



Morphological comparisons of two pairs of easily confused species in subtribe Goodyerinae (Cranichideae; Orchidaceae)

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Abstract

Two yellow-lipped species of *Zeuxine* viz. *Z. flava* and *Z. sakagutii* and another pair of species of *Rhomboda*, *R. moulmeinensis* and *R. fanjingensis*, are so similar that they are frequently misidentified. In this paper, based on field observations, study of type specimens and protologues, illustrations and comparisons of these two pairs of confused species are provided to enable identification.

Key words: Chinese orchids, *Rhomboda*, *Zeuxine*

Introduction

Zeuxine Lindley (1826: 18) and *Rhomboda* Lindley (1857: 181) belong to subtribe Goodyerinae (Orchidoideae; Cranichideae; Pridgeon *et al.* 2003a, 2003b). *Zeuxine* comprises about 80 species distributed in tropical and southern Africa through tropical and subtropical Asia, to New Guinea, northeastern Australia, and the southwestern Pacific islands; with 14 species occurring in China, two of them are endemic (Chen *et al.* 2009b). Flowers of *Zeuxine* species are nearly always white or green, but a few are yellow. In China, there are two species with yellow-lipped flowers: *Z. flava* (Wallich ex Lindley 1840b: 487) Trimen (1885: 90) and *Z. sakagutii* Tuyama (1936: 26). These two species are easily confused, more often, *Z. sakagutii* has been neglected (Lang *et al.* 1999b) or misidentified as *Z. flava* (Chen *et al.* 2009b, Barretto *et al.* 2011b, Wu *et al.* 2011, Huang *et al.* 2012). Indeed, these two species differ in leaves, sepals and petals, pedicel and ovary, anther cap, viscidium and pollinia (Table 1, Fig. 1).

Rhomboda was once included in *Anoectochilus* Blume (1825: 411) because of their similar floral structure, and this treatment was followed by many orchidologists (King & Panting 1898, Tang & Wang 1951, Seidenfaden 1978a, Lang *et al.* 1999a). However, the genus was reinstated by Ormerod (1995) based on features such as its medial bicarinate callus within the hypochile of the lip, two large stalked calli, flanges on the exterior surfaces of the hypochile and the presence of two large wings on the column. Pridgeon *et al.* (2003a), Chen *et al.* (2009a) and Barretto *et al.* (2011a) also supported Ormerod's treatment. *Rhomboda*, with about 25 species, is distributed from the Himalayas and northeastern India, across southern and southeastern China to southern Japan and throughout Southeast Asia to New Guinea and the southwestern Pacific islands; only four species have been recorded in China (Chen *et al.* 2009a).

Rhomboda moulmeinensis (Parish & Reichenbach 1874: 142) Ormerod and *R. fanjingensis* Ormerod are two easily misidentified species. *Rhomboda moulmeinensis* was originally described as *Etaeria moulmeinensis* by Parish & Reichenbach based on Parish's collection (Parish 237). *Rhomboda fanjingensis* was described by Ormerod (1995) based on the specimen collected in China, northeastern Guizhou, Mt. Fanjing (*Sino-British Plant Expedition*, no. 0197), which was considered to be conspecific with *R. moulmeinensis* (Lang *et al.* 1999a). According to our fieldwork, observations of the type specimens and the study of protologues, in China *R. moulmeinensis* only occurs in Yunnan Province, and the number of individuals is small. However, *R. fanjingensis* is widely spread in the southern to southwestern portions. Thus, most records (Jin *et al.* 2009, Xu *et al.* 2010, Zhao *et al.* 2013) of *R. moulmeinensis* in China are *R. fanjingensis*. Descriptions of these two species in *Flora Reipublicae Popularis Sinicea* (Lang *et al.* 1999a)

County, Panqi River above its confluence with the Heiwan River, SE side of the Fanjing Shan mountain range, growing in shade on forest floor, 550 m, 24 August 1986, *Bartholomew et al.* 301 (PE!), Xinjia Village, 1 August 2013, *Tian et al.* 808 (HSNU!); Hunan: Sangzhi County, Mt. Tianping, Huangliantai, under forests, 27 August 1988, *Beijing Expedition Plant Team* 4159 (PE!), Tong Dao Dong Autonomous County, Linkou Town, Shibi Village, under forests on slope, 400 m, 5 September 1995, *Chen* 01 (PE!), Jianghua Yao Autonomous County, Mt. Dalong, dense forests along valleys, 450 m, 25 November 1987, *Zhao* 764687 (PE!); Sichuan: Emeishan City, Heilong River, 900 m, under forests on slope, 26 August 1964, *Guan, Wang & Li* 1807 (PE!), Emeishan City, Mt. Emei 2 kilometers from stalagmite ditch to the horn stone, 700 m, under broad-leaved forests along rivers, 7 September 1963, *Xing & Lang* 1376 (PE00200437!, PE00200438!), Emeishan City, near Mt. Emei Hong Chungping, 1100 m, under forests, 14 July 1971, *236 Sichuan task team* 2003 (PE00200441!), Emeishan City, Ximen Village, 18 October 1952, *Fang, Jiang & Zhang* 33305 (PE!); Yunnan: Mt. Gaoligong, 16 July 2011, *Hu* b26 (HSNU!), Mar-li-po, Kwan-ka-o, under dense woods, thick humus, 1000 m, 14 February 1940, *Wang* 86822 (PE!).

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