

A new species of *Minuartia* (Caryophyllaceae) from northwestern Anatolia, Turkey

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Abstract: *Minuartia turcica* M.Koç (Caryophyllaceae) is described as a new species of sect. *Minuartia*. The specimens were collected from the village of Yukarıçiftlik in the district of Safranbolu (Karabük Province, Turkey). The new species is similar to *Minuartia leucocephaloides*, but the differences between the 2 species are discussed in this paper. Descriptions and illustrations are given, as is information on the distribution and conservation status of the new species.

Key words: Alsinoideae, *Minuartia*, taxonomy, western Black Sea region

Türkiye'nin kuzeybatı Anadolu bölgesinden *Minuartia*'nın (Caryophyllaceae) yeni bir türü

Özet: *Minuartia turcica* M.Koç (Caryophyllaceae) sect. *Minuartia*'nın yeni bir türü olarak tanımlandı. Örnekler Safranbolu Yukarıçiftlik köyünden toplandı (Karabük). Yeni tür *Minuartia leucocephaloides* türüne yakındır. Türler arasındaki farklar tartışıldı. Yeni türün betimi, yayılışı, resmi ve koruma statüsü verildi.

Anahtar sözcükler: Alsinoideae, *Minuartia*, taksonomi, batı Karadeniz bölgesi

Introduction

Minuartia L. is placed in the subfamily Alsinoideae (DC.) Fenzl in the family Caryophyllaceae. It comprises approximately 120 species and occurs in the northern hemisphere, with a few species native to Brazil and Chile (Bittrich, 1993). *Minuartia* includes 7 sections and 74 taxa found in *Flora of Turkey* (McNeill, 1967). As a result of recent studies, 2 taxa in this genus were determined to be synonyms.

Additionally, one species, one variety, and one hybrid have been added to the genus. The total number of taxa of this genus has therefore been increased to 75 in Turkey (McNeill, 1967; Davis et al., 1988; Aytaç & Duman, 2004; Eren et al., 2004; Parolly & Eren, 2006; Külköylüoğlu et al., 2009; Özhatay, 2009).

The first author of this paper collected some interesting *Minuartia* specimens from Safranbolu (Karabük Province) during a project, supported by

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Bozok University, to revise information about sect. *Minuartia* taxa (Caryophyllaceae) in Turkey. These specimens were compared with related species in the herbaria of ANK, GAZI, ISTE, HUB, EGE, and Bozok University and with records in the literature (McNeill, 1963; Rechinger, 1964; Zohary, 1966; McNeill, 1967; Halliday, 1976; Davis et al., 1988; Rechinger, 1988; Shishkin, 1995; Bojňanský & Fargašová, 2007). The studies showed that these

specimens are representatives of a species new to science.

Minuartia turcica M.Koç sp. nova (Figures 1-3).

[Sect. *Minuartia*]

Type: Turkey, A4 Karabük: Safranbolu, north of Yukarıçiftlik village, Kurttepesi vicinity, 800-900 m, in open forest, stony places, 41°17'N, 32°43'E, 27.vi.2010, M.Koç 1197 (holotype: Bozok Univ.

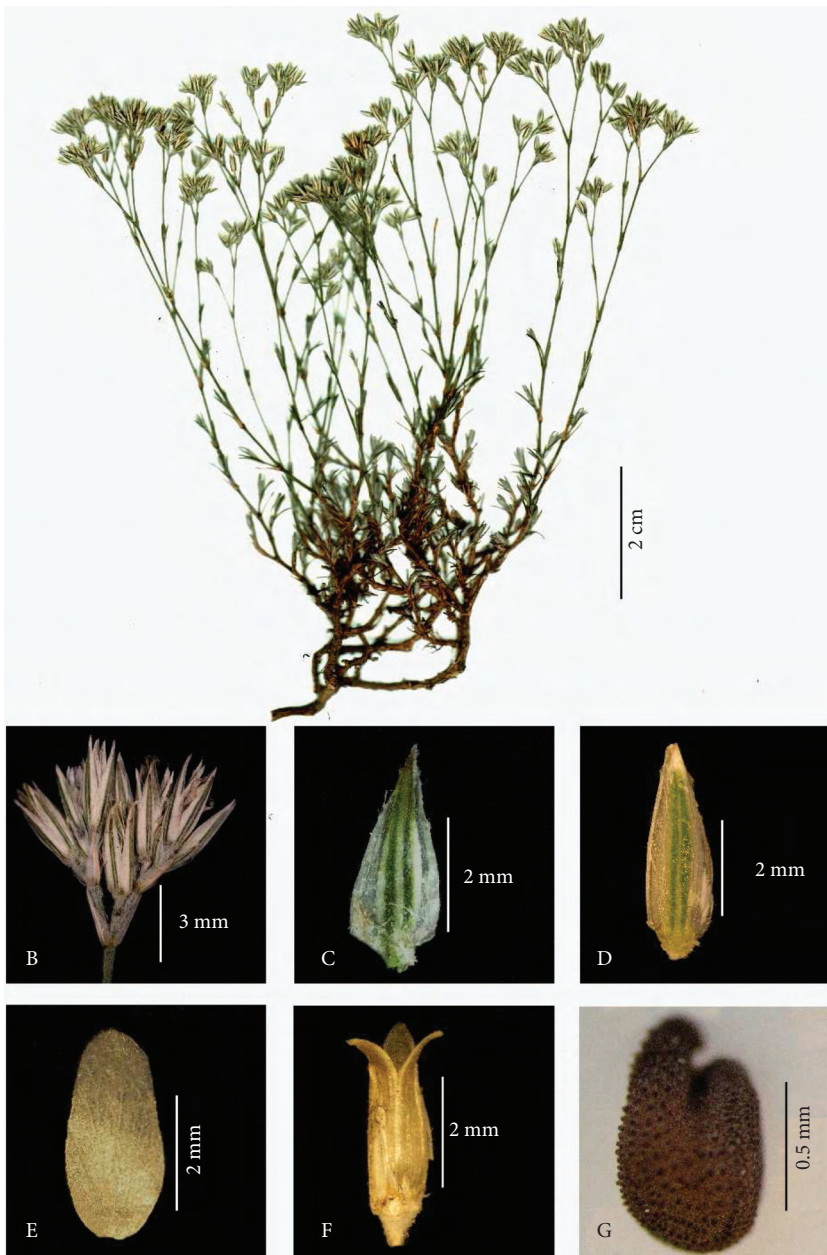


Figure 1. *Minuartia turcica*: A- habit, B- cyme, C- bract, D- sepal, E- petal, F- capsule, G- seed.

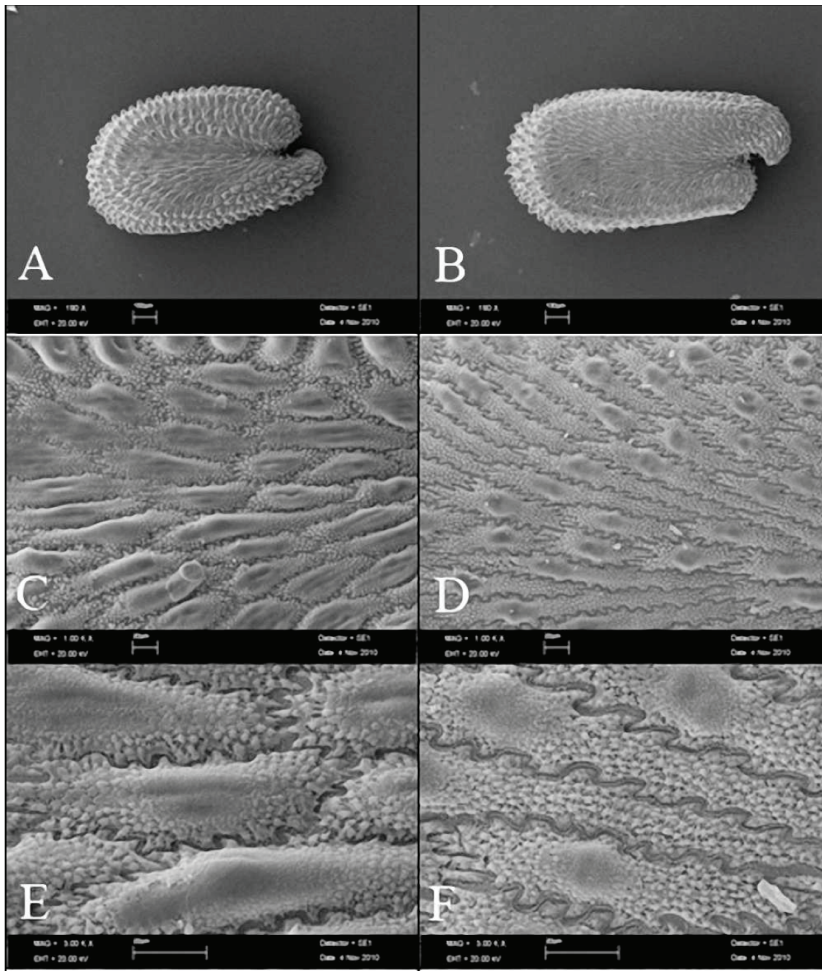


Figure 2. SEM photographs of the seed coat. A, C, and E- *Minuartia turcica*. B, D, and F- *M. leucocephaloides*. Scale bars: A and B = 100 µm; C-F = 20 µm.

Herb.; isotypes: Bozok Univ. Herb., Erciyes Univ. Herb., ANK, GAZI).

Diagnosis: Affinis *Minuartia leucocephaloides*, sed planta densa floccosa (non sparsa pubescenti vel rare velutina), sepalis 2.5-4 mm longis (non 4-6.5 mm longis), capsula calyce aequali (non 1/2-2/3-plo brev) differt.

Description: Caespitose, greyish-green perennial herb, densely floccose-hairy throughout except rarely sepals. Stems woody, erect, 6-18 cm long, 0.6-1.2 mm in diameter, branched from base. Leaves subulate-setaceous, 3-7 × 0.5-1 mm, 3-veined; apex acute to acuminate; margins membranous and ciliate towards the base; leaf sheaths membranous, 0.6-1 mm long. Bracts lanceolate-ovate, 2-4 × 0.9-1.5 mm, 3-veined;

apex acute to acuminate; margins membranous towards the apex. Inflorescences branched, with terminal and lateral lax cymes, compact 3-10-flowered per cyme. Fasciculate flowers sessile; alar flowers pedicellate, pedicels erect, 0-2 mm and 1/2 or as long as in sepals. Calyx conical in fruit, hardened and truncate at the base. Sepals linear-lanceolate, 2.5-4 × 0.7-1 mm, floccose-hairy or glabrous and glaucous, distinctly 1-midveined and 2 faint lateral veins; margins and apex membranous; apex obtuse to broadly acute. Petals elliptic-ovate, 2.5-3.8 × 0.7-1.1 mm, almost as long as sepals, white, obtuse at apex. Stamens 10; filaments 2-3 mm long; staminal glands prominent, inflated at base, unipartite, at the base of outer filaments, 5 in number, whitish-orange. Styles

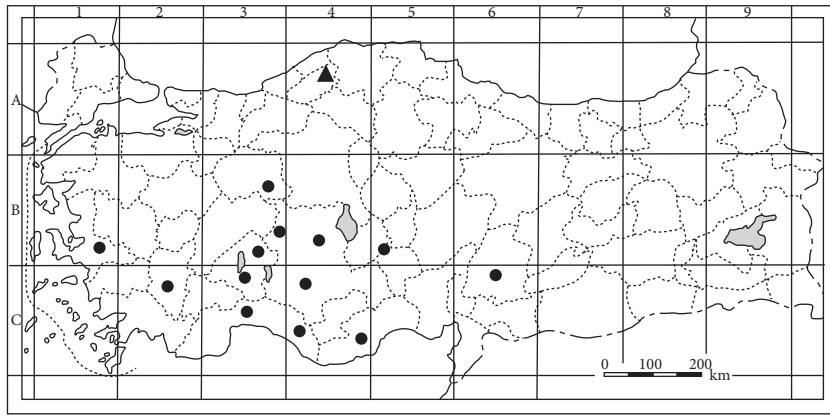


Figure 3. Distribution of *Minuartia turcica* (▲) and *Minuartia leucocephaloides* (●) in Turkey.

1.5-2 mm. Capsule cylindrical, 2.5-4 × 0.8-1.2 mm, 3-7-seeded, as long as sepals. Seeds oval or reniform, faint flattish, with radicle prolonged into rounded bump, 0.8-1 × 0.5-0.6 mm. Surface tuberculate; elongate tubercles, light-brown or brown. Fl. 6-7, in open forest, stony places, 800-900 m.

Specimens examined: *Minuartia leucocephaloides* – Turkey, **B1** İzmir: Kemalpaşa, Nif Dağı, 1500 m, 16.vi.2009, *M.Koç* 242, *Aksoy, Hamzaoğlu & Budak* (Bozok Univ. Herb.); **B3** Konya: Sultandağları, Monas köyü üstleri, Mortoprak mevkii, 1320 m, 05.vii.1975, *G.Dökmeci* 32641 (ISTE); Konya: Akşehir, Savaş (Bermende) köyü, 1100 m, 02.vii.2010, *M.Koç* 1217, *Aksoy, Hamzaoğlu & Budak* (Bozok Univ. Herb.); Isparta: Yenişarbademli-Aksu arası, Dedegöl Dağı, Pınargözü mevkii, c. 1700-2200 m, 22.vi.2006, *Hamzaoğlu* 4032, *Aksoy & Budak* (Bozok Univ. Herb.); Eskişehir: Eskişehir-Emirdağ arası, Afyonkarahisar yol ayrımı, 1170 m, 02.vii.2010, *M.Koç* 1212 & *Budak* (Bozok Univ. Herb.); **B4** Konya: Ermenek, Kızıl Dağ güneyi, 2100 m, 09.vii.1978, *M.Vural* 1050 (ANK); **B5** Aksaray: Hasan Dağı kuzey yamacı, Ağışme Deresi mevkii, c. 1775 m, 27.vii.1974, *H.Peşmen* 1975 & *A.Düzenli* (ANK); **C2** Denizli: Babadağ, Evren Tepe etekleri, 1450 m, 09.viii.1996, *S.Oluk* 1720 (EGE); **C3** Isparta: Sütçüler, Çimenova, Sarp Dağ, *P.H.Davis* 15806 (ANK); Antalya: Elmalı çevresi, 1968, *P.Quezel et al. s.n.* (ANK); **C4** Konya: Ermenek, Hamitseydi Boğazı, 16.viii.1949, *P.H.Davis* 16242 (ANK); Mersin: Anamur, Beşkuyu, Çamurlu yayla, c. 1900 m, 17.viii.1949, *P.H.Davis* 16277

(ANK); Antalya: Gazipaşa, Çobanlar köyü yaylası, 1900-2000 m, 19.vii.1981, *H.Sümbül* 1059 (HUB); **C6** Kahramanmaraş: Göksun, Höbek Dağı, Döngel mağaraları, 900 m, 22.vii.1977, *B.Yıldız* 1239 (HUB).

Conservation status: *Minuartia turcica* is an endemic species known only from the type gathered in the western Black Sea region (Safranbolu/Karabük). This species must be classified as “Critically Endangered” (CR-B1a) according to the World Conservation Union categories (IUCN, 2001).

Ecology: *Minuartia turcica* grows in open forest and stony places at 800-900 m with *Minuartia micrantha* Schischk., *Anthericum ramosum* L., *Quercus infectoria* Olivier subsp. *infectoria*, *Quercus cerris* L. var. *cerris*, *Pinus nigra* J.F.Arnold var. *caramanica* (Loudon) Rehder, and *Salvia* sp.

Discussion and conclusion

Minuartia turcica belongs to sect. *Minuartia* due to some morphological characters such as a conical calyx, hardened and truncate base, distinctive staminal glands, and capsule as long as calyx (McNeill, 1967; Halliday, 1976). This species is similar to *Minuartia leucocephaloides* because it has erect stems, sessile flowers in the fasciculate, pedicellate alar flowers, margins of sepals and membranous apex, and obtuse or wide acute apex. Although *Minuartia turcica* is different from this species, it is completely densely floccose, with sepals 2.5-4 mm long and capsule as long as sepals (Table). While

Table. Diagnostic characters of *Minuartia turcica* and *Minuartia leucocephaloides*.

	<i>Minuartia turcica</i>	<i>Minuartia leucocephaloides</i>
General indumentum	densely floccose	usually sparsely pubescent or sometimes velutinous
Sepals	2.5-4 mm long	4-6.5 mm long
Capsule	as long as sepals	1/2-2/3 shorter than sepals
Alar pedicel	1/2 or as long as sepals	1/2-1/3 in sepals
Seed surface	elongate tubercles	rounded tubercles

Minuartia turcica has a distribution in the western Black Sea region, which provides a more humid habitat, *Minuartia leucocephaloides* is an endemic species that has a distribution in central Anatolia and the Mediterranean and Aegean regions, which have a drier climate (Figure 3).

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