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New Taxa and Nomenclatural Actions

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A new synonym of *Pedicularis cyathophylla* (Orobanchaceae)

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Pedicularis cyathophylla Franchet in Bull. Soc. Bot. France 47: 25. 1900.

Type: **China. Sichuan:** Kangding, Zheduoshan Mountains (Ta-tsién-kou & Tche-to-chan), *J. A. Soulié 218* (holotype, P00160827, P!).

Pedicularis xiangchengensis H. P. Yang in Acta Phytotax. Sin. 28: 137. f. 3: 3. 1990, syn. nov.

Type: **China. Sichuan:** Xiangcheng, Rewu, on mountain slopes, alt. 4100–4300 m, 1981-08-06, *Qing-Zang Exped. 3829* (holotype, 00032964, PE!; isotypes, KUN!, CDBI!).

In *Flora of China*, *Pedicularis* ser. *Cyathophyllae* H. L. Li contains two species, *P. cyathophylla* Franchet and *P. xiangchengensis* H. P. Yang (Yang et al., 1998). The former species was described by Franchet (1900) based on a single collection, *J. A. Soulié 218* (P); the latter was published by Yang (1990), also from only one collection, *Qing-Zang Expedition 3829* (PE). Yang (1990) proposed that *P. xiangchengensis* was closely related to *P. cyathophylla*, from which it mainly differs by having crested corolla galea, emarginate middle lobe of lower corolla lip, and 3–5 calyx lobes (also see Yang et al., 1998).

Based on field observations, examinations of the type specimens of *P. cyathophylla* and *P. xiangchengensis*, and further comparisons of additional specimens, we found that *P. cyathophylla* possessed a conspicuous crested galea, especially of the fresh flowers in the field; the emarginate middle lobe of lower corolla lip was indistinct in the type of *P. xiangchengensis* and fresh flowers of *P. cyathophylla*; and the number of calyx lobes was inconstant from 2 to 5, small or large, margin entire or leaf-like (see S3-1. Fig. 1; S3-2. Fig. 2). It was clear that the macro-morphological characters of *P. xiangchengensis* resembled those of *P. cyathophylla*. The pollen morphology of both species was also consistent (Yu & Wang, 2008), and DNA barcoding of four candidate DNA loci (*rbcl*, *matK*, *trnH-psbA*, and internal transcribed spacer) showed that a sample collected at the type location of *P. xiangchengensis* can not be discriminated from four samples of *P. cyathophylla* from other sites (Yu et al., 2011). Therefore, we suggest that *P. xiangchengensis* should be treated as a new specific synonym of *P. cyathophylla* herein.

Additional specimens examined:

China. Qinghai: Nangqen, *T. N. Ho et al. 2410* (KUN), 2435 (KUN); Yushu, *T. N. Ho et al. 2555* (KUN). **Sichuan:** Dajin, *Xin Li 7798* (PE); Daofu, *Wen-Pei Fang et al. 10965* (PE), *Wen-Bin Yu et al. LIDZ1180* (KUN); Fubian, *Fa-Zan Wang 21435* (KUN, PE); Heishui, *Xin Li 73073* (KUN, PE); Litang, *J. K. Ward 4423* (E); Litang, *Wen-Bin Yu et al. 111* (KUN), *LIDZ1204* (KUN); Maerkang, *Xin Li 716104* (KUN, PE); Muli, *J. R. Rock 17825* (E), 216636 (E), 23756 (E), *T. T. Yu 6445* (KUN, PE), 6447 (KUN), 6574 (KUN); Qianning, *Nan-Shui-Bei-Diao Exped. 9680* (KUN, PE); Xiangcheng, *Qing-Zang Exped. 3699* (KUN, PE), 4891 (KUN), *D. E. Boufford et al. 30686* (KUN), 28478 (KUN), *Wen-Bin Yu et al. HW10215* (KUN); Xiaojin, *Mian Zhou 94* (PE), *Xiu-Sai Zhang & You-Rao Ren 6177* (PE); Yajiang, *Henduan Mts. Exped. 4974* (PE), *Kai-Yong Lang et al. 2877* (KUN, PE), *Zhong-Tian Guan 42-0129* (PE), *Nan-Shui-Bei-Diao Exped. 2636* (PE), *Wen-Bin Yu et al. LIDZ1198* (KUN). **Yunnan:** Zhongdian, *Zhongdian Exped. 1423* (KUN), *D. E. Boufford et al. 29113* (KUN), *Xue Yang & Wen-Li Li 1081* (KUN), *Hong Wang et al. 03-042* (KUN), *Wen-Bin Yu et al. 53* (KUN), *LIDZ1268* (KUN).

Online supplementary data:

S3-1. Fig. 1. Photographs of type specimens. **A, B,** *Pedicularis cyathophylla* Franchet. **A,** Holotype of *P. cyathophylla* Franchet (*Soulié 218*, P). **B,** Flowers, crested galea showed by an arrow. **C, D,** *P. xiangchengensis* H. P. Yang. **C,** An isotype of *P. xiangchengensis* H. P. Yang (*Qing-Zang Exped. 3829*, KUN). **D,** Flower, entire middle lobe of lower corolla lip indicated by arrow. (Scale bar: 1 cm.)

S3-2. Fig. 2. Photographs of *Pedicularis cyathophylla* Franchet (photographed at Daxue Mountain of Shangri-La, in NW Yunnan, China). **A,** Habitat. **B,** Flowers, crested corolla galea shown by an arrow. **C, D,** Corolla lower lips, entire or emarginate middle lobe shown by arrows. **E,** Flower and calyx, number of calyx lobes is shown. **F,** Bumblebee pollinating on flower. (Scale bar equivalents. A, 5 cm; B–F, 1 cm.)

S3-3. References

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