in shaded forests and semi shaded forest margins at 860-1,500 m altitude (Figure 7).

Notes. Begonia wutaiana is separable from B. chuyunshanensis in having carpellate flowers with 2 (vs. 3) styles and 2 (vs. 3) ovary locules, one of the major characters for sectional assignment in Begonia (Doorenbos et al., 1998; Shui et al., 2002) (Table 2). Begonia wutaiana is so similar to B. chuyunshanensis in habit and foliage, however, that it could hardly be identified without seeing carpellate flowers. Begonia wutaiana is a member of sect. Platycentrum, whereas B. chuyunshanensis is grouped within sect. Diplocclinium. We have observed both kinds of carpellate flowers on the same individual (Taiwan. Pingtung Hsien, Wutai Hsiang, Province Road # 24, between road markers 42 & 43 km. Semi shaded broadleaf forest margin, 120°43'50'' E, 22°44'17'' N, elev. ca. 1,100 m, Leong 2990, HAST) (Figure 14: G, H), which probably represent a natural hybrid between the two species. The specific epithet is derived from the type locality, Wutai Hsiang, in Pingtung Hsien.

Key to species of Begonia in Taiwan

(Natural hybrids, B. ×buimontana and B. ×taipieiensis, are excluded from this key.)

1. Stems annual, dying back to ground annually; plants tuberous or with moniliform rhizomes; carpellate flowers with 2 or 3 tepals.
2. Plants tuberous, with elongated stolons; flowers of both sexes with 2 tepals................................................. B. ravenii
1. Stems perennial, evergreen; plants rhizomatous or erect; carpellate flowers with 5-6 (10) tepals.

2. Plants with moniliform rhizomes, stolons absent; staminate flowers with 4 tepals; carpellate flowers with 3 tepals.

3. Rhizomes rather short or poorly developed; aerial stems always present.

4. Peduncle less than 2 cm long; tepals of carpellate flowers 6; fruit berry-like, wingless.

5. Aerial stem well-branched, with secondary or even tertiary branches; leaves 7-14 × 2-4 cm; petiole to 4 cm long.

6. Anthers narrowly oblong to oblong-elliptic, 2.9-3.2 mm long.

7. Styles 2; ovary locules 2.

8. Inflorescences arising directly from rhizome.

9. Styles 2; ovary locules 2.

10. Outer tepals and ovary pubescent; leaves markedly pubescent.

11. Young shoots, petiole and lower leaf surface rusty lanate; leaves distinctly palmately lobed.

12. Upper surface of leaves sparsely pubescent to tomentulose; staminate flower buds dropping precociously.

13. Styles 3; ovary locules 2.

14. Leaves broadly ovate to suborbicular; pedicel of carpellate flowers with a pair of bracteoles; anthers 1.9-2.3 mm long; abaxial wing of capsule to 5 mm long.

15. Leaves entire to serrate or denticulate, but not palmately lobed; abaxial wing of capsule rotund to orbicular, 18-26 mm long.

16. Aerial stems to 8 (-15) cm long; leaves subcoriaceous.

17. Styles 3; ovary locules 3.

18. Inflorescences arising from aerial stem.

1. Stems perennial, evergreen; plants rhizomatous or erect; carpellate flowers with 5-6 (10) tepals.

2. Plants with moniliform rhizomes, stolons absent; staminate flowers with 4 tepals; carpellate flowers with 3 tepals.

3. Rhizomes rather short or poorly developed; aerial stems always present.

4. Peduncle less than 2 cm long; tepals of carpellate flowers 6; fruit berry-like, wingless.

5. Aerial stem well-branched, with secondary or even tertiary branches; leaves 7-14 × 2-4 cm; petiole to 4 cm long.

6. Anthers narrowly oblong to oblong-elliptic, 2.9-3.2 mm long.

7. Styles 2; ovary locules 2.

8. Inflorescences arising directly from rhizome.

9. Styles 2; ovary locules 2.

10. Outer tepals and ovary pubescent; leaves markedly pubescent.

11. Young shoots, petiole and lower leaf surface rusty lanate; leaves distinctly palmately lobed.

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15. Leaves entire to serrate or denticulate, but not palmately lobed; abaxial wing of capsule rotund to orbicular, 18-26 mm long.

16. Aerial stems to 8 (-15) cm long; leaves subcoriaceous.

17. Styles 3; ovary locules 3.

18. Inflorescences arising from aerial stem.

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台灣秋海棠屬五新種植物
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本文報導特產於台灣的五個秋海棠新種：九九峰秋海棠（Begonia bouffordii）、坪林秋海棠（Begonia pinglinensis）、霧台秋海棠（Begonia wutaiana）（以上屬於扁果組，sect. Platycentrum）、出雲山秋海棠（Begonia chuyunshanensis）、藤枝秋海棠（Begonia tengchiana）（以上屬於秋海棠組，sect. Diploclinium），並提供線圖與彩色照片以資辨識。台灣目前已知的原生秋海棠共17種，本文另製作檢索表以利鑑別。

關鍵詞：九九峰秋海棠；出雲山秋海棠；坪林秋海棠；藤枝秋海棠；霧台秋海棠；秋海棠科；新種；台灣；植物分類學。