

中国毛茛科翠雀属的分类学研究(三): 拟澜沧翠雀花、磨顶山翠雀花和粗距蓝翠雀花的名实订正

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摘要: 通过标本室和野外观察,发现根据云南西北部德钦标本描述的拟澜沧翠雀花(*Delphinium pseudothibeticum* W. T. Wang & M. J. Warnock)与同样根据德钦标本描述的短角萼翠雀花(*D. ceratophorum* Franch. var. *brevicorniculatum* W. T. Wang)属于同一植物,故将前者处理为后者的异名;而根据德钦标本描述的磨顶山(“磨顶”应为德钦县羊拉乡茂顶,故“磨顶山”实应为“茂顶山”)翠雀花(*D. motingshanicum* W. T. Wang & M. J. Warnock)和粗距蓝翠雀花(*D. caeruleum* Jacq. ex Camb. var. *crassicalcaratum* W. T. Wang & M. J. Warnock)均与云南西北部颇为常见的宽距翠雀花(*D. beesianum* W. W. Smith)属于同一植物(磨顶山翠雀花为宽距翠雀花的高大个体),故将磨顶山翠雀花和粗距蓝翠雀花均处理为宽距翠雀花的异名。

关键词: 毛茛科; 翠雀属; 分类学

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Taxonomic Studies on the Genus *Delphinium* (Ranunculaceae) from China (III): The Identities of *D. pseudothibeticum*, *D. motingshanicum* and *D. caeruleum* var. *crassicalcaratum*

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Abstract: Both herbarium and field observations have shown that *Delphinium pseudothibeticum* W. T. Wang & M. J. Warnock described from Mo-ting (= Mao-ding) Shan, Deqen, northwestern Yunnan, China, is identical with *D. ceratophorum* Franch. var. *brevicorniculatum* W. T. Wang, and that both *D. motingshanicum* W. T. Wang & M. J. Warnock and *D. caeruleum* Jacq. ex Camb. var. *crassicalcaratum* W. T. Wang & M. J. Warnock, also described from Mo-ting Shan, are identical with *D. beesianum* W. W. Smith (*D. motingshanicum* is no more than a gigantic form of *D. beesianum*). *Delphinium ceratophorum* var. *brevicorniculatum* is currently known only from Deqen, while *D. beesianum* is a very common species in northwestern Yunnan. *Delphinium pseudothibeticum*, *D. motingshanicum* and *D. caeruleum* var. *crassicalcaratum* are all synonymized.

Key words: *Delphinium*; Ranunculaceae; Taxonomy

In 1996, when checking specimens of *Delphinium* L. (Ranunculaceae) at the United States National Herbarium, Smithsonian Institution (US), Professor

Wen-Tsai Wang considered the sheet J. F. Rock 22852 from Mo-ting Shan, Atuntze (= Deqen), northwestern Yunnan, China, to be a mixed collection of three different

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undescribed taxa. As a result, in 1997, he and his co-author for the account of *Delphinium* of the *Flora of China*, Dr. Warnock, described them respectively as *D. motingshanicum* W. T. Wang & M. J. Warnock (Rock 22852A; Fig. 1: A), *D. pseudothibeticum* W. T. Wang & M. J. Warnock (Rock 22852B; Fig. 2: A), and *D. caeruleum* Jacq. ex Camb. var. *crassicalcaratum* W. T. Wang & M. J. Warnock (Rock 22852C; Fig. 3: A)^[1].

In fact, Munz^[2] had previously noticed the mixed nature of the sheet in US and of another two duplicates, one (Fig. 2: B) in the Herbarium of the New York Botanical Garden (NY), and the other (Fig. 2: C) in the Herbarium of the University of California (UC). The left part on the NY sheet (Fig. 2: B) conforms to J. F. Rock 22852B, while the right part conforms to J. F. Rock 22852C. The upper left part on the UC sheet is obviously the detached terminal inflorescence of J. F. Rock 22852A (Fig. 1: A), and the remaining parts conform to J. F. Rock 22852B. Munz cited the NY, UC and US sheets, in part, under *Delphinium hamatum* Franch. (undoubtedly he referred to only the parts conforming to J. F. Rock 22852B). To make the matter more complicated, he had also cited J. F. Rock 22852 under both *D. beesianum* W. W. Smith^[3] and *D. ceratophorum* Franch.^[4] (a species closely similar to or even conspecific with *D. hamatum*; see below); regrettably he did not specify the herbarium in which the sheets were conserved. It is to be noted that Dr. E. D. Merrill, a renowned expert of tropical Asian plants, named on the determinavit slips all the three mixed sheets just mentioned as *D. caeruleum* Jacq. ex Camb., a species closely similar to *D. beesianum* (see below).

In our extensive survey of herbarium specimens of *Delphinium*, we found another two sheets of J. F. Rock 22852. The one (Fig. 4: A) in the Herbarium of the Kunming Institute of Botany, Chinese Academy of Sciences (KUN) is not mixed and conforms to J. F. Rock 22852B, while the one (Fig. 4: B) in the Herbarium of the Royal Botanical Gardens, Kew (K) is mixed, including J. F. Rock 22852B and 22852C^[5], but was annotated by Munz as *D. ceratophorum* only. Through the courtesy of Dr. D. E. Boufford, another

duplicate of J. F. Rock 22852 was found in the Gray Herbarium of Harvard University (GH). This sheet (Fig. 2: D) is not mixed, conforming to J. F. Rock 22852B, and was identified as *D. ceratophorum* by Munz. We were unable to trace any sheet of J. F. Rock 22852 annotated as *D. beesianum* by Munz or other taxonomists.

With the K, KUN, NY, UC and US sheets of J. F. Rock 22852 and a large series of other pertinent specimens from northwestern Yunnan before us, together with our field observations in northwestern Yunnan, we have been eventually able to clear up the confusion in which the collection of J. F. Rock 22852 has been involved and to determine the identities of *Delphinium pseudothibeticum*, *D. motingshanicum* and *D. caeruleum* var. *crassicalcaratum*. The results are presented below.

1 Identity of *Delphinium pseudothibeticum*

In the protologue of *Delphinium pseudothibeticum*, Wang and Warnock^[3] stated that it is closely related to *D. thibeticum* Finet & Gagnep., but differs in the stem spreading white hispid (vs. retrosely puberulent, often glabrescent), the leaves densely white strigose abaxially (vs. subglabrous), the inflorescence rachis and the pedicel sparsely hispidulous (vs. densely retrosely puberulent), and the ovaries densely pubescent (vs. only distally sparsely pubescent).

The characters given for *Delphinium pseudothibeticum*, however, are actually more reminiscent of *D. ceratophorum* Franch. var. *brevicorniculatum* W. T. Wang, which was described by Wang^[6] himself in 1962 on the basis of four collections also from Deqen, namely T. T. Yu 9309 (PE), 9356 (PE), 9598 (PE), 9832 (PE) (Fig. 5), with T. T. Yu 9598 being designated as the holotype. After careful comparison of the type material of *D. pseudothibeticum* with that of *D. ceratophorum* var. *brevicorniculatum*, we are convinced that the two taxa are identical. In *D. thibeticum*, the leaves are divided to the base, the stem, the inflorescence rachis and the pedicel are all densely retrosely puberulent, and the bracteoles subtend the flower, and

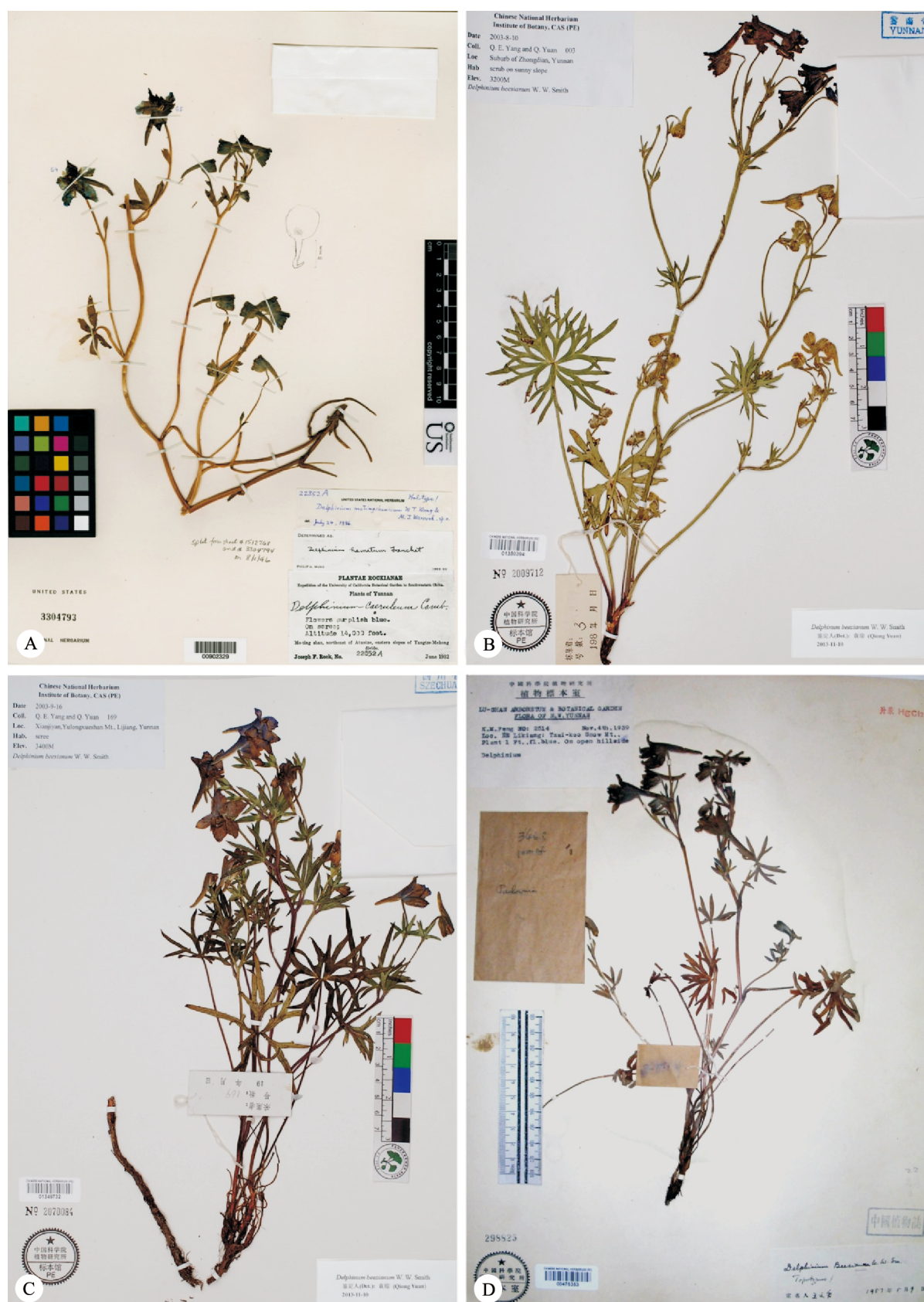


Fig. 1 Specimens of *Delphinium beesianum* W. W. Smith. A: J. F. Rock 22852A (holotype of *D. motingshanicum* W. T. Wang & M. J. Warnock, US), Deqen, Yunnan, China; B: Q. E. Yang & Q. Yuan 3 (PE), Zhongdian, Yunnan, China; C: Q. E. Yang & Q. Yuan 169 (PE), Lijiang, Yunnan, China; D: K. M. Feng 2514 (PE), Lijiang, Yunnan, China.

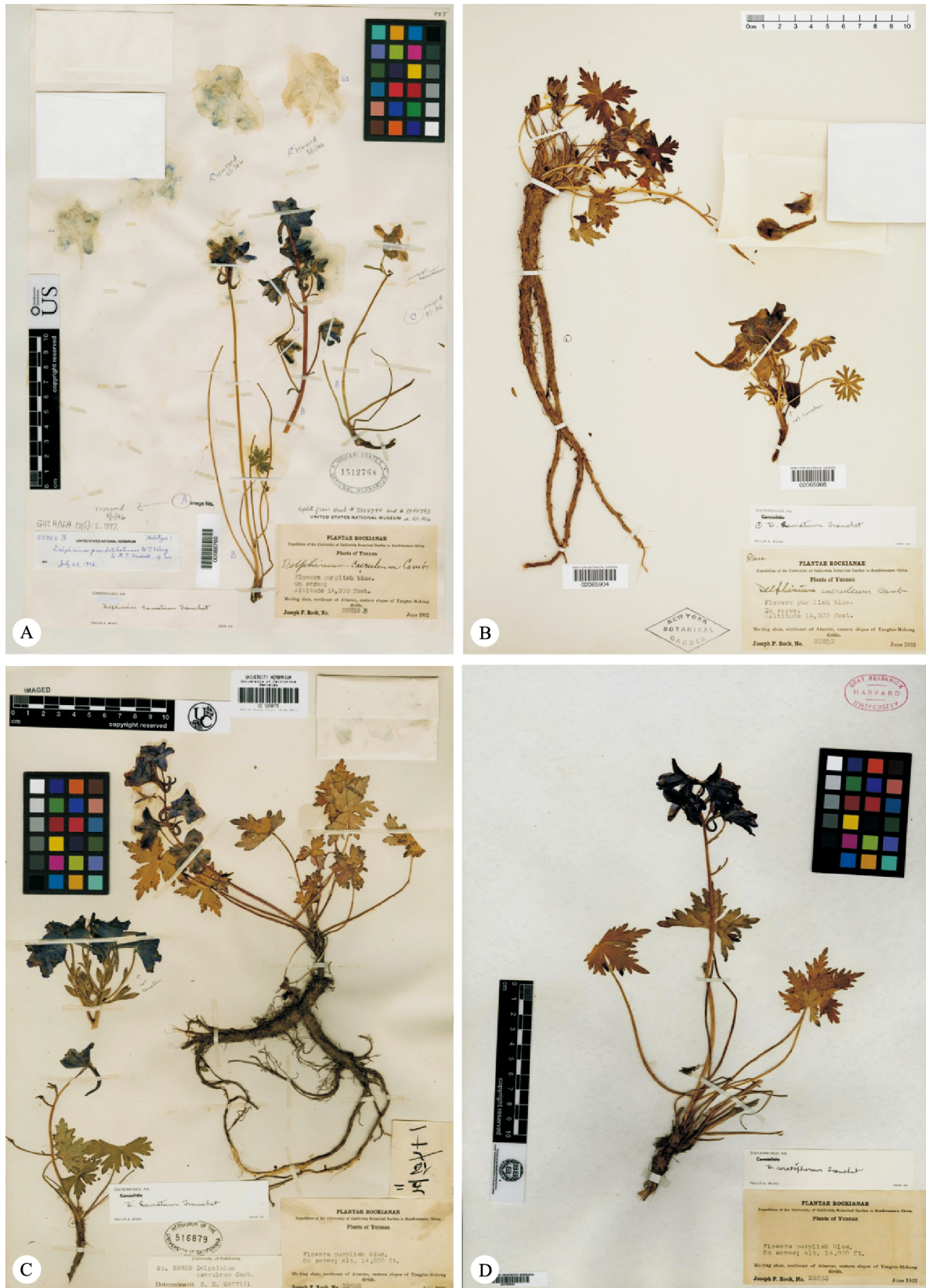


Fig. 2 Specimens of *Delphinium ceratophorum* Franch. var. *brevicorniculatum* W. T. Wang. A: J. F. Rock 22852B (holotype of *D. pseudothibeticum* W. T. Wang & M. J. Warnock, US), Deqen, Yunnan, China; B: J. F. Rock 22852B (left part, isotype of *D. pseudothibeticum*, NY), same locality; C: J. F. Rock 22852B (right and lower parts, isotype of *D. pseudothibeticum*, UC), same locality; D: J. F. Rock 22852B (isotype of *D. pseudothibeticum*, GH), same locality.



Fig. 3 Specimens of *Delphinium beesianum* W. W. Smith. A: J. F. Rock 22852C (holotype of *D. caeruleum* Jacq. ex Camb. var. *crassicalcaratum* W. T. Wang & M. J. Warnock, US), Deqen, Yunnan, China; B: Q. E. Yang & Q. Yuan 76 (PE), same locality; C: C. W. Wang 69468 (PE), same locality; D: Qinghai-Xizang Exped. 11187 (PE), same locality.



Fig. 4 Specimens of *Delphinium ceratophorum* Franch. var. *brevicorniculatum* W. T. Wang. A: J. F. Rock 22852B (isotype of *D. pseudothibeticum* W. T. Wang & M. J. Warnock, KUN), Deqen, Yunnan, China; B: J. F. Rock 22852B (left and right parts, isotype of *D. pseudothibeticum*, K), same locality.

thus it is at once distinguished from *D. ceratophorum* var. *brevicorniculatum*.

Based on the above analysis, we place *Delphinium pseudothibeticum* in synonymy of *D. ceratophorum* var. *brevicorniculatum*.

***Delphinium ceratophorum* Franch. var. *brevicorniculatum* W. T. Wang** in Acta Bot. Sin. **10**: 157. 1962; Munz in J. Arn. Arb. **49**: 91. 1968, pro syn. sub *D. hamatum* Franch.; W. T. Wang in Fl. Reipubl. Popularis Sin. **27**: 429. 1979; et in Vas. Pl. Hengduan Mount. **1**: 488. 1993; et in Fl. Yunnan. **11**: 132. 2000; W. T. Wang & Warnock in Fl. China **6**: 261. 2001. Type: China. Yunnan: Deqen, Baima Shan, grassy slope, alt. 3900 m, Aug. 12, 1937, T. T. Yu 9598 (holotype, PE!; isotypes, KUN!, PE!).

Delphinium ceratophorum var. *brevicorniculatum* f. *lobatum* W. T. Wang in Acta Bot. Sin. **10**: 157. 1962. Type: China. Yunnan: Deqen, Baima Shan,

rocky hills, alt. 4100 m, Jul. 25, 1937, T. T. Yu 9161 (holotype, PE!; isotypes, KUN!, PE!).

D. pseudothibeticum W. T. Wang & M. J. Warnock in Guihaia **17**: 8.1997; W. T. Wang in Fl. Yunnan. **11**: 140. 2000; W. T. Wang & Warnock in Fl. China **6**: 265. 2001. **syn. nov.** Type: Yunnan: Deqen (Atuntze), Moting (Mao-ding) Shan, scree, 4600 m, 1932-06, J. F. Rock 22852B (holotype, US!; isotypes, GH!, KUN!, K!, NY!, UC!).

Additional specimens examined. China. Yunnan: Deqen, K. M. Feng 6098 (KUN; PE), J. F. Rock 23080 (K, KUN), T. T. Yu 9309 (KUN, PE), 9356 (KUN, PE), 9832 (KUN, PE), C. W. Wang 69662 (PE), 69547 (NAS, KUN, PE), J. S. Yang s.n. (PE), Q. E. Yang & Q. Yuan 73 (PE).

Distribution and habitat. *Delphinium ceratophorum* var. *brevicorniculatum* is currently known only from Deqen, northwestern Yunnan, China (Fig. 6). It grows on rocky, grassy slopes at altitudes of 3900–4600 m.

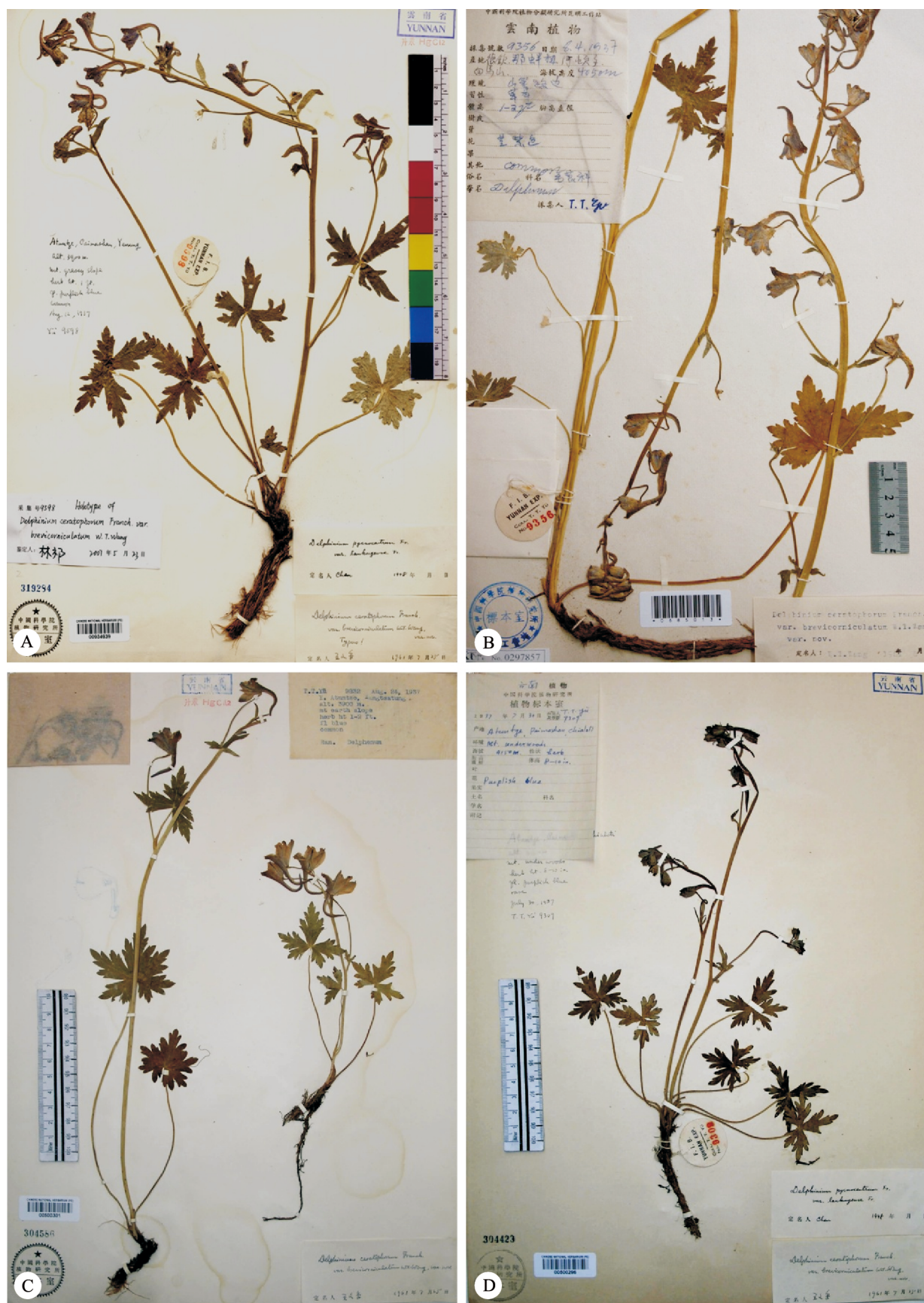


Fig. 5 Specimens of *Delphinium ceratophorum* Franch. var. *brevicorniculatum* W. T. Wang. A: T. T. Yu 9598 (holotype, PE), Deqen, Yunnan, China; B: T. T. Yu 9356 (paratype, KUN), same locality; C: T. T. Yu 9832 (paratype, PE), same locality; D: T. T. Yu 9309 (paratype, PE), same locality.

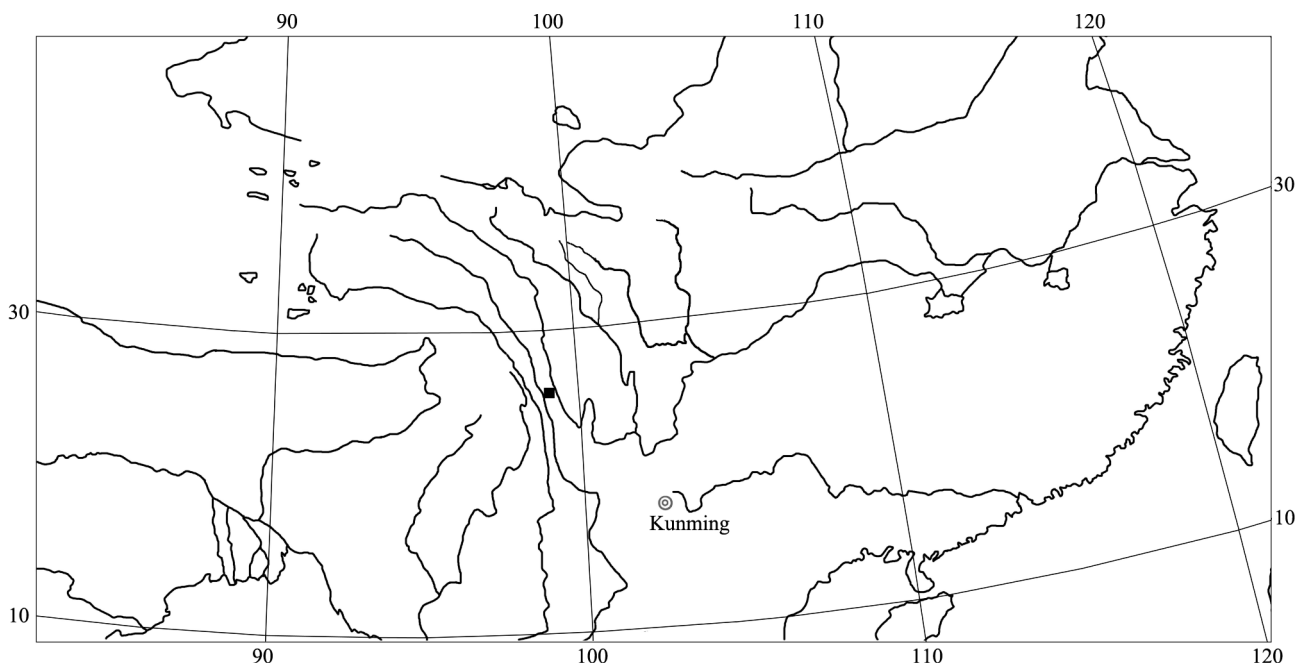


Fig. 6 Distribution of *Delphinium ceratophorum* Franch. var. *brevicorniculatum* W. T. Wang (■)

Notes. Wang^[7-8], and Wang and Warnock^[9] recognized four varieties under *Delphinium ceratophorum*: var. *ceratophorum*, var. *brevicorniculatum*, var. *hirsutum* W. T. Wang, and var. *robustum* W. T. Wang. These varieties all occur in northwestern Yunnan, and differ from each other only in some variable characters, such as the stature, the density of sepal pubescence, or the length of the sepal coracle. As indicated by the varietal epithet '*brevicorniculatum*', var. *brevicorniculatum* is different from the typical variety mainly in the very short sepal coracle. It seems better to treat *D. ceratophorum* as a polymorphic species, recognizing no infraspecific taxa. For the time being we herewith adopt a conservative approach, retaining all these varieties as independent taxonomic entities.

It is noteworthy that Munz^[2] has referred *Delphinium ceratophorum* var. *brevicorniculatum* to *D. hamatum* Franch. Although here we refrain from adopting this classification, we regard the treatment as very likely justifiable. Indeed, *Delphinium hamatum* and *D. ceratophorum*, which are geographically sympatric, seem hardly distinguishable from each other and may better be treated as being conspecific. The degree of leaf division, the only character by which *D. ceratophorum* is distinguished from *D. hamatum*, is found to be highly

variable in our herbarium and field observations. We set this problem aside for the future study.

According to the record on the field label, J. F. Rock 22852 was collected from Mo-ting Shan, northeast of Atuntze, eastern slopes of Yangtze-Mekong divide. From this description of the collecting locality and a map on page 153 in the book 'Plant-hunting in China' by Cox^[10], it is clear that 'Mo-ting' must be 'Mao-ding' as currently known, a place in Yangla Xiang, Deqen County, Yunnan^[11]. Baima Shan, the type locality of *Delphinium ceratophorum* var. *brevicorniculatum*, also belongs to the Yangtze-Mekong divide and is closely adjacent to Mo-ting Shan, the type locality of *D. pseudothibeticum*.

2 Identity of *Delphinium motingshanicum* and *D. caeruleum* var. *crassicalcaratum*

Wang and Warnock^[1] compared *Delphinium motingshanicum* with *D. pylzowii* Maxim., a species widely distributed in Gansu, Qinghai, Sichuan and Xizang and characterized, among other characters, by having black staminodes. *Delphinium motingshanicum* has blue staminodes, so it is at once distinguishable from *D. pylzowii*. As shown in Figure 1, *D. motingshanicum*

is no more than a gigantic form of *D. beesianum* growing in favorable habitats. The plant is highly variable. In stature, it exhibits all gradation from large to small, and the inflorescence varies from a simple one-flowered to an often branched several-flowered corymb (Figs. 1, 3, 7). The relatively few oblong-linear ultimate lobules of leaves, the corymbiform inflorescence, and particularly the carpel number of 5 (the number 4 should be just an occasional deviation; the carpel number is usually very constant in *Delphinium* s.s., being 3 or 5) in *D. motingshanicum* are all reminiscent of *D. beesianum*.

In the protologue of *Delphinium caeruleum* var. *crassicalcaratum*, Wang and Warnock^[1] stated that it is different from the typical variety in the stem densely puberulent, and with longer white hairs and yellow glandular hairs (vs. appressed puberulent only), the leaves smaller, 1.5–1.9 cm broad (vs. larger, 1.8–5 cm broad), the spur of the upper sepal cylindric-subulate, 3–4 mm in diameter at base (vs. subulate, 2–3 mm in diameter at base).

Our examination of the type material of *Delphinium caeruleum* var. *crassicalcaratum* against the rich herbarium material (including type material as shown in Figure 7) of *D. beesianum*, however, has shown that *D. caeruleum* var. *crassicalcaratum* is identical with *D. beesianum*. As shown in Figure 3, the type material of *D. caeruleum* var. *crassicalcaratum* shows no difference from the specimens of *D. beesianum* from Deqen. Contrary to *D. motingshanicum*, a gigantic form of *D. beesianum*, it is obvious that *D. caeruleum* var. *crassicalcaratum* represents a diminutive form of the species. We assume that Wang and Warnock^[1] might have been much influenced by E. D. Merrill's identification of J. F. Rock 22852 as *D. caeruleum*, so as to describe J. F. Rock 22852C as a variety of the species rather than refer it conveniently to *D. beesianum*.

Delphinium beesianum is undoubtedly most closely similar to *D. caeruleum* in having five carpels, differing mainly in the stem densely puberulent, and with longer white hairs and yellow glandular hairs, and in the thicker, cylindric-subulate spur of the upper

sepal, so they are very easily confused with each other. Such confusion cannot be better reflected by the fact that *D. beesianum* var. *malacotrichum* Hand.-Mazz. is synonymous with *D. caeruleum*^[6–8] whereas *D. caeruleum* var. *crassicalcaratum* is synonymous with *D. beesianum* as pointed out above. Geographically, *D. caeruleum* is more northerly and westerly distributed than *D. beesianum*, although they are partially sympatric in western Sichuan. The former occurs in Gansu, Qinghai, western and northern Sichuan, and Xizang in China, and also in Bhutan, Nepal, and Sikkim, while the latter occurs in western Sichuan, southeastern Xizang and primarily in northwestern Yunnan. Further studies may reveal that it is better to treat *D. beesianum* and *D. caeruleum* as two geographical subspecies. From the stem pubescence, the spur shape and size, and the geographical distribution of *D. caeruleum* var. *crassicalcaratum* as well, it seems justifiable to place the variety in synonymy of *D. beesianum*. Indeed, one of the diagnostic characters to distinguish between *D. beesianum* and *D. caeruleum* is that the former has a somewhat thicker spur, a characteristic feature to which the varietal epithet of *D. caeruleum* var. *crassicalcaratum* refers.

Based on the above analysis, we place both *Delphinium motingshanicum* and *D. caeruleum* var. *crassicalcaratum* in synonymy of *D. beesianum*.

Delphinium beesianum W. W. Smith in Not. Bot. Gard. Edinb. **8**: 130. 1913; Hand.-Mazz., Symb. Sin. **7**: 276. 1931; W. T. Wang in Acta Bot. Sin. **10**: 264. 1962; Munz in J. Arnold Arb. **48**: 506. 1967, p. p., quoad pl. Yunnan; W. T. Wang in Fl. Reipubl. Popularis Sin. **27**: 451. 1979; et in Guihaia **17**: 9. 1997; et in Vas. Pl. Hengduan Mount. **1**: 492. 1993; et in Fl. Yunnan. **11**: 144. 2000; W. T. Wang & Warnock in Fl. China **6**: 269. 2001; Q. Yuan & Q. E. Yang in Acta Phytotax. Sin. **41**: 560. 2003. Type: China. Yunnan: Lijiang (Lichiang), ledges of limestone cliffs on the eastern flank of the Lichiang Range, 14000 ft, Sept. 1910, G. Forrest 6694 (holotype, E!; isotypes, IBSC!, K!, P!, PE!, UC!).

D. calcicola W. W. Smith in Not. Bot. Gard. Edinb.



Fig. 7 Type specimens of *Delphinium beesianum* W. W. Smith, G. Forrest 6694, Lijiang, Yunnan, China. A: Holotype (E); B: Isotype (P); C: Isotype (K); D: Isotype (UC).

8: 130. 1913; Chen in Bull. Fan Mem. Inst. Biol., n. s., 1: 171. 1948. — *D. beesianum* f. *calcicola* (W. W. Smith) W. T. Wang in Acta Bot. Sin. 10: 265. 1962. Type: China. Yunnan: Lijiang (Lijiang), 1910, G. Forrest 6364 (holotype, E!; isotypes, P!, PE!).

D. motingshanicum W. T. Wang & M. J. Warnock in Guihaia 17: 3. 1997. **syn. nov.** Type: China. Yunnan: Deqen (Atuntze), Moting (Mao-ding) Shan, scree, 4600 m, J. F. Rock 22852A (holotype, US!, isotype, UC!).

D. caeruleum var. *crassicalcaratum* W. T. Wang & M. J. Warnock in Guihaia 17: 9. 1997. **syn. nov.** Type: China. Yunnan: Deqen (Atuntze), Moting (Mao-ding) Shan, scree, 4600 m, J. F. Rock 22852C (holotype, US!, isotypes, K!, KUN!, NY!).

Additional specimens examined. China. Sichuan: Konkaling, T. T. Yu 13140 (KUN, PE), Muli, Qinghai-Xizang Exped. 14034 (KUN, PE). **Xizang:** Tsarung, Rock 22267 (K), Zogang, Qinghai-Xizang Exped. 11037 (KUN, PE). **Yunnan:** Deqen, C. J. Chen 92379 (PE), Z. H. Pan & C. Q. Yuan 84152 (NAS), Qinghai-Xizang Exped. 11187 (KUN), H. Sun & Z. G. Qian 766 (KUN), 69468 (PE), 69525 (PE, KUN), 70146 (PE, KUN), Q. E. Yang 9480 (PE), Q. E. Yang & H. H. Kong 3239 (IBSC), Q. E. Yang & H. Z. Kong 98-399

(PE), Q. E. Yang & Q. Yuan 76 (PE), 86 (PE); Lijiang, R. C. Ching 31053 (KUN), 2514 (KUN, PE), 23373 (KUN), G. Forrest 11276 (PE), 27882 (PE), H. Ohba et al. 1061 (KUN), J. F. Rock 10788 (P), Q. E. Yang 94117 (PE), Q. E. Yang & H. Z. Kong 98-475 (PE), Q. E. Yang & Q. Yuan 169 (PE), 172 (PE); Without precise locality, G. Forrest 20204 (PE), 28472 (PE); Zhongdian, K. M. Feng 2097 (KUN), 2395 (KUN, PE), 23373 (KUN), Z. G. Qian & H. Sun 0992 (KUN), J. F. Rock 17248 (IBSC, P), 24738 (IBSC), H. Sun 9034 (KUN), H. Sun & Z. G. Qian 0859 (KUN), 0967 (KUN), 0976 (KUN), T. T. Yu 13649 (KUN, PE), J. S. Yang 8202 (KUN), 88-1 (PE), Q. E. Yang & H. H. Kong 3120 (IBSC), 3150 (IBSC), Q. E. Yang & H. Z. Kong 98-222 (PE), 98-325 (PE), 98-526 (PE), Q. E. Yang & Q. Yuan 3 (PE), 106 (PE), A. L. Zhang 101093 (KUN), Zhongdian Division 1652 (HIB, KUN, PE).

Distribution and habitat. *Delphinium beesianum* is distributed in western Sichuan, southeastern Xizang and northwestern Yunnan (Fig. 8). It grows in grassy or gravelly slopes, and in alpine meadows.

Notes. Wang^[5], and Wang and Warnock^[6] recognized three varieties under *Delphinium beesianum*: var. *beesianum* (western Sichuan, southeastern Xizang

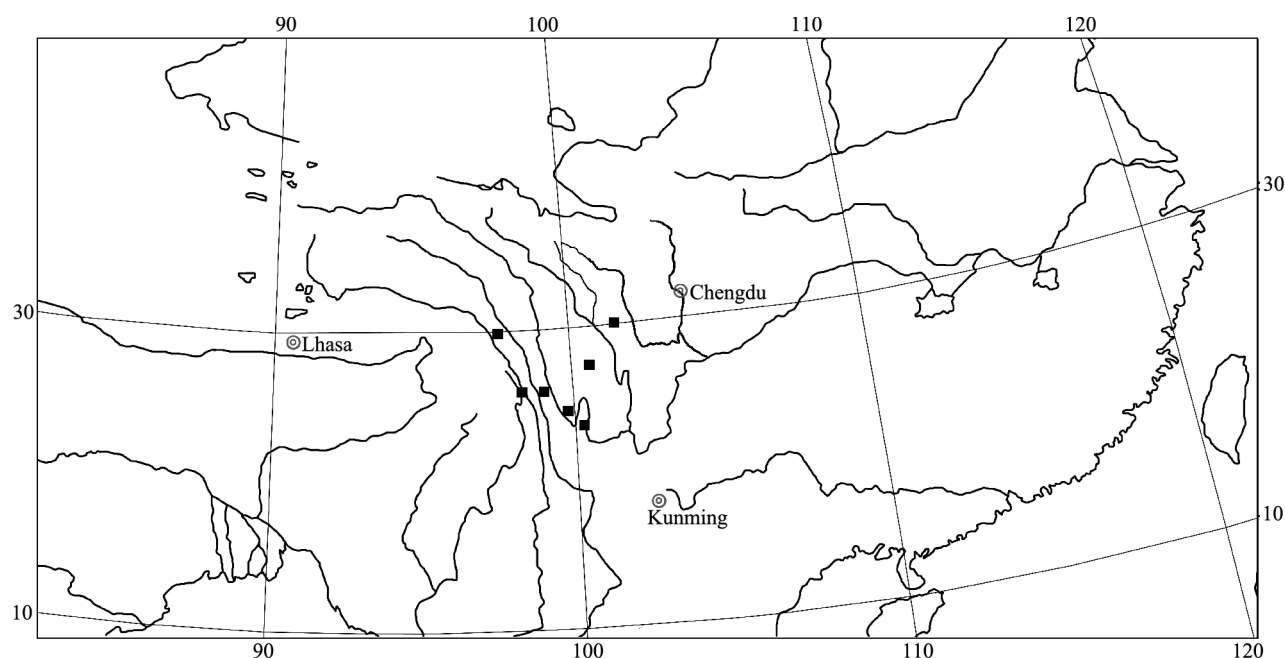


Fig. 8 Distribution of *Delphinium beesianum* W. W. Smith (■).

and northwestern Yunnan), var. *latisectum* W. T. Wang (northwestern Yunnan), and var. *radiatifolium* (Hand.-Mazz.) W. T. Wang (western Sichuan). They are different from each other only in the number and width of the leaf lobes, two characters exhibiting some gradation. Munz^[3] treated *D. beesianum* as a polymorphic species, recognizing no infraspecific taxa. This treatment may be acceptable, although here we refrain from doing so. It is to be noted that many specimens assigned to *D. beesianum* by Munz^[3], as pointed out by Wang^[1], and Yuan and Yang^[5], actually belong to several other species of *Delphinium*.

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