



## Research Article

### Contributions to the genus *Minuartia* (Caryophyllaceae) in Turkey

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#### Abstract

In this study, *Minuartia granuliflora* was presented as a new record for the flora of Turkey. Besides, *Minuartia corymbulosa* var. *breviflora* was rediscovered and was proposed as the CR [B1-a] category according to the IUCN criteria. Description, photos and distributions of the taxa were given.

**Keywords:** Caryophyllaceae, new record, *Minuartia*, rediscovery, Turkey

### Türkiye’de *Minuartia* (Caryophyllaceae) cinsine katkılar

#### Özet

Bu çalışmada, *Minuartia granuliflora* Türkiye florası için yeni kayıt olarak verildi. Ayrıca, *Minuartia corymbulosa* var. *breviflora* yeniden keşfedildi ve IUCN kriterlerine göre CR [B1-a] kategorisi olarak önerildi. Taksonların betimlemesi, fotoğrafları ve dağılışları verildi.

**Anahtar kelimeler:** Caryophyllaceae, yeni kayıt, *Minuartia*, yeniden keşif, Türkiye

#### INTRODUCTION

*Minuartia* L. is in the subfamily Alsinoideae (DC.) Fenzl of the family Caryophyllaceae Juss. It comprises ca. 120 species and occurs in the northern hemisphere, with one species native to Brazil and Chile (Bittrich 1993). The genus *Minuartia* is comprised of about 54 species, mostly in Mediterranean Europe and eastward into south-central Asia. *Minuartia* (sects. *Minuartia* and *Plurinerviae* McNeill) includes 34 taxa in the flora of Turkey (McNeill 1967; Davis et al. 1988; Tan & Vural 2000). As a result of recent studies, five species, *Minuartia turcica* Koç, *M. aksoyii* Koç & Hamzaoğlu, *M. buschiana* Schischk subsp. *artvinica* Koç & Hamzaoğlu, *M. hamzaoglui* Koç & Aksoy and *M. torosensis* Koç & Hamzaoğlu, were added to this genus (Koç et al. 2011; 2012; 2019; Koç & Aksoy 2013). As a result, the total number of taxa in this genus was increased to 39 in Turkey.

The authors collected some interesting *Minuartia* specimens from Kop Mountain (Bayburt, Turkey) and between Eskişehir and Bursa (Turkey) during the project supported by the Bozok University to revise the Turkey sect. *Minuartia* taxa (Caryophyllaceae). These specimens were compared with related species with records in the literature (McNeill 1963; 1967; Rechinger 1964;

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1988; Zohary 1966; Halliday 1976; Davis et al. 1988; Kamari 1997; Schischkin 1936; Bojnanský & Fargašová 2007). The studies showed that these specimens are representatives of a new record and one rediscovered taxon in Turkey. Measurements and other details given in the description are based on herbarium specimens in the Biology Department of the Gazi University (GAZI) and on field observations.

## MATERIAL AND METHOD

The collected specimens were first compared with the similar species from the *Flora of Turkey and the East Aegean Islands* and as well as the *Flora of the U.S.S.R.*, *Flora Europaea*, *Flora Iranica*, *Flora of Lowland Iraq*, *Flora Palaestina* and *Flora Hellenica* for identification (Schischkin 1936; Rechinger 1964; 1988; Zohary 1966; McNeill 1967; Halliday 1976; Davis et al. 1988; Kamari 1997). Pictures were taken with an Olympus SZX-16 Stereo Microscope and DP 72 digital camera. The vegetative parts were measured with a ruler with an accuracy of 0.5 mm and the floral characteristics were studied using an ocular micrometer. The specimens collected were deposited in the GAZI herbarium (Gazi University, Ankara, Turkey).

## RESULTS AND DISCUSSION

### Taxonomic treatment

*Minuartia granuliflora* (Fenzl) Grossh., Fl. Kavk. II: 381 (1842) (Figures 1 and 3).

**Type.** Parts of Transcaucasia bordering on Turkey, Nordm. s. n. (LE?).

**Description.** Tufted, perennial herb. Stem erect or ascending, 5–15 cm, puberulent below, glandular above, greenish. Leaves subulate-setaceous, 5–12 × 1–1.5 mm, puberulent, 3-nerved, greenish; apex acute to acuminate; leaf fascicles open at flowering time. Inflorescences lax, 3–10-flowered, glandular, reddish-greenish. Bracts ovate, 1.5–3 × 1–1.5 mm, glandular, 3-nerved; apex acute. Pedicels 2–5 mm, flowered and seeded erect, glandular. Sepals ovate or ovate-lanceolate, 2–4 × 1–1.4 mm, glandular, distinctly 1-midveined and 2 faint lateral veins, reddish-greenish but median nerved white; apex acute; margins 0.1–0.2 mm membranous. Petals rotund or widely ovate, 2–5 × 0.9–2 mm, usually exceeding sepals, white; apex obtuse; base cuneate. Stamens 10; filaments 1–3 mm long; staminal glands prominent, at the base of outer filaments, bipartite, 5 in number, whitish-orange. Styles 1–2 mm. Capsule ovoid, 2–3.5 × 1–1.5 mm, 3–6-seeded, 2/3 as long as sepals. Seeds dark brown, reniform, 1–1.2 × 0.7–0.9 mm; lateral and dorsal surface tuberculate. *Fl.* 7, 1815–2500 m, stony places.

**Distribution.** Caucasus, Russia and Turkey.

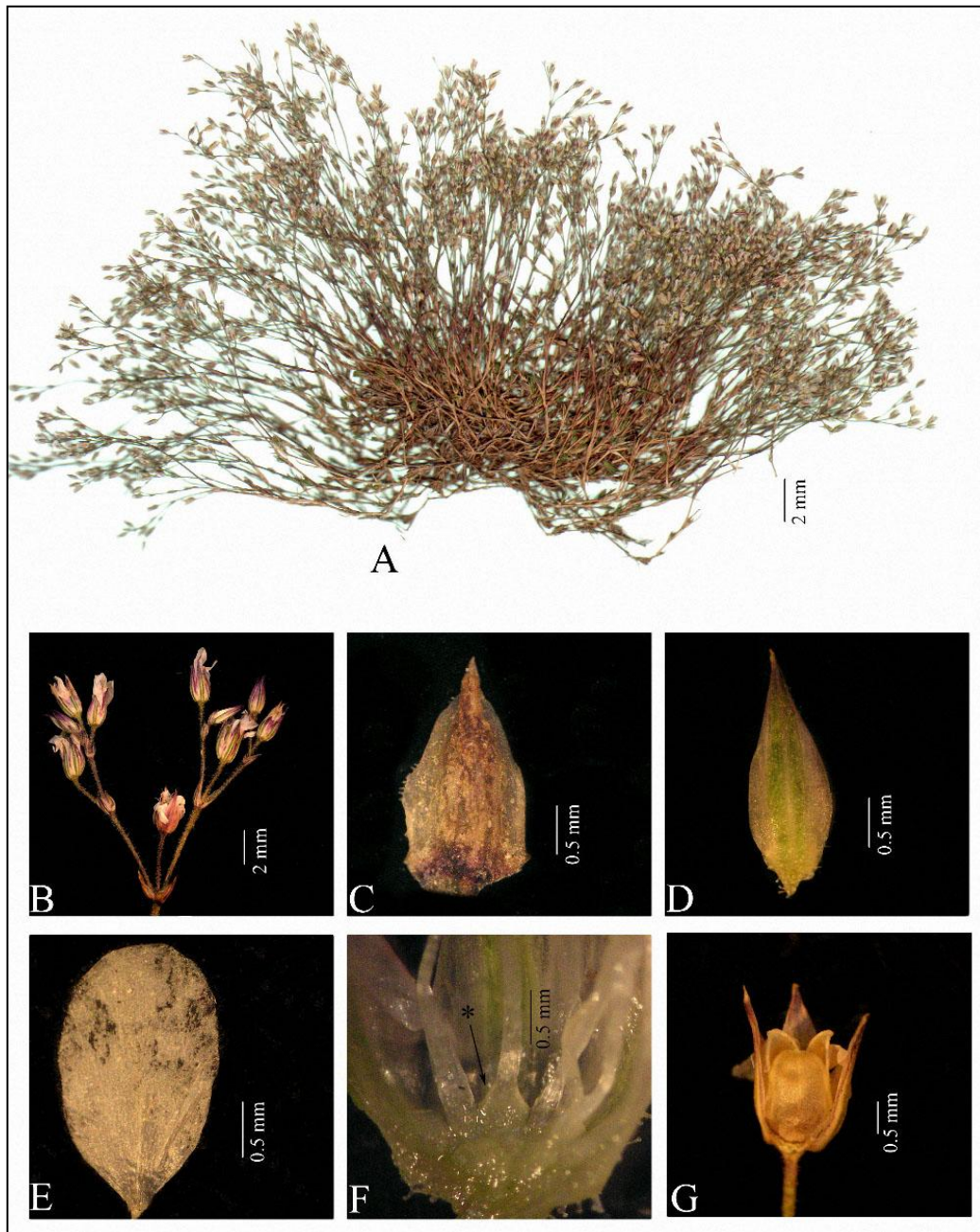
*Minuartia corymbulosa* (Boiss. & Balansa) McNeill var. *breviflora* (Boiss.) McNeill, Notes Roy Bot Gard Edinburgh 24: 380 (1963) (Figures 2 and 3).

**Type.** [Turkey. **B4** Ankara]: Prope Angoram Galatiae, Wiedemann s.n. (holo. G, with barcode G00150382, seen as photo!).

**Description.** Caespitose, perennial herb. Stem ascending, 10–15 cm, puberulent below, glandular above, greenish. Leaves linear-setaceous, 6–10 × 0.7–1 mm, glabrous or puberulent, 3-nerved, greenish; apex acute to acuminate; leaf fascicles close at flowering time. Bracts ovate-deltoid, 1.5–2.5 × 0.8–1.2 mm, glandular, 3-nerved; apex acute. Pedicels 0.5–5 mm, erect, glandular.

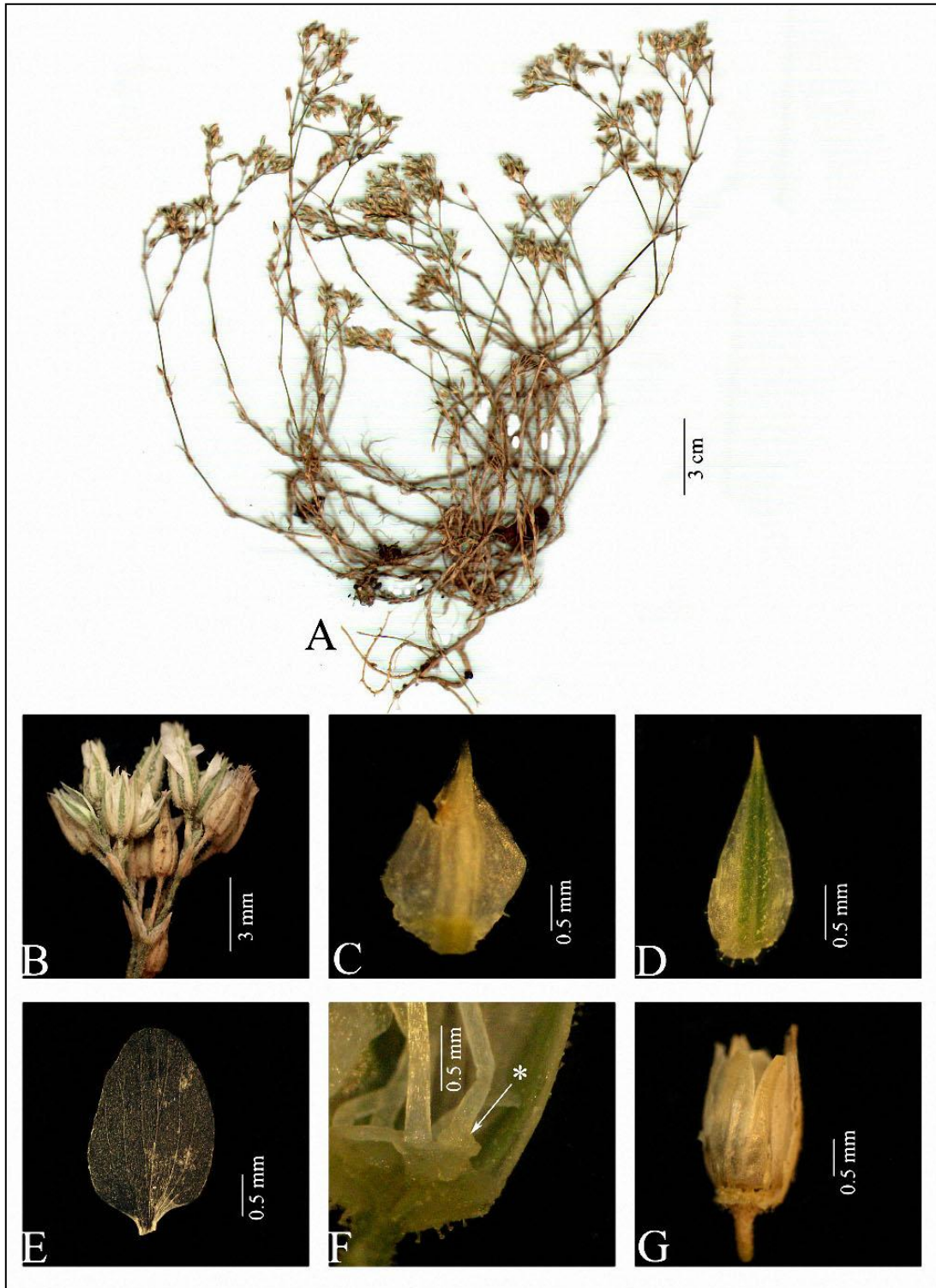
Inflorescences compact, 3–10-flowered, glandular, greenish. Sepals ovate-lanceolate,  $2-3 \times 0.8-1.3$  mm, glandular, distinctly 1-midveined and 2 faint lateral veins, greenish but median nerved white; apex acute; margins  $0.1-0.2$  mm membranous. Petals widely ovate,  $2-3.5 \times 1-1.5$  mm, usually exceeding sepals, white; apex obtuse; base cuneate. Stamens 10; filaments  $1.5-3$  mm long; staminal glands prominent, at the base of outer filaments, bipartite, 5 in number, whitish-orange. Styles  $2-4$  mm. Capsule ovoid,  $1.5-2 \times 0.7-1$  mm, 3–6-seeded,  $2/3$  as long as sepals. Seeds brown, reniform,  $1-1.2 \times 0.7-0.9$  mm; granulate, lateral and dorsal surface tuberculate. *Fl.* 7, 760 m, stony places.

**Distribution.** Endemic for Turkey.



**Figure 1.** *Minuartia granuliflora* (M.Koç 600). A. habit, B. cyme, C. bract, D. sepal, E. petal, F. staminal gland (\*), G. capsule.



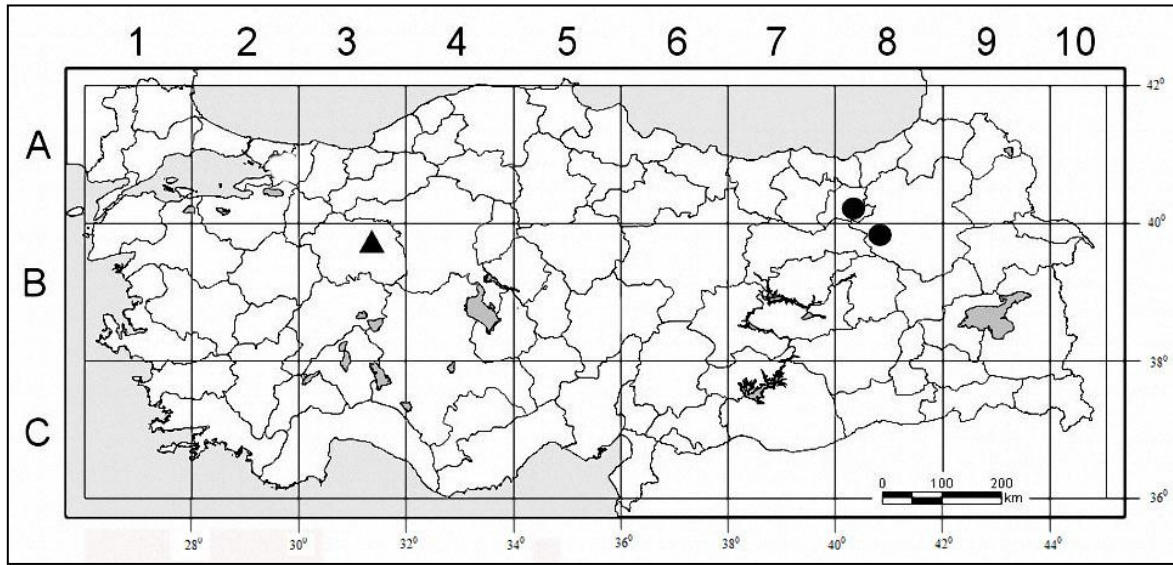


**Figure 2.** *Minuartia corymbulosa* var. *breviflora* (M.Koç 1288). A. habit, B. cyme, C. bract, D. sepal, E. petal, F. staminal gland (\*), G. capsule.

### Taxonomic notes

Specimens collected in the vicinity of Bayburt were investigated first according to the *Flora of Turkey and the East Aegean Islands*, and afterwards according to the *Flora of the U.S.S.R.* (McNeill 1967; Schischkin 1936). These specimens are like *Minuartia erythrosepala* (Boiss.) Hand.-Mazz.

var. *erythrosepala* (Boiss.) Bornm. due to having ovate to ovate-lanceolate sepals and usually red-tinted sepals. However, this specimen is different from this species, with petals that are usually 1.25 times longer than the sepals. As a result of these investigations, it was noticed that specimens were from the *Minuartia granuliflora* taxon, showing a distribution in Russia. As it can be understood from the type address, the taxon was collected from Turkey's border but its presence in Turkey could not be identified. It was indicated as a footnote that some specimens collected in the vicinity of Bayburt, in the flora of Turkey by McNeill are like this taxon, while the type picture of the taxon was not reached. However, it was found that description of the taxon was matched one-to-one with *Minuartia granuliflora* in the *Flora of the U.S.S.R.* Therefore, it was decided that the taxon is a new record for the flora of Turkey.



**Figure 3.** Distribution of *Minuartia granuliflora* (●) and *Minuartia corymbulosa* var. *breviflora* (▲) in Turkey.

Specimens collected in the vicinity of Eskişehir were investigated according to the *Flora of Turkey and the East Aegean Islands* (McNeill 1967). As a result of this investigation, it was understood that specimens are from the taxon called *Minuartia corymbulosa* var. *breviflora*. The taxon is different from the other two varieties with sepals broadly ovate and petals exceeding sepals. The taxon is only known from Ankara where it is a type address and is not found in any other collection record. Moreover, the taxon is in the EX category according to the Red Data Book of Turkish Plants published by Tuna Ekim et al. (2000). As a result of this study, both a second locality was determined for the taxon and it was rediscovered. Also, the *Critically* [CR: B1a] category was proposed for the taxon in the EX category (Akçakaya 2016).

### Specimens examined

***Minuartia granuliflora*.** Turkey. **A8** Bayburt: Between Bayburt and Aşkale, Kop Mountain, Çalidere village, 1815 m a.s.l., 12.07.2009, M.Koç 600, Hamzaoğlu & Budak (GAZI).

***Minuartia corymbulosa* var. *breviflora*.** Turkey. **B3** Between Eskişehir and Bursa, around Söğüt, 760 m a.s.l., 17.07.2010, M.Koç 1288 (GAZI).

**ACKNOWLEDGMENTS**

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