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OXYTROPIS MANDOKHAILII (FABACEAE) A NEW SPECIES FROM ZHOB, PAKISTAN

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Abstract

A new species *Oxytropis mandokhailii* (Fabaceae) from Zhob distict of Pakistan is described and illustrated. The new species is characterized by basally fused unequal stipules, heteromorphic leaves and very long stems. Key to *Oxytropis* species in Flora of Pakistan is amended to reflect the diagnostic characters of *O. mandokhailii.*

Key words: *Oxytropis mandokhailii*, Zhob, Balochistan, Pakistan.

Introduction

The genus *Oxytropis* de Candolle is a member of tribe Galegeae (Polhill, 1981). *Oxytropis* resembles *Astragalus* but is distinguished by mucronate keel which is not mucronate in *Astragalus*, pod septum shape (arising from adaxial suture in *Oxytropis* vs. abaxial suture in *Astragalus* (Erkula *et al*., 2014), presence of glandular trichomes and verticillate leaflets in several species (though *A. alatavicus* and *A. pamirensis* also have verticillate leaflets), leaflets basally oblique, and vascular bundles reaching the apex of the keel (Zhu *et al*., 2010). *Oxytropis* species were originally placed under *Astragalus* by Linnaeus [1753], but was recognized as a distinct genus by de Candolle (1802) who transferred several species from *Astragalus* under the new genus. Several studies based on molecular data report that *Oxytropis* and *Astragalus* are sister groups (Zhang & Podlech, 2006; Chaudhary *et al*., 2008) and diverged approximately 12–16 MYA (Wojciechowski, 2005). *Oxytropis* is a large genus with about 611 species distributed in subarctic and temperate northern hemisphere in Asia, Europe, and North America (Anon., 2021). It is very diverse in Central Asian mountain regions (Grubov, 2003). *Oxytropis* has been divided into three subgenera and 20 sections (Vassilczenko, 1984; Zhu and Ohashi 2000; Lock and Schrire, 2005; Zhu *et al*., 2010). *Oxytropis* is represented in Pakistan by c. 28-29 species distributed in temperate regions of Khyber Pakhtunkhwa province and Kashmir (Ali, 1977; Anon., 2021, Vassilczenko, 1984). Of these the following 10 taxa are endemic in Pakistan: *Oxytropis alii* Vassilcz., *O. birirensis* Ali, *O. caudiciramosa* Vassilcz., *O. gilgitensis* Vassilcz., *O. gloriosa* Ali, *O. golengolensis* Vassilcz., *O. indensis* Vassilcz., *O. immersa* var. *jinaliensis* Ali, *O. kalamii* Vassilcz. and *O. staintoniana* Ali, while *O. chitralensis* Ali, *O. pakistanica* Vassilcz., *O. proxima* Boriss. (Syn. *O. sikaramensis* (Sirj. & Rech. f.) Ali) and *O. luteo-coerulea* are subendemic to Pakistan/Afghanistan.

During an exploration of Zhob district of Balochistan province of Pakistan an *Oxytropis* species was collected from mountainous areas. After a detailed morphological examination and comparison with the described species in the Flora of Pakistan (Ali, 1977) and Flora Iranica (Vassilczenko, 1984), it could not be compared with any known species of the genus *Oxytropis*. It is described and illustrated here as *Oxytropis mandokhailii* sp. nov. Comparison with closely related species is also provided.

Oxytropis mandokhailii N. Khan, A. Sultan et M. Rashid sp. nov.
(Fig. 1-14)

Diagnosis: The new species has affinities to *Oxytropis margacea* by its narrow leaflets, basally connate stipules and inflorescence longer than leaves, but differs by its heteromorphic, longer leaves. *Oxytropis margacea* has 3-5 cm long leaves while *O. mandokhailii* has 6-14 cm long leaves. The new species also has longer stems (20-110 cm) while *O. margacea* has 15-20 cm long stems. Calyx in *O. mandokhailii* is black and white appressed pubescent, while calyx has white minute appressed hairs in *O. margacea*. The new species also has affinities to *Oxytropis cabulica* by its peduncle longer than leaves and calyx with black and white appressed hairs, but differs by its connate stipules opposed to free stipules in *O. cabulica*, linear to lanceolate leaflets, longer stem up to 110 cm long, versus oblong to elliptic leaflets and stem up to 30 cm long in *O. cabulica*. The new species also differs by its stipitate, unilocular, black and white pubescent legume opposed to subsessile partially bilocular, black pubescent legume in *O. cabulica*.

A decumbent perennial herb. Stems many from the base, decumbent to diffuse, 20-110 cm long, pubescent with white and rarely black appressed hairs, internodes from 2-4-8cm long having small longitudinal ridges and furrows, underground rhizome light brown with the internodes up to 1cm. Stipules 3-15 x 1-3 mm, unequal, green ovate, or linear-lanceolate, pubescent with white or black and white hairs, basally connate. Leaves dimorphic, basal leaf unifoliolate (rarely) to trifoliolate or five- foliolate. Unifoliolate leaf elliptic to oblong-lanceolate, blade c. 4 x 0.8 cm, petiole up to 4 cm, sparsely pubescent with simple hairs. Upper stem leaves alternate, 4-14.5 cm long, petiole (0.4-) 2-4.4 cm, rachis (1.2-) 3.5-8 cm, leaflets 1.5-5 cm x 0.8-2.5 mm, linear,

linear-lanceolate often falcate. Number of leaflets mostly 7-9 very rarely 11, sub-opposite, sessile, sparsely pubescent on both side with simple white hairs. Inflorescence an axillary peduculate raceme, peduncle (2.6-) 6.5 (-22) cm, raceme 3-7 (-13) cm. Inflorescene longer than leaves. Bracts minute, 1.2-2 mm, linear or ovate-acuminate, persistent, black and white pubescent with a ciliate margin. Flower pink to pale purple, pedicel 1-1.7 mm long with simple hairs, calyx 4-5 mm long, persistent, densely to sparsely pubescent with black and white hairs, tube 3-3.5 mm long, teeth linear, subequal 1-1.5 mm long, standard 6 x 4 mm, obovate, cuspidate to apiculate, sometimes slightly emarginate, glabrous, wing 6 mm x 1 mm, oblong, obtuse, claw 2-3 mm, keel 5 mm long, mucro 1-1.5 mm, claw 2 mm, stamens 4 mm long, staminal sheath glabrous with 1 mm curved free filament tips. Carpel 4 mm, ovary 2 mm long, pubescent with white hairs, ovules 6-12, style curved, 1.5-2 mm long, stigma capitate. Legume stipitate, stipe c. 1 mm, fruiting pedicel 1.5-2.5(-3) mm, body oblong, 8-18 x 3-4 mm, somewhat turgid, adaxially deeply sulcate, densely to sparsely pubescent with black and white hair, unilocular, bearing 6-12 seeds, beak 1.5 to 2.5 mm long, seeds 2 x 1 mm, oblong, reniform to rhomboid, smooth, glabrous, pale brown.

Type: Pakistan, Balochistan, Zhob District: Laswanday Mountain, west of Zhob city, *Nazar Khan*, 1800 m, 28 June, 2019 (RAW 101087).

Additional specimens examined: Balochistan, Zhob district, SharanTangi (Tangi Sar), *Nazar Khan*, 16 August, 2019 (RAW 101088).

Distribution: Pakistan (Zhob, Balochistan), elevation 1760 to 1955 m.

Flowering time: June to August.

Ecology: *Oxytropis mandokhailii* grows in moist places along the streams in the western side of Zhob valley, from Laswanday to Sharan Tangi (Tangi Sar), also recorded from Alladin China, near Shaghala along a spring and at Ghami China near Qamardin Karez along the mountain slopes. The plant grows among grasses, sedges and rushes. Often only the inflorescence is the visible part while the foliage is cryptic and often hard to distinguish from grasses. The plants were found among *Juncus fontanessii*, *Saccharum spontaneum* and *Schoenoplectus littoralis*.

Etymology: The species is named after Mandokhail tribe, as the localities where the species was collected belong to Mandokhail tribe's territory.

Amendment to key to *Oxytropis* species in Flora of Pakistan, Papilionaceae, No. 100: In order to reflect the diagnostic characters of *Oxytropis mandokhailii* the key to *Oxytropis* species given in "Flora of Pakistan, Papilionaceae, No. 100" (Ali, 1977) needs to be modified to read:

1. Leaf, bracts and calyx glandular ……..……...… 2
- Leaf, bracts and calyx eglandular ……...……...……. 3
2. Fruit glabrous to subglabrous, glands prominent ……...…… *Oxytropis microphylla*
- Fruit uniformly hairy, glands almost obscure ...…….……...…… *Oxytropis chiliophylla*
3 Fruit membranous, inflated ..……...…… 4
- Fruit not as above ……...…... 6
4 Fruit c. 12-14 mm wide (in pressed condition), mucro of the keel c. 3 mm long ……..… *Oxytropis platonychia*
- Fruit c. 10 mm or less wide, mucro of the keel c. 2 mm or less ……..……...……. 5
5 Mucro of the keel than or equal to 1 mm ...……...……...…… *Oxytropis tatarica*
- Mucro of the keel more than 1 mm long (up to c. 2 mm) ..……...…… *Oxytropis cachemiriana*
6. Aerial stem elongated ...……...……... 7
- Aerial stem not elongated ……..... 10
7. Stipules united at the base, leaf opposed, inflorescence elongated or globose at least when young .....….. 8
- Stipules free lateral, inflorescence elongated ……...…..……...…… *Oxytropis glabra*
8. Stipules often unequal, inflorescence elongated, stems up to 110 cm long, leaves heteromorphic, basal leaves often uni- or tri-foliolate, upper stem leaves, usually 7 foliolate, leaflets linear to linear lanceolate, often falcate …….. *Oxytropis mandokhailii*
- Inflorescence globose, at least when young, stem and leaves not with above combination of characters ……...…. 9
9. Subtending leaf longer or only slightly shorter than the inflorescence, lateral calyx teeth c. 1.5-2 mm long ……..……. *Oxytropis hypoglottoides*
- Subtending leaf much shorter than the inflorescence, lateral calyx teeth c. 3 mm long ...…….. *Oxytropis lapponica*
10. Leaflets verticillate (at least at some points along the rachis) …….……...….. 11
- Leaflets not verticillate …..……..……. 13
11. Calyx teeth shorter than the tube ….……...…… *Oxytropis staintoniana*
- Calyx teeth longer than the tube ……..……...……..…… 12
12. Leaflets 30-40 per leaf, densely hairy ….……...……...…… *Oxytropis chitralensis*
- Leaflets 9-12 per leaf, sparsely hairy ……..……...……...…… *Oxytropis birirensis*
13. Fruit sessile ….……..…… 14
- Fruit stipitate ……..……...…… 17

14. Mucro of the keel c. 2-2.5 mm long ……..……. 15
- Mucro of the keel 1 mm long ...……...… 16
15. Calyx c. 15-16 mm long, teeth c. 9 mm long, vexillum c. 13-14 mm long, plant villous, hairs spreading .....…… *Oxytropis sikaramensis*
- Calyx c. 13 mm long, teeth c. 4 mm long, vexillum c. 21 mm long, plant velvety brownish …….....….. *Oxytropis stracheyana*
16. Vexillum c. 9 mm long, branches spreading flexuous ….…….. *Oxytropis savellanica*
- Vexillum c. 7 mm or less, branches not flexuous, woody …..……...……. *Oxytropis densa*
17. Calyx teeth c. 6-8 mm long ……..……...…… *Oxytropis gloriosa*
- Calyx teeth up to 5 mm long ……..…….....…… 18
18. Calyx c. 4 mm long (teeth c. 2 mm), vexillum c. 6-7 mm long .....……... *Oxytropis crassiuscula*
- Calyx more than 4 mm long, vexillum 9 mm or more long ……..…….……..… 19
19. Calyx teeth equal to calyx cup (mucro of the keel c. 2.5 mm long) ...……..…. *Oxytropis luteo-caerulea*
- Calyx teeth smaller the cup ……...……...……..… 20
20. Calyx teeth up to 2 mm long, cup c. 3.5-4 mm long (mucro less than 1 mm long) .…… 22
- Calyx teeth c. 2.5 mm or more ….……...…..… 21
21. Leaflets more than 7 mm long and mostly more than 2.5 mm broad ...……. *Oxytropis mollis*
- Leaflets 7 mm or less long, mostly c. 2.5 mm or less broad ……..……...… *Oxytropis humifusa*
22. Stipules uniformly pubescent outside; petiole up to 4.5 cm; leaflets 4-10 mm long, c. 1-4 mm broad; peduncle c. 2.5-30 cm long …….. *Oxytropis immersa* var. *jinaliensis*
- Stipules whitish papery, glabrous or scantily pubescent; petiole c. 5-12 mm long; leaflets c. 2-6 mm long, less than 1-2 mm broad; peduncle up to 6.5 cm long ……..……. *Oxytropis immersa* var. *immerse*

Fig. 1. *Oxytropis mandokhailii* Habit (*Photo by Nazar Khan*).

Fig. 2. Upper stem leaves and inflorescence with fruits (*Photo by Nazar Khan*).

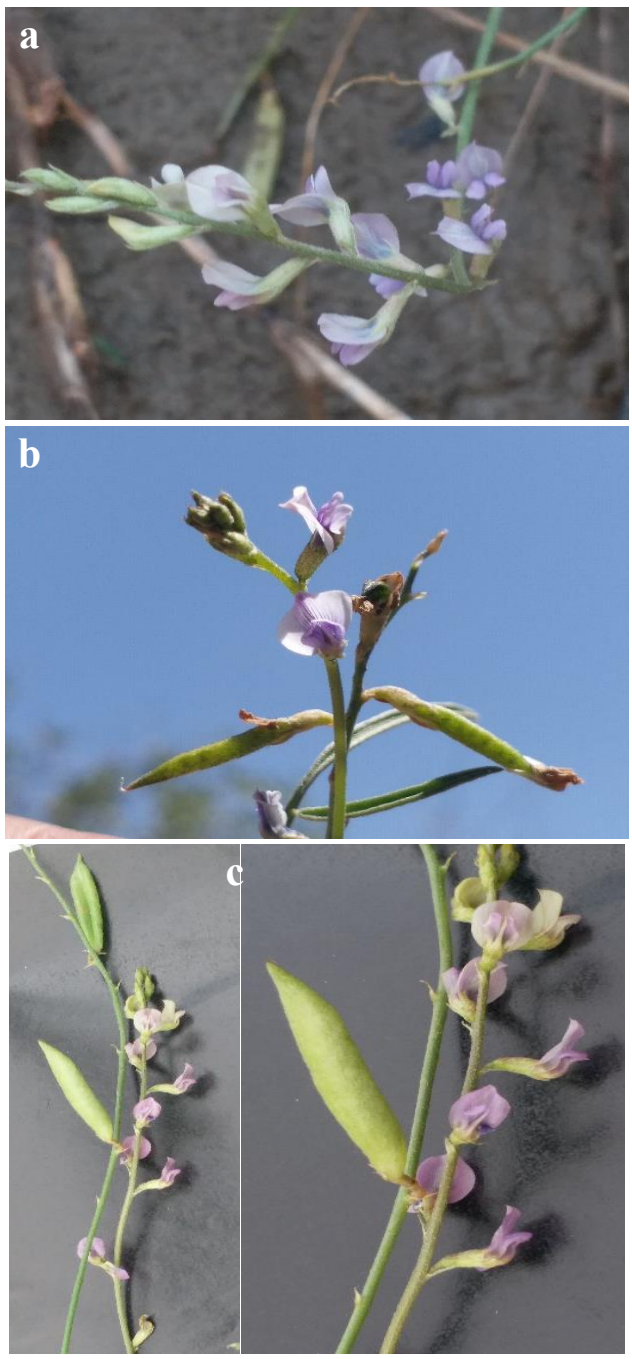

Fig. 3a. *Oxytropis mandokhailii* inflorescence, 3b & 3c inflorescense with fruits (*Photos by Nazar Khan*).

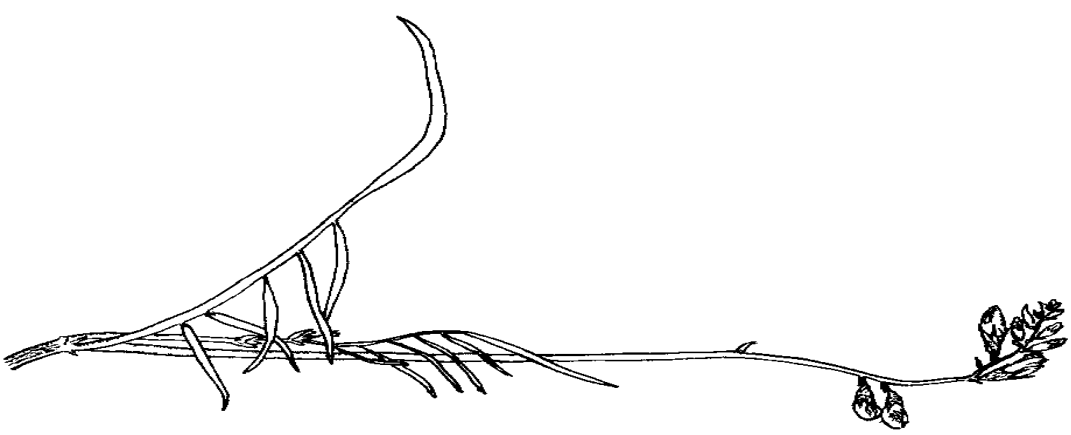

Fig. 4. *Oxytropis mandokhailii* upper stem leaves and inflorescence (scale bar = 1cm).

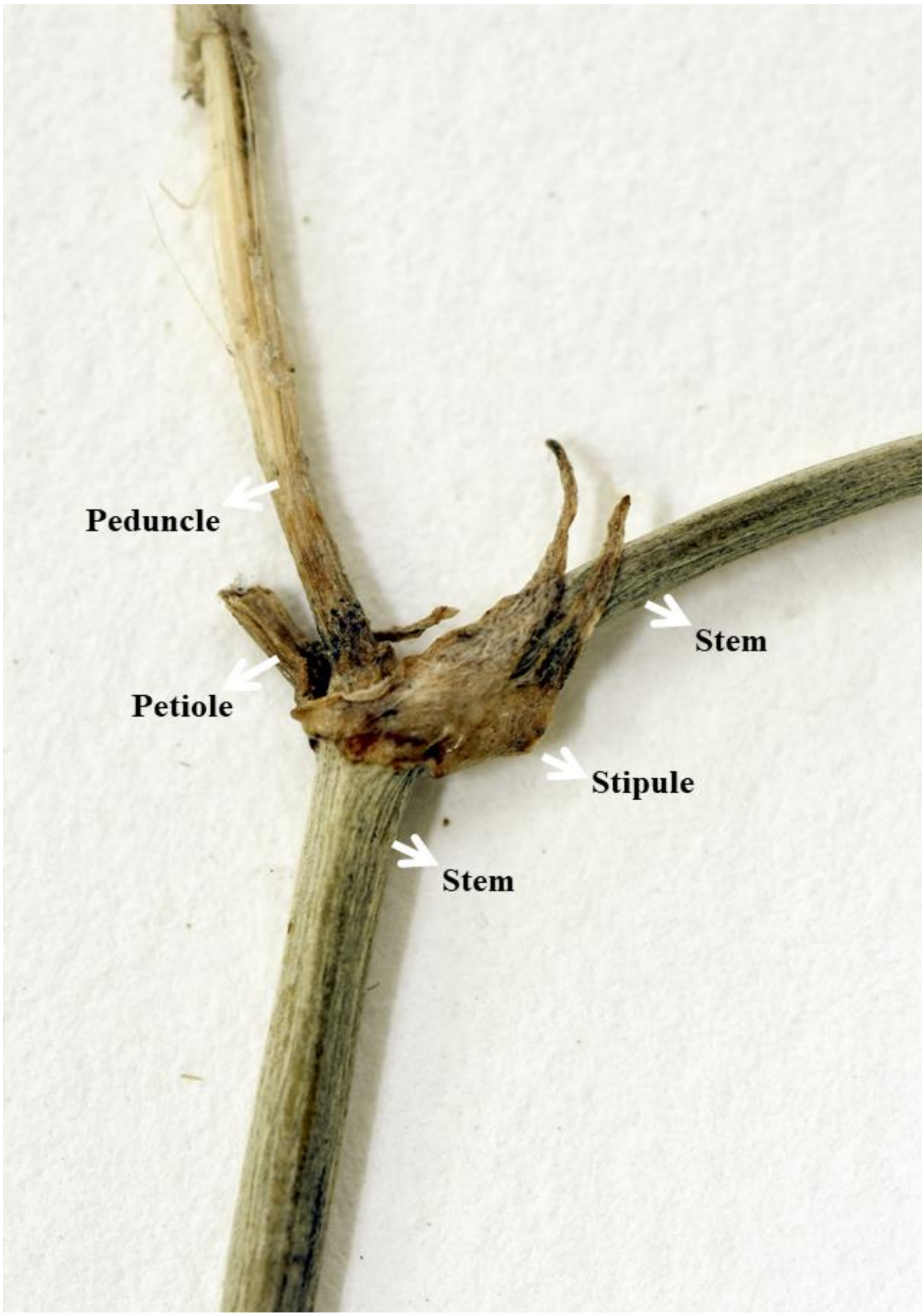

Fig. 5. Portion of stem showing fused stipules.

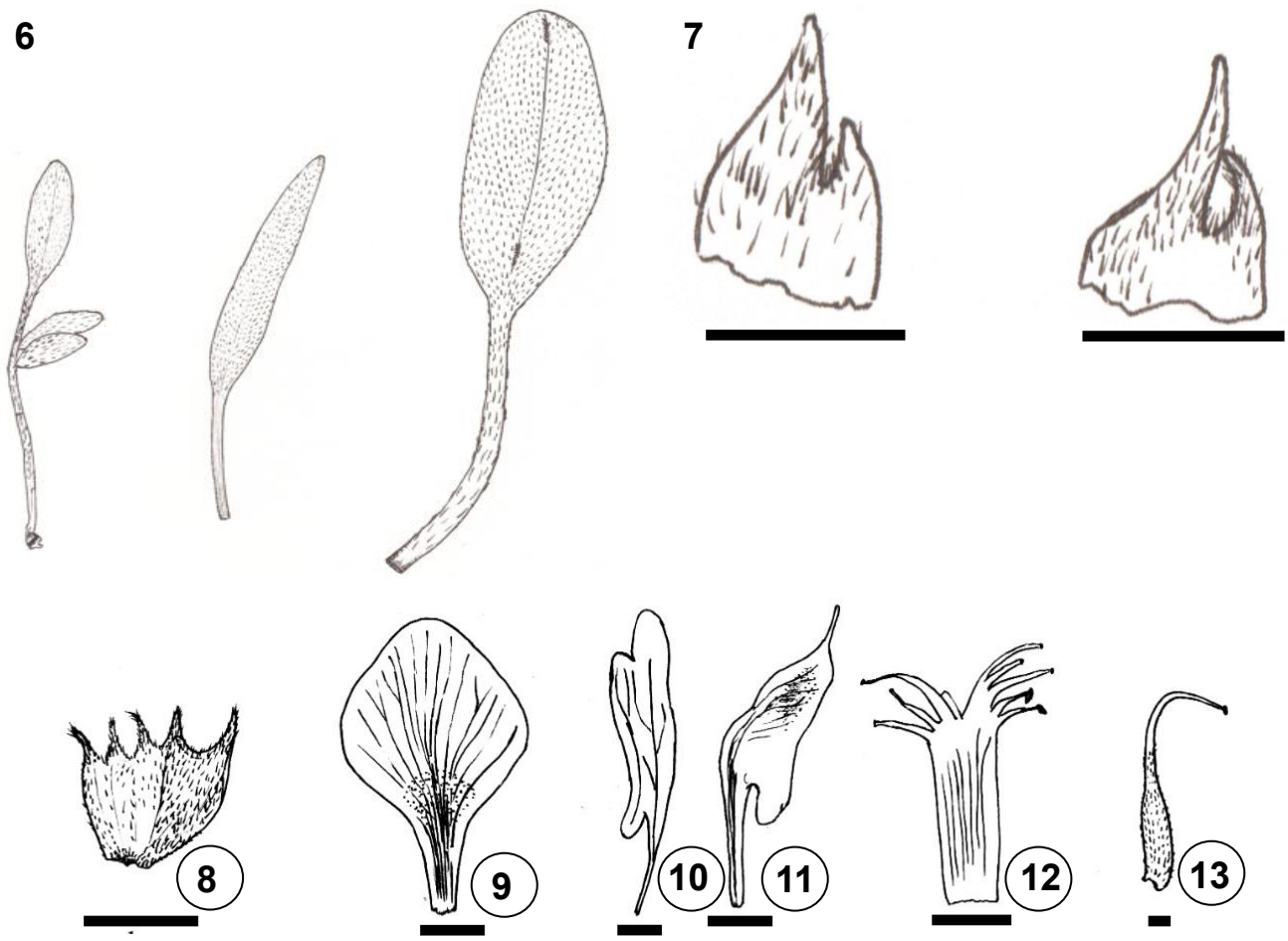

Fig. 6. *Oxytropis mandokhailii* basal leaves (scale bar = 1 cm), Fig. 7. Stipules (scale bar = 3 mm), Fig 8. Calyx (scale bar = 4 mm), Fig. 9. Standard (scale bar = 2mm), Fig. 10. Wing (scale bar = 1mm), Fig. 11. Keel (scale bar = 1.5mm), Fig. 12. Stamens (scale bar= 1mm), Fig. 13. Carpel (scale bar = c. 0.5mm).

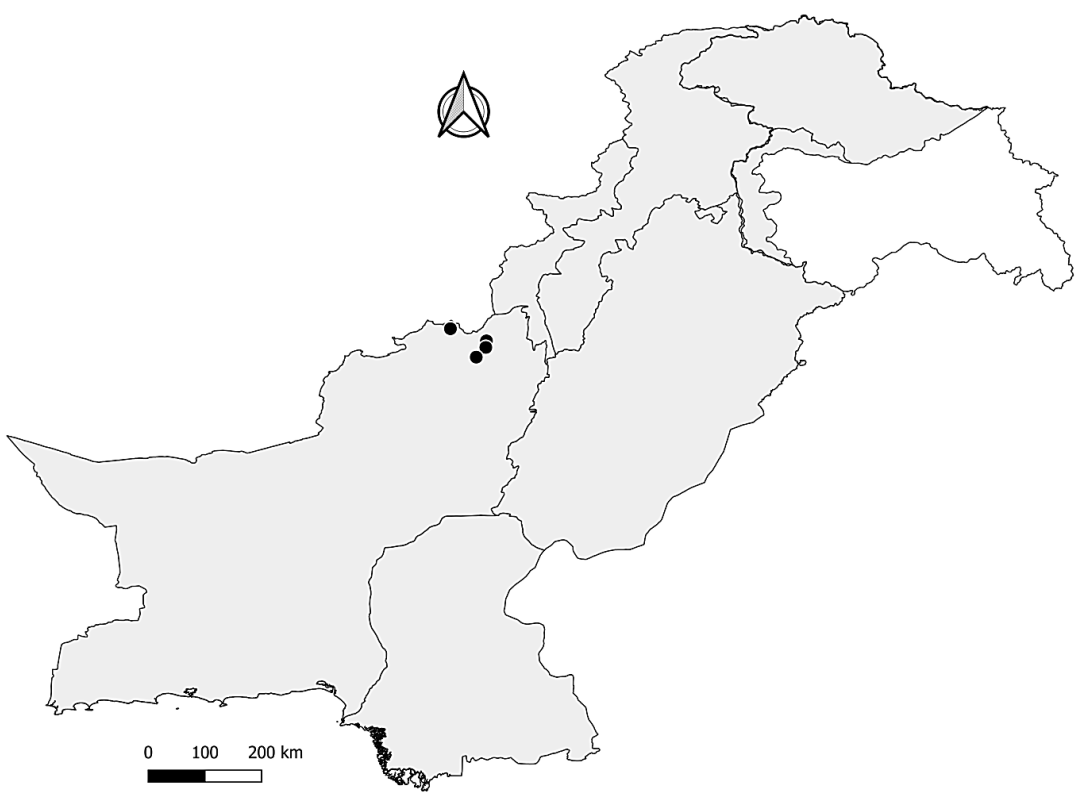

Fig. 14. Distribution of *O. mandokhailii*.

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