

Two newly recorded species of *Strobilanthes* (Acanthaceae) from China

^{1,2,4}DENG Yun-Fei* ³WANG Hong ³ZHOU Shi-Shun

¹(South China Botanical Garden, the Chinese Academy of Sciences, Guangzhou 510650, China)

²(Kunming Institute of Botany, the Chinese Academy of Sciences, Kunming 650204, China)

³(Xishuangbanna Tropical Botanical Garden, the Chinese Academy of Sciences, Mengla 666303, Yunnan, China)

⁴(Graduate University of Chinese Academy of Sciences, Beijing 100049, China)

Abstract Two newly recorded species of Acanthaceae from China, *Strobilanthes quadrifaria* (Nees) Y. F. Deng and *S. serrata* J. B. Imlay, are described and illustrated. Lectotype of *S. quadrifaria* is designated.

Key words Acanthaceae, *Strobilanthes*, new record, new combination, China.

Strobilanthes Bl. is the second largest genus of the family Acanthaceae distributed in tropical and subtropical regions of Asia. Estimates of the number of species in *Strobilanthes* range from 250 species (Hu, 2002; Carine & Scotland, 2002) to 350 (Mabberley, 1987) or 450 or more (Terao, 1983). Bremekamp (1944) divided *Strobilanthes* and its related genera into over 54 genera arranged in 27 informal groups in his monograph of the subtribe Strobilanthinae. Terao (1983) recognized a broadly circumscribed *Strobilanthes* comprising all species of Strobilanthinae. The results of recent molecular studies (Moylan et al., 2004), statistical analysis (Carine & Scotland, 2002), and pollen and gross morphology investigation (Terao, 1983; Wood, 1994, 1995) demonstrate clearly that it is problematic to adequately diagnose the majority of groups erected by Bremekamp (1944) and others (Hu, 2002; Tsui, 1990; Hsieh & Huang, 1974) when they divided the Strobilanthinae and that a single monophyletic expanded *Strobilanthes* should be recognized (Deng et al., 2006; Moylan et al., 2004; Carine & Scotland, 2002).

In the course of examination of the specimens of Acanthaceae in Herbarium of Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences (HITBC), two species of *Strobilanthes* are found as new record from China and here reported.

1. *Strobilanthes quadrifaria* (Wall. ex Nees) Y. F. Deng, comb. nov.—*Ruellia quadrifaria* Wall. [Cat. 7152. nom. nud.] ex Nees in Wall., Pl. As. Rar. 3: 83. 1832; Nees in DC., Prodr. 147. 1847.—*Hemigraphis quadrifaria* (Wall. ex Nees) T. Anders. in Journ. Linn. Soc., Bot. 9: 463. 1867.—*Sericocalyx quadrifarius* (Wall. ex Nees) Bremek. in Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk., Tweede Sect. 41: 163. 1944. Type: Myanmar. Mt. Taong Dong, Wallich 7152 (lectotype, K-W!, here designated; isolectotype, K!).

四列马蓝 新拟 Fig. 1

Undershrub (0.2–)1–1.5 m high, stems pilose with large-celled hairs. Leaves equal in each pair, petiolate; petioles (0.3–)1.5–4 cm long, pilose; blades 5–11 × 2–6 cm, elliptic to ovate, acute, base attenuate and ± decurrent onto the petiole, margin crenulate-dentate, rather densely pilose with large white hairs on both surfaces and especially on the veins.

Received: 9 December 2006 Accepted: 25 April 2007

Supported by the National Natural Science Foundation of China, Grant Nos. 30370109, 39899400, 30499340, 30670142; the Knowledge Innovation Program of the Chinese Academy of Sciences, Grant Nos. KSCX2-YW-Z-021, KSCX-SW-122; and the Director Foundation of South China Botanical Garden, the Chinese Academy of Sciences, Grant No. 2002-1112.

* Author for correspondence. E-mail: <yfdeng@scbg.ac.cn>.

Inflorescence of shortly pedunculate axillary and terminal spikes densely covered with long, silky, white large-celled hairs, spikes 2–5 cm long, ca. 1 cm wide, very compact; peduncles 0.5–1 cm long. Bracts lanceolate, ca. 2×0.6 cm, pilose with white large-celled hairs; bracteoles ovate, ca. 5×2 mm, pilose with white large-celled hairs especially towards the apex. Calyx 8–10 mm long, silky, with white large-celled hairs, 5-lobed to 1 mm of the base, lobes linear, acuminate, ciliate. Corolla in bud puberulent, in flower purple, 2–2.8 cm long, straight, the tube 2 mm wide at the base, then gradually widened to 6–8 mm, outside glabrous except for the lobes, inside glabrous except for hairs retaining the style, lobes ovate, rounded, 4×4 mm; stamens 4, didynamous, filaments pilose, the longer pair ca. 8 mm long, the shorter pair ca. 4 mm long; anthers included, the thecae oblong, glabrous, 3×1 mm. Style ca. 2 cm long, glabrous except for pilose at the base, ovary glabrous. Capsule not seen.

China. Yunnan (云南): Gengma (耿马), near Nanping (南平), alt. 550 m, 1959-11-20, *Yunda Diaochadui* (云大调查队) A0005 (YUKU); Jinghong (景洪), Naban (那班), Anmalaozhai (安马老寨), near Bianfudong (蝙蝠洞), alt. 640 m, 1988-11-01, *G. D. Tao et al.* (陶国达等) 44675 (HITBC); Menghai (勐海), Daluo (打洛), 1978-10-23, *G. D. Tao et al.* (陶国达等) 19796 (HITBC).

Laos. Oudomxay: Muang Buang, alt. 900 m, 1996-12-12, *H. Wang & B. G. Li* 2882, 2887, 2875 (HITBC).

Habitat: In shaded and moist place in forest. Alt. 550–900 m.

Distribution: China, Laos, Myanmar and Thailand. New to China and Laos.

Strobilanthes quadrifaria (Wall. ex Nees) Y. F. Deng was originally described as *Ruellia quadrifaria* Wall. ex Nees (1832), which was transferred to *Hemigraphis* and *Sericocalyx* by Anderson (1867) and Bremekamp (1944) respectively. The latter two genera are separated from *Strobilanthes* based on the characters of yellow corolla and 4–8-seeded capsule (Bremekamp, 1944; Hu, 2002). In fact, yellow corolla is an insufficient character to delimit the genera in Acanthaceae. Another example is *S. adpressa* J. R. I. Wood, which has yellow or bluish corolla (Chen et al., 2006; Wood, 2003).

2. *Strobilanthes serrata* J. B. Imlay in Bull. Misc. Inform., Kew 1939: 117. 1939, “*serratus*”; J. R. I. Wood et al. in Kew. Bull. 58: 169. 2003. Type: Thailand. Payap: Doi Chiangdao, *Kerr* 6587 (holotype, K!; isotype, BM!). Fig. 2.

Gutzlaffia glandulosa Lace in Bull. Misc. Inform., Kew 1915: 406. 1915, non *Strobilanthes glandulosa* Bl., 1826. Type: Myanmar. Ruby Mines, *Lace* 6019 (holotype, K!; isotype, E).

齿叶马蓝 新拟

Anisophyllous perennial herbs. Stems sulcate, pubescent along the sulcule. Leaves unequal in each pair, petiolate; petioles 2–9 cm long, sparsely expressed pubescent; blades $5-12 \times 4-6$ cm, apex acuminate, base gradually narrowed and then $\pm$ decurrent up to 2 cm onto the petiole, margin coarsely serrate, upper surface glabrous, green variegated with white patches, lower surface glabrous except for pubescent veins, uniformly violet; lateral veins 7–9 pairs, flat above and elevated beneath. Inflorescence of simple or branched pedunculate spikes from the uppermost leaf axils commonly forming a terminal panicle of spikes; peduncles of the panicle 2–10 cm long, subglabrous to pubescent; inflorescence branches densely glandular-pilose; spikes 2–7 cm long, densely glandular-pilose, imbricate; flowers in opposite pairs, clearly separate along the spikes except the very top, 1–2 cm apart below. Floral bracts $3-4 \times 1.5-1.8$ mm, oblong-ovate to oblong-obovate, obtuse, densely glandular-pilose, persistent.

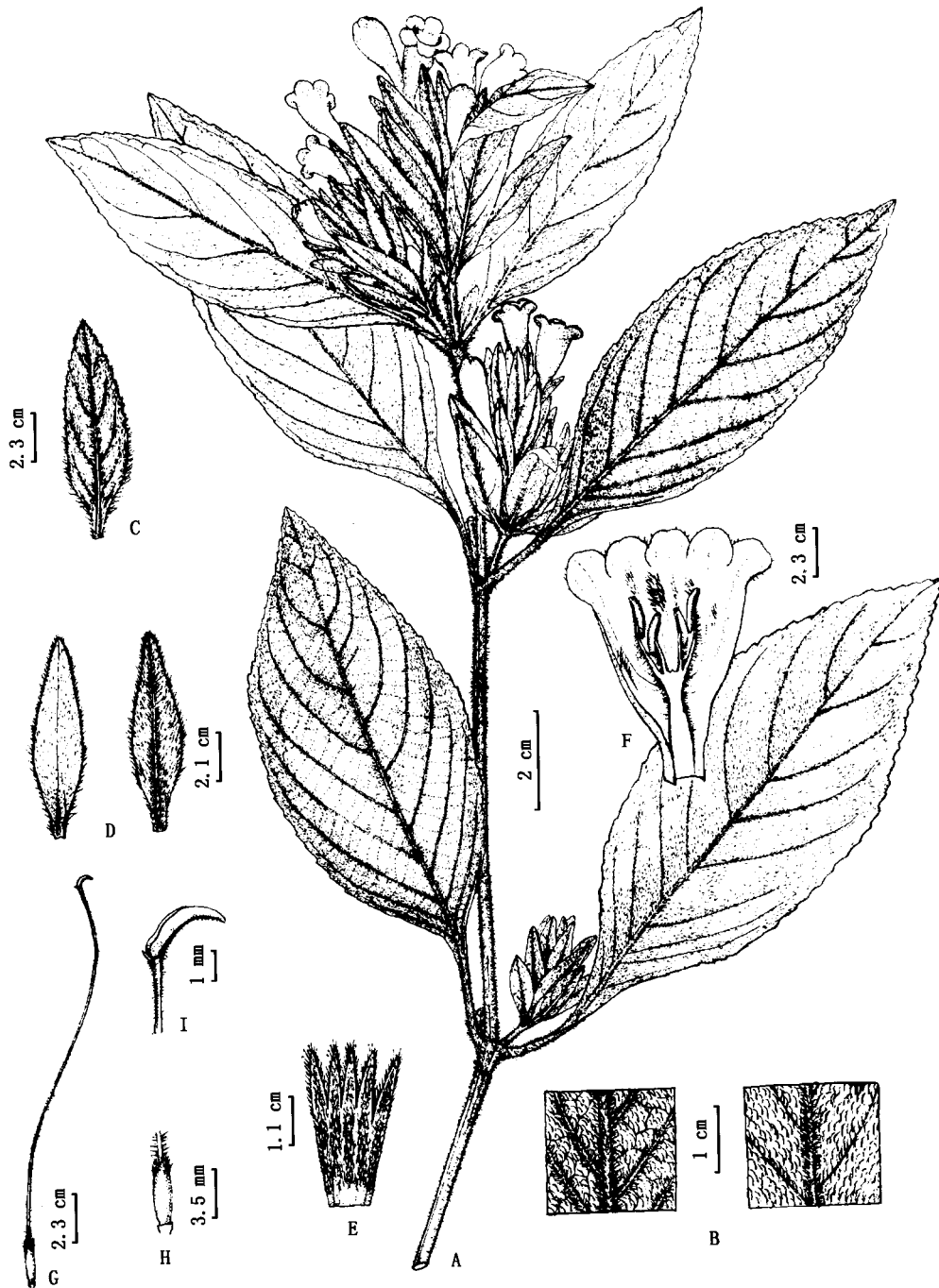


Fig. 1. *Strobilanthes quadrifaria* (Wall. ex Nees) Y. F. Deng. A, inflorescence branch; B, leaves; C, bract; D, bracteoles; E, calyx; F, opened corolla showing stamens; G, ovary and style; H, ovary; I, stigma. Drawn by Y. X. Liu from G. D. Tao et al. 44675.



Fig. 2. *Strobilanthes serrata* J. B. Imlay. A, plant; B, inflorescence; C, opened corolla showing stamens and styles; D, bracts, bracteoles and calyx; E, calyx; F, bracts; G, bracteoles; H, capsule; I, seeds. Drawn by X. L. Wu from H. Wang 7466.

Bracteoles 3–4×1–1.5 mm, oblong to obovate, obtuse, densely glandular-pilose outside, glabrous and densely covered with white clavate cystoliths inside. Calyx 3–5 mm long, subequally 5-lobed to the base, lobes oblong, densely glandular-villose outside, glabrous and densely covered with white clavate cystoliths inside. Corolla 2–2.6 cm long, dirty white, widen from ca. 1 mm at the base to 8 mm at mouth, ventricose from a short basal cylindrical tube for 6–8 mm long, outside sparsely to densely pilose with the large-celled hairs, inside glabrous except for the hairs retaining the style, lobes ca. 3×3 mm, blue, ovate, obtuse. Fertile stamens 2; filaments ca. 4 mm long, glabrous, erect; anthers included, ca. 1.5 mm long, muticous, glabrous. Style ca. 2 cm long, glabrous. Ovary villose. Capsule 5–7 mm long, ca. 2 mm wide, oblong-ellipsoid, silky-pubescent, 4-seeded. Seeds 2 mm long, 2 mm wide, lenticular, pubescent with appressed, mucilaginous hairs.

China. Yunnan (云南): Honghe (红河), Amushan (阿母山), alt. 1600 m, *Y. M. Shui* (税玉民) 4422 (KUN); Mengla (勐腊), Guangnali (广那里), alt. 690 m, in *Parashorea chinensis* forest, 2005-01-10, *H. Wang* (王红) 7466 (HITBC).

Myanmar. Ruby Mines Distr.: Bernardmyo-Mogok, alt. 1950 m, 1912-10-27, *Lace* 6019 (E, K).

Thailand. Chiang Mai: Doi Chiang Dao, alt. 1900 m, 1922-11-06, *Kerr* 6584 (K).

Distribution: Thailand and Myanmar. New record to China.

Habitat: In China, it is found in partly shaded, moist places in evergreen forests; alt. 700–1600 m.

Strobilanthes serrata is similar to *S. himalayana* J. R. I. Wood, *S. tubiflos* (C. B. Clarke) J. R. I. Wood and *S. kachinensis* J. R. I. Wood & J. R. Benn. These four species form a closely related group, which is characterized by the flowers arranging in spikes and forming a terminal panicle, inflorescence densely glandular-pilose, and corolla abruptly ventricose from a short cylindrical base. The identification key to these four species is provided below.

Key to *Strobilanthes serrata* and its allies

1. Fertile stamens 4 *S. himalayana*
1. Fertile stamens 2.
 2. Flower pairs distant along the whole spike except very top and 1–2 cm apart below *S. serrata*
 2. Flower pairs imbricate along the whole spike.
 3. Bracts obovate, emarginate *S. tubiflos*
 3. Bracts oblong to obovate, acute *S. kachinensis*

Acknowledgements We are grateful to Ms. LIU Yun-Xiao (IBSC) and Mr. WU Xi-Lin (KUN) for preparing the line drawings. The first author (Deng) is grateful to John WOOD (FHO), Robert SCOTLAND (FHO), Mark CARINE (BM), and Kaj VOLLESEN (K) for their helps during his visit to the British herbaria.

References

- Anderson T. 1867. An enumeration of the Indian species of Acanthaceae. Journal of the Linnean Society, Botany 9: 425–526.
- Bremekamp C E B. 1944. Materials for a monograph of the Strobilanthinaceae. Verhandelingen der Nederlandsche Akademie van Wetenschappen Afdeling Natuurkunde, Tweede Sectie 41 (1): 1–305.
- Carine M A, Scotland R W. 2002. Classification of Strobilanthinaceae (Acanthaceae): trying to classify the unclassifiable. Taxon 51: 259–279.
- Chen W-H (陈文红), Deng Y-F (邓云飞), Shui Y-M (税玉民). 2006. *Strobilanthes adpressa* J. R. I. Wood, a newly recorded species of Acanthaceae from China. Journal of Tropical and Subtropical Botany (热带亚热带植物学报) 14: 345–346.
- Deng Y F, Wood J R I, Scotland R W. 2006. New and reassessed species of *Strobilanthes* (Acanthaceae) in the

- Flora of China, Botanical Journal of Linnaean Society 150: 369–390.
- Hsieh C F, Huang T C. 1974. The Acanthaceae plants of Taiwan. *Taiwania* 19: 19–57.
- Hu C-C (胡嘉琪). 2002. Acanthaceae. In: *Florae Reipublicae Popularis Sinicae* (中国植物志). Beijing: Science Press. 70: 1–309.
- Mabberley D J. 1987. *The Plant Book*. Cambridge: Cambridge University Press.
- Moylan E C, Bennett J R, Carine M A, Olmstead R G, Scotland R W. 2004. Phylogenetic relationships among *Strobilanthes* s.l. (Acanthaceae): evidence from ITS nrDNA, *trnL*-F cpDNA, and morphology. *American Journal of Botany* 91: 724–735.
- Nees von Esenbeck C G. 1832. Acanthaceae. In: Wallich N ed. *Plantae Asiaticae Rariores*. London. 3: 70–117.
- Terao H. 1983. Taxonomic study of the genus *Strobilanthes* Bl. (Acanthaceae). Generic Delimitation and Infrageneric Classification. Ph.D. Dissertation. Kyoto: Kyoto University.
- Tsui H-P (Cui H-B) (崔鸿宾). 1990. *Materiae ad Floram Acanthaceae Sinicarum* (1). *Acta Botanica Yunnanica* (云南植物研究) 12: 269–278.
- Wood J R I. 1994. Notes relating to the flora of Bhutan: XXIX. Acanthaceae, with special reference to *Strobilanthes*. *Edinburgh Journal of Botany* 51: 175–274.
- Wood J R I. 1995. Notes on *Strobilanthes* (Acanthaceae) for the flora of Ceylon. *Kew Bulletin* 50: 1–24.
- Wood J R I. 2003. The 2-lipped species of *Strobilanthes* (Acanthaceae). *Kew Bulletin* 58: 83–129.

中国爵床科马蓝属二新记录种

^{1,2,4}邓云飞* ³王 洪 ³周仕顺

¹(中国科学院华南植物园 广州 510650)

²(中国科学院昆明植物研究所 昆明 650204)

³(中国科学院西双版纳热带植物园 云南勐腊 666303)

⁴(中国科学院研究生院 北京 100049)

摘要 报道中国爵床科Acanthaceae马蓝属*Strobilanthes* Bl.两个新记录种——四列马蓝*Strobilanthes quadrifaria* (Wall. ex Nees) Y. F. Deng和齿叶马蓝*S. serrata* Imlay, 并绘制了形态图。指定了四列马蓝的后选模式。

关键词 爵床科; 马蓝属; 新记录; 新组合; 中国