

NEW SPECIES AND NEW RECORDS OF AGROSTIS FOR THE FLORA OF IRAN

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Agrostis gariana is described as a new species to the science from Lorestan province, Iran. The new species is closely related to *A. canina* from Sect. *Agraulus*. *A. vinealis*, as an Irano-Turanian element from Sect. *Agraulus*, is a new record for the flora of Iran. These species are compared with the closely related species and their distribution data and illustrations are provided.

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یک گونه جدید و یک گزارش جدید از جنس *Agrostis* برای فلور ایران

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گونه *Agrostis gariana* به عنوان آرایه‌ای جدید از لرستان در ایران معرفی می‌شود که خویشاوند نزدیک *A. canina* از بخش Sect. *Agraulus* است. گونه دیگری از بخش Sect. *Agraulus* با نام *A. vinealis* که از عناصر ایران و تورانی است برای اولین بار از ایران گزارش می‌شود. این گونه‌ها با نزدیک ترین گونه‌های خویشاوند خود مقایسه شده و تصویر و اطلاعات پراکنش جغرافیایی آنها ارائه می‌شود.

INTRODUCTION

The species of the genus *Agrostis* (Poaceae, Agrostideae) are distributed in almost all non tropical countries of both hemispheres as well as in mountainous regions of the tropics (Tzvelev 1976). This genus has almost 150 (Tzvelev 1976) to 200 (Nasir & Ali 1972) species in the world. In Flora Iranica (Bor 1970) 5 species from Iran were reported, viz. *A. gigantea* Roth., *A. stolonifera* L., *A. tenuis* Sibth., *A. canina* L. and *A. olympica* (Boiss.) Bor. All the species of the genus are fodder plants of pasture and consequently are of great economic importance. In Flora Iranica the genus has been divided into 2 sections; sect. *Trichodium* (Michx.) Trin., including all the species without palea or palea /lemma length is about 1/4 (*A. canina* L., *A. tenuifolia* M. B. and *A. nervosa* Nees), and sect. *Vilfa* (Adans.) Roemer & Schults; all the species with longer palea, including all of the other species reported from Flora Iranica area based on palea length. Tzvelev (1976) did not agree with this circumscription and grouped all *Agrostis* species in 4 sections; viz., sect. *vilfa* Adans., plants with lemma glabrous, usually awnless, callus hair usually less than 1/6 of lemma or absent, palea 2/3-

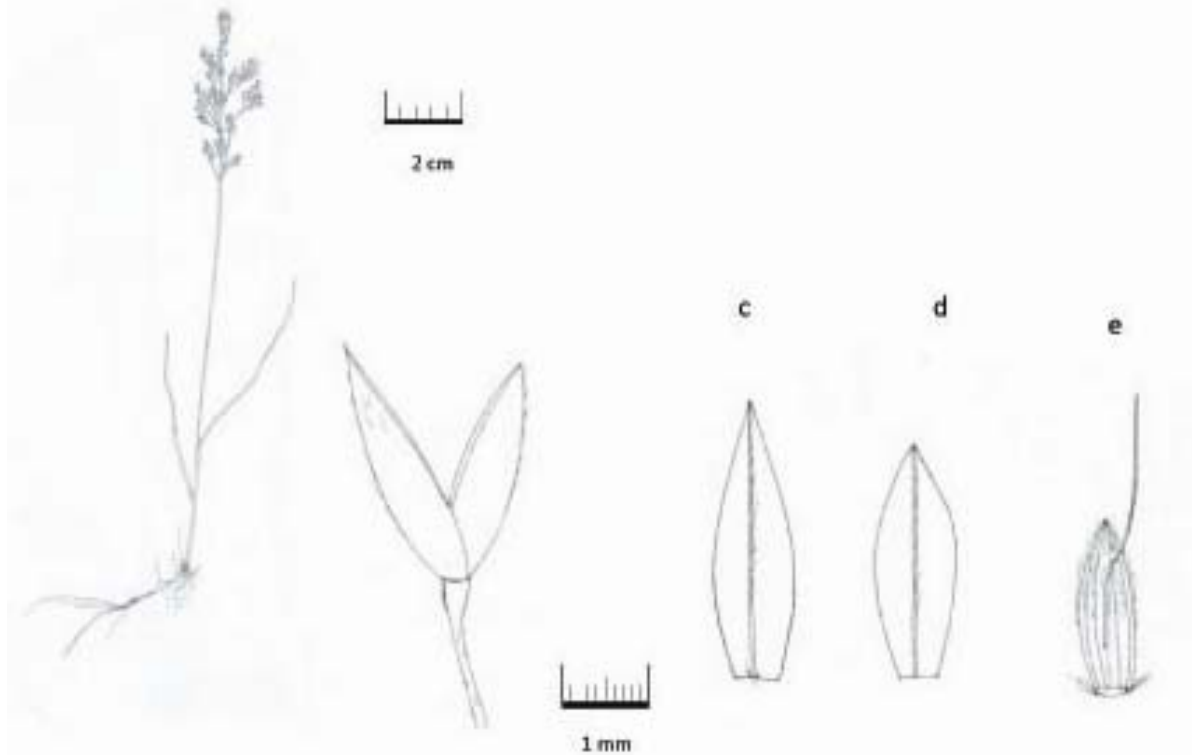
1/2 of lemma, anthers 0.6- 0.8 mm (comprising *A. stolonifera*, *A. gigantea*, *A. tenuis*), sect. *Pentatherum* (Boiss.) Bor, plants with lemma somewhat pilose, dorsally awned, callus hair 2/5- 4/5 of the length of lemma, palea 2/3 or more of lemma, anthers 0.3- 0.8 mm (including *A. olympica*), sect. *Agraulus* (Beauv.) Tzvel., lemma glabrous, usually dorsally awned, callus hair less than 1/4 of lemma, palea usually absent, anthers 0.6- 1.5 (2) mm (including *A. canina* and *A. vinealis* Shreb.), and sect. *Trichodium* (Michx.) Dum. (without any species from Iran). This article contains one new species and one new record for the flora of Iran and clarifies the Section status of *Agrostis* in Iran.

MATERIALS AND METHODS

In the course of 3 years research on the taxonomy of the genus *Agrostis*, many specimens of several herbaria (IRAN, FUHM, TUH and TARI and local herbaria i. e., Nowshahr, Tabriz, Khorasan, Kermanshah, Golestan and Kordestan) were studied using Flora Iranica (Bor 1970), Flora of Iraq (Bor 1968), Flora of Pakistan (Nasir and Ali 1972), Flora of Turkey (Dogan 1985) and Grasses of the Soviet Union (Tzvelev 1976).

Table 1. Diagnostic morphological characters of *Agrostis gariana*, *A. vinealis* subsp. *planifolia* and the closest relatives.

Species characters	<i>A. gariana</i>	<i>A. canina</i>	<i>A. olympica</i>	<i>A. vinealis</i> subsp. <i>planifolia</i>	<i>A. stolonifera</i>
Plant state	rhizomatous	stoloniferous	rhizomatous	rhizomatous	stoloniferous
Lemma indumentums	hairy	glabrous	hairy	glabrous	glabrous
Lemma awn length (mm)	2.5- 3.5	0	2- 2.5	3.5- 4.2	0
Palea length (mm)	0	0	1.5-1.7	0	0.7- 1
Ratio: Callus hair/lemma	1/5- 1/6	1/5 – 1/6	1/1	1/6- 1/8	absent
Lemma length (mm)	1.3- 2.1	1.7- 2	1.5- 1.75	2.2- 2.4	1.7- 2
Spikelet length (mm)	2.3- 2.7	2- 2.5	1.5- 2.3	3- 3.4	2- 3

Fig. 1. *Agrostis gariana*: a. habit, b. spikelet (without floret), c. upper glume, d. lower glume, e. lemma.

RESULTS AND DISCUSSION

Agrostis gariana (Fig. 1) and *A. vinealis* (Fig. 2) are described as a new species and a new report for the first time from Iran, respectively. These species are compared with their closely related taxa in Table 1.

NEW SPECIES

Agrostis gariana Taheri, **sp. nov.** (Fig. 1).

Section *Agraulus* (Beauv.) Tzvelev

Typus. Iran, Lorestan: Broujerd, Kuh-e Garin, 33 m, 23,

07, 2010, Zarini, 95709 (holotypus TARI).

Affinis *Agrostis canina* sed rhizomatibus (in illa stoloniferis), setae lemmatis 2.5-3.5 mm longis (in illa setis evanescentibus), spiculis 2.3-2.7 (in illa 2-2.5) mm longis, a *A. olympica* paleis evanescentibus (in illa 1.5-1.7 mm longis), callo lemma multo brevior (in illa aequanti), seta lemmatae 2.5-3.5 (in illa 2-2.5) mm longo.

Perennial with short fibrous rhizomes. Stem to 15 cm long, erect to decumbent only at base, glabrous and

smooth. Leaf sheaths glabrous; ligule 1-1.5 mm long; renewing leaf blade folded lengthwise; stem leaves linear- acuminate, flat, 3- 5.5 cm x 0.3- 1.5 mm, scabrid at margins and on the upper surface. Panicles erect, 4.5- 5 x 1.3- 2.5 cm, ovate; branches ascending, unequal, scabrid, to 2.2 cm long, often with spikelets in upper half; pedicels 1- 2.7 mm long, somewhat scabrid. Spikelets 2.3-2.7 mm long, elliptic, acute, purplish. Glumes 1.5- 2.3 mm long, lanceolate- acute, sub equal, slightly scabrid on keel. Lemma ovate, 1.3-2.1 mm long, 5 veined, pilose-hairy on dorsal surface, awned. Awn dorsal, geniculate, arising from 1/3 of inferior part, up to 3 mm long. Callus hairs very short, 1/5- 1/6 lemma length. Palea absent. Anthers 1- 1.1 mm long.

Etymology. The new species named after Garin mountain in Lorestan province.

Geographical distribution. Endemic to Iran.

NEW RECORD TO IRAN

Agrostis vinealis Schreb. subsp. *planifolia* (C. Koch) Tzvel., Novit. Syst. Pl. Vasc. (Leningrad) 8: 61 (1971) (Fig. 2).

Section *Agraulus* (Beauv.) Tzvelev

A. vinealis subsp. *planifolia* is characterized by the following characters: perennial; panicle lanceolate, rather dense, dark purplish; lemma glabrous, dorsally awned; callus hairs 0.2- 0.3 mm long; awn 3.5- 4.2 mm long, slightly geniculate, attached to lemma in lower 1/3 of its length; palea absent.

A. vinealis is related to *A. canina* and both are very similar in overall appearance. *A. vinealis*, due to having panicle relatively short, usually constituting less than 1/3 of the total stem length, lemma glabrous, dorsally geniculate awn with five apical teeth, absent palea is distinguished from the other species at a distance. This species is different from *A. canina* by having creeping underground shoots, but without prostrate aerial branches, shorter ligule of upper stem leaves and lemma with exerted geniculate awn. This species was originally described from Caucasia and it was not included for Iran. The nearest locality to the Iranian collection is Anatolia in NE of Turkey.

Perennial with creeping rhizomes. Stem to 60 cm long, erect to decumbent only at base, glabrous and smooth. Leaf sheaths glabrous; ligule 2.5- 3.2 mm long; blades linear- acuminate, flat, 3- 15 cm x 2- 3 mm, scabrid at margins and on both surfaces. Panicles erect, 5-18 x 1.5- 2.5 cm; branches ascending, unequal, scabrid, to 3.5 cm long, spikelets solitary; pedicels 1- 4.5 mm long, somewhat scabrid. Spikelets 3- 3.4 mm long, elliptic, acute, purplish. Glumes 3- 3.4 mm long, lanceolate- acute, sub equal, slightly scabrid on keel. Lemma ovate, 2.2- 2.4 mm long, 5 veined, glabrous,

awned. Awn dorsal, slightly geniculate, arising from slightly below the middle, up to 4.2 mm long. Callus hairs very short. Palea absent.

Geographical distribution. Caucasia, Turkey. Euro-Siberian element penetrating to Irano-Turanian.

Specimens examined. Azerbaijan: Sabalan, 2620 m, Foroughi 7153; Arasbaran protected area, between Mahmoodabad and Makidi, 2000 m, Hamzeh'ee & Asri 18611; Arasbaran protected area, Doghrun and Kalan muntains, 2300 m, Assadi & Sardabi 24135; Arasbaran protected area, Toopkhaneh, 2250 m, Hamzeh'ee & Asri 81679.

Key to the *Agrostis* sections in Iran

1. Lemma pilose. Callus hairs as long as lemma. Anthers 0.3- 0.6 mm long

Sect. *Pentatherum* (Nabel.) Tzvel.

- Lemma pilose or glabrous. Callus hairs short or absent. Anthers 1- 1.5 mm

2

2. Lemma awned. Palea absent

Sect. *Agraulus* (Beauv.) Tzvel.

- Lemma usually awnless; Palea 2/3- 1/2 lemma

Sect. *vilfa* Adans.

Identification key to the *Agrostis* species in Iran

1. Callus hairs as long as lemma. Lemma awned

A. olympica

- Callus hairs short or absent. Lemma awned or awnless

2

2. Palea absent

3

- Palea 1/3 - 2/3 as long as lemma

5

3. Lemma somewhat pilose, 1.3- 2.1 mm long, awned

A. gariana

- Lemma glabrous, 1.7- 2.4 mm long, awned or awnless

4

4. Spikelets 2- 2.5 mm long. Lemma 1.7- 2 mm long, without awn

A. canina

- Spikelets 3- 3.4 mm long. Lemma 2.2- 2.4 mm long, with a long exerted awn

A. vinealis

5. Plant with long stolons

A. stolonifera

- Plant with rhizomes

6

6. Ligules of non-flowering culms longer than broad. Panicle branches aculeolate

A. gigantea

- Ligules of non-flowering culms usually broader than long; Panicle branches smooth

A. tenuis

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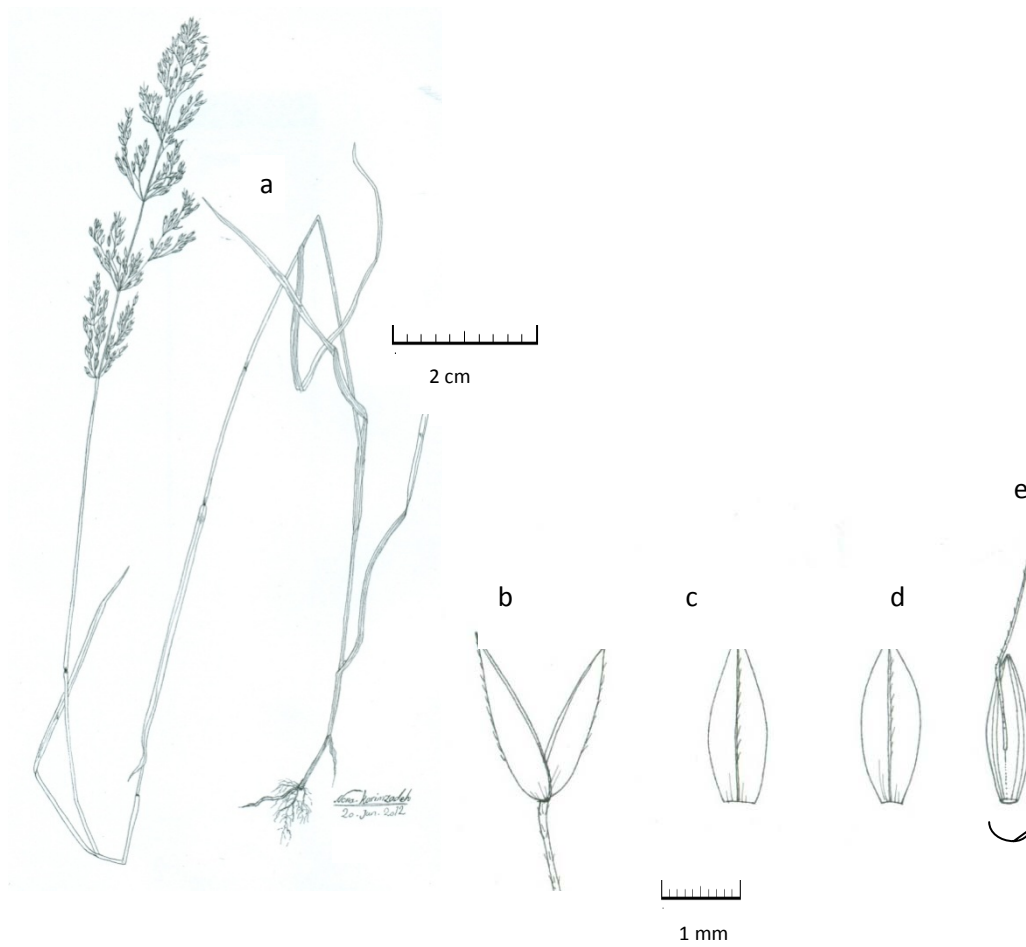


Fig. 2. *Agrostis vinealis*: a. habit, b. spikelet, c. upper glume, d. lower glume, e. lemma.

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