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TAXONOMIC NOVELTIES

New varieties of *Elymus ciliaris* (Poaceae: Triticeae) from the Russian Far East

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ABSTRACT

According to the results of an experimental study of the closely related species *Elymus ciliaris* and *E. amurensis* growing in the Russian Far East, *Elymus ciliaris* should be considered as a single polymorphic species comprising four varieties, including var. *amurensis*. Two varieties are described for the first time. Descriptions and photographs of the typal specimens are given.

Keywords: *Elymus ciliaris*, varieties, Triticeae, Poaceae

РЕЗЮМЕ

Шабанова (Кобозева) Е.В., Агафонов А.В. Новые разновидности *Elymus ciliaris* (Poaceae: Triticeae) из Российского Дальнего Востока. В результате экспериментального изучения близкородственных видов *Elymus ciliaris* и *E. amurensis*, произрастающих на территории Российского Дальнего Востока, *Elymus ciliaris* следует рассматривать в качестве единого полиморфного вида, который включает четыре разновидности, в том числе var. *amurensis*. Две разновидности описаны впервые. Приведены описания и фотографии типовых образцов.

Ключевые слова: *Elymus ciliaris*, разновидности, Triticeae, Poaceae

The subsection *Ciliares* (Nevski) Tzvelev within the section *Goulardia* (Husnot) Tzvelev of the genus *Elymus* L. comprises two closely related species, *Elymus ciliaris* (Trin.) Tzvelev and *E. amurensis* (Drob.) Czer. (Tsvelev & Probatova 2019).

According to Tsvelev & Probatova (2019), *Elymus amurensis* is distributed in Russia along the Amur River (Jewish Autonomous Region and Khabarovsk Territory) and in the south of Primorye Territory, and outside Russia – in Northeast China. The range of *E. ciliaris* s. str. is much wider and covers the northern part of East Asia. The Flora of China (Chen & Zhu 2006) indicates the distribution for *E. ciliaris* var. *ciliaris* as China (almost the entire territory), Mongolia, Korea, Japan, and Russia.

Tsvelev (1976) suggested that *E. ciliaris* in Japan is being replaced by a closely related species, *E. racimifer* (Steud.) Tzvelev, and "it is possible that the record of *E. ciliaris* for Sakhalin belongs to this species" (Tsvelev 1976: 118).

The species *E. ciliaris* and *E. amurensis* are found in Russia only within the southern part of the Far East. We noted the co-occurrence of both species only to the south of the city of Nakhodka. These species differ from each other by a small number of morphological characters, which allows taxonomists to interpret the composition and rank of taxa quite freely.

Based on the results of a comprehensive analysis of data on comparative morphology, variability of endosperm storage proteins by SDS-PAAG electrophoresis (Kobozeva et al. 2011), polymorphism of inter simple sequence repeats DNA sequences, and GBSS1 nuclear gene sequencing (Agafonov et al. 2021), it was proposed that all morphotypes of two species be considered as varieties of the base species *E. ciliaris*.

Therefore, *E. amurensis* should be recognized in the previously proposed combination of *E. ciliaris* var. *amurensis* (Drob.) C. L. Chen (Chen, 1997). The species is generally characterized by broadly rounded palea at the apex, 1.2–2 mm shorter than lemma without considering the awn.

The varieties are described on the basis of signs of the presence of setae on lemmas, cilia along the edge of the lemmas, and pubescence on the upper side of the leaf blades. Descriptions of the new variations are given below.

Elymus ciliaris (Trin.) Tzvelev **var. *pubifolius*** A.V. Agaf. & Kobozeva, **var. nov.**

Descriprion. Plants 50–120 (170) cm tall, green or with grayish bloom, form tufts. Stems glabrous, with nodes glabrous green, brownish or with grayish bloom. Sheaths of upper leaves glabrous. Sheaths of lower leaves short-hairy, rarely glabrous. Leaf blades 0.4–0.6 cm wide, densely pubescent above, covered with short hairs and bristles below. Spikes straight or slightly inclined 12–20 cm long, green or with grayish bloom. Spikelets 1.2–1.5 cm long, with 7–9 flowers. Glumes almost equal, up to 0.6–0.8 cm long, broadly lanceolate, with cilia and single bristles. Lemmas 0.9–1.0 cm long, scabrous on back, long bristly along margin, long-ciliate, with awns 1.2–1.6 cm long bent at maturity. Palea broadly rounded, with spinules along keels, shorter than lemma by 1.2–2 mm. Rachilla segments with short bristles. Anthers 1.5–2 mm long, yellow.

Holotypus. Russia, "Primorsky Krai, Khasansky District, settl. Slavyanka, alt. 10 m 42°52.479'N 131°23.064'E, urban area, 03 VIII 2020, A. Agafonov, S. Asbaganov" – [Приморский край, Хасанский район, пгт Славянка, выс. 10 м н.у.м., 42°52.479'N 131°23.064'E, урбанизированная территория, 03 VIII 2020, А. Агафонов, С. Асбаганов] (NSK0086405). Fig. 1.

Habitat. Fragment of a meadow with tall grass on the side of a dirt road.

Geographical distribution. Russia, Primorye Territory, Khasan district (urban-type settl. Slavyanka, settl. And-

reevka), Nakhodka-town, Olga district (neighborhood the village Brovki).

Affinity. The new variety differs from *E. ciliaris* var. *ciliaris* by its pubescent leaf blades above. It differs from *E. ciliaris* var. *amurensis* in the presence of setae on the lemmas.

Paratypus. Primorye Territory, Olga district, neighborhood the village Brovki, Margaritovka river valley, alt. 92 m 43°29.971'N 134°41.400'E, meadow fragment on the margine of mixed forest, 09 VIII 2020, S. Asbaganov, A. Agafonov (NSK0086404).

Elymus ciliaris (Trin.) Tzvelev **var. *glaberrimus*** A.V. Agaf. & Kobozeva, **var. nov.**

Descriprion. Plants 50–120 (170) cm tall, green or with grayish bloom, form tufts. Stems glabrous, with nodes glabrous green, brownish or with grayish bloom. Sheaths of upper leaves glabrous. Sheaths of lower leaves short-hairy, rarely glabrous. Leaf blades 0.4–0.6 cm wide, densely pubescent above, covered with short hairs and bristles below. Spikes straight or slightly inclined 10–20 cm long, green or with grayish bloom. Spikelets 1.2–1.5 cm long, with 7–9 flowers. Glumes almost equal, up to 0.6–0.8 cm long, lanceolate, glabrous, rare with spinules along keels. Lemmas 0.8–1.0 cm long, glabrous, rarely with spinules on back, with spinules or rare single bristles along keels (without cilia), with awns 1.2–1.6 cm long bent at maturity. Palea broadly rounded, with spinules along keels, shorter than lemma by 1.2–2 mm. Rachilla segments with short bristles. Anthers 1.5–2 mm long, yellow.

Holotypus. Russia, "Primorsky Krai, Khasansky District, neighborhood settl. Hasan, left bank of the Tumannaya-river, alt. 6 m 42°23.087'N 130°39.941'E, 04 VIII 2020, S. Asbaganov, A. Agafonov" – [Приморский край, Хасанский район, окр. пос. Хасан, лев. берег р. Туманная, выс. 6 м н.у.м., 42°23.087'N 130°39.941'E, 04 VIII 2020, С. Асбаганов, А. Агафонов] (NSK0086403). Fig. 2.

Habitat. Sandbank of the river.

Geographical distribution. Russia, Primorye Territory, Khasan district: surrounding settl. Khasan, surrounding urban-type settl. Slavyanka, surrounding settl. Andreevka.

Affinity. A new variety is distinguished from *E. ciliaris* var. *ciliaris* and from *E. ciliaris* var. *amurensis* by the absence of cilia on lemmas.

Paratypus. Primorye Territory, Khasan district, env. village Slavyanka, pass to Baklan bay, alt. 47 m, 42°50.899'N 131°24.050'E, meadow community near a dirt road, 05 VIII 2020, A. Agafonov, S. Asbaganov (NSK0086402).

Key for identification of the varieties in *Elymus ciliaris*

1. Lemma's more or less hispid, margin long ciliated along keels **2**

\+ Lemma's glabrous or finely scabrous **3**

2. Leaf blade glabrous to scabrous ..... **var. *ciliaris***

\+ Leaf blade pubescent or pilose ..... **var. *pubifolius***

3. Lemma's margin more or less ciliated ..... **var. *amurensis***

\+ Lemma's glabrous without cilia ..... **var. *glaberrimus***

Figure 1 Holotype of *Elymus ciliaris* var. *pubifolius* (NSK0086405)

Figure 2 Holotype of *Elymus ciliaris* var. *glaberrimus* (NSK0086403)

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LITERATURE CITED

Agafonov, A.V., E.V. Shabanova (Kobozeva), M.V. Emtseva, S.V. Asbaganov & O.V. Dorogina 2021. Phylogenetic relationships among different morphotypes of StY-genomic species *Elymus ciliaris* and *E. amurensis* (Poaceae) as a unified microevolutional complex. *Botanica Pacifica* 10(1):19–28.

Chen, S.L. 1997. A new subspecies and new combinations in Chinese Triticeae (Poaceae). *Novon* 7(3):227–230.

Chen, S.L. & G.H. Zhu 2006. *Elymus* L. In: *Flora of China, vol. 22, Poaceae* (W. Zhengyi, P.H. Raven & H. Deyuan, eds), pp. 400–429, Science Press and Missouri Botanical Garden, Beijing and St. Louis.

Kobozeva, E.V., D.E. Gerus, S.V. Ovchinnikova & A.V. Agafonov 2011. Taxonomic relationships between StY genome species *Elymus ciliaris* and *E. amurensis* (Poaceae). *Turczaninowia* 14(3):35–44 (in Russian with English summary). [Кобозева Е.В., Герус Д.Е., Овчинникова С.В., Агафонов А.В. 2011. Таксономические взаимоотношения между StY геномными видами *Elymus ciliaris* и *E. amurensis* (Poaceae) // Turczaninowia. Т. 14, вып. 3. С. 35–44].

Tzvelev, N.N. 1976. *Grasses of the USSR*, Nauka, Leningrad, 788 pp. (in Russian). [Цвелев Н.Н. 1976. Злаки СССР. Л.: Наука. 788 с.].

Tzvelev, N.N. & N.S. Probatova 2019. *Grasses of Russia*. KMK Scientific Press, Moscow, 646 pp. (in Russian). [Цвелев Н.Н., Пробатова Н.С. 2019. Злаки России. М.: Товарищество научных изданий КМК. 646 с.].