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 (Steuvel 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 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.


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

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

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.
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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 ¼–½ 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),

= S. densiflora P. Smirn. (SMIRNOV 1929: 265; non S. densiflora Hughes [Hughes 1921: 18, fig. 20]).
= S. densa P. Smirn. (SMIRNOV 1930: 15).

Figure 2. Distribution map of Stipa krylovii (● = localities known from herbaria and literature; ▲ = new locality in Nepal).
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 anthers 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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Authors’ contributions: PDG revised herbarium materials, prepared of the map and SEM photographs and wrote the manuscript; CAP wrote the manuscript; MN revised herbarium materials and wrote the manuscript; BE prepared the map.

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