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A New Species of *Bellardiochloa*, *B. doganiana* (Poaceae, Poeae, Poinae), from the Taurus Mountains of Turkey

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Abstract

Bellardiochloa doganiana, a new species from Taurus Mountains of Turkey, is described and illustrated. It differs from the other four species of the genus in its basal tuft of short, stiff, terete, arched, pungent tipped basal leaf–blades, and conical panicles with numerous panicle branches, pedicels as long as or longer than the spikelets, mostly with 1 or 2 spikelets per branch.

Key Words: *Bellariochloa*, Poaceae, Turkey

Introduction

Bellardiochloa Chiov., hitherto, was known as a genus of four alpine species, all of which occur in Turkey (Mill 1985, in the Flora of Turkey; Euro+Med, 2006; Cabi & Doğan 2012). The genus is centered in Turkey. Two species are endemic to Turkey: *Bellardiochloa carica* R.R.Mill occurs in Muğla and southwest Antalya (this region was known as Caria in ancient times); *B. argaea* (Boiss. & Bal.) R.R.Mill is endemic to Erciyes Dağı (mythological Mount Argaeus) in Kayseri. *Bellardiochloa polychroa* (Trautv.) Roshev. extends from north central (Ordu) to eastern Turkey (Ağrı), occurring outside Turkey from the Transcaucasus republics of Georgia, Armenia, and Azerbaijan, adjacent Caucasus Mts. of Russia, to northwest Iran. *Bellardiochloa variegata* (Lam.) Kerguélen [syn. *B. violacea* (Bellardi) Chiov.] occurs in southern Europe from Spain to Greece and the Balkan Republics in the Carpathian Mountains, extending into Turkey in Bursa, and Bolu provinces.

The genus is readily distinguished from *Festuca* L. and *Poa* L. by the hairy rachilla internodes with a crown of short stiff hairs at the apices and on the callus of each lemma, from *Festuca* by short, ovate hilum, and from *Poa* by the rounded back of the lemma with a short

apical awn. It differs from both these genera in having caryopses with soft to semi-soft endosperm, indicating high lipid content (Rosengurtt et al., 1972), instead of hard endosperm (with lipid in *Poa*, without lipid in *Festuca*). It is phylogenetically isolated from both genera, but closer to *Poa* than *Festuca* (Gillespie et al, 2010).

No material of *Bellardiochloa* is recorded in the Flora of Turkey from Turkey's Taurus Mts. east of ca. 30.5° E. In 1991 R.Soreng identified a single specimen at ANK (herbarium acronyms follow Thiers, continually updated), mounted with an *Eremopoa* sp. [new det. *E. songarica* (Schrenk ex Fisch. & C.A.May.) Roshev. = *Poa diaphora* Trin. s.l.], as “*Bellardiochloa* sp.”, from south of Bozkır, Konya (R.Çetik et al, 271/151). Upon revisiting ANK in 2014, with the co-authors we found the specimen still in the *Eremopoa* folders. Having greater experience with the genus, by now having collected the four previously known species of the genus, we determined the specimen collected by R.Çetik et al. was a new species. However, lacking more than the one skimpy specimen with 2 solitary early flowering culms, we headed to the Palaz Dağları south of Bozkır to see if we could relocate the species and check for variations in it, while at the same time collecting species of *Poa* under grant to E.Cabi (TÜBİTAK “212T113” Taxonomic Revision of the genus *Poa* in Turkey). We found populations of the *Bellardiochloa* (in fruit) at two new locations, and determined that variation in the taxon was minimal, and not overlapping in key characteristics with other species. We describe it below.

Taxonomy

***Bellardiochloa doganiana* Cabi & Soreng, sp. nov. (Fig. 1, 2, 3)**

Type:—TURKEY. Konya, Bozkır, Palaz Dağları, steep slopes on northwest side of pass to Hacıobası, 2015 m, 37.04410 N, 32.09117 E, 25 July 2014, R.J. Soreng 8861, E.Cabi & B.Çingay (holotype US, isotypes ANK, B, CAN, E, G, HAOC, ISTE, K, KNYA, LE, NAKU, W).

Perennial, densely tufted, tufts small, with numerous crowded, short basal leaves and few culms. Culms (12–)20–25(–38) cm tall, slender, with usually one node exposed, smooth, with purplish striations where exposed. Leaves; sheaths of basal leaves short (mostly less than 1 cm long), thin, papery, smooth, glabrous, upper culm sheaths scabrous distally, hooks mostly antrorse, uppermost culm sheath 7.2–8.7 cm long, with margins fused at the base for 1–1.5 mm; ligules of upper culm leaf 3–4 mm long, membranous, longer on the margins than the center, shallowly lacerate to erose, minutely asperous on the margin, broadly decurrent; blades of basal leaves (1.5–)2–2.5(–3) cm long, 0.8–1.5(–2) mm wide (as folded, involute,

terete to elliptical, in cross-section, thick, indurate, bright light green, shiny, straight or arched, abaxially smooth, margins very finely scabrous, abaxially hispidulous over deep valleys and ridges, apically pungent, culm leaf blades 1–2.5(–4) cm long, thinner than the basal ones, abaxially antrorsely scabrous distally. Panicles (6–)7.5–11(–12) cm long, erect, conical, open, sparsely flowered, lower internodes 1.3–2.5(–3.2) cm long; peduncle (9–)11–20 cm long; branches whorled, (3–)5–9(–11) at the lower nodes, ascending to spreading, moderately scabrous with hooks distributed more or less evenly around the subterete to weakly angled surfaces; longest branches (2–)3–5(–6), with 1–2(–4) spikelets, pedicels 4–20 mm long, equaling or longer than their spikelets. Spikelets (4–)4.5–5.5(–6) mm long, (1) 2–3 flowered, narrowly lanceolate; Glumes weakly keeled with broad scarious margins, margins (edges) lightly scabrous to nearly smooth, abaxially smooth and glabrous, slightly lustrous, apex of the glume slightly obtuse and asperous in the margin or acute and sharply pointed, unequal (first glume 1–1.5 mm shorter than the second glume), first glume 3–3.8 mm long, narrowly lanceolate, 1–veined, second glume 3.5–4.2 mm long, lanceolate; Rachilla internodes 1 mm, terete scabrous to pubescent with stiff hairs to 0.15 mm; Callus of rachilla joint and lemma base with stiff hairs to about 0.5 mm mm long, upper rachilla extension (to sterile rudiment) 1.5–3 mm; lemmas 4 to 5 mm, awned, awn 0.4–1.5 mm long on at least some florets within spikelets, scabrous, lemmas round on back, 5–veined; Lemmas are mostly smooth and glabrous, or central nerve, and sometimes the sides near the base, with sparse hairs to 0.5 mm long up to the lower 2/5th, lower margins involute, upper margins sparsely scaberulous, body distally herbaceous, purplish, moderately muriculate to sparsely scabridulous, the upper margin scarious–hyaline, lightly scaberulous, apical margin slight erose or entire, scaberulous in the margin; Paleas subequal to lemma, scarious for the most part, keels scabrous from the middle. Flowers bisexual; Lodicules 1 mm long, with a lateral lobe in the upper 1/3rd, purplish distally, apical margin with 1 or 2 prickles; Anthers 3, 2.5–3 mm long; Ovary glabrous, styles apical, approximate, lanceolate in outline, plumose with short secondary branching, caryopsis 2.6–2.9 mm long, fusiform in lateral view, shallowly sulcate, pale cream colour with purple tinge near the apex, glabrous, endosperm soft (with lipid), hilum ovate, 0.5 mm long.

Etymology:—The new *Bellardiochloa* species is named in honor of the Turkish botanist Prof. Dr. Musa Doğan for his extensive contributions to the flora of Turkey and grasses in particular and teaching many students the joys of the botanical world. (In Turkish the letter “ğ” is silent and could be phonetically rendered as a soft h in Latin, but we decided to retain the ğ as g to more nearly match the spelling.)

Distribution: –Apparently endemic to the Palaz Dağları, along the shared eastern Antalya and south–western Konya regional borders in Mediterranean Region (Fig. 4).

Habitat:–High *Astragalus* steppe to low subalpine, on limestone and mixed sedimentary rocks, 2000–2300 m.

Additional specimens examined: –TURKEY. Konya, Bozkır, Kızılot Yayla, 1700 m, R.Çetik, T.Ekim, G.Yurdakul 271 or 151 (ANK!); Antalya, Gündoğmuş, Palaz Dağları, steep slopes on east side of Geyik Dağı, ca. 2270 m, 36.88479 N, 32.19690 E, limestone, east facing slope with low shrub grass steppe community, with *Astragalus* L., *Euphorbia* L., *Daphne* L., *Alopecurus gerardii* (All.) Vill., *Melica* L., *Bromus* L., *Festuca* L., *Poa thessala* Boiss. & Orph., 25 July 2014, R.Soreng 8871, E.Cabi & B.Çingay (NAKU!, US!).

The new species differs from all other *Bellardiochloa* species in its dense tuft of short stiff, arching, terete, pungent tipped, basal leaf–blades, conical panicles with numerous branches per node, with mostly 1 or 2 spikelets per branch, on pedicles as long as or longer than the spikelets.

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FIGURE 1. *Bellardiochloa doganiana*. A. habit; B. inflorescens; C. spikelet; D. first glume; E. second glume; F. [florete lateral](#) view; G. palea; H. caryopsis ventral view, with hilum; I. caryopsis dorsal view; J. detail [of upper culm](#) leaf sheath and ligule. Scale bar: 1 cm for A and B, 1 mm for C to J. Drawn by E.Karabacak from *R.J.Soreng 8861*.

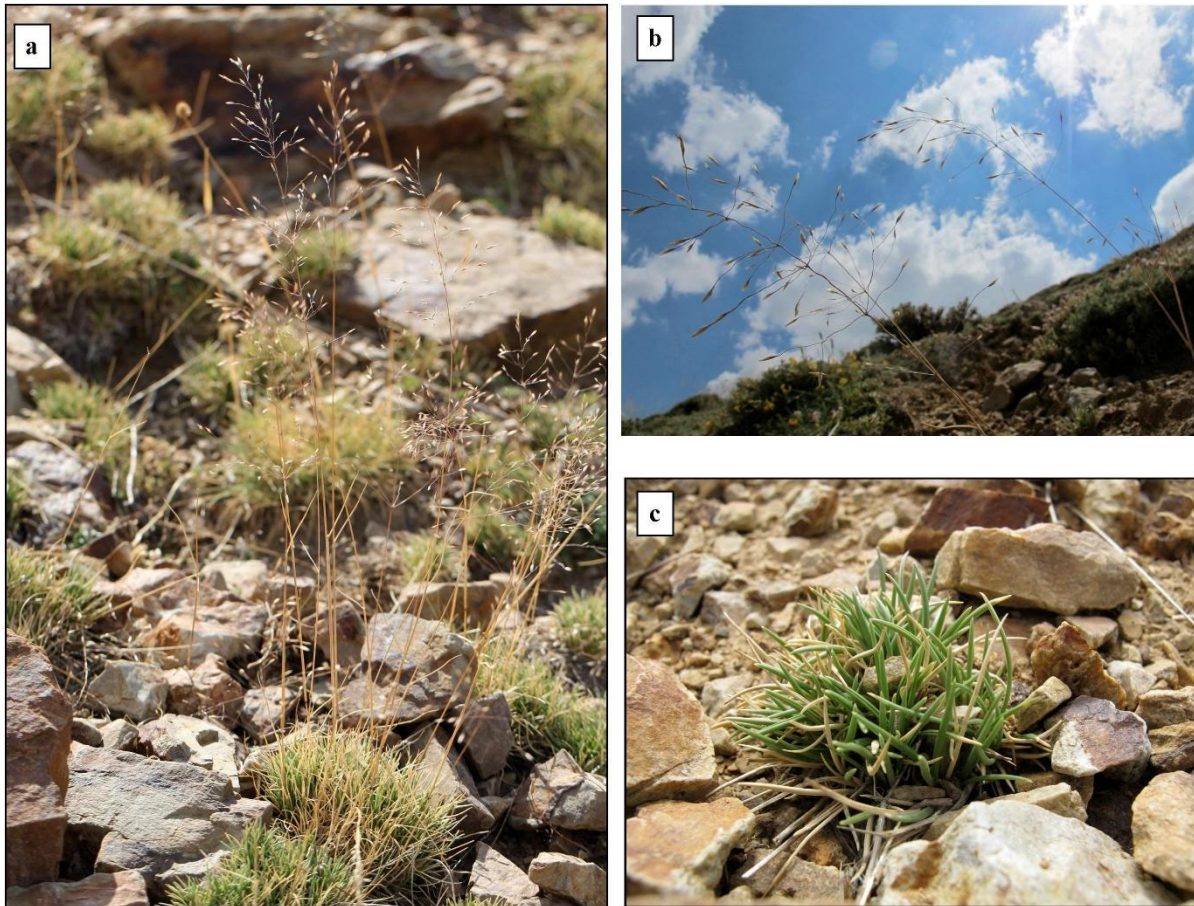


FIGURE 2. *Bellardiochloa doganiana* photos taken at the type locality. a) habit, b) inflorescence, c) sterile basal tuft of leaves. Photos taken by Evren Cabi.

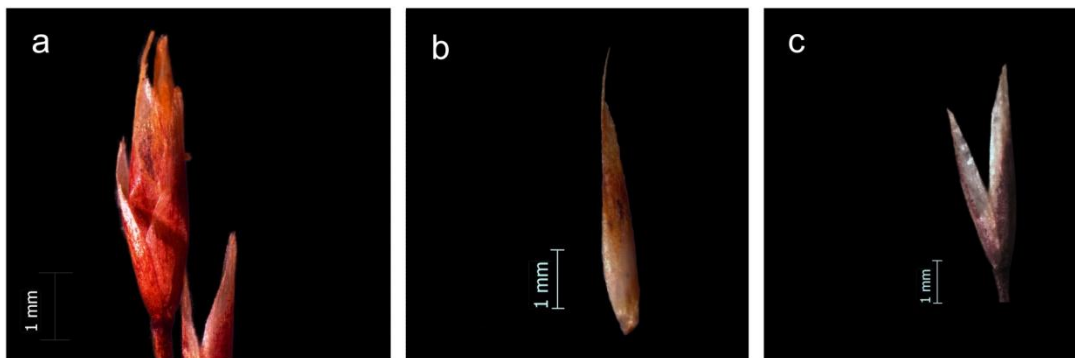


FIGURE 3. *Bellardiochloa doganiana* spikelet photos. a) spikelet, b) lemma, c) glumes.

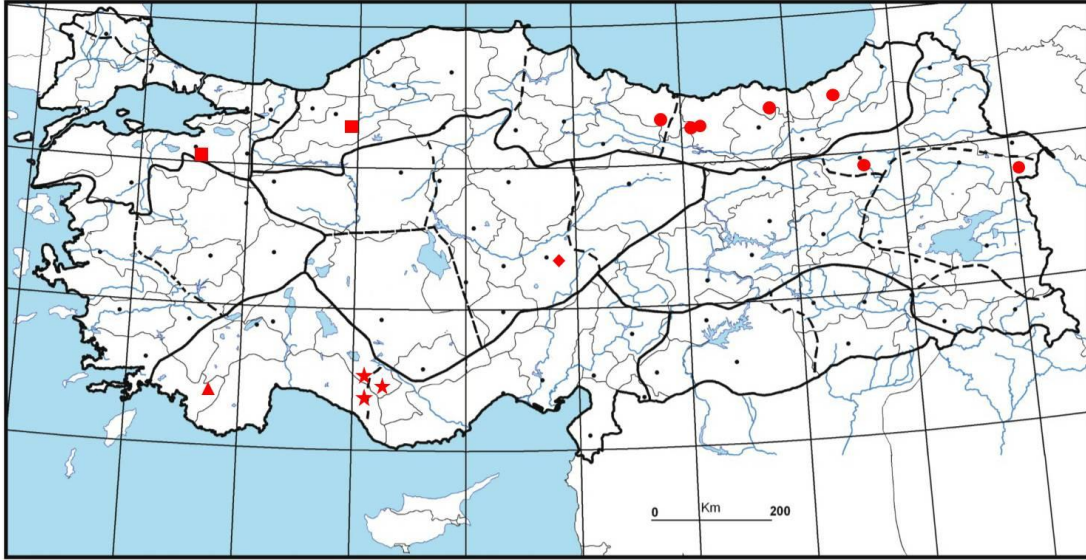


FIGURE 4. Distribution of *Bellardiochloa* species in Turkey. ▲ *B. carica*, ◆ *B. argaea*, ● *B. polychroa*, ■ *B. variegata*, ★ *B. doganiana*.