A revision of Clematis sect. Fruticella (Ranunculaceae)

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Abstract  In this paper Clematis sect. Fruticella is revised. Five species, two varieties, and three forms are recognized. They are classified into two series, and keyed, described, and illustrated. Brief taxonomic history and geographical distribution of the section are given, and the relationships of sect. Fruticella with other sections of the Clematis and of the five species within the section are discussed. Two new combinations, ser. Fruticosa (Tamura) W. T. Wang & L. Q. Li, and C. fruticosa f. pinnatisecta (W. T. Wang & L. Q. Li) W. T. Wang & L. Q. Li, are proposed, and a new series, ser. Virides W. T. Wang & L. Q. Li, is described.

Key words  Clematis sect. Fruticella, Ranunculaceae, taxonomic revision.

1  Brief taxonomic history

In 1832, Turczaninow described the first species of the section Fruticella Tamura, Clematis fruticosa Turcz., and two varieties under it, i.e. var. viridis Turcz. and var. canescens Turcz., based on specimens collected by Kusnetsov from Nei Mongol, China. In 1877, Maximowicz described the second species of the section, C. nannophylla Maxim., and afterwards in 1889, he added two varieties (C. fruticosa var. lobata Maxim. (1889b) and var. tomentella Maxim. (1889a)) to C. fruticosa and one variety (C. nannophylla var. foliosa Maxim. (1889c)) to C. nannophylla, based on the specimens collected by Potanin and Przewalski from the arid regions of North and West China respectively.

In the account of the tribe Clematideae DC. by Spach (1839), C. fruticosa was not included.

In the monograph of the Clematis published by Kuntze (1885), C. fruticosa and C. nannophylla were treated as two subspecies of C. recta L., which was placed in sect. 1. Scandentes aperulatae.

In the classification of the Clematis proposed by Prantl (1888), C. fruticosa and C. nannophylla together with C. songarica Bunge, C. asplenifolia Schrenk and other allies were placed in sect. Flammula subsect. Rectae. This treatment was adopted by Rehder & Wilson (1913) and Handel-Mazzetti (1939).

In 1933, Kozlov described three forms of C. fruticosa (C. fruticosa f. lancifolia Kozlov, f. atriplexifolia Kozlov and f. chenopodifolia Kozlov) on the basis of the specimens collected by Licent and Serre from North and West China. In the present revision, C. fruticosa f. atriplexifolia Kozlov is accepted to represent the form of C. fruticosa with 3-lobed to 3-sect leaves.

In 1955, on the basis of C. fruticosa Tamura founded a new subsection, subsect. Fruticosae under sect. Flammula. Twelve years later in 1967, he elevated this group to sectional rank, naming it as sect. Fruticella, and giving the diagnosis “sepals are rather thick and dilated marginate”. However, with the species of the C. fruticosa group, in which the sepals are ascending, yellow, and narrowly dilated along margin after anthesis, Tamura...
associated _C. delavayi_ Franch., _C. songarica_ and their allies, in which the sepals are spreading, white, and not dilated after anthesis. Tamura’s sect. _Fruticella_ sensu lato was adopted by Chang (1980), Snoeijer (1992), Johnson (1997), and Grey-Wilson (2000).

In the account of the Chinese _Clematis_ by Chang (1980), _C. fruticosa_ var. _canescens_ Turcz. was elevated to specific rank, and a new subspecies of it (_C. canescens_ ssp. _viridis_ W. T. Wang & M. C. Chang) was described. Unfortunately, the new specific name _C. canescens_ (Turcz.) W. T. Wang & M. C. Chang was a misidentification, being misapplied to the plants of _C. fruticosa_ var. _tomentella_ Maxim. In 2001, in the revised account of the Chinese _Clematis_ published by Wang & Bartholomew, the misidentification just mentioned was corrected, and _C. fruticosa_ var. _tomentella_ and _C. canescens_ ssp. _viridis_ were all raised to specific rank, and a new variety, _C. nannophylla_ var. _pinnatisecta_ W. T. Wang & L. Q. Li, was described.

In the revision of _Clematis_ sect. _Clematis_ published by Wang (2003), _C. songarica, C. delavayi_ and their allies were transferred to the subsection _Angustifoliae_ of that section from sect. _Fruticella_ sensu Tamura. After the removal of _C. songarica, C. delavayi_ and their allies, the section _Fruticella_ defined in the present revision appears to become a monophyletic group.

### 2 Relationships with other sections of the _Clematis_

In having ascending, yellow sepals and usually lanceolate-linear stamen filaments, the floral structure of sect. _Fruticella_ shows remarkable resemblance to that of sect. _Meclatis_, and by the floral characters just mentioned these two sections may be distinguished from all other sections of the genus _Clematis_. Sect. _Fruticella_ differs from sect. _Meclatis_ only in its dilated sepals and its glabrous stamens. In sect. _Meclatis_, the sepals are not dilated, and the stamen filaments are hairy. Compared with sect. _Meclatis_, therefore, sect. _Fruticella_ is more primitive in having glabrous stamens, and more advanced in having dilated sepals. However, in any case the striking resemblance of their floral structure appears to indicate that the two sections are closely related between each other, and might be together derived from a common ancestry, i.e. sect. _Clematis_, in which the sepals are spreading, white, and not dilated after anthesis, the stamens are glabrous, and the filaments are linear in outline (Wang, 2003).

### 3 Relationships of the five species in sect. _Fruticella_

Within sect. _Fruticella_, the five species are strikingly uniform in floral structure, suggesting their close affinity. They can be classified into two groups according to the inflorescence position and structure. In the _C. fruticosa_ group consisting of four species, the flowers are arranged in terminal, pedunculate, bibracteate, usually several-flowered cymes on the hornotinous branch. In the fifth species, _C. viridis_ (W. T. Wang & M. C. Chang) W. T. Wang, however, the cymes shift from terminal to lateral position on the hornotinous branch, their peduncles and bracts disappear, and the flower number is reduced from usually several to only one. This phenomenon of the solitary flowers terminal to lateral branchlets has been considered secondary by Wang (2002).

In the _C. fruticosa_ group are observed three evolutionary trends of leaf morphology: from undivided to pinnatisect, from green to grey-green, and from narrowly ovate to linear. Of the four species, _C. fruticosa_ with three forms and _C. nannophylla_ with two varieties have green, narrowly ovate or lanceolate, often subglabrous leaves, and are both strongly variable in leaf division, and in leaf division there are a series of intermediate forms between _C. fruticosa_ f. _fruticosa_ with undivided leaves and _C. nannophylla_ with pinnatisect leaves. In
another two species, *C. canescens* with undivided, narrowly rhombic-ovate or lanceolate leaves and *C. tomentella* (Maxim.) W. T. Wang & L. Q. Li with undivided, linear leaves, the leaves are grey-green in colour, and more or less densely hairy. Considering that the pinnatisect, or grey-green, or linear leaves might all be products resulted from adaptation to the deteriorating climate and strong aridity occurring in Northwest China by the Late Tertiary (Liou, 1982; Zhou, 1982; Hsu, 1983; Axelrod et al., 1998), we would put forward the following speculation: *C. nannophylla, C. canescens* and *C. tomentella* might all be differentiated out from *C. fruticosa f. fruticosa*, the primitive taxon of the sect. *Fruticella*, and come into existence later than the latter at that period.

4 Geographical distribution

Sect. *Fruticella* here defined consists of five species, which fall into two groups as mentioned above, and are confined to the arid regions and the alpine areas of the Hengduan Mountains of the eastern Asiatic continent (Fig. 1).

![Fig. 1. Map showing distribution of the two series and five species in sect. Fruticella.](image)

The first group, ser. *Fruticosae*, consists of four species, two varieties, and three forms, widespread in the Loess Plateau and its adjacent arid regions of China and the Gobi desert of Mongolia. In the northern Loess Plateau and its adjacent arid regions of Nei Mongol, the
distribution center of sect. *Fruticella*, are concentrated the total four species of the series, and from there *C. canescens* extends northward to southern Mongolia, *C. tomentella* westward to southwestern Nei Mongol and the Gobi desert of Mongolia, with a few populations extending southwestward to southern Gansu; *f. atripllexifolia* is widespread on the Loess Plateau and adjacent southwestern Nei Mongol, also with a few populations extending southwestward to southern Gansu; and *f. pinnatisecta* is restricted in geographical distribution to the central hinterland of the Loess Plateau.

The second group, ser. *Virides*, is monotypic, and its only species, *C. viridis*, occurs in alpine areas of the northern Hengduan Mountains of Southwest China. In bearing green, linear leaves and lateral, solitary flowers on hornotinous branch, this species is more advanced than *C. fruticosa*, and might be derived from *C. fruticosa f. fruticosa*, and migrate to the northern Hengduan Mountains from the Loess Plateau.

5 Taxonomic treatment


Small shrubs. Seedling leaves unknown (Essig, 1991). Leaves opposite, simple, undivided or pinnatifoliate to pinnatisect. Flowers bisexual, medium-sized or small, in terminal cymes, rarely solitarily arising from the apexes of axillary, short or abbreviated branchlets. Sepals 4, ascending, yellow, valvate, on margin velutinous, after anthesis along margin dilated into narrow membranous wings. Stamens numerous, glabrous; filaments lanceolate-linear; anthers narrowly oblong, apex obtuse. Achenes numerous, compressed, bearing elongate plumose persistent styles.

Five species, occurring on the Loess Plateau and adjacent regions and in the Hengduan Mountains of China, and in the Gobi desert of Mongolia.

Key to infrasectional taxa

1. Flowers arranged in terminal pedunculate, bibracteate 1-10(-25)-flowered cymes on hornotinous branch (Ser. 1. *Fruticoseae*).
2. Leaves undivided, sometimes some ones with 1 or 2 lobes near base.
   3. Leaves grey-green, on both surfaces sparsely puberulous or subglabrous…………1a. *C. fruticosa f. fruticosa*
   4. Leaves grey-green, on both surfaces more or less densely appressed-puberulous.
   4. Leaves narrowly rhombic-ovate to lanceolate, margin usually 1-3-dentate per side, sometimes entire ………………………………………………………………………………………………………. 3. *canescens*
   5. Leaves linear or lanceolate-linear, margin usually entire…………………………………..4. *C. tomentella*
2. Leaves near base lobed to sect, or pinnatisect.
   5. Leaves near base 3-lobed or 3-parted, sometimes 3-sect………………1b. *C. fruticosa f. atripllexifolia*
   5. Leaves pinnatisect.
   6. Leaf blade oblong-lanceolate in outline, primary lateral lobes subrhombic, 3-lobulate, with ovate or
triangular lobules……………………………………………...…….1c. C. fruticosa f. pinnatisecta
6. Leaf blade narrowly ovate or ovate in outline, primary lateral lobes narrowly oblong, linear, or
triangular, undivided or unequally lobed……………………………………2. C. nannophylla
7. Leaf blade 0.5-1.4(-2)×0.3-0.9(-1.4) cm, primary lobes triangular, narrowly oblong, or
linear…………………………………………………..…………………2a. var. nannophylla
7. Leaf blade larger, 2.5-4.5×1.6-3 cm, primary lobes linear………………2b. var. foliosa
1. Flowers solitary, arising from apexes of short or abbreviated axillary branchlets of hornotinous branch;
leaves green, linear, entire, subglabrous (Ser. 2. Virides)…………………………………..…..5. C. viridis


Flowers arranged in terminal pedunculate, bibracteate 1-10(-25)-flowered cymes on hornotinous branch.

Four species occurring on the Loess Plateau and adjacent regions of China and the Gobi desert of Mongolia.


This species consists of three forms widespread on the Loess Plateau and adjacent regions of China with the typical form extending to the Gobi desert of Mongolia.

Because C. fruticosa is highly variable in leaf shape and division, and between it and C. nannophylla Maxim. there are intermediate forms as mentioned above, further study is needed for elucidation of their relationships.

1a. f. fruticosa Fig. 2: A, B

Small shrub. Stem up to 1 m tall; branches shallowly 4-5-sulcate, sparsely puberulous, glabrescent. Leaves simple; leaf blades green, thinly coriaceous or coriaceous, lanceolate, broadly lanceolate, or narrowly triangular, 1.5-4×0.5-1.6 cm, apex acute, base cuneate or broadly cuneate, margin dentate, denticulate, or entire, on both surfaces sparsely appressed-puberulous or subglabrous, midrib abaxially slightly prominent; petioles 0.3-1.2 cm long. Cymes terminal and axillary, 1-5-flowered; peduncle 0.7-2 cm long; bracts foliaceous. Flower 1.8-3.5 cm in diam.; pedicel 0.4-1.3 cm long, puberulous. Sepals 4,
yellow, elliptic-ovate, 1-1.8(-2) × 0.6-1.2 cm, apex acute, inside glabrous, outside subglabrous or sparsely puberulous, margin velutinous, marginal wings 1-2 mm broad. Stamens 8-13 mm long, glabrous; anthers narrowly oblong, 2.5-4 mm long, apex obtuse. Ovaries pubescent; styles 7-11 mm long, densely villous. Achenes ovate or elliptic, 4-6× 2.2-3.5 mm, villous; persistent styles ca. 2.5 cm long, yellowish-plumose. Fl. Jul.-Aug.

China (SW Gansu, NW Hebei, SW Nei Mongol, Ningxia, N Shaanxi, Shanxi) and Mongolia. In bushes or on dry slopes; alt. 800-1900 m.

Additional specimens examined:

**China. Gansu (甘)**: Têwo (迭部), J. F. Rock 15007 (K). **Hebei (冀)**: Xiaowutai Shan (小五台山), T. P. Wang (王天平) 797, Y. Liu (刘英) 11119, X. L. Huang (黄秀兰) 5677 (PE); Yu Xian (玉县), C. G. Yang (杨朝广) 1711 (PE). **Mongolia. Bulgan Somon**, Norlindh 10385 (S); Gobi, Potanin s.n. (LE, P), Lisovsky 305, Pahomov s.n. (TIE).

**C. fruticosa f. atriplexifolia** Kozlov in Publ. Mus. Hoangho Paiho Tien Tsin 22: 11, pl. 2. 1933. Type: China. **Shanxi (晋)**: Kaochan, 1925-08-22, Licent 7618 (syntype, TIE; isosyntype, PE!). **Beijing (京)**: Yanqing (延庆), Tongtchoang Pou, 1930-08-24, Serre 9967 (syntype, TIE; isosyntype, PE!).


**C. fruticosa f. chenopodiofolia** Kozlov in l.c., pl. 3. Type: China. **Hebei (冀)**: Pankiao, 1917-08-07, Licent 3265 (syntype, TIE; isosyntypes, K!, P!, UPS!). **Nei Mongol (内蒙古)**: Baotou (包头), Plaine de Toumet, Palakai, 1919-07-30, Licent 5557 (syntype, TIE; isosyntypes, K!, P!, PE!).

This form differs from f. fruticosa in its leaves 3-lobed, 3-parted, or 3-sect near base.

Leaf blade broadly lanceolate or lanceolate, 2-5.5× 0.6-2.2 cm, margin coarsely dentate or lobulate. Fl. Jul.-Sept.
China (Beijing, S & C Gansu, NW Hebei, SW Nei Mongol, Ningxia, N Shaanxi, Shanxi). On dry slopes or cliffs; alt. 700-2300 m.

Additional specimens examined:

**China. Beijing**: Baihua Shan (百花山), D. F. Jin 504 (PE). **Gansu**: Dangchang (丹昌), Q. E. Yang (504) 92007 (PE); Tiwo (504), J. F. Rock 14566 (G, GH, P, S); Heshui (504), T. P. Wang (504) 17381 (PE), H. Y. Zou (504) 3251 (WUK); Min Xian (504), K. S. Hao (504) 555 (PE, WUK); Wudu (504), T. P. Wang (504) 14932 (PE); J. X. Yang (504) 3358 (WUK); Yan-pu-ko, F. N. Meyer 1786 (LE, P); Zhenyuan (504), S. Q. Zhong (504) 190 (PE).

**Hebei**: Xiaowutai Shan (小五台山), C. F. Li (504) 10662, Y. Liu (504) 11230 (PE); Zhuolu (504), C. G. Yang (504) 441, 1473 (PE).

**Nei Mongol**: Baotou (包头), T. P. Wang (504) 2392 (PE); Daqing Shan (大青山), W. Y. Hsia (夏纬瑛) 2731 (PE); Sartchy, David 2701 (LE, P); Ordos (504), Licent 13701 (GH, TIE); Ul Shan (504), X. Z. Lang (郎学忠) 159 (PE).

**Ningxia**: Guyuan (固原), Gansu Exped. (甘肃队) 56-2294 (PE); Yanchi (盐池), Yellow River Exped. (黄河队) 56-7859 (PE); Pingluo (平罗), Z. Y. Yu (于兆英) 754 (WUK); Helan Shan (贺兰山), Y. P. Xu (徐养鹏) 2490 (WUK).

**Shaanxi**: Ansai (安塞), J. X. Yang (4771) 56-7730 (PE); Jingbian (靖边), Yellow River Exped. (504) 6877 (PE, WUK); Suide (504), T. P. Wang (504) 6606 (PE); Wuqi (504), Yellow River Exped. (504) 15516 (WUK); Huayuan (504), Loess Plat. Exped. (504) 84-2785 (WUK); Kushehshan (504), T. P. Wang (504) 3706 (WUK); Lin Xian (504), Loess Plat. Exped. (504) 84-3145 (WUK); Lin Xian (504), Yellow River Exped. (504) 10159 (WUK); Pingluo (504), T. P. Wang (504) 2303 (PE); Xi Xian (504), T. P. Wang (504) 3467 (PE, WUK); Xiaoyi (504), T. P. Wang (504) 2794 (PE, WUK); Zhidan (504), J. X. Yang (4903, 4924) (WUK).

**Shanxi**: Guandishan (504), S. Ma (马塞) 15516 (WUK); Hunyuan (504), Loess Plat. Exped. (504) 84-2785 (WUK); Kushehshan, T. P. Wang (504) 3706 (WUK); Huayuan (504), Lin Xian (504), Lin Xian (504) 54-1394 (WUK); Pingluo (504), T. P. Wang (504) 1234 (GH, PE); Qinian (504), K. M. Liou (504) 1443 (PE); Without precise locality, 1884-07-05, Potanin s.n. (LE, P); Wutai Shan (五台山), K. M. Liou (504) 3696, K. C. Kuan & Y. L. Chen (504) 2303 (PE); Xi Xian (504), T. P. Wang (504) 3467 (PE, WUK); Xiaoyi (504), T. P. Wang (504) 2794 (PE, WUK); Zhidan (504), P. Y. Li (504) 10300 (WUK).


Type: China. Shaanxi (904): Huanglong (504), Huanglong Shan (504), 1939-08-10, K. T. Fu (504) 3122 (holotype, PE!; isotype, WUK!).

This form differs from **f. fruticosa** in its pinnatisect leaves and larger oblong-lanceolate leaf blades up to 5.5 cm long, 3 cm broad. Fl. Jul.–Sept.

China (N Shaanxi and W Shanxi). On dry slopes; alt. 1050-1500 m.

Additional specimens examined:

**China. Shaanxi**: Ansai (504), J. X. Yang (504) 4762 (WUK); Jingbian (504), Yellow River Exped. (504) 6877 (PE, WUK); Suide (504), Petrov s.n. (LE); Zhidan (504), J. X. Yang (504) 4903, 4924 (WUK); **Shanxi**: Baode (504), Yellow River Exped. (504) 56-7859 (PE); Suihe (504), Petrov s.n. (LE); Zhidan (504), J. X. Yang (504) 4903, 4924 (WUK).


This species consists of two varieties occurring on western Loess Plateau and adjacent regions of China.

2a. var. nannophylla Fig. 3: D, E

Small shrub. Stem 30-100 cm tall; branches shallowly 4-5-sulcate, densely appressed-puberulous. Leaves simple; leaf blades green, coriaceous, ovate or narrowly ovate, 0.5-1.4(-2)×0.3-0.9(-1.4) cm, apex acute, base cuneate or subtruncate, pinnatifid lobed, 1-3(-4) pairs of primary lateral lobes; lobes triangular, narrowly oblong, or linear, undivided or unequally 2-lobed, on both surfaces sparsely puberulous, glabrescent, midrib obscure; petioles 1.5-4 mm long. Cymes terminal, 1-3(-7)-flowered; peduncles 1-2 cm long; bracts foliaceous. Flower 1.2-2.2 cm in diam.; pedicel 0.5-1.3 cm long, densely puberulous. Sepals 4, yellow, oblong or long elliptic, 0.8-1.6×0.4-0.8 cm, apex obtuse or subtruncate, inside glabrous, outside puberulous or glabrous, margin velutinous, margin wings 0.8-1.8 mm broad. Stamens 6-8 mm long, glabrous; anthers narrowly oblong, 2.2-3 mm long, apex obtuse. Ovaries pubescent; styles 5-7 mm long, densely villous. Achenes elliptic, 3-4×2.2-2.5 mm, densely pubescent; persistent styles ca. 2 cm long, yellowish-plumose. Fl. Jul.–Aug.

China (C Gansu, SW Nei Mongol, Ningxia, and E Qinghai). On dry slopes; alt. 1200-3200 m.

Additional specimens examined:

China. Gansu (quirrel): Baiyin (quirrel), Y. Q. He 6207 (PE); Jingtai (quirrel), Z. Y. Yu (quirrel) 3309 (WUK); Jingyuan (quirrel), Yellow River Exped. (quirrel) 56-5495 (PE); Lanzhou (quirrel), J. F. Rock 13231 (S), Licent 4488 (PE, TIE), Y. S. Lian (quirrel) 96912 (PE);
Lichen, 1923-07-06, R. C. Ching (cí lián chéng) 241 (US); Liancheng (lián chéng) 60-3569 (PE); Lintao (líng táo) 56-1635 (PE); Lotani, on road to Liku, Purdom 1027 (K, US); Xiahe (xià hé), T. P. Wang (tōng xīn) 5708 (PE); Yongdeng (yòng dēng), Loess Plat. Exped. (huáng tǔ yáo kuàng duì) 85-4858 (WUK).

Nei Mongol (nèi měng gǔ): Alxa Zuoqi (ā lā shān zuǒ qí), Y. M. Yang (yáng yǒng míng) 496 (HIMC).

Ningxia (nìng xiā): Tongxin (tōng xīn), Loess Plat. Exped. (huáng tǔ yáo kuàng duì) 85-4156 (WUK).

Qinghai (qīng huái): Datong (dà tōng), 1880-08-06, Przewalski s.n. (LE); fl. Hoangho, 1880-07, Przewalski 433 (LE); Guide (guì dé), S. W. Liu (liú shàng wǔ) 3121 (PE); Ledu (lè dū), K. M. Liou (liū jì mò) 5866, K. S. Hao (hào jǐng shèng) 745 (PE); Minhe (mín hé), S. W. Liu (liú shàng wǔ) 2697 (PE); Xunhua (xún huà), Loess Plat. Exped. (huáng tǔ yáo kuàng duì) 85-5873 (WUK).


This variety differs from var. foliosa in its larger leaves 2.5-4.5 cm long, 1.6-3 cm broad, and in their lobes and lobules all linear. Fl. Jun.-Oct.

China (S Gansu). On dry or gravelly slopes; alt. 1200-1700 m.

Additional specimens examined. Gansu (gāng sū): Min Xian (mín xiàn), Hummel 3777, 5376 (S); Chieh Chou (chī ā chóu), F. N. Meyer 1786, 1794 (K).


Small shrub. Stem shallowly 6-sulcate, glabrescent, near apex on nodes densely appressed-puberulous; hornotinous branches velutinous. Leaves simple, shortly petiolate; leaf blades grey-green, coriaceous, narrowly rhombic-ovate or lanceolate, 1.9-3(-5)×0.25-0.8(-1.6) cm, apex pungent, base cuneate, margin above base 1-3-dentate per side, sometimes entire, undivided, seldom 3-lobed, on both surfaces more or less densely appressed-puberulous, trinerved, the 2 lateral veins obscure; petioles 1.5-3 mm long. Cymes terminal, 3-5-flowered; peduncles 1-1.2 cm long, velutinous; bracts triangular, ca. 2 mm long, velutinous. Flower ca. 2 cm in diam.; pedicel 3-4 mm long, velutinous. Sepals 4, yellow, lanceolate or long elliptic, 1.2-1.9×0.4-0.7 cm, apex acute or obtuse, inside glabrous, outside puberulous, margin velutinous, marginal wings 1-1.8 mm broad. Stamens 8-12 mm long, glabrous; anthers linear, 2.8-3.2 mm long, apex obtuse. Ovaries densely pubescent; styles 8-12 mm long, densely villous. Fl. Jul.-Aug.
Fig. 4. *Clematis canescens* (Turcz.) W. T. Wang & M. C. Chang. A, flowering branch; B, sepal, outside; C, stamen (from Bunge s.n.).
China (SW Nei Mongol) and S Mongolia. By sandy stream banks.

Additional specimens examined:

**China. Nei Mongol**: Siziwang Qi (四子王旗), Naomugen (脑木根), Y. Z. Zhao (赵一之) 38 (PE); the same locality, Weijingsumu (卫境苏木), Y. Z. Zhao (赵一之) 1263 (PE).

**Mongolia. Sain-shand, Isachenko & Rochhovskaja 1817 (LE).**


*C. fruticosa* f. *lancifolia* Kozlov in Publ. Mus. Hoangho Paiho Tien Tsin 22: 10, pl. 1. 1933. Type: China. Nei Mongol (内蒙古): S Ordos (鄂尔多斯), Sjara Osson gol, 1922-08-10, Licent 6869 (syntype, TIE; isosyntypes, K!, PE!); the same locality, 1923-08-11, Licent 7069 (syntype, TIE!; isosyntypes, G!, K!); the same locality, 1923-08-20, Licent 7087 (TIE!; isosyntypes, K!, PE!).


Small shrub. Stem 60-100 cm tall; branches shallowly 4-6-sulcate, densely puberulous. Leaves simple, shortly petiolate; leaf blades grey-green, coriaceous, linear, linear-lanceolate, or broadly linear, 1-4.8×0.2-0.8 cm, apex acute, base cuneate, margin entire, sometimes below 1-2-dentate, on both surfaces more or less densely appressed-puberulous, midrib obscure; petioles 2-5 mm long or nearly absent. Cymes terminal, (1-)2-10(-25)-flowered, sometimes narrowly panicle-like; peduncles 0.7-3 cm long; bracts linear or lanceolate-linear, 0.4-1.5 cm long. Flower 1.3-2.2 cm in diam.; pedicel 0.5-1.8 cm long, densely puberulous. Sepals 4, yellow, broadly lanceolate, lanceolate, long elliptic, or oblong, 0.8-1.6×0.4-0.9 cm, apex shortly cuspidate, inside glabrous or sparsely puberulous, outside puberulous, margin velutinous, marginal wings 0.6-2 mm broad. Stamens 7-10 mm long, glabrous; anthers narrowly oblong, 2-3 mm long, apex obtuse. Ovaries densely pubescent; styles 6-11 mm long, densely villous. Achenes long elliptic or narrowly ovate, 3-5×1.4-2.5 mm, villous; persistent styles ca. 2 cm long, white-plumose. Fl. Jul.–Aug.

China (Beijing, N Gansu, SW Nei Mongol, and Ningxia) and S Mongolia. On dry sandy slopes; alt. 1700-2150 m.

Additional specimens examined:

**China. Beijing**: Baihua Shan (百花山), 1850-1858, Bazilevski s.n. (LE). **Gansu**: Anxi (安西), Anonymous 312 (PE); Hexi Zoulang (河西走廊), Mazong Shan (马宗山), Hexi Exped. (河西队) 1394, 1413, 1451 (PE); Richthofen range, Rock 13322 (K); Shandan (山丹), Hexi Exped. (河西队) 64-877, 64-991 (PE); Sunan (肃南), Hexi Exped. (河西队) 67-528, 67-547 (PE); Yongchang (永昌), Anonymous 131 (PE); Yumen (玉门), T. N. Liou (刘慎谔) 2359 (PE, WUK), Anonymous 392 (PE); Zhangye (张掖), P. C. Tsoong (钟补...

Flores ad apices ramulorum rami hornotini axillarium brevium vel abbreviatorum solitarii, tantum pedicellati; pedunculi absentes.

One species endemic to the northern Hengduan Mountains of Southwest China.


Small shrub. Stem 60-120 cm tall; branches 4-6-angulate, shallowly 4-6-sulcate, glabrous, rarely puberulous; axillary branchlets 0.2-4 cm long, puberulous. Leaves simple, shortly petiolate; leaf blades green, chartaceous, lanceolate-linear or linear, rarely lanceolate, 1.4-3.5(-4.5)×0.2-0.6(-0.8) cm, apex acute or pungent, base cuneate or attenuate, margin entire, on both surfaces sparsely puberulous or subglabrous, midrib abaxially slightly prominent; petioles 0.5-2.5 mm long or nearly wanting. Flowers solitary, terminal to axillary short or abbreviated branchlets, only pedicellate, 2-3 cm in diam.; pedicel slender, 1.4-4 cm long, puberulous. Sepals 4, yellow, ovate or subelliptic, 1.4-2.7×0.7-1.3 cm, apex apiculate, inside glabrous, outside sparsely puberulous and on margin velutinous, marginal wings 1-3(-4) mm broad. Stamens 6-13 mm long, glabrous; anthers narrowly oblong or oblong, 2.5-4 mm long, apex obtuse. Ovaries densely pubescent; styles 6-9 mm long, densely villous. Achenes elliptic or narrowly obovate, 4-6×2.5-3.5 mm, densely pubescent, near apex villous, rimmed; persistent styles (2-)3-3.5 cm long, white-plumose. Fl. Jun.-Jul.

China (S Qinghai, W Sichuan, and E Xizang). On dry slopes or in bushes; alt. 3000-3600 m.

Additional specimens examined:

China. Qinghai (青): Chindu (称多), T. N. Ho et al. (何廷农等) 1907 (PE); Yushu (玉树)

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王文采等．1992．铁线莲属灌木铁线莲组修订．王文采 李良千 (中国科学院植物研究所系统与进化植物学重点实验室 北京 100093)

摘要

对毛茛科铁线莲属 Clematis 的灌木铁线莲组 sect. Fruticella 进行了全面修订，确定此组共含 5 种、2 变种和 3 变型；对此组的分类学简史和地理分布做了介绍；写出本组 2 系的形态特征和地理分布，组下分类群检索表，以及各种植物的形态描述、地理分布、生长环境等，并附有各分类群的 3 幅插图。根据花的构造认为在铁线莲属中，灌木铁线莲组与黄花铁线莲组 sect. Meclatis 在亲缘关系上最为接近。二组拥有的共同特征为：花的 4 枚萼片呈黄色，斜上方开展；雄蕊花丝下部变宽，呈披针状条形。二组的区别为：灌木铁线莲组的萼片边缘在花开放后展宽成膜质狭翅，雄蕊无毛；而在黄花铁线莲组，萼片边缘不展宽，雄蕊花丝被柔毛。本组 5 种的花构造一致；在其他营养器官形态特征方面观察到以下演化趋势：(1) 叶由不分裂到羽状全裂，由绿色到灰绿色，由狭菱状卵形到条形；(2) 花序含数朵花，具花序梗和 2 包片，生于当年生枝顶端，到花数目减少到 1 朵，花序梗和苞片消失，花生于当年生枝的腋生短枝顶端。根据上述演化趋势认为灌木铁线莲的模式变型 C. fruticosa f. fruticosa (叶绿色，狭卵形或披针形；花序通常含数朵花，顶生于当年生枝上) 是本组的原始类型，其他种可能均源出于此类型。根据花序特征，本组被划分为 2 系。第 1 系，灌木铁线莲系 ser. Fruticosae，含 4 种，分布于我国黄土高原及相邻干旱地区，向北达蒙古戈壁荒漠，向南在甘肃越过秦岭到达甘肃南部。在黄土高原北部及相邻的内蒙古西南部集中分布本系全部 4 种，这里是灌木铁线莲组的分布中心。第 2 系，绿叶铁线莲系 ser. Virides，含绿叶铁线莲 C. viridis 1 种，分布于我国横断山区北部的高山灌丛草地。

关键词 铁线莲属；灌木铁线莲组；毛茛科；分类学修订