Pedicularis wanghongiae (Orobanchaceae), a new species from Yunnan, southwestern China

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Abstract

Pedicularis wanghongiae M.L.Liu & W.B.Yu, a new species from Gaoligong Mountains in Yunnan Province, southwestern China, is described and illustrated. This new species was found growing in the wet meadow at the top of the mountains near Dulongjiang Township and Cikai Township. Pedicularis wanghongiae is morphologically similar to P. praeruptorum Bonati, but differs from the latter in having an upward bent galea, shorter petioles and only two pubescent filaments. In addition, stems of P. wanghongiae are densely glandular pubescent, and its leaves are abaxially white pubescent along the veins. Furthermore, the pollen grain of P. wanghongiae is bisyncolpate with microfoveolate exine ornamentation. Molecular phylogenetic analyses using four DNA loci (ITS, matK, rbcL and trnL-F) support the delimitation of this new species. Morphologically, this new species should be placed in Pedicularis series Paucifoliatae Prain according to Tsoong’s classification. However, series Paucifoliatae was shown to be paraphyletic based on molecular data. A key to species in series Paucifoliatae is presented, and relationships among these species discussed.

Key words: Gaoligong Mountains, Pedicularis, Morphology, Taxonomy

Introduction

The hemiparasitic genus Pedicularis Linnaeus (1753: 607), consisting of around 600–800 species throughout the world, mainly distributed in arctic-alpine regions in the northern hemisphere (Li 1951; Yang et al. 1998; Mill 2001; Wu et al. 2003; Wang & Li 2005). Two-thirds of the more than 350 species of Pedicularis in China are confined to the Himalayan-Hengduan Mountains region, a center for species diversity and endemism of this genus (Hong 1983; Yang et al. 1998; Wang et al. 2009; Yu et al. 2008, 2010).

Mainly focusing on Chinese species, Li (1948, 1949) and Tsoong (1963) proposed different classification systems of Pedicularis. In Li’s system, 282 species were classed into 65 series, 18 sections and three greges (groups), whereas in Tsoong’s system, 329 species were classed into 112 series and 13 greges (groups).

Series Paucifoliatae Prain (1890: 80) is characterized by having rigid stems, few cauline leaves, and the corolla with a long and slender beak (Yang et al. 1998). The delimitation of this series is inconsistent between Li’s and Tsoong’s systems (Table 1). Li (1949) placed five species in this series, while Tsoong (1963) added three species from series Asplenifoliae Prain (1890: 79), reduced P. aphyllocaulis Handel-Mazzetti (1925: 239) as a synonym of P. praeruptorum Bonati (1921: 126), and transferred P. tsangchanensis Franchet ex Maximowicz (1888: 571) to series Filiculae Li (1949: 9). In addition, Li (1949) established series Asplenifoliae based on the absence of cauleine leaves and less leaf segments, which is very close to series Paucifoliatae. Li’s series Asplenifoliae includes nine species, while Tsoong (1963) retained P. mayana Handel-Mazzetti (1936: 858) and P. yui Li (1949: 102), and a newly described species P. tenacifolia Tsoong (1963: 416) was placed in this series (Table 1).

During a field expedition in Gaoligong Mountains (southwestern China) in 2007, Lian-Ming Gao and Zhi-Rong Zhang, from Kunming Institute of Botany, Chinese Academy of Sciences, collected an undescribed species (Figs. 1, 2A). Recently, we conducted extensive field investigations on Pedicularis in the Gaoligong Mountains. Through