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# A new species of *Schulzia* (Apiaceae) from Western Tian-Shan

Georgii A. Lazkov & Eugene V. Kljuykov

*Summary: Schulzia tianschanica*, a species of Apiaceae new to science, is described from the Sandalash Range (Western Tian-Shan). It is distinguished from *S. albiflora* by the number of unequal long rays of the umbel bent downwards when fruiting as well as by stylopodia, which are separated from mericarps by grooves. The new species differs from *S. prostrata* also in number and length of umbel rays, in a monocarpic life cycle, in the size of fruits, in stylopodia separated from mericarps by grooves and in radical leaves, 3-pinnate with closely spaced primary segments.

*Keywords:* Apiaceae, new species, Sandalash Range, *Schulzia*, Talas Range, taxonomic characters, Western Tian-Shan

The genus *Schulzia* Sprengel includes 5 species and has a wide distribution area from Central Asia to the Himalayas (Pimenov & Kljuykov 1990, 2002). According to other sources, the number of species may reach 7 (IPNI 2019).

In Central Asia the genus *Schulzia* has been represented by two species up to now (Pimenov & Kljuykov 2002). Unknown specimens of *Schulzia* were gathered on Sandalash Range (Western Tian-Shan) during a floristic field expedition in 2018 in different regions of Kyrgyzstan. Later, two more morphological similar but poorly preserved specimens from Kazakhstan (Talas Range, Maidantal River Valley and Dzabagly River) without precise locality information were discovered in herbaria LE and MW. These specimens are closely related to *S. albiflora* (Kar. & Kir.) Popov and *S. prostrata* Pimenov & Kljuykov, but they possess strong morphological differences. The differential characters from all known species of *Schulzia* from Kyrgyzstan and Kazakhstan allow us to describe our plants as a new species.

## Materials and methods

Field research was conducted in 2018 in the Sandalash Range. More than 500 herbarium specimens, including *Schulzia* species, were collected and deposited in FRU and LE. The coordinates of localities were recorded using a GPS device. For comparison, type specimens and other material of the genus *Schulzia* stored in institutions with the largest herbarium collections from Central Asia [FRU, LE, TASH] were studied.

## Results

### *Schulzia tianschanica* Lazkov & Kljuykov sp. nov. (Table 1, Fig. 1–5).

**Diagnosis.** The new species differs from *Schulzia albiflora* in unequal long rays of the central umbel. Rays 14–30, 12–17 cm long (vs 9–12, 3–5 cm long), recurved downwards (vs more or less directed upwards). Conic stylopodia separated from mericarps by grooves (vs short conic, merged with mericarps) (Fig. 1). Stem with whorled leaves. From *S. prostrata* the new species differs in monocarpic life cycle (vs polycarpic), longer rays of the terminal umbel. Rays14–30,

**Table 1.** Comparative morphological characters of the genus *Schulzia tianschanica* and related species.

| Characters | *Schulzia tianschanica* | *Schulzia albiflora* | *Schulzia prostrata* |
|---|---|---|---|
| Life form | monocarpic | monocarpic | polycarpic |
| Basal leaves (color) | green | green | glaucous |
| Basal leaves (arrangement of primary segments) | closely spaced | closely spaced | distant |
| Basal leaves (dissection) | 3-pinnate | 3-pinnate | bipinnate |
| Stem | developed | undeveloped | undeveloped |
| Rays of terminal umbel (relative length) | unequal | equal | unequal |
| Rays of central umbel (number) | 14–30 | 9–12 | 3–15 |
| Rays of terminal umbel (longest) in cm | 12–18 | 3–5 | 2–9 |
| Fruit length in mm | 2.5–3 | 2.5–3 | 3.5–5 |
| Shape of stylopodia | conic | low-conic | low-conic |
| Stylopodia (compound with mericarps) | separate | adnate | adnate |

12–17 cm long (vs 3–15, 2–9 cm long). Conic stylopodia separated from mericarps by grooves (vs short conic, adnate to mericarps); size of fruit 2.5–3 mm (vs 3.5–5 mm long); developed stem with whorled leaves (vs undeveloped stem); radical leaves green, 3-pinnate, with primary segments closely spaced (vs glaucous, bipinnate with distant primary segments).

**Types.** Kyrgyzstan. Sandalash Range, Sandalash River basin, near ascent to Kumbel pass, 2613 m, limestone rocks (41°57'10.5" N, 71°08'20.1" E), 27 July 2018, *G.A. Lazkov* [holotypus LE 01050640 (Fig. 2), isotypi: FRU, MW].

**Description.** Monocarpic herb, glabrous. Tap root up to 1 cm in diam., collar with black brown remnants of petioles. Stems with the pods of terminal umbel 3–13 cm long, ca. 6 mm in diameter at base, solid, finely grooved, branched from the base, internodes 1–3, short. Basal leaf blades 5–9 cm long, 2–4 cm wide, narrowly triangular or lanceolate, 3-pinnate with primary segments closely spaced and touching; terminal segments dissected on linear-lanceolate lobes 2–3 mm


**Figure 1.** General views of fruits. 1 – *Schulzia albiflora* (immature fruit, with stylopodia merged to mericarps), 2 – *S. tianschanica* (immature fruit, with stylopodia separate from mericarps).


**Figure 2.** *Schulzia tianschanica* holotype [LE 01050640].

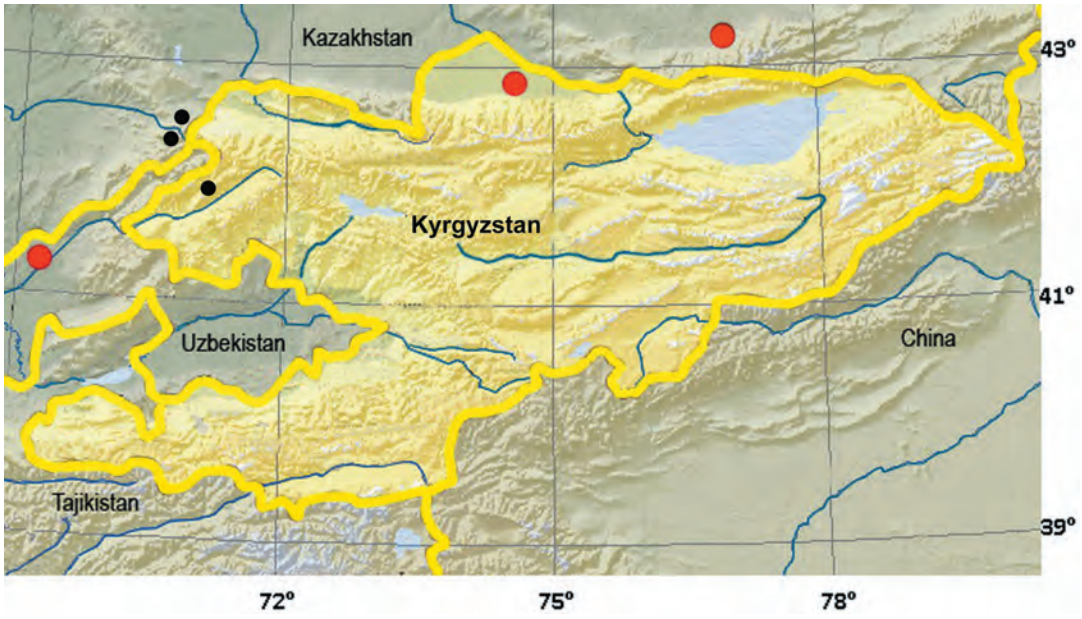


**Figure 3.** Distribution of *Schulzia tianschanica* (black dots).

long, cartilaginous at the top; stem leaves 3-pinnate, 4 in a whorl with smaller leaf blades, in the axils with extra umbels, exceeding the terminal umbel. Umbels 20–34 cm in diameter, with 14–30 ribbed, unequal rays, longest of which 12–18 cm long, when fruiting bent downwards when fruiting; bracts are leaf-shaped, pinnate, on short petioles. Umbellets 1.3–2 cm in diameter, 25–40 flowers, pedicels near equally round in cross section, 3–5 mm long; bracteoles 10–15, leaf-

**Figure 4.** *Schulzia tianschanica* (Sandalash Range).

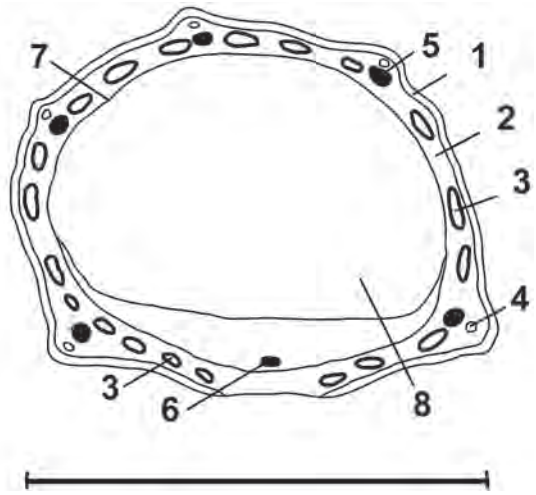


**Figure 5.** Mericarp of *Schulzia tianschanica* in cross section. 1 – exocarp; 2 – mesocarp; 3 – inter rib and commissural secretory ducts; 4 – rib secretory ducts; 5 – vascular bundles; 6 – vascular bundle of funiculus; 7 – endocarp; 8 – endosperm. Scale bar = 1 mm.

shaped, pinnate, on short petioles; calyx teeth obscure, petals 1–1.2 mm long, ovate, curved inside at apex, white with brownish secretory ducts. Fruits elongate; mericarps homomorphic, dorsally convex, 2.5–3 × 1.0–1.2 mm; ribs equal, filiform; commissure narrow; stylopodia conic, separated from mericarps by grooves; styles ca. 1.2 mm long, recurved; mesocarp with parenchymal cells; furrow and commissural secretory ducts are cyclic; rib secretory ducts are solitary, represented in all ribs; endosperm at commissural side flat.

All comparative characters of *Schulzia tianschanica* and related species are given in Table 1.

**Additional specimens examined.** Kazakhstan [Chimkent]: Tian-schan occid., Maidantal River Valley, August 1902, *B. Fedtschenko* [LE]; Kazakhstan. Syrdar. Prov.: Chimkent. Distr., Talas Range, Dzabagly-su River, alpine zone, meadow, 18 August 1921, *R.I. Abolin, M.G. Popov 8570* [LE!, MW 0861130!, TASH].

Note. Both additional studied specimens are poorly preserved and do not contain precise locality information.

**Etymology.** The specific epithet was selected after the Tian-Shan Mountain, where this species grows.

**Phenology.** Flowering in July–August; fruiting in July–September.

**Distribution area.** Kyrgyzstan, Sandalash Range; Kazakhstan, Talas Range (Fig. 3).

**Habitat.** The species grows on steep shadow slopes of limestone rocks, at elevations of more than 2600 m (Fig. 4).

Note. Data about habitat conditions received from type specimen only.

## Discussion

The new species is intermediate in some characters between *S. albiflora* and *S. prostrata* also growing in Central Asia. It is closer to *S. albiflora* in fruit size, in leaf features as well as in monocarpic life cycle. Some other characters as unequal, recurved downwards rays of the terminal

umbel point to *S. prostata*. At the same time, it has strong morphological differences from both species: presence of whorled stem leaves, umbel rays reaching 18 cm in length as well as stylopodia separated from mericarps by grooves. The latter characters are very important for species delimitation in *Schulzia* and unique in the whole genus. Another feature of the new species (unequal rays of terminal umbel recurved downwards in the fruit) has been discovered newly, when *S. prostrata* was described. Thus, the main differences of the new species are found in the morphology of the vegetative and generative organs, while anatomic characters like transverse fruit section (taxonomically important and typically rich in Apiaceae) do not display any sufficient difference from *S. albiflora* (Fig. 5).

*Schulzia tianschanica* is growing in the high mountain zone of western extremity of Western Tian-Shan region (Sandalash, Talas Ranges) on limestone rocks. This species is allopatric with *S. albiflora* and *S. prostrata* and their distribution areas do not overlap. No species of *Schulzia* has been recorded from Sandalash Range before, and it seems that data on the occurence of *S. albiflora* and *S. crinita* (Pall.) Spreng. on western spurs of Talas Range by Karmyscheva (1973, 1982) are probably a misidentification of *S. tianschanica*, what is also confirmed by the study of herbarium materials. Very similar, *S. tianschanica* is growing in other mountain ranges of Western Tian-Shan, including Uzbekistan, from where it was reported as *S. albiflora* (without precise locations) by Pimenov (2017). The distribution area of the related species *S. prostrata* is restricted to Central Tian-Shan region within Kyrgyzstan and to Western China (Xinjiang) (Vinogradova 1994; Pimenov & Kljuykov 2002; Pimenov 2017).

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## References

**Karmyscheva N.X. (1973):** Flora and vegetation of the Aksu-Jabagly Nature Reserve (Talas Alatau). – Alma-Ata: Nauka. [In Russian]

**Karmyscheva N.X. (1982):** Flora and vegetation of western spurs of the Talas Alatau. – Alma-Ata: Nauka. [In Russian]

**Pimenov M.G. (2017):** Updated checklist of Chinese Umbelliferae: nomenclature, synonymy, typification, distribution. – Turczaninowia **20**(2): 106–239.

**Pimenov M.G. & Kljuykov E.V. (1990):** The new species and floristic findings in the Umbelliferae (Central Tian-Shan). – Bot. Zhurn. (St. Petersburg) **75**: 89–98. [In Russian]

**Pimenov M.G. & Kljuykov E.V. (2002):** Umbelliferae of Kirgizii. – Moscow: KMK Scientific Press. [In Russian]

**IPNI (2019):** The International Plant Names Index. Available from: http://www.ipni.org/ [accessed 3 January 2019]

**Vinogradova V.M. (1994):** Umbelliferae Juss. – In: Grubov V.I. [ed.]: Plantae Asiae Centralis 10: 9–99. – St. Petersburg: Mir i Semya. [In Russian]

Addresses of the authors:

Georgii A. Lazkov (corresponding author)
Laboratory of Flora
Institute of Biology
National Academy of Sciences
720071 Bishkek
Kyrgyz Republic
E-mail: glazkov1963@mail.ru

Eugene V. Kljuykov
Botanical Garden
Faculty of Biology
Lomonosov Moscow State University
Leninskie Gory 1–12
119234 Moscow
Russia