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A New Suffruticose Taxon of *Dianthus* (Caryophyllaceae) from Bingöl, Turkey

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ABSTRACT
Dianthus hymenolepis Boiss. subsp. *bingolensis,*, collected from Bingöl (Turkey), was defined as new subspecies for the scientific world. *D. hymenolepis* subsp. *bingolensis* grows rocky slopes in *Quercus petrae* openings. The description, photographs and general ecological preferences of the newly defined subspecies were given.

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Bingöl'den Yeni Bir Çalımsı *Dianthus* (Caryophyllaceae) Taksonu, Türkiye

ÖZET
Bingöl'den (Türkiye) toplanan *Dianthus hymenolepis* Boiss. subsp. *bingolensis*, bilim dünyası için yeni bir alttür olarak tanımlandı. *D. hymenolepis* subsp. *bingolensis Quercus petrae* açıklıklarındaki kayalık yamaçlarda yetişir. Yeni olarak tanımlanan alttürün betimlemesi, fotoğrafları ve genel ekolojik tercihleri verildi.

Araştırma Makalesi

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INTRODUCTION

The name "*Dianthus*" was first used by Carl Linnaeus (1707-1778) as a genus name in the work called *Species Plantarum*. The genus is described in this work with a total of 15 species.

Of these species; *Dianthus barbatus* L., *D. carthusianorum* L. and *D. armeria* L. already grow in Turkey. Linnaeus did not describe the genus in his work, did not divide it into groups or sections. A small number of species; It is distinguished by using quite basic characters such as clustered or single flowers, herbaceous or bushy, calyx and petal shape (Linnaeus, 1753). Some taxa of the genus were transferred to the genus *Petrorhagia* (Ser.) Link described later (Link, 1831). If this transfer was not counted, no taxonomic changes have were on genus since its publication.

Dianthus L. (Turkish Karanfil) is the second largest genus of Caryophyllaceae family after *Silene* L. The gene centre of the genus, which contains about 300 species, was considered the Mediterranean phytogeographic region (Dequan and Turland, 2001). With 84 species that have already grown in Turkey is the country where most of *Dianthus* species in the World (Post, 1896; Schischkin, 1936; Rechinger, 1964; 1988; Tutin and Walters, 1993; Gemici and Leblebici, 1995; Menemen and Hamzaoğlu, 2000; Özhatay and Kültür, 2006; Vural, 2008; Yılmaz et al., 2011; İlçim et al., 2013; Hamzaoğlu et al., 2014; 2015a; 2015b; 2015c; 2017; 2018; Hamzaoğlu and Koç, 2015; 2018a; 2018b; 2019a; 2019b; 2019c; 2019d; Deniz et al., 2016; Oskay, 2018; Hamzaoğlu, 2020; Koç, 2020). Turkey, this diversity-owned; It owes its wealth to habitat, which emerges as a result of its climatic, topographic and geological diversity (Davis, 1965; İlhan, 1976). Although the main volumes of the work Flora of Turkey and the East Aegean Islands were completed in 1985; two additional volumes were published subsequently and many new taxa were identified each year, indicating this richness (Davis, 1985; Davis et al., 1988; Güner et al., 2000; Dirmenci et al., 2018; Fidan, 2019; Güzel et al., 2018; Özbek et al., 2019; Özgişi et al., 2018; Pınar and Eroğlu, 2019; Şenol et al., 2018; Şirin et al., 2019; Terzioğlu et al., 2019; Yıldırım 2019).

MATERIAL and METHODS

Specimens belonging to the species defined were collected in Bingöl Province in Turkey. Use was made of the related literature and the specimens in the GAZI, ANK, ISTO and E herbaria in the identification and evaluation of the specimens (Reeve, 1967; Rechinger, 1988). The Canon EOS60D digital camera was used for taking the photographs. A ruler with a sensitivity of 0.5 mm was used in the writing of the sizes of the morphological characters given in the depiction.

RESULTS and DISCUSSION

Dianthus hymenolepis Boiss. subsp. ***bingolensis*** Hamzaoğlu and Behçet, **subsp. nov.**

Type: Turkey. **B8** Bingöl: Bingöl, S. of Alıncık village, 38°52'09"K - 40°26'02"D, *Quercus petrae* openings, rocky slopes, 1440 m a.s.l., 01.07.2018, *L.Behçet and Y.Yapar* 15493 (holo. GAZI, iso. ANK, Bingöl Univ. Herb.) (Figures 1 and 2).

Diagnosis: *Dianthus hymenolepis* subsp. *bingolensis* differs from *Dianthus hymenolepis* mainly because it has sheaths of cauline leaves 2–2.5 times as long as wide (not up to 1.5 times as long as wide); inflorescence, epicalyx scales and calyx glandular-pubescent (not puberulent); seeds 1.9–2.3 mm wide (not 1.3–1.6 mm wide).

Description: Suffruticose perennial, many-stemmed, pruinose. Stems erect, 25–60 cm tall, usually unbranched, glabrous or puberulent, 5–9-noded. Sterile shoot leaves linear, flattened, glabrous or puberulent, with scabrous margins, acute-acuminate at apex, equal or slightly longer than cauline leaves. Cauline leaves similar to sterile shoot leaves; lower usually persistent after anthesis; middle 30–55 × 2–5 mm, ± separated to stem, shorter than internodes, 3–veined, sheaths 2–2.5 times as long as wide; upper greenish at base, nodes swollen. Inflorescence capitate, usually simple, with (3–)5–10(–18) flowers, glandular-pubescent; pedicels 0–2 mm, greenish. Epicalyx scales 4(–6), cartilaginous-herbaceous, greenish or straw-colored, sometimes purplish to apex, glandular-pubescent, separated from calyx, ± equal or longer than calyx, apex aristate, arista 1/2–3/5 as long as scale; outer veinless below, distinctly 3–5-veined above, linear-lanceolate or lanceolate, 15–19 × 2–3 mm, with narrowly scarious (0.2–0.3 mm) margins, apex acute except arista; inner veinless below, distinctly 5–7-veined above, oblanceolate, 17–22 × 3–5 mm, with narrowly scarious (0.3–0.4 mm) margins, apex obtuse except arista. Calyx lanceolate, 16–20 × 3–4 mm, usually indistinctly below, distinctly 35–40-veined above, glandular-pubescent, greenish below, purplish above; teeth broadly oblong-lanceolate, 3.5–4.5 × 1.7–2.2 mm, 5–7-veined, with ciliate and distinctly scarious margins, apex rounded, obtuse, mucronate. Petals 19–25 mm long; limb suborbicular, 7–9 × 6–8 mm, c. 1/3 as long as petal, about 2/3 exserted from calyx, spotted or not, barbulate, pink or reddish-purple, 5–9-toothed to apex, teeth broadly triangular, up to 1/7 as long as limb; claw 13–16 × 1.4–1.6 mm, collar almost as wide as claw. Capsule shorter than calyx. Seeds broadly elliptic, 3.2–4.1 × 1.9–2.3 mm, blackish.

Ecological preferences: *Dianthus hymenolepis* subsp. *bingolensis* is a local endemic taxon restricted to between the two villages (Alıncık and Aşağıköy) in the west of Bingöl, eastern Turkey. It prefers rocky slopes in forest clearings and usually grows at altitude of 1400–1580 m. The bloom period of the subspecies is June through July. The dominant forests taxa are *Quercus petraea* (Matt.) Liebl. subsp. *pinnatiloba* (K.Koch) Menitsky, *Sorbus umbellata* (Desf.) Fritsch var. *taurica* (Zinserl.) Gabrieljan, *Cerasus mahaleb* (L.) Mill. var. *mahaleb*, *Astragalus gummifer* Labill., *Anthemis tinctoria* L. var. *tinctoria*, *Chaerophyllum macrospermum* (Willd. ex Spreng.) Fisch. and C.A.Mey. ex Hohen., *Dianthus floribundus* Boiss., *Elymus erosiglumis* Melderis, *Galium paschale* Forssk., *Galium verum* L. subsp. *glabrascens* Ehrend., *Helichrysum plicatum* DC. subsp. *pilicatum*, *Hypericum scabrum* L., *Papaver fugax* Poir. var. *platydismus* Cullen, *Pimpinella corymbosa* Boiss., *Polygonum setosum* Jacq. and *Satureja boissieri* Hausskn. ex Boiss.

Dianthus hymenolepis in "Flora of Turkey and the East Aegean Islands" and "Flora Iranica" is distinguished from other perennial species with capitate inflorescence (*D. barbatus* L., *D. pseudarmeria* M.Bieb. and *D. persicus* Hausskn.) by a suffruticose habit and rounded, obtuse, mucronate calyx teeth apex (Reeve, 1967; Rechinger, 1988). These and many more morphological characters are also similar to *D. hymenolepis* subsp. *bingolensis*. Although there are many similarities, there are also some important morphological differences between *D. hymenolepis* subsp. *hymenolepis* and *D. hymenolepis* subsp. *bingolensis*, the most important of which are inflorescence, epicalyx scales and calyx indumentum, petal limb features, seed shape and width (Table 1).

Additional Specimens Seen

Dianthus hymenolepis subsp. ***bingolensis*** (**paratype**): Turkey, Bingöl: Bingöl, near Aşağıköy village, S. of cemetery, 38°50'59"K - 40°23'16"D, *Quercus petrae* openings, rocky slopes, 1580 m a.s.l., 15.07.2019, *L.Behçet and Y.Yapar* 17432 (GAZI, ANK, Bingöl Univ. Herb.); ***Dianthus hymenolepis*** (subsp. ***hymenolepis***): Turkey, Tunceli: Ovacık, Munzur Dağı, 1700 m, rocky limestone slopes, 16.7.1957, *P.H.Davis* 31220 and *I.C.Hedge* (ANK!); Muş: Varto, Sağlıcak village, Değirmendere place, 1840 m, 6.7.2013, grassy and rocky slopes, *Hamzaoğlu* 6842, Aksoy and *Koç* (GAZI!); Van: Çatak, Kavuşşahap Dağı, c. 2160 m,

rocky slopes, 22.7.1954, *P.H.Davis* 23001 (ANK!); Hakkari: 2 km west of city centre, 1870 m, stony roadside, 27.8.1975, *M.Dalcı* 190 (E–foto!); ibid., Zap gorge, beneath (2–3 km) Hakkari, 1400 m, dry S. slopes (stony), 24.6.1966, *P.H.Davis* 45454 (E–foto!); Hakkâri: between Yüksekova and Dağlıca, 1830 m, 30.6.2006, steppe, *Hamzaoğlu* 4084 and *Budak* (GAZI!); Sat Dağı, between Yüksekova and Varegöz, 1800 m, dry stony slopes, 30.6.1966, *P.H.Davis* 45830 (ISTO!; E–foto!).

Figure 1. Habitat and habit of *Dianthus hymenolepis* subsp. *bingolensis*.
Şekil 1. Dianthus hymenolepis subsp. bingolensis'in habitatı ve görünümü.

Table 1. Diagnostic characters between *Dianthus hymenolepis* subsp. *bingolensis* and *D. hymenolepis* (subsp. *hymenolepis*).
Tablo 1. Dianthus hymenolepis subsp. bingolensis ve D. hymenolepis (subsp. hymenolepis) arasındaki ayırt edici karakterler.

Characters / Karakterler	*D. hymenolepis subsp. bingolensis*	*Dianthus hymenolepis (subsp. hymenolepis)*
Stem / Gövde	glabrous or puberulent	puberulent
Sheaths of cauline leaves / Gövde yaprakları kını	2–2.5 times as long as wide	up to 1.5 times as long as wide
Inflorescence, epicalyx scales and calyx / Çiçekdurumu, epikaliks pulları ve kaliks	glandular-pubescent	puberulent
Epicalyx scales / Epikaliks pulları	1/2–3/5 as long as calyx	1/3–1/2 as long as calyx
Seeds / Tohumlar	broadly elliptic, 1.9–2.3 mm wide	elliptic, 1.3–1.6 mm wide

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Statement of Conflict of Interest

Authors have declared no conflict of interest.

Author's Contributions

The contribution of the authors is equal.

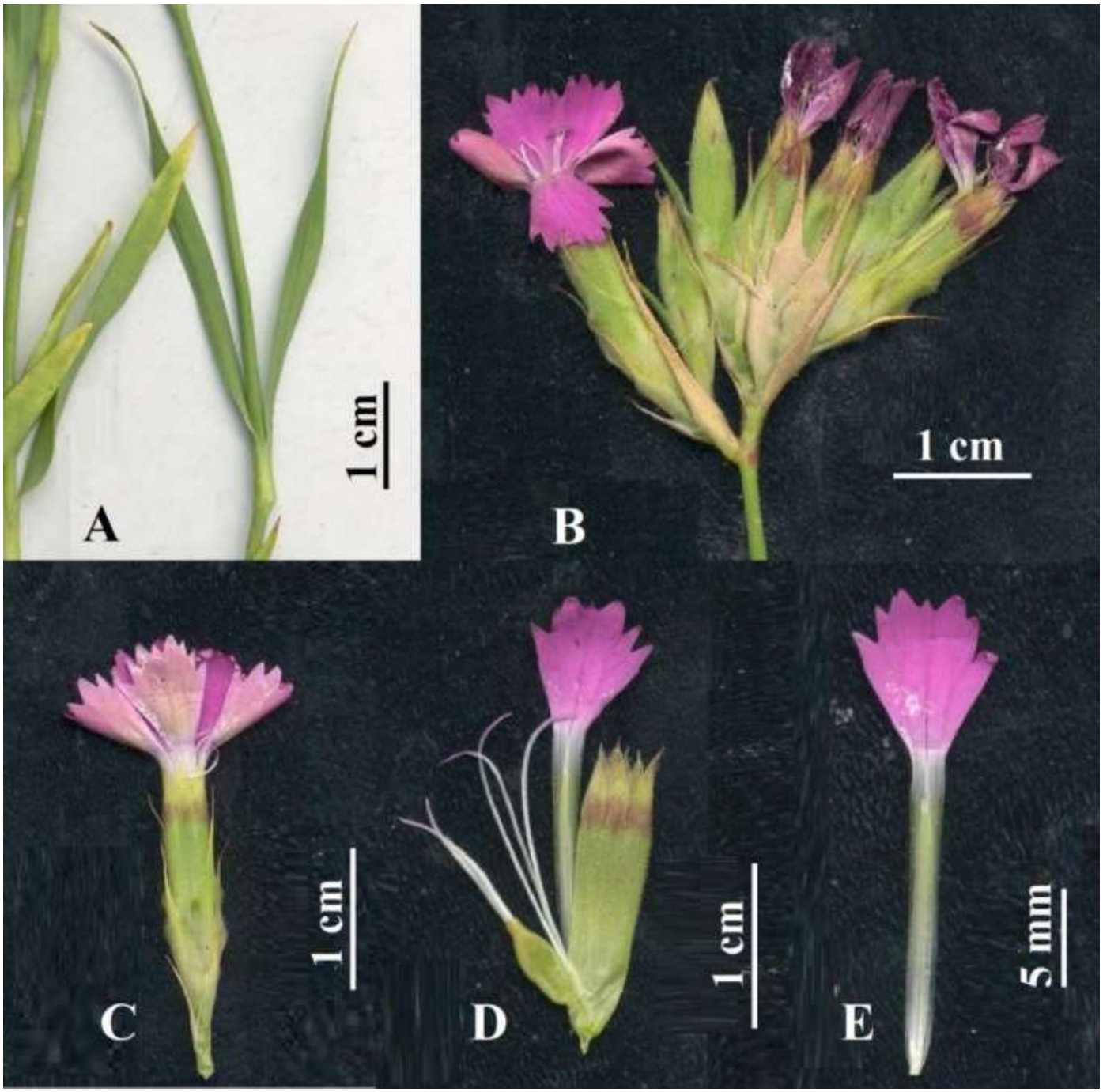

Figure 2. *Dianthus hymenolepis* subsp. *bingolensis* (A) leaf and sheath, (B) inflorescence, (C) epicalyx scales and flower, (D) parts of flower, (E) petal.

Şekil 2. Dianthus hymenolepis subsp. bingolensis. (A) yaprak ve kın, (B) çiçekdurumu, (C) epikaliks pulları ve çiçek, (D) çiçeğin kısımları, (E) petal.

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