A New Combination in *Mackaya* (Acanthaceae), with Lectotypification for *Mackaya tappingensis*

Author(s): Deng Yunfei and Wu Zhengyi (Wu Chengyih)
Published By: Missouri Botanical Garden
DOI:
A New Combination in Mackaya (Acanthaceae), with Lectotypification for Mackaya tapeningensis

Deng Yunfei

Key Laboratory of Plant Resources Conservation and Sustainable Utilization, South China Botanical Garden, Chinese Academy of Sciences, Guangzhou, 510650, People’s Republic of China; Key Laboratory of Biodiversity and Biogeography, Kunming Institute of Botany, Chinese Academy of Sciences, Kunming, 650204, People’s Republic of China; and Graduate School of the Chinese Academy of Sciences, Beijing, 100039, People’s Republic of China. yfdeng@scbg.ac.cn

Wu Zhengyi (Wu Chengyi)

Key Laboratory of Biodiversity and Biogeography, Kunming Institute of Botany, Chinese Academy of Sciences, Kunming, 650204, People’s Republic of China

ABSTRACT. Comparative survey of morphological characters shows that Eranthemum tapeningense W. W. Smith is better treated in Mackaya Harvey. Consequently, a new combination, M. tapeningensis (W. W. Smith) Y. F. Deng & C. Y. Wu, is proposed, and its lectotype is designated. The species is distributed in China and Burma (Myanmar).

Key words: Acanthaceae, Eranthemum, Mackaya, Pseuderanthemum.

While revising the family Acanthaceae for the forthcoming volume 19 of Flora of China, the position of Pseuderanthemum tapeningense (W. W. Smith) C. Y. Wu & H. S. Lo (Anonymous, 1975) was drawn to our attention because it differs from other members of Pseuderanthemum Radlkøfer in its secund flowers in terminal racemes and its campanulate corolla without a long slender cylindrical tube. The species was originally described as Eranthemum tapeningense W. W. Smith (Smith, 1918) from three collections from Burma (Myanmar), i.e., Forrest 9655, 9484, and 12149. In the original description, Smith (1918) indicated that this taxon was related to E. indicum (Nees) C. B. Clarke and E. lateriflorum C. B. Clarke. Eranthemum indicum, originally described in Thyrsacanthus Nees as T. indicus Nees, was transferred to Mackaya by Ensermu et al. (1992), and E. lateriflorum to Gymnostachyum Nees by Hansen (1985a). It is reasonable, then, to re-evaluate the position of E. tapeningense.

Wu (1984) included Eranthemum tapeningense in his Index Florae Yunnanensis, cited the three Forrest collections listed above, and believed these collections to be from Longchuan xian of Yunnan Province, China. Simultaneously, he mentioned that the species might belong in Odontonemella Lindau, but did not actually transfer the species from Eranthemum L. to Odontonemella. Hu (2002) included this species under Pseuderanthemum in her treatment of the family Acanthaceae for Flora Reipublicae Popularis Sinicae and indicated that it is distributed in the boundary areas between China and Burma (Myanmar).

Odontonemella was established by Lindau (1893), characterized by a ventricose corolla, two fertile stamens, two staminodes, and spangopollen, and was typified by O. indica Lindau. Odontonemella indica was originally described in Eranthemum as E. indicum (Clarke, 1885) and was transferred to Mackaya by Ensermu et al. (1992). Lindau (1895) added a new member to the genus, O. leptostachya Lindau based on Leptostachya wallchii Nees, which is the lectotype of Leptostachya Nees (Hansen, 1985b; Deng & Xia, 2005) and does not fit the original description of Odontonemella given by Lindau (1895). Recent studies placed Odontonemella in synonymy with Mackaya (Brummitt, 1992; Ensermu et al., 1992; Mabberley, 1997; Scotland & Volessen, 2000).

In October 2004, the first author had the opportunity to check the material identified as Pseuderanthemum tapeningense when he visited the herbaria of Kew and Edinburgh. In the Edinburgh herbarium, the first author saw all three collections cited by Smith, of which G. Forrest 9655 was dissected by Smith. This collection clearly shows that the species has two fertile stamens and two staminodes. It is not Pseuderanthemum because of its campanulate corolla without a long cylindrical tube. It also differs from Eranthemum in the corolla shape, which is long and cylindrical in Eranthemum and campanulate in Mackaya, and in the pollen grains (Lindau, 1893; Hu, 2002).
After comparison with related genera, we concluded that the species belongs in Mackaya rather than in Pseuderanthemum or Eranthemum. Our recent molecular data (unpublished) also indicate that Mackaya forms a sister group with Asystasia Blume and forms paraphyletic groups with Pseuderanthemum. A new combination, *M. tapingensis* (W. W. Smith) Y. F. Deng & C. Y. Wu, is therefore necessary.

The genus Mackaya (Harvey, 1859) is characterized by its second flowers, campanulate corolla, two fertile stamens, and two staminodes. Kanjilal and Das (1939) incorrectly included Asystasia in Mackaya and transferred three Assam species of Asystasia to Mackaya, i.e., *M. atroviridis* (T. Anderson) Das, *M. macrocarpa* (Nees) Das, and *M. neesiana* (Wallich) Das. These three species are quite different from Mackaya in having four stamens and we prefer to place them in Asystasia rather than Mackaya. In recent studies, however, Mackaya has been treated separately from Asystasia (Ensermu et al., 1992; Mabberley, 1997; Scotland & Vollesen, 2000; Wood, 2001). It was placed in subtribe Asystasieae (Benth., 1876; Clarke, 1885; Lindau, 1895), tribe Odontonemae (Lindau, 1895), or subtribe Justiciinae (Scotland & Vollesen, 2000) together with *Dicentranthera* T. Anderson, *Asystasiella* Lindau, *Glossochilus* Nees, and *Salpinmium* T. J. Edwards.

*Mackaya* is a small genus of three species with a disjunct range: *M. bella* Harvey is restricted to South Africa (Phillips, 1951), but *M. indica* (Nees) Ensermu occurs in India, Bhutan, Nepal, and Burma (Myanmar). *Mackaya tapingensis*, proposed herein, is found in southwestern Yunnan, China, and adjacent Burma (Myanmar).

Pollen morphology is one of the important characters defining the generic boundary in the family Acanthaceae (Lindau, 1893, 1895; Bremekamp, 1944). Pollen of *Mackaya tapingensis* is oblate-spheroidal, 3-colporate, and ellipsoidal with a perforate exine (polar axis [P] = 50.2 [46–53] μm; equatorial diameter [E] = 44.9 [42–48] μm) (Fig. 1). It is quite different from pollen of *Eranthera* species but is similar to that of *Pseuderanthemum* species and other *Mackaya* species (Raj, 1961; Daniel, 1993, 1998; Scotland & Vollesen, 2000; Hu et al., 2005a, b). It differs from pollen of the other two species of *Mackaya* only in size (Ensermu et al., 1992).


![Figure 1. Pollen grain of Mackaya tapingensis (W. W. Smith) Y. F. Deng & C. Y. Wu from G. Forrest 9655 (IBSC).](image)


**Distribution and habitat.** The species is distributed in southwestern China (Yunnan) and Burma (Myanmar). It grows in shady habitat under forest at elevations of 600–1800 m.

**Relationships.** *Mackaya tapingensis* is similar to *M. indica*, but differs in its lanceolate (vs. elliptic) leaves and glabrous (vs. puberulent or glabrescent) calyx that is basally connate to 1/3–1/2 (vs. less than 1/5) (Smith, 1918; Hu, 2002).

**Additional specimens examined.** BURMA (MYANMAR). Shan: Valley of the Taping, G. Forrest 9484 (E); Valley of the Taping, 2000 ft., G. Forrest 12149 (E). CHINA: Yunnan: Gengma Xian, 2250 m, 7 Jan. 2006, Deng Yunfei 18452 (IBSC); Lu-se (now Luxi Shi), 1750 m, 3 Mar. 1934, H. T. Tsai 56406 (IBSC, KUN); Lu-Hsi Hsien (now Luxi Shi), 1750 m, 9 Feb. 1934, H. T. Tsai 56686 (IBSC, KUN, SZ); Yingjiang Xian, 900 m, 26 Oct. 1986, Lin Qin 770760 (KUN); Yingjiang Xian, 1800 m, 19 Jan. 1989, Sun Hang 1530 (KUN); Yingjiang Xian, 1450 m, Dec. 1981, Tao Guoda 12791 (HITBC); Yingjiang Xian, 1500 m, 3 Nov. 1974, Tao Guoda 13128 (HITBC, KUN); Yingjiang to Ruili, autumn 1952, R. C. Ching 50112 (KUN, SWFC); Zhenkang Xian, 1130 m, 14 Feb. 1959, Zhu Taiping 641 (KUN); western Yunnan, autumn 1952, R. C. Ching 50633 (KUN, SWFC).

**Acknowledgments.** This work was supported in part by the National Natural Science Foundation of China (no. 30370109, 39899400, 30499340), the Knowledge Innovation Program of the Chinese Academy of Sciences (grant no. KSCX2-YW-Z-021, KSCX-SW-122), the Director Foundation of South China Botanical Garden, the Chinese Academy of Sciences (no. 2002-1112), and a grant of Prof. Wu Zheng-yi’s Outstanding Prize from Yunnan Province.
China (2001). The first author thanks John Wood, Robert Scotland (FHO), and Kaj Vollesen (K) for their help during his visit to British herbaria and the curators of E, HITBC, IBSC, K, KUN, SWFC, and SZ for their help during his visits to their herbaria. We are grateful to Hao Zhenping (IBSC) for her assistance with the pollen studies.

Literature Cited


