



## *Oxytropis dariimaae* (Fabaceae), a new species from Khovd Province, Mongolia

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**ABSTRACT:** A new species, *Oxytropis dariimaae* (Fabaceae), from Sutai Mountain, Khovd Province, Mongolia is described and illustrated in this study. The new species is morphologically similar to *O. sutaica*, which belongs to section *Verticillares*; however, it can be distinguished by several key characteristics, including peduncle length, raceme structure, leaflet size, and pod morphology. *Oxytropis dariimaae* was provisionally assessed as data deficient. We provide taxonomic keys and comparative plates of closely related species to facilitate identification.

**KEY WORDS:** Altai Mountains, Mongolia, *Oxytropis sutaica*, sect. *Verticillares*.

### INTRODUCTION

*Oxytropis* DC. (1802:24, 66) belongs to the Astragalinae clade within the tribe Galegeae of the family Fabaceae. The genus is classified into six subgenera and 25 sections (Malyshev, 2008; POWO, 2025), with 608 species, distributed throughout the subarctic and temperate Northern Hemisphere (Malyshev, 2008). This genus is mainly distributed in eastern and central Asia, Europe, and North America, with 154 species in Asian Russia (Baikov, 2012), 133 species in China (Zhu *et al.*, 2010), 119 species in Kazakhstan (Abdulina, 1999), 100 species in Mongolia (Baasanmunkh *et al.*, 2021, 2022), 67 species in Kyrgyzstan (Lazkov and Sultanova, 2014), 62 species in Uzbekistan (Turdiev *et al.*, 2025), 58 species in Tajikistan (Abdusalyamova, 1978; Nowak *et al.*, 2020), 39 species in Iran and Pakistan (Ali, 1977; Rechinger, 1984; Maassoumi, 2013, 2018) and 22 species in India (Kumar and Sane, 2003; Chaudhary *et al.*, 2024).

Approximately 100 taxa of *Oxytropis* have been recorded in Mongolia, including 13 endemic and 36 subendemic taxa (Ulziikhutag, 2003; Baasanmunkh *et al.*, 2021, 2022). Recently, two new species—*O. oyunmaae* Munkht. & Baasanm. (Baasanmunkh *et al.*, 2025a) and *O. jamsranii* Munkht. & Baasanm. (Baasanmunkh *et al.*, 2025b)—have been described in Mongolia. *Oxytropis sobolevskajae* Pjak was recently found in the western part of Mongolia (Baasanmunkh *et al.*, 2025b). Traditionally, Mongolian *Oxytropis* is classified into six subgenera and 20 sections (Ulziikhutag, 2003; Malyshev, 2008), among which sect. *Verticillares* DC. contains 24 species, including four endemic and 11 subendemic taxa (Malyshev, 2008; Baasanmunkh *et al.*, 2021, 2022, 2025a, b). Members of this section are characterised by an

acaulescent growth form, leaflets arranged in three or more whorls, and the absence of sessile glands or glandular hairs (Malyshev, 2008). A new species, *Oxytropis dariimaae* Munkht. & Baasanm. from the Sutai Khaikhan Mountain Nature Reserve in the Mongolian Altai phytogeographical region (Grubov, 1982) under sect. *Verticillares*, is described and illustrated in this study. The new species is morphologically most similar to *O. sutaica* (Fig. S1) of sect. *Verticillares*. However, it has also been compared with other allied species such as *O. acanthacea* Jurtzev, *O. hailarensis* Kitag., *O. lanata* (Pall.) DC., *O. myriophylla* (Pall.) DC., *O. oyunmaae*, *O. oxyphylla* (Pall.) DC., *O. pavlovii* B.Fedtsch. & Basil., and *O. selengensis* Bunge.

### MATERIALS AND METHODS

Specimens were collected from Sutai Mountain, Darvi Soum, Khovd Province, Mongolia, during field expeditions in early June, 2025. Herbarium specimens, including type specimens, were deposited in the Herbarium of the National University of Mongolia (UBU). The regional conservation status of the new species was assessed using Red List Criterion D, in accordance with the International Union for Conservation of Nature (IUCN) national Red List guidelines (IUCN, 2024). For species identification, we used various sources, including literature (Grubov, 1982, 2004; Abdulina, 1999; Malyshev, 2008; Zhu *et al.*, 2010; Oyuntsetseg *et al.*, 2022), herbarium specimens from ALTB, LE, MW, NS, GFW, UBA, and UBU (Thiers, 2023), and occurrence records deposited in Plantarium (<http://www.plantarium.ru>), Global Biodiversity Information Facility (GBIF) (GBIF, 2025; <https://www.gbif.org/>), and iNaturalist (iNaturalist, 2025).



**Fig. 1.** *Oxytropis dariimaae* Munkht. & Baasanm. **A–B.** General habits; **C.** Fruiting peduncle; **D.** Standard; **E.** Wings; **F.** Keel; **G.** Pistil; **H.** Stamens; **I.** Pod; **J.** Pod valve; **K.** Leaf; **L.** Leaflet, adaxial view; **M.** Leaflet, abaxial view. (Photos by D. Munkhulga).

A point distribution map was produced based on the herbarium specimens using ArcGIS (Esri 2012).

## TAXONOMIC TREATMENT

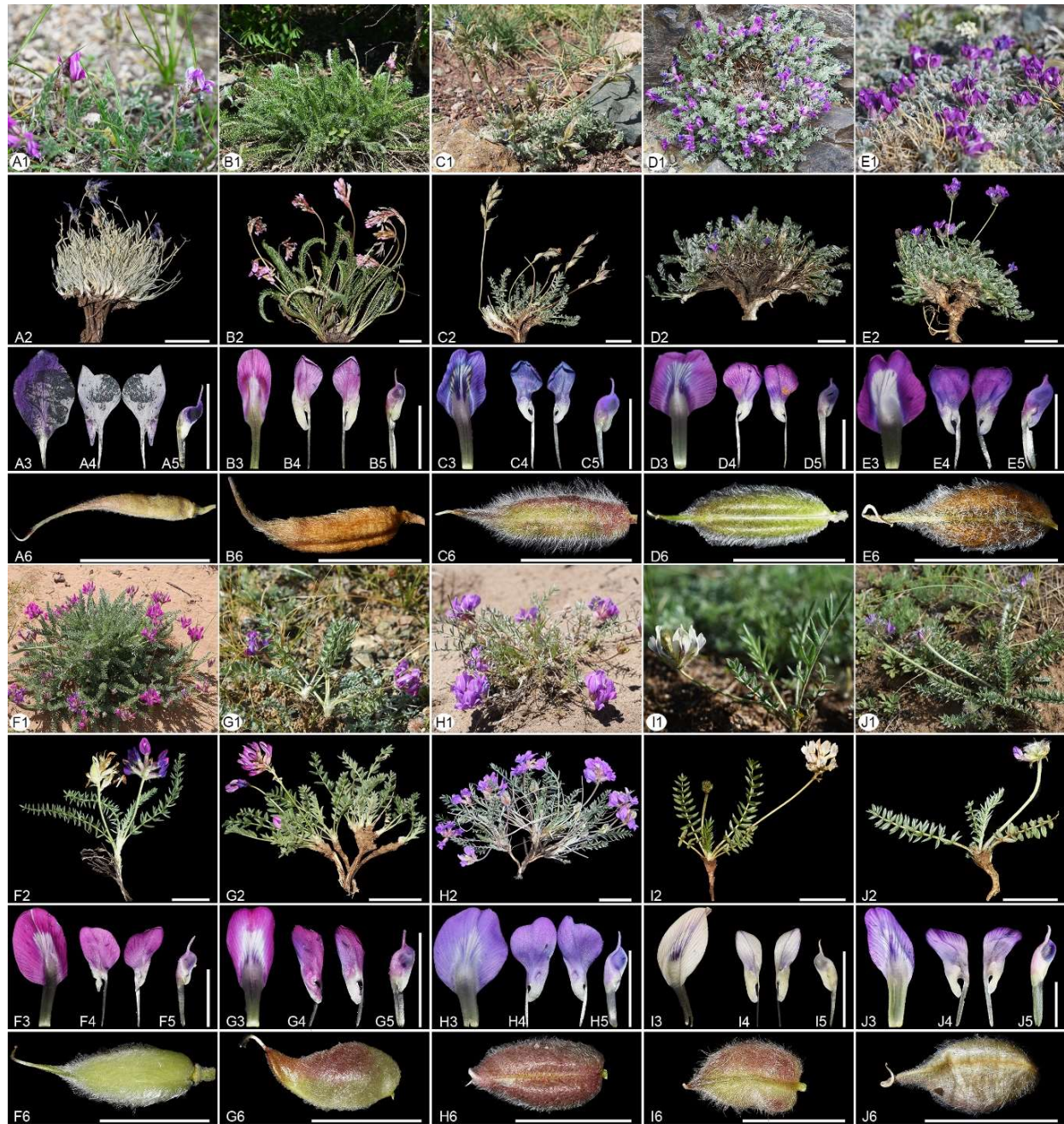
*Oxytropis dariimaae* Munkht. & Baasanm., *sp. nov.*

### Fig. 1

**Type:** MONGOLIA. The Mongolian Altai phytogeographical region: Khovd Province, Darvi Soum, Sutai mountain, Sutain khureenii am, 1535 m elev., 46°46'59.7" N, 93°36'55.8" E, 21 June 2025, *S. Baasanmunkh, D. Munkhtulga & C. Choinom MM11* (holotype: UBU0039448!; isotype: UBU0039449!, Fig. S2).

**Diagnosis:** *Oxytropis dariimaae* (Fig. 1) is most similar to *O. sutaica* (Figs. 2E, 3). However, it can be easily distinguished from *O. sutaica* by its racemes 5–8-flowered (vs. 1–3-flowered), peduncle 5–10 cm, ca. 2 × as long as leaves, without glands (vs. scarcely exceeding leaves, with scattered minute glands), leaflets 3–5 mm long (vs. 1–3 mm long), bracts lanceolate to narrowly lanceolate, ca. 1 cm, herbaceous, equal to or shorter than calyx (vs. lanceolate, ca. 5 mm, herbaceous, shorter than calyx), pod 15–18 × 5–7 mm (vs. 10–15 × 5 mm).

**Description:** Acaulescent perennial herb, 5–10 cm tall, from a multiheaded caudex, with dense silvery white trichomes. Caudex branches with persistent petioles.



**Fig. 2.** General habits and details characters of selected *Oxytropis* species in section *Verticillares* in Mongolia. **A1-A6.** *O. oyunmaae*; **B1-B6.** *O. myriophylla*; **C1-C6.** *O. dariimaae*; **D1-D6.** *O. acanthacea*; **E1-E6.** *O. sutaica*; **F1-F6.** *O. lanata*; **G1-G6.** *O. pavlovii*; **H1-H6.** *O. hailarensis*; **I1-I6.** *O. oxyphylla*; **J1-J6.** *O. selengensis*. **1-2.** General habit, **3.** Standard, **4.** Wings, **5.** Keel, **6.** Pod. Scale bar: A3-J6 = 1 cm; scale bar: A2-J2 = 3 cm. (Photos by D. Munkhulga).

Stipules triangular, scarious, appressed villous with long trichomes, adnate to petiole. Leaves 3–5 cm, petioles ca. 1 cm long, densely covered with appressed long white trichomes; leaflets verticillate, in 6–10 whorls, 3 or 4 blades per whorl; leaflet blades elliptic, apex acute, 3–5 mm long, densely covered with appressed long white pilose. Peduncle 5–10 cm, ca. 2 × as long as leaves. Racemes 5–8-flowered; bracts lanceolate to narrowly lanceolate, ca. 1 cm, herbaceous, equal to or shorter than

calyx, with ascending or appressed long white trichomes, apex acute. Calyx cylindrical, 10–12 mm long (with teeth), covered with intermixed spreading long white and black short trichomes; teeth linear-lanceolate, 2–3 mm long. Corolla purple; standard ca. 15–18 mm long, with lamina elliptic-ovate, limb ca. 8–10 × 5–8 mm; wings shorter than the standard, ca. 13–15 mm long, with lamina greatly expanded and slightly emarginate at the tip, limb ca. 8 × 3–4 mm; claw ca. 7 mm long; keel ca. 10–13 mm long,



shorter than wings, limb ca.  $6-7 \times 2.5-3$  mm claw ca. 6 mm long; keel cusp about 2 mm long. Pods not inflated, ellipsoid, or oblong leathery to thinly leathery, 2-locular,  $15-18 \times 5-7$  mm, covered with intermixed spreading long white and black short trichomes, beak ca. 2 mm long.

**Distribution and ecology:** *Oxytropis dariimaae* is a strictly endemic taxon restricted to the Sutai Khairkhan Mountain range in the Mongolian Altai phytogeographical region of western Mongolia (Fig. 3). This species grows on stony and gravelly mountain slopes, rocks, and pebble-stony bottoms of sayrs at altitudes ranging from 1400 to 1700 m asl. Flowering begins in late May or early June. Fruiting occurs from mid-July onward. This species is associated with *Farinopsis salesoviana* (Stephan) Chrtek & Soják, *Goniolimon speciosum* (L.) Boiss., *Astragalus tibetanus* Benth. ex Bunge, *A. gregorii* B.Fedtsch. & Basil., *Hedysarum ferganense* Korsh., *Tulipa uniflora* (L.) Besser ex Baker, *Dracocephalum fruticosum* Stephan ex Willd., *Ziziphora pamiroalaica* Juz., *Thymus gobicus* Tscherneva, and *Euphorbia mongolica* (Prokh.) Prokh.

**Etymology:** The new species is named after Sc.D. Shagdar Dariimaa, one of the most renowned botanists in Mongolia. Dr. Dariimaa has made substantial contributions to the study of the Asteraceae family in Mongolia and described several new species of *Artemisia* L. for science.

**Conservation status:** *Oxytropis dariimaae* is currently known from one location that comprises approximately 20 individuals within 2 km<sup>2</sup>. Based on the IUCN Red List Categories and Criteria (IUCN, 2024), the species is categorised as Data Deficient (DD) due to insufficient information on its distribution and population status.

**Notes:** Morphologically, *O. dariimaae* differs from several *Oxytropis* species in sect. *Verticillares*, which are given in Fig. 2. It differs from *O. hailarensis*, *O. oxyphylla*, *O. pavlovii*, and *O. selengensis* by having non-inflated, ellipsoid or oblong pods that are leathery to thinly leathery and 2-locular (vs. pod inflated, ovoid, membranous, 1-locular (Fig. 2-G6; H6; I6; J6)); it differs from *O. acanthacea* by having multiheaded caudex, herbs (Fig. 2-C2) (vs. hemispherical cushions, shrublets (Fig. 2-D2)); it differs from *O. lanata* by having a lamina elliptic-ovate (Fig. 2-C3) (vs. ovate-orbicular (Fig. 2-F3)), and pods that are not inflated, ellipsoid, covered with intermixed spreading long white and black short trichomes (Fig. 2-C6) (vs. slightly inflated, ovoid-oblong, softly lanate (Fig. 2-F6)); it differs from *O. myriophylla* by leaflets in 6–10 whorls (vs. 12–16(–50) whorls); it differs from *O. oyunmaae* by having calyx cylindric, 10–12 mm long (vs. campanulate, 5–6 mm long), lamina elliptic-ovate (vs. obovate-orbicular (Fig. 2-A3)), pods ellipsoid or oblong, beak ca. 2 mm long (vs. oblong-linear, beak 6 mm long (Fig. 2-A6)).

*Oxytropis sutaica* (Fig. S1) was originally described

on Sutai Mountain within the Altai Mountain Range in Mongolia, where it thrives in high-altitude alpine environments (Grubov, 2004). It is a species endemic to Mongolia (Baasanmunkh *et al.*, 2021), typically found growing on talus near neve basins and in alpine meadows dominated by Kobresia–sedge communities at elevations ranging from 3000 to 3500 meters. This species is morphologically and ecologically similar to *O. chionobia* Bunge and *O. oligantha* Bunge. *Oxytropis chionobia*, described from the Dzungarian Alatau, is distributed throughout the alpine regions of Kazakhstan, Kyrgyzstan, and Tajikistan (Bunge, 1874). *O. oligantha*, originally described in the Altai Mountain Range (Chuya river basin), occurs in rocky, high-altitude habitats of Mongolia, Kazakhstan, and Russia (Tuva) (Vasilchenko *et al.*, 1948; Polozhij, 1994). The three species share similar growth forms and vegetative morphology, differing only in subtle characteristics such as leaflet size, cushion density, and the number of flowers per raceme. However, further taxonomic revision is required on three species based on morphological and molecular analysis. Therefore, *O. oligantha* is not treated as a separate species in the identification key.

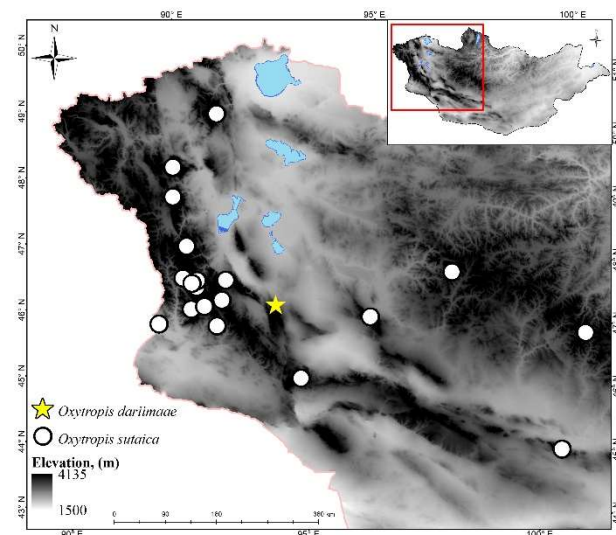


Fig. 3. Distribution map of *Oxytropis dariimaae* (yellow star) and *O. sutaica* (white circle) in Mongolia.

**Additional specimens examined: *Oxytropis sutaica*:** MONGOLIA. Khangai phytogeographical region: Bayankhongor province, Erdenetsogt soum, Kholsain davaa 2700 m elev.,  $46^{\circ}49'59.5''$  N,  $100^{\circ}46'36.2''$  E, 04 August 1980, *I.A. Grubov s.n.* (MW0183922). Zavkhan province, Otgon soum, Otgontenger mountain 3300 m elev.,  $47^{\circ}37'32.0''$  N,  $97^{\circ}34'29.6''$  E, 26 July 1983, *P.I. Dimitrev 6889* (MW0184039). Khovd phytogeographical region: Uvs province, Tarialan soum, Kharkhiraa mountain, 3000 m elev.,  $49^{\circ}34'55.4''$  N,  $91^{\circ}30'50.5''$  E, 08 June 1978, *Baatartseveg & Batkhuyag s.n.* (UBU0039954). Mongolian Altai phytogeographical region: Khovd province, Bulgan soum, Ulaan davaa, 15 June 1970, *T. Jamsran & V. Hilbig s.n.* (UBU0036182). Khovd province, Mankhan soum, Munkhkhairkhan mountain, 3300 m elev.,  $46^{\circ}57'20.0''$  N,  $91^{\circ}25'22.7''$  E, 14 August 1978, *G.N. Ogureeva s.n.* (MW0184041); same locality,



17 July 1979, *A.A. Kischinskiy s.n.* (MW0184042). Khovd province, Mankhan soum, Baatarkhairkhan mountain range, 2800 m elev., 47°02'33.0" N, 92°23'53.9" E, 24 July 1979, *I.A. Gubanov 6717* (MW0183919-MW0183921). Khovd Province, Uyenich Soum, 2850 m elev., 46°34'36.3" N, 92°01'08.2" E, 25 July 1979, *I.A. Gubanov 6718* (MW0183918). Khovd province, Duut soum, Munkhkhairkhan mountain, 3000 m elev., 47°27'25.5" N, 91°22'38.3" E, 26 August 1983, *I.A. Gubanov 6666* (MW0184038; MW0184040). Khovd province, Mara Uul mountain, 48°10'49.2" N, 90°51'12.7" E, 24 June 2002, *A. Zemmrich AZ261* (GFW039265). Gobi-Altai province, Khasagt Khaikhan mountain, 46°47'21.0" N, 95°48'03.0" E, 16 July 2007, *T. Jamsran s.n.* (UBU0032116). Khovd province, Munkhkhairkhan soum, Khukh lake, 2800 m elev., 46°58'50.4" N, 91°28'26.7" E, 26 July 2016, *B. Oyuntsetseg & S. Baasanmunkh s.n.* (UBU0012261). Khovd province, Erdeneburen soum, Tsambagarav mountain, 3000 m elev., 48°37'32.7" N, 90°43'15.5" E, 16 June 2020, *B. Oyuntsetseg & K. Khaliunaa W2020-13* (UBU0003410). Khovd province, Erdeneburen soum, Tsambagarav mountain, 2923 m elev., 48°38'17.7" N, 90°43'39.9" E, 03 June 2024, *B. Oyuntsetseg, G. Bayarmaa & D. Munkhtulga WEST24\_14* (UBU00036103; UBU0037607; UBU0037610). Gobi Altai phytogeographical region: Bayankhongor province, Shinejinst soum, Ikhbogd mountain, 3200 m elev., 44°58'07.0" N, 100°23'13.3" E, *A. A. Yunatov 8675* (NS0026109). Bayankhongor province, Shinejinst soum, Baruun Bogd mountain, Tsonj, 3300 m elev., 44°58'04.5" N, 100°23'06.9" E, 09 July 2021, *L. Erdene-Ochir s.n.* (UBU0032486).

### Key to *O. dariimaae* and species of sect. *Verticillares* in Mongolia

- 1a. The turfs are prickly due to sharp, hardening leaf petioles. *O. acanthacea*
- 1b. The turfs are not prickly ..... 2
- 2a. Ovary and pods glabrous ..... 3
- 2b. Ovary and pods pubescent ..... 5
- 3a. Leaflets small, 3–6 mm rarely 9 mm long, disposed 16–27 in a whorl ..... *O. stukovii*
- 3b. Leaflets 10–22 mm long, 10–16 in a whorl ..... 4
- 4a. Pods are not inflated, hard-skinned. Standard 24–25 mm long, keel beak 2 mm long. Stipules covered with dense white hairs ... *O. prostrata*
- 4b. Pods inflated, membranous. Standard 14–21 mm long, keel beak 2.5–3 mm long. Stipules glabrous ..... *O. hailarensis*
- 5a. Corolla yellow, yellowish white (rarely yellowish white in *O. oxyphylla*) ..... 6
- 5b. Corolla violet, purplish, reddish, or bluish and usually 2-colored .. 8
- 6a. Leaves 8–20 cm; leaflets (at least some typically) verticillate, in 1–9 whorls but apically 1 to several leaflets reduced to 2 opposite blades ..... *O. ochrantha*
- 6b. Leaves 3–14 cm; leaflets at least some verticillate or sometimes subverticillate, in 4–11 whorls, 3 or 4 blades per whorl ..... 7
- 7a. Leaves 6–14 cm; leaflets in 6–11 whorls ..... *O. oxyphylla*
- 7b. Leaves 3–8 cm; leaflets in 5 or 6 whorls ..... *O. viridiflava*
- 8a. Calyx short-campanulate ..... 9
- 8b. Calyx tubular or tubular-campanulate ..... 11
- 9a. Pods not inflated, leathery, oblong-linear, with dense long trichomes, beak linear. Leaflets elliptic, 3–4 each in 8–10 whorls; standard lamina obovate-orbicular ..... *O. oyunmaae*
- 9b. Pods inflated, membranous, ovoid or globose ..... 10
- 10a. Plants shortly caulescent; flowers 7–12 mm long; leaflets oblong, 4–6 each in 8–14 whorls; pods 7–10 mm long ..... *O. racemosa*
- 10b. Plants acaulescent; flowers 22–25 mm long; leaflets linear-oblong, 4 each in 8–14 whorls; pods 20–25 mm long ..... *O. rhynchophysa*
- 11a. Stipules with dense white tomentum; as a result, base of petiole and tip of caudex densely wrapped in white tomentum ..... 12
- 11b. Stipules glabrous or pilose but not tomentose-pubescent ..... 15
- 12a. Leaflets 3–6 each in 20–30 unevenly distant whorls. *O. mongolica*
- 12b. Leaflets 3–6 each in 10–20 whorls ..... 13
- 13a. Leaflets with sparse appressed hairs, in distant whorls ..... *O. lasiopoda*
- 13b. Leaflets with dense white or grey tomentum, in closely set whorls ..... 14
- 14a. Caudex elongated; leaflets with grey tomentum, oblong or linear, 4–8 each in 12–18 whorls ..... *O. lanata*

- 14b. Caudex very short; leaflets with white tomentum, lanceolate or ovate, obtuse, 3–7 each in 10–15 whorls ..... *O. lanuginosa*
- 15a. Plants with appressed or yellowish glandular trichomes ..... 16
- 15b. Plants non-glandular ..... 17
- 16a. Beak of corolla keel 1.8–3.8 mm; leaflets in 20–30(–50) whorls; bracts 8–15 mm ..... *O. myriophylla*
- 16b. Beak of corolla keel 1.5–2.5 mm; leaflets in (2 or)3–12 whorls and some or most leaflets merely opposite; bracts 3–10 mm .. *O. bicolor*
- 17a. Leaves with 3–9 whorls of linear or lanceolate leaflets ..... 18
- 17b. Leaves with 6–18 whorls of leaflets ..... 19
- 18a. Leaves 3–6 cm; leaflets in 4 or 5 whorls; peduncle 3–5 cm .... *O. pumila*
- 18b. Leaves 7–20 cm; leaflets in 3–9 whorls; peduncle 6–11 cm ..... *O. oxyphylla*
- 19a. Pods broadly ovoid-globose or ovoid, inflated, membranous, unilocular (semibilocular in *O. dubia*) ..... 20
- 19b. Pods ellipsoid or oblong-ovoid, slightly inflated, leathery to thinly leathery, semibilocular ..... 24
- 20a. Leaflets 10–20 (25) mm long ..... *O. turczaninovi*
- 20b. Leaflets 2–10 (15) mm long ..... 21
- 21a. Calyx pubescent with white hairs only; corolla 10–12 mm long, pale violet; racemes capitate, with 5–9 flowers. Leaflets 4–6 each in 7–8 whorls, oblong or ovate, adpressedly white-pilose, 5–8 mm long, 1–3 mm wide ..... *O. selengensis*
- 21b. Calyx pubescent with white and short black hairs ..... 22
- 22a. Peduncles straight; corolla dark violet, 22–24 mm long; standard slightly emarginate at apex; pods lanceolate-elongate or ovoid-elongate, about 12 mm long, adpressedly white-pubescent; leaflets 3–5 in 10–12 whorls, narrowly lanceolate, acute, 8–15 mm long, 1.5–3 mm wide, sparsely covered with long white hair. .... *O. dubia*
- 22b. Peduncles ascending; corolla small, 13–16 mm long ..... 23
- 23a. Peduncles numerous, ascending; racemes capitate or spicate, many flowered; corolla (12)13–15 mm long; leaflets elliptic or ovate, acuminate at apex, 8–10 mm long, adpressedly long-white-pilose; pods 13–17 mm long ..... *O. pavlovii*
- 23b. Peduncles few, almost ascending; racemes densely capitate, few-flowered; corolla (12)14–16 mm long; leaflets 4–10(15) mm long, linear-lanceolate, acuminate, usually convolute, adpressedly pubescent; pods 10–12 mm long ..... *O. reverdattoi*
- 24a. Flowers about 25 mm long in lax inflorescence; pods coriaceous, hard, oval, with white hairs ..... *O. heterophylla*
- 24b. Flowers small, 13–18 mm long, few-flowered; Pods not inflated, ellipsoid, or oblong leathery to thinly leathery, with intermixed spreading long white and black short trichomes ..... 25
- 25a. Plants (1.5–)2–6 cm tall, cushion-forming, with dense silvery white trichomes; leaves 1–5 cm long; leaflets 1–1.5 mm long; racemes 1–3-flowered; peduncle obsolete or to as long as leaves; bracts lanceolate, ca. 5 mm, herbaceous, shorter than calyx ..... *O. sutaica*
- 25b. Plants 5–10 cm tall, caespitose; leaves 3–5 cm long; leaflets 3–5 mm long; racemes 5–8-flowered; peduncle 5–10 cm, ca. 2 × as long as leaves; bracts lanceolate to narrowly lanceolate, ca. 1 cm, herbaceous, equal to or shorter than calyx ..... *O. dariimaae*

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