



Stipa krylovii Roshev. (Poaceae), a new record for the flora of Nepal

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Abstract: *Stipa krylovii* is newly reported for the flora of Nepal, and this is the most southerly location yet found for this species. A full description of *S. krylovii* is included, along with illustrations, notes on its taxonomy and a distribution map.

Key words: distribution extension; feather grass; Nepal

The genus *Stipa* L. *sensu lato* is one of the largest genera of grasses and comprises about 680 species which are common or dominant in open grasslands and steppes. Although it is traditionally considered to have a cosmopolitan distribution with centres of diversity in warm temperate regions of Central Asia, Southern Europe, Australia and the Americas (STEUDEL 1854; HITCHCOCK 1951; BOR 1970; FREITAG 1985), most researchers currently studying the tribe *Stipeae* Dumort. now consider *Stipa* to be an Old World genus with around 150 species (ROSHEVITZ 1934; TZVELEV 1976; MARTINOVSKY 1980; WU & PHILLIPS 2006; HAMASHA et al. 2012; ROMASCHENKO et al. 2012; NOBIS et al. 2016a).

The *Annotated Checklist of the Flowering Plants of Nepal* (Press et al. 2000) and the *Flora of Mustang, Nepal* (OHBA et al. 2008) follow a broad concept for *Stipa* and include within it almost all members of the tribe *Stipeae* with elongated florets. Thus at present there are 11 species recognized in Nepal, namely: *S. breviflora* Griseb., *S. roborowskyi* Roshev., *S. koelzii* R.R. Stewart, *S. przewalskyi* Roshev. *S. capillata* L., *S. consanguinea* Trin. & Rupr., *S. duthiei* Hook. f., *S. mongholica* Turcz. ex Trin., *S. roylei* (Nees) Mez., *S. sibirica* (L.) Lam. and *S. staintonii* Bor. Additionally, two species namely *S. millerii* Noltii and *S. purpurea* Griseb. were recently also given from the country (NOBIS et al. 2015; MICHE et al. 2015).

During a revision of the collections of feather grasses belonging to the section *Leio-*stipa** Dumort at AA, BM, B, E, FRU, GOET, K, KHOR, KRA, KRAM, KUN, LE, M, MSB, MW, P, PE, PR, TAD, TK, UPS, W, WA, WU we found duplicates of a Nepalese collection at E, K and BM

(abbreviations according to THIERS [2016]), referable to *Stipa krylovii* Roshev., a species not previously recorded from the country. This collection had previously been determined as *S. capillata*.

The taxonomy and nomenclature of *Stipa* section *Leio-*stipa** Dumort. is complex as it consists of many apparently closely related groups, taxa which are hard to distinguish (TZVELEV 1974; FREITAG 1985) and species with highly variable morphology. The species of this section are characterized by their scabrous awns, which are covered with very short, semiadherent bristles (up to 0.3 mm long).

Stipa krylovii is morphologically close to *S. sareptana* A.K. Becker and *S. capillata*, from both by the length of ligules of the vegetative leaves, the abaxial surfaces of the vegetative leaves and the indumentums of the lemma (Table 1), as well as its generally more northeastern pattern of distribution and different habitat preferences. Despite these differences, there are still conflicting opinions about its taxonomic status, since some authors treat it as a separate species (ROSHEVITZ 1929, 1934; GRUBOV 1955; KENG 1941; PAZIJ 1968; TZVELEV 1976; LOMONOSOVA 1990; GUDKOVA 2012; NOBIS et al. 2016b), while others consider it to be a subspecies or variety within *S. sareptana* (WU & PHILLIPS 2006; Kuo & Sun 1987).

***Stipa krylovii* Roshev. (ROSHEVITZ 1929: 379). Figure 1.**

Lectotype (selected by TZVELEV 1976): Selenginskaya Dauriya, gory mezhdu Temnikom i Dzhidoi, yugo-zapadnaya chast' khr. Borgoiskogo, na sklonakh so stepnoi rastitelnost'yu [Selenga Dauria, mountains between Temnik and Dzhida, southwestern part of the ridge. Borgoyskogo on the slopes with steppe vegetation]. 28.VII.1912, V. Smirnov 524 (LE!).

≡ *S. sareptana* A.K. Becker subsp. *krylovii* (Roshev.) D.F. Cui (Cui 1996: 299).

≡ *S. sareptana* A.K. Becker var. *krylovii* (Roshev.) P.C. Kuo & Y.H. Sun (Kuo & Sun 1987: 275).

Table 1. A comparison of the main characters distinguishing *Stipa capillata*, *S. sareptana* and *S. krylovii*

Characters	<i>S. capillata</i>	<i>S. krylovii</i>	<i>S. sareptana</i>
Length of culm (cm)	30–130	20–60(90)	30–80
The leaf blade width (mm)	0.5–1.3	0.3–0.6	0.4–0.7
Abaxial surface of vegetative leaves	Glabrous or scabrous	Glabrous or rarely somewhat scabrous	Scabrous due to 0.25 mm long spinules
Adaxial surface of vegetative leaves	With hairs 0.2–0.5 mm long	With hairs 0.05–0.1 mm long	With hairs 0.1 mm long sometimes with admixture of longer hairs near the margins
Ligules of vegetative leaves (mm)	(0.6)1–1.5(2.5)	0.1–0.3	0.2–1
Length of the awn (cm)	10–18	(8)12–16(20)	10–15
Length of column (cm)	3–5(7.5)	(1.8)2.5–3.5(4)	2.5–5
Length of anthercium (mm)	9–14	(8.5)9–12	9–11
Length of callus (mm)	3–4.5	(2.2)2.4–3.5(4.5)	2–3
Coronula of hairs at the top of lemma	Absent	Present	Present rarely reduced

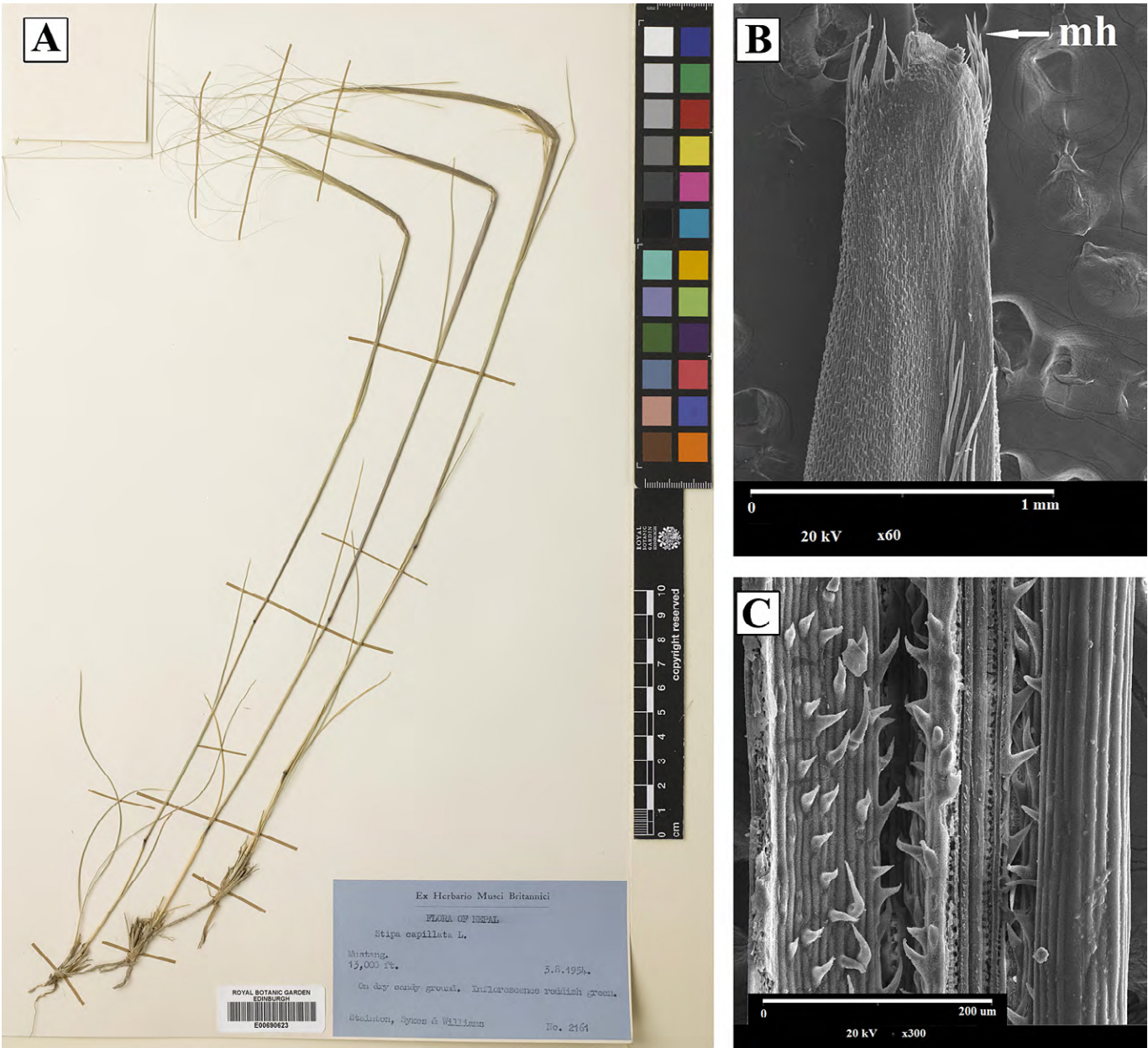


Figure 1. *Stipa krylovii*. **A.** Specimen collected in Mustang, Nepal (E 00690623). **B.** Top of lemma (mh – macrohair). **C.** Pattern of hairiness on the adaxial surface of a blade from a vegetative shoot.

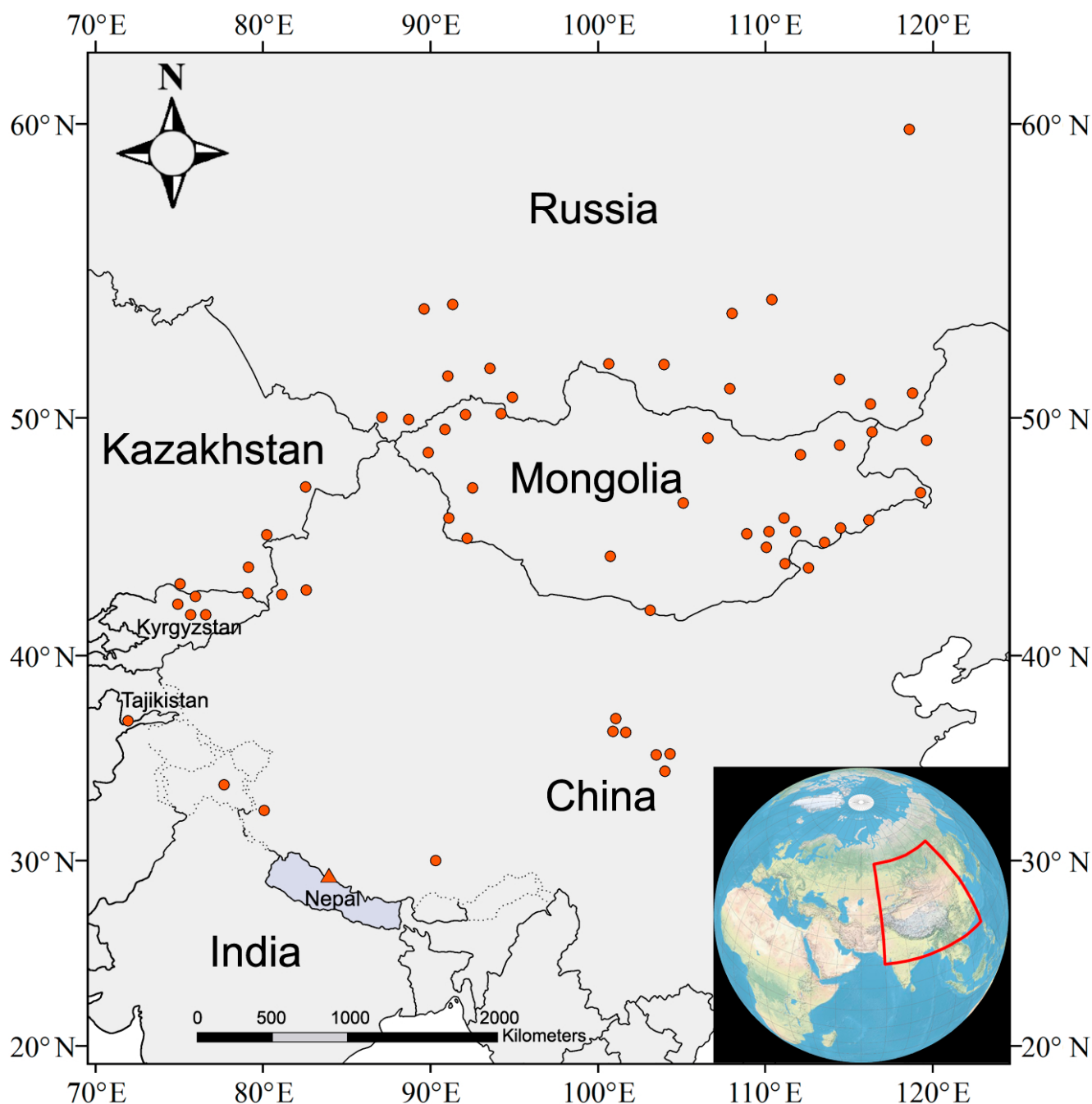


Figure 2. Distribution map of *Stipa krylovii* (● = localities known from herbaria and literature; ▲ = new locality in Nepal).

- = *S. capillata* L. var. *coronata* Roshev. (ROSHEVITZ 1916: 168).
- = *S. densiflora* P. Smirn. (SMIRNOV 1929: 265; non *S. densiflora* Hughes [HUGHES 1921: 18, fig. 20]).
- = *S. densa* P. Smirn. (SMIRNOV 1930: 15).
- = *S. decipiens* P. Smirn. (SMIRNOV 1934: 338; 1936: 110 in clavi).

Perennial grass, densely tufted; culms 20–60(90) cm with 3–4 nodes, glabrous below the nodes. Cauline leaves: sheaths shorter than internodes, glabrous or slightly scabrous, upper sheaths up to 10 mm width, encompassing the panicle in the flowering period, and for the most part during fruiting; blades glabrous to slightly scabrous, to 0.5 mm in diameter; ligules not equal with approximate range from bottom to top I – 0.5–0.6 mm; II – 1–1.5 mm; III – 2.7–3.5 mm; IV – 5.5–7 mm (often broken in herbarium

specimens). Leaves of vegetative shoots: blades usually up to $\frac{1}{3}$ – $\frac{1}{2}$ of the culm length, convolute, 0.3–0.5 mm in diameter, abaxial surface glabrous along the entire length or somewhat scabrous on the lower part, adaxial surface covered with short prickles 0.05–0.1 mm long; ligules short, 0.1–0.3 mm long. Panicle 10–20 cm. Glumes 18–25 mm. Anthecium (8.5)9–12 mm, with a well developed ring of hairs at the apex. Callus (2.2)2.4–3.5(4.5) mm. Awn (8)12–16(20) cm, bi-geniculate, scabrous along its whole length due to 0.1–0.3 mm long hairs.

Distribution: Eastern Kazakhstan, Russia (Siberia: Altai, Khakasiya, Tuva, South Krasnoyarsk, Irkutsk, Buryatiya, Chita, South Yakutia; Tzvelev 1976; LOMONOSOVA 1990),

China (Gansu, Hebei, Nei Mongol, Ningxia, Qinghai, Shanxi, Xinjiang, Xizang; LU & WU 1996; WU & PHILLIPS 2006), Mongolia (GRUBOV 1955), Kyrgyzstan (LAZKOV & SULTANOVA 2011), Tajikistan (west Pamir; IKONNIKOV 1979), North India (Ladakh; NOBIS et al. 2016c). Figure 2.

Specimens examined (new records to the flora of Nepal): Nepal. Mustang, on dry sandy ground, inflorescence reddish green, 29°14' N, 083°52' E, 1300 ft above sea level, 3-VII-1954, *Stainton, Sykes & Williams 2161* (E 00690623!, K!, BM! – 3 sheets). Figure 2.

Stipa krylovii is a new record for the flora of Nepal and this is the most southerly station of this taxon. Although the collection of *S. krylovii* in Nepal was made in 1954 these specimens were misidentified as *S. capillata*. *Stipa krylovii* differs from *S. capillata* mainly by having a ring of hairs at the top of the lemma (Table 1). *Stipa krylovii* is also morphologically close to *S. sareptana*, but they differ in the surfaces of the leaf blades of their vegetative shoots which are glabrous or rarely somewhat scabrous in *S. krylovii* vs. scabrous with up to 0.25 mm long prickles in *S. sareptana*, and in the anthecium which has a well-developed ring of hairs at the apex in *S. krylovii* only. Furthermore, *S. sareptana* flowers earlier in the season than *S. krylovii* and *S. capillata* which flower and fruit at about the same time. More extensive fieldwork in Nepal and wider examination of existing material in herbaria will be necessary to gain a full understanding of the distribution of *S. krylovii* in Nepal.

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