

## REVISION OF *MECONOPSIS INTEGRIFOLIA* VAR. *UNIFLORA* (PAPAVERACEAE)

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**Abstract.** *Meconopsis integrifolia* var. *uniflora* is raised to the rank of species with the name *M. uniflora*. An emended diagnosis, distribution information, description, habitat details, and explanatory photographs are provided.

**Keywords:** *Meconopsis integrifolia*, *Meconopsis pseudointegrifolia*, Haba Xueshan, Baima Xueshan, Xianggelila, Dêqên, Yunnan

Fruiting specimens of *Meconopsis integrifolia* (Maxim.) Franch. var. *uniflora* C. Y. Wu & H. Chuang were first collected on 25 August 1937, by K. M. Feng (冯国楸) on Haba Xueshan (哈巴雪山), Xianggelila Xian (香格里拉县; “Zhongdian Xian”), northwestern Yunnan (Fig. 1), then again on 7 September 1962 by the Zhongdian Team (中甸队) at the same locality as the first collection at 4350–4450 m elevation. On Haba Xueshan, the vertical zone above 4350 m comprises an area of calcareous rocky slopes around the highest peak of the mountain. Although no flowers were available, C. Y. Wu (吴征镒) and H. Chuang (庄璇) described the plant as a new variety (var. *uniflora*) of *M. integrifolia* in *Flora Yunnanica* (云南植物志), Vol. 2, p. 28 (1979).

In his monumental monograph of the genus, Grey-Wilson (2014) divided the conglomerate species *Meconopsis integrifolia* in the concept of G. Taylor (1934) into four species: *M. integrifolia* (Maxim.) Franch., *M. pseudointegrifolia* Prain, *M. sulphurea* Grey-Wilson, and *M. lijiangensis* (Grey-Wilson) Grey-Wilson. Grey-Wilson (2014) treated *M. integrifolia* var. *uniflora* as a synonym of *M. pseudointegrifolia*.

In 2017, B. Xu (徐波), one of the present authors, observed a dwarf yellow poppy in flower (12 July) and in fruit (5 October) on the calcareous scree of Baima Xueshan (白马雪山), Dêqên Xian (德钦县), northwestern Yunnan, at 4897 m elevation. Although the locality is some 120 km northwest of Haba Xueshan, our collaborative studies have determined the plants to be identical to *Meconopsis integrifolia* var. *uniflora* on Haba Xueshan. They share such features in common as the subscapose inflorescence with solitary flowers and shape and hairiness of the fruits. The ellipsoid fruiting capsules are rounded at both ends, reminiscent of the shape of a kiwi fruit. Persistent reddish brown hairs cover the fruiting capsules, which have short styles and relatively large stigmas that remain at maturity. Through the newly obtained information on the flowers from living plants, photographs, and specimens, we determined that *M. integrifolia* var. *uniflora* should be recognized as a distinct species from the related *M. pseudointegrifolia* in several features, as described below.

***Meconopsis uniflora*** (C. Y. Wu & H. Chuang) T. Yoshida, B. Xu & D. E. Boufford, *stat. nov.* Fig. 1–6.

Basionym: *Meconopsis integrifolia* (Maxim.) Franch. var. *uniflora* C. Y. Wu & H. Chuang, *Flora Yunnanica* 2: 27 (1979). TYPE: CHINA. NW Yunnan: Zhongdian [Xianggelila] Xian, Haba Xueshan, 25 Aug. 1937, K. M. Feng 2195 (Holotype: KUN; Isotype: A).

*Meconopsis uniflora* differs from the related *M. pseudointegrifolia* Prain in the usually solitary flowers (usually 3- to 6-flowered in the latter), pale lemon yellow petals (yellow in the latter), abaxial surface of the petals covered with dark hairs except on the periphery (usually not hairy in the latter), stamens usually spreading together (radiating in the latter), style to 4 mm long (to 7 mm long in the latter), stigma to 11 mm across (to 7 mm across in the latter) and stigma lobes ca. 2 mm wide (ca. 1 mm wide in the latter), midvein prominently grooved on upper leaf surface (not prominently grooved in the latter) and broadened at the apex (scarcely broadened at the apex in the latter).

*Herbs*, monocarpic, 10–25 cm tall in flower, to 35 cm in fruit. *Taproot* elongate, 4–8 cm long, 5–7 mm across, abruptly enlarged at crown. *Most parts of plant* with dense soft spreading hairs; hairs to 8 mm long. *Stem* (below pseudo-whorl of bracts) simple, 1–6 cm long, 6–9 mm across in flower, to 10 cm long, 12 mm across in fruit. *Leaves* crowded near base, somewhat thick; petiole broadly linear, 2–4 cm long, 2–3 mm wide; lamina obovate, elliptic, oblong, or oblanceolate, 2–6 × 0.7–1.5 cm, base attenuate, margin entire, apex obtuse or acute, both surfaces with 3 visible parallel veins running from base toward apex, with dense pale greenish yellow hairs. *Inflorescence* subscapose, with solitary flowers, rarely with additional small flower; pseudo-whorled bracts 4–7, sessile or short petiolate, lamina linear-oblong, 2.5–4 cm long, 3–8 mm wide. *Flowers* half nodding or laterally facing, rarely upright, cup- or parabola-shaped, 5–8 cm across. *Pedicel* (scape) 7–15 cm long, 4–7 mm across in flower, to 22 cm long, 8 mm across in fruit, abruptly thickened at apex, with dense brownish hairs. *Calyx* unknown. *Petals* 10–13, pale lemon yellow, obovate

Field research was supported by the National Natural Science Foundation of China (Grant No. 31460047). We are grateful to Jiansheng Peng (彭建生), photographer and director of Shangri-la Travel Co., Ltd., who accompanied Xu Bo on his visit to Baima Xueshan, for allowing us access to his photographs.

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FIGURES 1–3. 1, Holotype specimen of *Meconopsis integrifolia* var. *uniflora*, K. M. Feng 2195 (KUN); 2, *Meconopsis uniflora* with other herbs such as *Saussurea leucoma* Diels and mosses. China, NW Yunnan, Dêqên Xian, Baima Xueshan, 4897 m. Photograph by J. Peng, 12 July 2017; 3, *Meconopsis uniflora*. China, NW Yunnan, Dêqên Xian, Baima Xueshan, 4897 m. Photograph by J. Peng, 12 July 2017.





FIGURE 4. *Meconopsis uniflora*. Inner filaments of flower incurved with anthers adhering to stigma. China, NW Yunnan, Dêqên Xian, Baima Xueshan, 4897 m. Photograph by J. Peng, 12 July 2017.





FIGURE 5. *Meconopsis uniflora*. Abaxial surface of petals covered with dark hairs except along the margins. China, NW Yunnan, Dêqên Xian, Baima Xueshan, 4897 m. Photograph by B. Xu, 12 July 2017.

or narrowly obovate, 3.5–6 × 1.5–2.5 cm, undulate toward apex, margin entire or irregularly denticulate except near base, somewhat rolled inward except near base, abaxial surface with dark hairs except on periphery. *Stamens* usually spreading together; filaments similar to petals in color, filiform; anthers oblong; thecae orange. *Ovary* ellipsoid, with dense ascending brownish hairs; style 2–4 mm long, 3–4 mm across, ridged, hairy except near apex; stigma similar to petals in color, dome-shaped, with depression or hole in center, 7–11 mm across, lobes (rays) 7–10, linear-oblong with broadened apex, ca. 2 mm wide, upper surface grooved along midvein and raised on periphery, with dense short hairs especially on periphery. *Capsule* ellipsoid, 2.5–5 × 1.2–2.2 cm, base rounded, apex rounded or truncate, with dense persistent reddish brown hairs.

**Distribution:** China, northwestern Yunnan: Xianggelila Xian and Dêqên Xian, 4350–5000 m elevation.

**Habitat:** unstable southwest-facing, rocky limestone slopes and scree near ridge, often intermixed with reddish mudstone; rooting in thin sandy earth among rocks.

**Additional specimens examined:** CHINA. NW Yunnan: Xianggelila Xian, Nikeze (尼可则), alpine gravelly slope, 4350–4450 m, 7 Sept. 1962, *Zhongdian Team* 1890 (KUN);

Haba Xueshan, 4400–4700 m, 3 July 1987 (in flower), *Z. D. Fang* (方震东) 35 (KUN). Dêqên Xian, Baima Xueshan, alpine screes, 4897 m, 28°29'00"N, 99°00'29"E, 5 Oct. 2017, *B. Xu Tsui*-1031 (KUN).

*Meconopsis uniflora* is a rare endemic of unstable, calcareous rocky slopes in the higher alpine zone and limited to northwestern Yunnan. We consider it to be one of the most endangered species in the genus.

*Meconopsis pseudointegrifolia* usually grows with other herbs and grasses on stable, stony meadows, whereas *M. uniflora* is usually on unstable, calcareous scree and on rocky slopes near the ridge where there are few plants and few pollinators to visit the flowers. Although the filaments of *M. uniflora* are spreading at anthesis, some of the inner filaments are sometimes incurved with the anthers adhering to the stigma, as seen in Fig. 4, supposedly resulting in self pollination.

The lower photo on page 186 of Grey-Wilson's (2014) monograph, taken by Joe Atkin on Baima Shan (Baima Xueshan), 5000 m, is not *Meconopsis pseudointegrifolia* as indicated in the caption, but *M. uniflora*.

An earlier *Meconopsis uniflora* Gumbel., *Garden* 22: 90 in obs. (1882), is a *nomen nudum*.





FIGURE 6. Fruiting plant of *Meconopsis uniflora* with an additional developing fruit. China, NW Yunnan, Dêqên Xian, Baima Xueshan, 4897 m. Photograph by B. Xu, 5 October 2017.

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