

Five new species and one new variety of *Ranunculus* (Ranunculaceae) from Sichuan, with one new species representing a new section (postprint)

Authors: Wang Wencai

Date: 2021-04-29T12:31:39+00:00

Abstract

Five new species of *Ranunculus* (Ranunculaceae) are described from western Sichuan. Three of these—*Ranunculus shimianensis*, *Ranunculus tenuifurcatus*, and *Ranunculus tenuilobatus*—belong to *Ranunculus* sect. *Auricomus*; *Ranunculus ludingensis* belongs to *Ranunculus* sect. *Ranunculus*; and the fifth species, *Ranunculus filicaulis* (characterized by a prostrate habit, ten or more radiating stolons, and flowers with three petals and two stamens), represents a new section. Additionally, a new variety of *Ranunculus nephelogenes* is described.

Full Text

Five New Species and One New Variety of *Ranunculus* (Ranunculaceae) from Sichuan, with One New Section Represented by One of These Species

WANG Wen-Tsai

State Key Laboratory of Systematic and Evolutionary Botany, Institute of Botany, Chinese Academy of Sciences, Beijing 100093, China

Abstract

Five species of the genus *Ranunculus* (Ranunculaceae) are described as new from western Sichuan Province. Of them, three new species—*R. shimianensis*, *R. tenuifurcatus*, and *R. perdissectus*—belong to Sect. *Auricomus*; one new species, *R. ludingensis*, belongs to Sect. *Ranunculus*; and the fifth new species, *R. filistoloniifer*, characterized by prostrate habit with ten or more stolons radiating outward, three petals per flower, and two stamens, represents a new section. Additionally, one new variety of *R. nephelogenes* is described.

Key words: Ranunculaceae, *Ranunculus*, new species, new variety, Sichuan

Introduction

During the identification of numerous Ranunculaceae specimens collected from western Sichuan in recent years by colleagues Zhu Xiangyun, Zhang Shuren, and others, I discovered five new species and one new variety within the genus *Ranunculus*. Among these, *R. filistolonifer* represents a new section.

Sect. *Auricomus* (Spach) Schur

***Ranunculus shimianensis* W. T. Wang, sp. nov.** *Habitu species nova haec est aliquantum similis R. hetianensi* L. Liou, a quo caulibus humilibus 3–6 cm altis, foliis caulinis indivisis, carpellis stylos brevissimos ferentibus valde differt. In *R. hetianensi*, caules 20 cm alti, folia caulina 3-secta, carpela stylos subulatos ferentes sunt.

Small perennial herbs. Stems 1–3, 3–6 cm tall, glabrous, simple or above base with a short branch, 2–4-leaved and above 2-flowered, the other one or two stems shorter, vegetative, only 2-leaved. Basal leaves 3–5, long petiolate, glabrous; blades papery, deltoid, broad-ovate, rhombic or rotund-ovate, 4–7 × 4–8.5 mm, at base truncate or broadly cuneate, at apex obtuse, on each margin obtusely or rotundly 1–3-dentate, inconspicuously 3-nerved; petioles 0.7–2 cm long, at base vaginate. Cauline leaves mostly similar to basal ones, glabrous, only the uppermost ones lanceolate or linear, and often on margin sparsely ciliate. Flower opposite to upper cauline leaf, 1–4.5 mm wide; pedicel 3–13 mm long. Sepals 5, broad-ovate, ca. 1.5 mm long. Petals 5, yellow, oblong-ovate, ca. 3 × 2 mm, glabrous, at apex rounded, abaxially above base with a small nectariferous pit lacking a scale. Stamens ca. 12, glabrous; filaments linear, 1 mm long; anthers broad-elliptic, ca. 0.8 × 0.5 mm. Carpels ca. 7, glabrous; ovaries 1 mm long; styles ca. 0.3 mm long; stigmas narrow-linear, ca. 0.2 mm long.

This species is somewhat similar in habit to *R. hetianensis* L. Liou, but differs markedly in its low stems 3–6 cm tall, undivided cauline leaves, and carpels bearing very short styles. In *R. hetianensis*, the stems are 20 cm tall, cauline leaves are 3-sect, and carpels bear subulate styles (LIOU L, 1980).

Specimen examined: Sichuan: Shimian Xian, Liziping Xiang, Menghuoxincun, Menghuocheng, alt. 2580 m, grassland, fls. yellow, 2019-04-18, S. R. Zhang, B. Z. Li & D. L. Lin 3102 (holotype and isotype, PE).

[Figure 1: see original paper]

***Ranunculus nephelogenes* Edgew. var. *furcatilobatus* W. T. Wang, var. nov.** *A. var. nephelogeni* differt foliorum basalium laminis furcate 3-lobatis. In *var. nephelogeni*, foliorum basalium laminae indivisae et integrae sunt.

This variety differs from the typical variety in its basal leaf blades being furcately 3-lobed. In the typical variety, the basal leaf blades are undivided and entire (LIOU L, 1980).

Specimen examined: Sichuan: Jiulong Xian, Tanggu Xiang, Wuxuhai, alt. 3707 m, in wet place on lake bank, fls. yellow, 2019-07-11, S. R. Zhang, Z. J. Shan & B. Z. Li 2944 (holotype, PE). Yunnan: Zhongdian, Tianyi, 1998-08-25, Q. E. Yang & H. Z. Kong 98-153 (PE); same locality, near Bitahai, 1998-09-03, Q. E. Yang & H. Z. Kong 98-239 (PE). Xizang: Markam Xian, Hong La just on N side of pass, S of Markam, alt. 4083–4145 m, mixed forest of *Picea*, *Abies*, *Quercus*, *Juniperus*, *Salix*, seepage in open with various other species of *Ranunculus* and *Veronica*, 2000-07-12, D. E. Boufford, S. L. Kelley, R. H. Ree & S. K. Wu 29406 (PE).

***Ranunculus tenuifurcatus* W. T. Wang, sp. nov.** *Ob folia basalia furcato-divisa, flores solitarios, petala 5, eorum foveolas nectariferas squamis carentes, carpella glabra, stigmata inconspicua species nova haec est affinis R. furcatifido W. T. Wang, a quo foliorum basalium laminis ambitu sub-oblongis, eorum lobis anguste linearibus margine integris, petalis majoribus orbiculari-obovatis vel late obovatis 4.5–6 mm latis praeclare recedit. In R. furcatifido, foliorum basalium laminae ambitu late rhombicae, earum lobi oblongo-oblancoolati, lineares vel anguste lanceolati vulgo 1–2-lobulati, petala anguste obovata 2–3 mm lata sunt.*

Perennial herbs. Stems 2, ca. 16 cm tall, from above base with long branches, appressed-pubescent. Basal leaves ca. 2, long petiolate; blades papery, suboblong in outline, 3–4 × 0.8–1.5 cm, furcately 3-parted, central lobe lanceolate-linear, 2–2.4 × 0.1–0.2 cm, lateral lobes narrow-linear, 0.09–2 × 0.09 cm, adaxially glabrous, abaxially with sparse hairs; petioles 5–6 cm long, at base with narrow membranous sheaths. Cauline leaves narrow-linear, 1–4.8 × 0.02–0.12 cm, subglabrous, in lower ones at base with narrow sheaths. Flowers solitary, terminal to stem and upper short branches or only terminal to stem. Sepals (4–)5, greenish, suboblong, ca. 4.8 × 1.1 mm, abaxially appressed-pubescent. Petals 5, yellow, orbicular-obovate or broad-obovate, 6–7 × 4.5–6 mm, at base shortly unguiculate, above base with a small nectariferous pit lacking a scale. Stamens ca. 10, glabrous; filaments narrow-linear, 1.2 mm long; anthers oblong ca. 1 × 0.3 mm. Gynoecium ovoid, ca. 4.5 × 3 mm; carpels ca. 80, glabrous; ovaries narrow-ovate, 0.5–0.8 × 0.3–0.4 mm; styles 0.3–0.6 mm long, abaxially with inconspicuous stigma tissue. Aggregate fruits narrow-ellipsoidal, ca. 6 × 4.8 mm; achenes ellipsoidal, ca. 1 × 0.8 mm, glabrous; persistent styles 0.6–0.8 mm long.

This new species is related to *R. furcatifidus* W. T. Wang in having basally furcately divided leaves, solitary flowers, five petals with nectariferous pits lacking scales, glabrous carpels, and inconspicuous stigmas. It differs clearly in its basal leaf blades being suboblong in outline with lobes narrowly linear and margin entire, and its larger petals being orbicular-obovate or broadly obovate, 4.5–6 mm wide. In *R. furcatifidus*, the basal leaf blades are broadly rhombic in outline with lobes oblong-oblancoolate, linear or narrowly lanceolate, usually 1–2-lobuled, and the petals are narrowly obovate, 2–3 mm wide (WANG WT,

1994).

Specimen examined: Sichuan: Kangding Shi, Diaohaizi, alt. 4038 m, on alpine meadow, 2017-07-21, X. Y. Zhu, Y. Jiang, K. L. Zu & R. P. Zhang GG117 (holotype, PE).

[Figure 2: see original paper]

***Ranunculus perdissectus* W. T. Wang, sp. nov.** *Ob foliorum laminas vulgo ter divisas, petala quinque, eorum foveolas nectariferas squamis carentes species nova haec est aliquantum similis R. tangutico (Maxim.) Ovcz., a quo foliorum laminis pinnatim divisas, floribus in mochasium dispositis valde differt. In R. tangutico, foliorum laminae 3-sectae, flores solitarii ad apicem caulis vel ramorum terminales sunt.*

Perennial herb. Stems 2, ca. 17 cm tall, from above base long 1–2-branched, appressed-puberulous, below with a few leaves. Basal leaves ca. 5, long petiolate; blades papery, broad-ovate or deltoid, 1–2.2 × 2–3.2 cm, pinnately divided, pinnae 2 pairs, shortly stipitate or sessile, twice or thrice dissected, ultimate lobes narrow-lanceolate-linear, narrow-linear or subfiliform, 2–9 × 0.2–1 mm, subglabrous or abaxially with sparse hairs; petioles ca. 4 cm long, puberulous. Cauline leaves similar to small basal leaves. Monochasium terminal, 4–6-flowered; bracts sessile, 2–3-sect, with lobes narrow-linear, 10–15 mm long; pedicels 1–6 cm long, appressed-puberulous. Flower: Sepals 5, narrow-elliptic, ca. 3 × 1.6 mm, adaxially glabrous, abaxially puberulous. Petals 5, yellow, broad-obovate or obovate, 6.6 × 3–4.5 mm, glabrous, 7-nerved, nectariferous pits lacking scales. Stamens 15–20, glabrous; filaments narrow-linear, ca. 1.2 mm long; anthers oblong, ca. 1 × 0.3 mm. Gynoecium ovoid, ca. 1.8 × 1 mm; carpels ca. 30, ovaries ca. 0.7 mm long, styles 0.3 mm long, glabrous. Aggregate fruits suboblong, ca. 5 × 2.5 mm; achenes obovoid or narrow-obovoid, 1.2 × 0.8–1 mm, appressed-puberulous; persistent styles 0.3 mm long.

This new species is somewhat similar to *R. tanguticus* (Maxim.) Ovcz. in having leaf blades usually thrice divided, five petals, and nectariferous pits lacking scales. It differs markedly in its leaf blades being pinnately divided and flowers arranged in a monochasium. In *R. tanguticus*, the leaf blades are 3-sect, and flowers are solitary and terminal on stems or branches (LIOU L, 1980).

Specimen examined: Sichuan: Kangding Shi, Waze Xiang, Huojiashong, Zheduo Shan, alt. 3648 m, alpine timber-line covered with *Rhododendron*, *Sorbus*, *Salix* species, 2010-08-10, J. I. Jeon, H. S. Lee, H. J. Eom, Y. I. Park & B. Liu S11332 (holotype, PE).

[Figure 3: see original paper]

Sect. *Nematocladium* W. T. Wang, sect. nov.

Herbae perennes, prostratae. Stolones decem vel plus, filiformes, ex fasciculo foliorum basalium nascentes, et radiatim extrinsecus expansi, ad nodos folia

vulgo unum vel duo et radices unam vel duas emittentes. Floris petala tria, et ejus stamina duo. Secundum hos characteres sectio nova haec ex generis Ranunculi sectionibus sinensibus ceteris distinguitur.

Perennial herbs, prostrate. Stolons ten or more, filiform, arising from a fascicle of basal leaves and spreading outward radially, at nodes usually producing 1–2 leaves and 1–2 roots. Flowers with three petals and two stamens. Based on these characters, this new section can be distinguished from other sections of *Ranunculus* in China (TAMURA M, 1995; WANG WT, 1995).

Type: *Ranunculus filistolonifer* W. T. Wang.

One species, occurring in Shimian Xian, Sichuan Province.

***Ranunculus filistolonifer* W. T. Wang, sp. nov.** Perennial herbs, prostrate. Stolons ten or more arising from the fascicle of basal leaves and radiately spreading in various directions, filiform, 10–25 cm long, 0.5(–1) mm across, near leaves with sparse hairs, with internodes 1.6–6 cm long, on each node putting forth 1(–3) leaf and 1(–2) root. Basal leaves ca. 5, long petiolate, glabrous; blades papery, reniform-ovate or subsemiorbicular, 3–5 × 5–7 mm, at base cordate-truncate or truncate, 3–5-rotund-dentate; petioles 8–10 mm long. There are two kinds of stolon leaves: most stolon leaves similar to basal leaves, but slightly smaller, with blades 1.5–4 × 3–7 mm, sometimes some upper stolon leaves being rhombic or obovate in shape; some stolon leaves even more smaller, shortly petiolate or sessile, rhombic or broad-ovate, on each margin with 3–4 triangular acute teeth. Flower solitary, terminal or axillary, glabrous. Sepals 3, green, triangular-ovate, ca. 1.2 × 0.8 mm. Petals 3, yellow, elliptic or broad-elliptic, 1.5 × 0.6–1.2 mm, at apex rounded, 3-nerved, nectariferous pit lacking a scale. Stamens 2; filaments linear, ca. 0.5 mm long; anthers broad-elliptic, also 0.5 mm long. Carpels 7–10; ovaries elliptic, ca. 0.8 mm long; styles ca. 0.2 mm long. Achenes ellipsoidal, slightly compressed, ca. 1.2 × 0.9 mm, glabrous; persistent styles ca. 0.4 mm long, often slightly hooked.

Specimen examined: Sichuan: Shimian Xian, Tianwan Xiang, Wandong River, alt. 2147 m, in forest, fls. yellow, 2019-07-07, S. R. Zhang, Z. J. Shan & B. Z. Li 2780 (holotype and isotype, PE).

[Figure 4: see original paper]

Sect. *Ranunculus*

***Ranunculus ludingensis* W. T. Wang, sp. nov.** *Ob folia ternata, sepala reflexa, petalorum foveolas nectariferas squamas ferentes carpella glabra species nova haec est affinis R. sinovaginato W. T. Wang, a quo plantis scaposis, foliolis longius petiolulatis, petalis haud unguiculatis, carpellis stylos breves ferentibus differt. In R. sinovaginato, plantae caulibus foliatis praeditae, foliola breviter petioluata vel sessilia, petala basi unguiculata, carpella stylos subulatos ferentia sunt.*

Small perennial herbs, 3–6 cm tall. Leaves 3–6, all basal, ternate, long petiolate; blades papery, cordate-pentagonal, $0.9\text{--}2.5 \times 1\text{--}3.8$ cm; central leaflet with petiolule up to 1 cm long, broad-rhombic, up to 1.5 cm broad, 3-cleft to 3-parted, with lobes 1–2-dentate or entire; lateral leaflets with petiolules up to 5 mm long, obliquely broad-ovate, unequally 2-parted, adaxially appressed-puberulous, abaxially with sparse hairs; petioles 1–4.5 cm long, subglabrous. Scape solitary, 2.5–5 cm tall, glabrous, on apex 1-flowered. Flower: Sepals 5, reflexed, narrow-triangular, $4.5\text{--}5 \times 2$ mm, glabrous. Petals 5, yellow, suboblong, ca. 8×3.2 mm, at base not unguiculate, inconspicuously 5-nerved, apex rounded, nectariferous pit with a semiorbicular scale. Stamens ca. 20, glabrous; filaments linear, rarely narrow-linear, ca. 1.2 mm long; anthers broad-elliptic, ca. 1.3×0.8 mm, rarely oblong, ca. 0.8×0.4 mm. Carpels ca. 9, glabrous; ovaries narrow-ovate, ca. 2 mm long; styles very short; stigmas 0.25 mm long.

This species has ternate leaves, reflexed sepals, petals with nectariferous pits bearing scales, and glabrous carpels, thus showing close affinity to *R. sinovaginatatus* W. T. Wang. It differs in having scapose plants with leaflets on longer petiolules, petals not unguiculate, and carpels bearing short styles. In *R. sinovaginatatus*, the plants have leafy stems, leaflets are shortly petiolulate or sessile, petals are unguiculate at base, and carpels bear subulate styles (LIOU L, 1980).

Specimen examined: Sichuan: Luding Xian, Xinxing Xiang, Caopingzi Cun, Yajiageng, alt. 2622 m, in grassy place on slope, fls. yellow, 2019-04-20, S. R. Zhang, B. Z. Li & D. L. Lin 3161 (holotype and isotype, PE).

[Figure 5: see original paper]

Acknowledgments

I sincerely thank Mr. Zhu Xiangyun, Mr. Zhang Shuren, and Mr. Ban Qin for providing valuable specimens, and Mr. Sun Yingbao for illustrating this paper and preparing the manuscript.

References

- LIOU L, 1980. *Ranunculus*. In *Flora Reipublicae Popularis Sinicae*. Beijing: Science Press, 28: 255-331. [刘亮, 1980. 毛茛属. 于中国植物志. 北京: 科学出版社, 28: 255-331.]
- TAMURA M, 1995. Ranunculaceae: Systematic Part. HIEPKO P, *Nat. Pflanzenfam.*, Zwei. Aufl., 17aIV: 224-497. Berlin: Duncker & Humblot.
- WANG WT, 1994. Notulae de Ranunculaceis Sinensibus (XVII). *Acta Phytotax. Sin.* 32(5): 467-479. [王文采, 1994. 中国毛茛科植物小志 (十七). 植物分类学报 32 (5): 467-479.]
- WANG WT, 1995. A revision of the genus *Ranunculus* in China. *Bull. Bot. Res. Harbin* 15(2): 137-180; (3): 275-329. [王文采, 1995. 中国毛茛属修订. 植物研究 15 (2): 137-180; (3): 275-329.]

Note: Figure translations are in progress. See original paper for figures.

Source: ChinaXiv — Machine translation. Verify with original.