

Two New Species of *Meconopsis* (*Papaveraceae*) from Southern Biluo Xueshan, Yunnan, China

Hideaki OHBA^a, Toshio YOSHIDA^b and Hang SUN^c

^aDepartment of Botany, University Museum, University of Tokyo,
7-3-1, Hongo, Bunkyo-ku, Tokyo, 113-0033 JAPAN;

E-mail: ohba@um.u-tokyo.ac.jp

■■■■■ ■■■■■ ■■■■■ ■■■■■ Sanbu-gun, Chiba, 299-■■■■■ JAPAN;

^cKunming Institute of Botany, Chinese Academy of Sciences,
Kunming, Yunnan, CHINA

(Received on May 2, 2009)

Two new species of *Meconopsis* (*Papaveraceae*), collected by Toshio Yoshida, from Mts. Biluo Xueshan in NW Yunnan along a narrow belt between two valleys Mekong (Lancang Jiang) and Salween (Nu Jiang), are described. *Meconopsis bijiangensis* is similar to *M. racemosa* Maxim., *M. rudis* (Prain) Prain and *M. speciosa* Prain, but apparently differs from them in having large, cylindrically ellipsoid capsules 2.5–3.8 cm long, with 3 or 4 grooves and dense spreading spine-like hairs the base of which is blackish and raised. *Meconopsis castanea* H. Ohba, T. Yoshida & Hang Sun resembles *M. bijiangensis* H. Ohba, T. Yoshida & Hang Sun and *M. racemosa* Maxim., but is distinguished from them by the maroon petals, the larger capsules, and the spine-like hairs without raised blackish base.

Key words: *Meconopsis bijiangensis*, *Meconopsis castanea*, new species, Sino-Himalayan flora, taxon, taxonomy.

The Biluo Xueshan mountain range, a branch chain of the Hengduan Mountains, is located along a narrow belt between the Lancang Jiang (upper Mekong) and Nu Jiang (upper Salween), and runs in a north-south direction in northwestern Yunnan. The name Biluo Xueshan is often used as equivalent to the Mekong-Salween Divide, which includes Meili Xueshan (Meili Snow Mountain), and lies in the northern part of the same axis. Recently, the second author, Toshio Yoshida, while photographing in the range, discovered two unknown species of *Meconopsis*. As a result of comparison with other species, we concluded that they represent undescribed

species distinguished well from similar species classified in section *Robustae* subsection *Grandes* series *Aculeatae* (Taylor 1934, Ohba 2006, Ohba et al. 2006).

Meconopsis bijiangensis H. Ohba, T. Yoshida & Hang Sun, sp. nov. [Figs. 1, 2]

Species haec ab *Meconopside racemosa* Maxim., *M. rudi* (Prain) Prain et *M. speciosa* Prain differt capsulis majoribus (2.5–3.8 cm longis), cylindricis 3 vel 4 canaliculatis, pilis hispidis patentibus basi nigris et prominentibus dense ornatis.

Type: CHINA, NW Yunnan, Bijiang, around the head of Pi-he Valley, Biluo Xueshan,

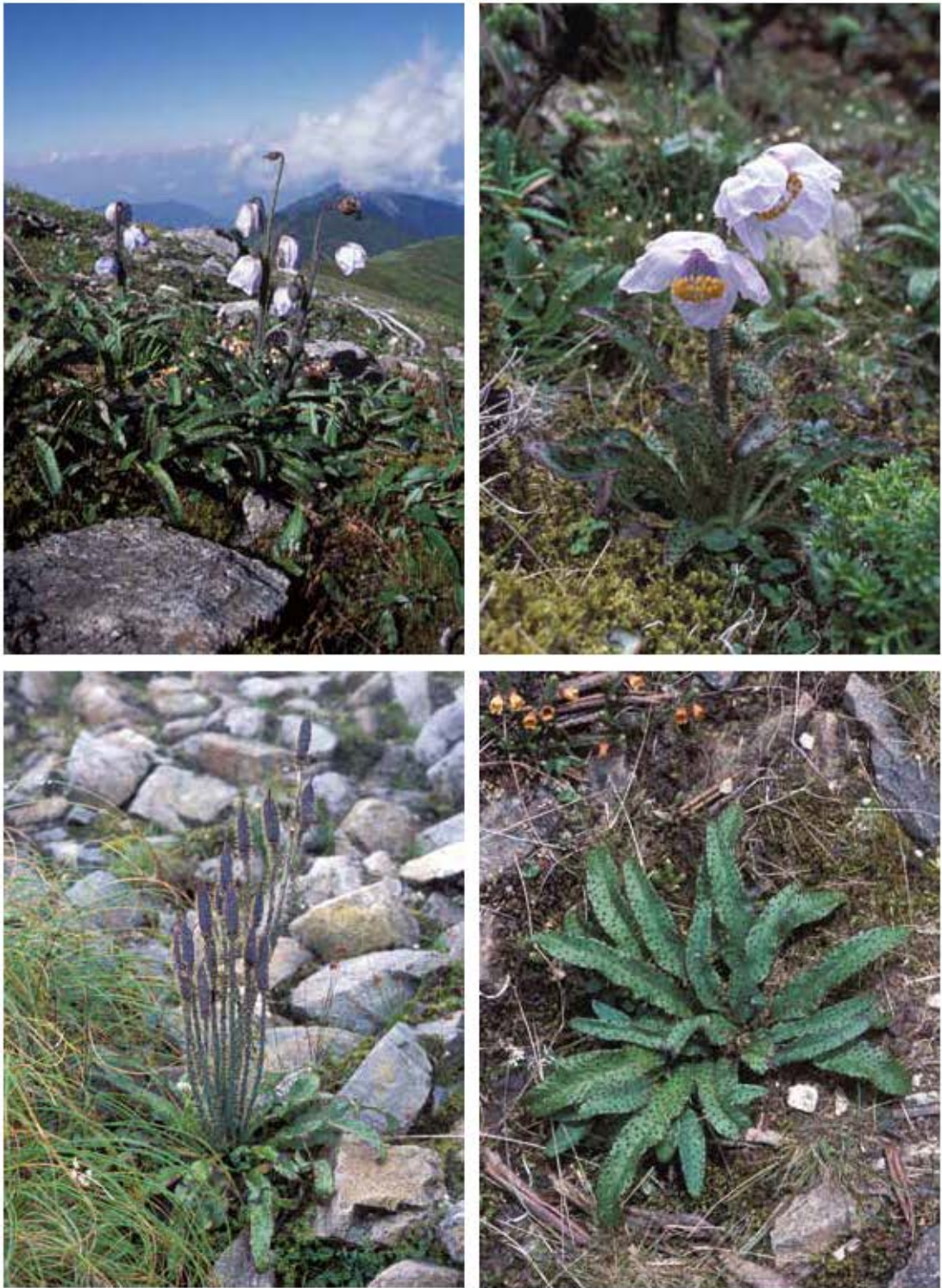


Fig. 1. *Meconopsis bijiangensis* H. Ohba, T. Yoshida & H. Sun (China, NW Yunnan, Bijiang, around the head of Pi-he Valley, Biluo Xueshan, 3700–4000 m, 8 July 2008).



Fig. 2. Isotype of *Meconopsis bijiangensis* H. Ohba, T. Yoshida & H. Sun (T. Yoshida K1, TI).

3700–4000 m, 8 July 2008, T. Yoshida K1 (KUN–holo, iso; TI–iso).

Herbs, monocarpic, 15–40 cm tall. Taproot flexible, dauciform or fusiform, to 15 cm long or more, 5–10 mm across near ground level. Stem, leaves, and pedicels hispid. Hairs pale brown to amber, often tinged purple, less than 3.5 mm long, ca. 0.3 mm wide near base; base dark purplish, thickened. Rosulate leaves absent at flowering time. Cauline leaves arising on basal third of stem (some buried underground), petiolate; petiole linear, 2–3 cm long, ca 3 mm wide; blade narrowly lanceolate or narrowly linear-lanceolate, 5–8 cm long, 0.7–1.4 cm wide, base long attenuate, margin irregularly sinuate and undulate, rarely lobulate, apex acute. Bracts indistinguishable from cauline leaves, petiolate, blade linear-lanceolate to almost linear, 4–5 cm long, 0.5–0.7 cm wide, base attenuate, margin irregularly sinuate and undulate, apex acute or rarely obtuse, both surfaces sparsely hispid, upper surface yellowish green and shiny, lower surface paler. Inflorescence a simple raceme occupying more than one thirds of stem, ebracteate except for lowermost 3–5 flowers. Flowers 7–12, semiglobose, usually nodding. Pedicel ascending to suberect, 2–5 cm long at flowering, to 10 cm long at fruiting, conspicuously hispid. Flower buds rounded to ellipsoid, hispid. Petals 4, rarely 5 or 6, pale mauve, orbicular to widely ovate or elliptic, 2–3.5 cm long and wide, apex widely rounded, base widely cuneate to truncate, margin minutely undulate. Stamens numerous; filaments filiform, 9–10 mm long, blackishblue, darker than petals; anthers ca. 1 mm long, orange before dehiscence. Ovary ellipsoid, densely hispid-hairy, hairs ascending. Style 2.5–5 mm long, tinged with amber after flowering. Stigma globose to ellipsoid, 1–2 mm long, 1–1.5 mm wide. Capsules cylindrical, 2.5–3.8 cm long, 0.9–1.3 wide, with 3 or 4 grooves, bluish green before maturity, hispid, hairs spreading, dark purple. Seeds reniform, 2–2.3 mm long; testa black, longitudinally wrinkled or

vaguely pitted.

The epithet derives from the county name, Bijiang, of the type locality. Bijiang literally means ‘blue river’ in Chinese.

Distr. NW Yunnan: Bijiang County, Biluo Xueshan between [26°37'24"N, 99°00'48"E] and [26°31'10"N, 99°00'35"E]; Gaoligong Shan; 3700–4000 m.

Meconopsis bijiangensis often grows gregariously on west facing (Nu Jiang side), gentle, stony slopes near the ridge in thick, dry, peaty soils derived from half decomposed mosses and other plants, and sometimes among dwarf shrubs of *Rhododendron*, just above the steep head of valleys that are influenced by ascending foggy winds from the southwest summer monsoon. Flowering late June to early August.

Other specimens examined. Biluo Xueshan, Wu Su-gong [S. K. Wu] 8832 (KUN); loc. cit., Nujiang Team 0848 (KUN); Gaoligong Shan, Nujiang Team 1135 (KUN).

Wu Su-gong 8832 was collected on 12 September 1964 with mature fruits 3.5 cm long. Nujiang Team 0848 was collected on 16 June 1978 before flowering with the flower buds held near the base of the stem, Nujiang Team 1135 was collected on 14 July 1978 with flowers.

Meconopsis bijiangensis resembles *M. racemosa*, *M. rudis* and *M. speciosa*. Those species generally grow in stony or sandy soil, or among rocks, and not among the thick accumulations of dead plants in which *M. bijiangensis* is found. They have smaller, more or less ellipsoid capsules; the capsules of *M. racemosa* and *M. rudis* are 1–2 cm long, whereas those of *M. speciosa* are 1.5–2.5 cm long. The characteristics of the capsules and seeds of *M. bijiangensis* approach those of *M. lancifolia* (Franch.) Franch. ex Prain, which has capsules oblong to oblong-ellipsoid and 2–3 cm long.

The petals of *M. racemosa*, *M. rudis* and *M. lancifolia* are blue or purplish blue versus pale blue to pale mauve in *M. bijiangensis* and *M. speciosa*. *Meconopsis speciosa* is unique in



Fig. 3. *Meconopsis castanea* H. Ohba, T. Yoshida & H. Sun (China, NW Yunnan, Fugong, S of Laowu Shan on Biluo Xueshan, 3650–3850 m, 17 July 2008).



Fig. 4. Isotype of *Meconopsis castanea* H. Ohba, T. Yoshida & H. Sun (T. Yoshida K3, TI).

having regularly and uniformly pinnatifid leaves and usually grows on calcareous stony slopes.

Meconopsis castanea H. Ohba, T. Yoshida & Hang Sun, sp. nov. [Figs. 3, 4]

Meconopsis bijiangensis H. Ohba, T. Yoshida & Hang Sun et *M. racemosae* Maxim. primo adspectu similiori, vene differt petalis castaneis, capsulis 2.0–2.5 cm (non 2.5–3.8 nec 1–2 cm) longis, ab hac basi pilarum spiniformium haudo nigri-prominenscenti.

Type: CHINA, NW Yunnan, Fugong, S of Laowu Shan on Biluo Xueshan, 3650–3850 m, 17 July 2008, T. Yoshida K3 (KUN–holo, iso; TI–iso).

Herbs, monocarpic 20–40 cm tall at flowering, to 50 cm or more at fruiting, hispid; hairs 3–5 mm long, pale brown or reddish brown, base without blackish spots. Roots-dauciform or fusiform, 10–25 cm long, 5–10 mm across near ground level. Stem moderately to densely spreading-hispid. Rosulate leaves absent at flowering time. Cauline leaves arising from basal third of stem; petiole of lowest leaves linear, buried underground, 3–5 cm long, 0.3–0.4 cm wide; distal leaves sessile or shortly petiolate (petiole less than 0.5 cm long), blade narrowly lanceolate or oblanceolate, linear (ob)lanceolate, 5–12 cm long, 0.5–2 cm wide, apex obtuse or acute, base attenuate margin irregularly sinuate or undulate; both surfaces moderately hispid, hairs erect to ascending, upper surface green, lower surface somewhat paler. Inflorescence a simple raceme occupying more than two thirds of stem. Flowers 6–10, saucer or cup shaped, usually half nodding. Pedicel 2.5–7 cm long at flowering, to 15 cm long at fruiting, conspicuously hispid, hairs spreading, ascending to suberect. Flower buds mostly rounded, hispid. Petals (4–)5–9, maroon or sometimes dark red, orbicular, ovate, elliptic or obovate, 2.5–3.5 cm long and wide, margin entire or minutely toothed apically, apex sometimes recurved, widely rounded. Stamens numerous, filaments filiform, 1–1.8 cm long,

darker than petals; anthers ca 2 mm long, orange before dehiscence. Ovary ellipsoid, densely hispid, hairs ascending. Style 3–6 mm long after flowering. Stigma capitate, 1.5–2.5 mm wide. Capsules obovoid, ellipsoid or cylindrical-ellipsoid, 2–2.5 cm long, densely hispid, hairs spreading.

Distr. NW Yunnan: N of Fugong County, W side of Biluo Xueshan with some extension to E side near the ridge, between [26°55'35"N, 98°57'56"E] and [26°56'11"N, 98°58'58"E], 3650–4000 m.

Meconopsis castanea grows on steep rocky slopes, rooting deeply in well decomposed blackish soil among large granite boulders that are partly covered with mosses. Flowering late June to July.

Except for flower color, *M. castanea* appears intermediate between *M. bijiangensis* and *M. racemosa*. The flower color of *M. castanea* observed by Yoshida is consistent throughout the population. No species of *Meconopsis* belonging to Series *Aculeatae* Prain, except for *M. castanea*, has been observed in the northern part of Fugong County in Biluo Xueshan.

- Revised key to the species in Series *Aculeatae*
- 1a. Leaves rosulate; except for *M. lancifolia* cauline leaves absent 2
 - 1b. Leaves cauline; rosulate leaves present or absent 13
 - 2a. Flowers in a raceme 3
 - 2b. Flowers solitary on stem 4
 - 3a. Flowers only on distal part of stem; capsules slenderly cylindrical; styles unclear
..... *M. forrestii* Prain
 - 3b. Flowers throughout stem; capsules narrowly ovoid; styles distinct
..... *M. lancifolia* (Franch.) Franch. ex Prain
 - 4a. Root dauciform 5
 - 4b. Root slender, when thickened not dauciform 8
 - 5a. Base of filament enlarged, linear 6
 - 5b. Base of filament filiform 7

- 6a. Flowers more than 2, when solitary plants less than 25 cm tall
..... *M. henricii* Bur. & Franch. 16
- 6b. Flower solitary; plants 25 to 35 cm tall
..... *M. pylonomma* Farrer 16a. Pedicels usually less than 1 cm long, spreading; leaves yellowish green
..... *M. prattii* (Prain) Prain 16b. Pedicels 2.5–7 cm, upper part usually curved downward; leaves not yellowish ...
..... 17
- 7a. Leaves pinnatifid to pinnatisect, basal lobes often pinnatifid; petals 1–1.5 cm long
..... *M. concinna* Prain 17a. Hairs echinate or spine-like, length variable with many short ones, longer ones more than 5 mm long; leaves oblanceolate; petals blue or purplish blue; capsules 1–2 cm long *M. racemosa* Maxim. 17b. Hairs hispid, nearly equal in length, less than 3.5 mm long; leaves narrowly (ob) lanceolate or linear (ob) lanceolate; petals maroon or dark red; capsules 2–2.5 cm long
..... *M. castanea* H. Ohba, T. Yoshida & H. Sun
- 7b. Leaves undulate; petals ca 3 cm long
..... *M. wumungensis* K. M. Feng 18a. Leaves entire but undulate; hairs hispid, mostly hyaline; petals blue
..... *M. prainana* Kingdon-Ward
- 8a. Leaves glabrous or sparsely hispid or pilose 9
..... 18b. Leaves sinuate to pinnatifid; hairs seldom hyaline 19
- 8b. Leaves conspicuous hispid or spinose 11
..... 19a. Leaves pinnatifid to pinnatifid 20
- 9a. Capsules linear ellipsoid; petals 4
..... *M. venusta* Prain 19b. Leaves sinuate 21
- 9b. Capsules obovoid; petals 4 or 5–10 10
..... 20a. Styles 1 cm long; hairs of ovaries dark yellow-brown [W Himalaya]
..... *M. aculeata* Royle
- 10a. Capsules narrowly obovoid, erect, ca 3 cm long; petals 4–10
..... *M. pseudovenusta* G. Taylor 20b. Styles 2–4 mm long; ovaries globose to ovoid, hairs red-brown, dense
..... 21a. Flowers a panicle; plants to 1 m tall [Kashmir only]
..... *M. latifolia* (Prain) Prain
- 10b. Capsules broadly obovoid or pear-shaped, bent, 1.5–2 cm long; petals usually 4
..... *M. bella* Prain 21b. Flowers a raceme or solitary; plants 10–50 cm tall 22
- 11a. Plants with stiff spine-like hairs; ovary obconical; styles 5–7 mm long
..... *M. horridula* Hook. f. & Thomson 22a. Styles 6 mm long; capsules 4–5 cm long; apex of cauline leaves rounded; base of hispid yellowish brown not blackish
..... *M. sinuata* Prain
- 11b. Plants hispid or hairs echinate; ovary ellipsoid; styles 0.5–4 mm long 12
..... 22b. Styles 2–5 mm long; capsules 2.5–3.8 cm long; apex of cauline leaves acute; base of hispid blackish purple
..... *M. bjiangensis* H. Ohba, T. Yoshida & H. Sun
- 12a. Stem at flowering 15–30 cm tall; blade of leaves 12–17 cm long, entire or irregularly pinnate
..... *M. impedita* Prain
- 12b. Stem at flowering around 15 cm tall; blade 5 cm long, pinnatifid
..... *M. neglecta* G. Taylor
- 13a. Petals yellow; plants glabrous or rarely with sparse pilose or hispid hairs
..... *M. georgei* G. Taylor
- 13b. Petals blue, red-purple, red, or brownish; plants with hispid hairs 14
- 14a. Petals 5 to 8, not 4 15
- 14b. Petals almost all 4 18
- 15a. Blade of leaves rather coriaceous, bluish green, widely elliptic, base of hairs blackish purple, warty *M. rudis* (Prain) Prain
- 15b. Blade herbaceous, without bluish shade, elliptic to oblong or (ob) lanceolate to narrowly (ob) lanceolate, base of hispid hairs blackish purple or not, often warty ...
..... 16

We are indebted to Dr. David E. Boufford, the Harvard University Herbaria, for encouraging us in studies in Sino-Himalayan botany and for reading the manuscript.

This work was partly supported by a Grant-in-Aid for Scientific Research (A) from the Japan Society for the Promotion of Science, No. 18255004 (to HO).

大場秀章^a, 吉田外司夫^b, 孫航^c: 中国雲南省碧羅雪山南部で発見された *Meconopsis* (ケシ科) の2新種

吉田外司夫は中国雲南省碧羅雪山南部植物相の写真撮影調査を行い、メコノプシス属 *Meconopsis* (ケシ科) の2新種を発見した。その一つ *Meconopsis bijiangensis* H. Ohba, T. Yoshida & H. Sun は、ヒマラヤの青いケシとして知られる *M. horridula* Hook. f. & Thomson とそれに近縁な *M. racemosa* Maxim., *M. rudis* (Prain) Prain, *M. speciosa* Prain に似る。しかし、いずれの種からも長さ2.5–3.8cm になる円柱形の大きな蒴果をもつこと

- Reference**
- Ohba H. 2006. *Meconopsis*, Himalaya-no-Aoi-Keshi. Yama-Kei Publishers, Co. Ltd., Tokyo (in Japanese with Latin names).
- Ohba H, Akiyama S and Wu S. K. 2006. Recent collections of the Sino-Himalayan *Meconopsis* (*Papaveraceae*). *J. Jpn. Bot.* **81**: 289–297.
- Taylor G. 1934. An Account of the Genus *Meconopsis*. New Flora and Silva Ltd., London.

や、基部が黒色の開出剛毛をもつことで区別できる。他の1種, *M. castanea* H. Ohba, T. Yoshida & H. Sun は上記の新種や *M. racemosa* に似るが、栗色または暗赤色の花弁をもつことが特徴的である。蒴果は *M. bijiangensis* よりは短く、長さ2–2.5 cm で、*M. racemosa* の1–2 cm よりは長い。

^a東京大学総合研究博物館,
^b千葉県山武郡 [redacted],
^c中国科学院昆明植物研究所)