



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

MIN-LU LIU^{1,3} & WEN-BIN YU^{2*}

¹Key Laboratory of Plant Diversity and Biogeography of East Asia, Kunming Institute of Botany, Chinese Academy of Sciences, Kunming 650201, China

²Center for Integrative Conservation, Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, Mengla 666303, China

³Graduate University of Chinese Academy of Sciences, Beijing 100049, China

*Author for correspondence. E-mail: yuwenbin@xtbg.ac.cn

Abstract

Pedicularis wanhongiae 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 wanhongiae* 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. wanhongiae* are densely glandular pubescent, and its leaves are abaxially white pubescent along the veins. Furthermore, the pollen grain of *P. wanhongiae* 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 *Paucifoliae* Prain according to Tsoong's classification. However, series *Paucifoliae* was shown to be paraphyletic based on molecular data. A key to species in series *Paucifoliae* 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 *Paucifoliae* 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 cauline leaves and less leaf segments, which is very close to series *Paucifoliae*. 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