

A new species of the genus *Cota* (Asteraceae) from Uludağ, Turkey

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Abstract: *Cota hamzaoglu* U.Özbek & Vural (Asteraceae, Anthemideae) is described as a new species from Uludağ in the Bursa province of Turkey. Information given on the new species includes a Latin diagnosis, taxonomic description, line drawing, and several photographs, as well as comments on the species' geographical distribution, including a map, and its affinity to *Cota oxylepis* Boiss. and *C. fulvida* (Grierson) Holub.

Key words: Asteraceae, Anthemideae, *Cota*, Anthemis, Uludağ, Turkey

Türkiye Uludağ'dan yeni bir *Cota* türü

Özet: *Cota hamzaoglu* U.Özbek & Vural (Asteraceae, Anthemideae) Uludağ'dan (Bursa) yeni bir tür olarak betimlendi. Yeni türün latince ayırt edici özellikleri, taksonomik betimi, çizimi, coğrafik yayılışı ve *Cota oxylepis* Boiss. ve *C. fulvida* (Grierson) Holub'ya yakınlığı hakkında bazı yorumlar yapıldı.

Anahtar sözcükler: Asteraceae, Anthemideae, *Cota*, Anthemis, Uludağ, Türkiye

Introduction

Anthemideae is one of the largest tribes of *Asteraceae*, comprising approximately 110 genera and approximately 1800 species (Oberprieler et al., 2007). According to the *Flora of Turkey*, the genus *Anthemis* L. in Turkey is made up of 50 species and 1 doubtful species, all of which have been delimited into 3 different sections by Grierson and Yavin (1975). *Anthemis* sect. *Anthemis* consists of 29 species, *Anthemis* sect. *Maruta* (Cass.) Griseb. contains 6 species, and the remaining 15 species

were placed in *Anthemis* sect. *Cota* (J.Gay) Rupr. The generic and infrageneric concepts of *Anthemis* have been changed several times. Recently, *Anthemis* sect. *Cota* was accepted as a generic name, *Cota* J.Gay, by Oberprieler (2001), Greuter et al. (2003), Oberprieler et al. (2007, 2009), and Lo Presti et al. (2010).

While on a project to revise Turkish *Anthemis* representatives, the authors collected some interesting specimens from Uludağ, in the Bursa district, during the summer of 2009. These were compared with specimens of closely related species in the herbarium

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of Gazi University and also with collected specimens found in the relevant literature (Täckholm, 1974; Grierson & Yavin, 1975; Fernandez, 1976; Feinbrun-Dothan, 1978; Pignatti, 1982; Meikle, 1985; Iranshahr, 1986; Shishkin, 1995; Güner 2000; Hamzaoglu et al., 2009; Özhatay et al., 2009).

Based on the comparative morphological studies conducted by the present authors (Table), the specimens from Uludağ were found to represent a species new to science (Figures 1-3). A map has been provided showing the distribution of *Cota hamzaoglui* U.Özbek & Vural, *C. oxylepis* Boiss., and *C. fulvida* (Grierson) Holub based on the localities in which they were found and the citations of Grierson and Yavin (1975) (Figure 4).

Species description

Cota hamzaoglui U.Özbek & Vural **sp. nova** (Figures 1 and 3).

Type: Turkey, A2 Bursa: Uludağ, above hotels, between cable cars, and near an old wolfram mine, 2050-2100 m, among *Juniperus* and *Vaccinium* subalpine shrubs, 31.07.2009, U.Özbek 2812 & M.Vural (Holotype GAZI; Isotypes BULU, HUB, ANK).

Diagnosis: Haec species *Cotae oxylepidi* Boiss. similis sed ab caulibus 12-30 cm longis (non 40-60 cm longis), pedunculo 2-9 cm longo (non 10-26 cm longo), foliorum lamina 1-2.5 cm longa × 0.5-1 cm lata (non 3-7 cm longa × 1-3 cm lata), subtus dense lanata (non subglabra ad sparsim lanata), laminae segmentis primariis 3 vel 4 jugis (non 4-8 jugis), laminae segmentis secundariis 1-3 jugis (non 4-8 jugis) et acheniis pallide brunneis (non obscure brunneis) 2-2.5 mm longis (non 3-3.5 mm longis) differt.

Description: Perennial herb densely branched at base. Stems erect with sterile shoots 1.5-5 cm long at base, each branch with 1 capitulum, 12-30 cm tall, sparsely lanate. Lower leaves petiolate; petiole 2-3 mm long; lamina 2- or 3-pinnatisect, oblong-elliptic in outline, 1-2.5 × 0.5-1 cm, lower surface densely lanate; primary segments 3 or 4 pairs, 0.4-0.7 cm long, oblong-elliptic, apex spinulose-acuminate; secondary segments 1-3 pairs, 0.2-0.3 cm long, lanceolate, apex spinulose-acuminate. Upper cauline leaves similar to lower ones but smaller and entire, lanceolate, amplexicaule at base. Peduncle 2-9 cm long, becoming slightly thickened at maturity below capitulum. Capitulum homogamous and discoid.

Table. A comparison of the diagnostic characters of *Cota hamzaoglui*, *Cota oxylepis*, and *Cota fulvida*.

Characters	<i>C. hamzaoglui</i>	<i>C. oxylepis</i>	<i>C. fulvida</i>
Stems	12-30 cm tall	40-60 cm tall	up to 30 cm tall
Indumentum	sparsely lanate	sparsely white tomentose, lanate, or subglabrous	yellowish sericeous
Peduncle (leafless part below capitula)	2-9 cm long	(10-) 15-26 cm long	-
Leaf lamina	1-2.5 × 0.5-1 cm	3-7 × 1-3 cm	1.5-5 × 0.5-1.5 cm
Indumentum of lower surface of leaf lamina	densely lanate	subglabrous to sparsely lanate	-
Primary segments of leaf lamina	3 or 4 pairs	4-8 pairs	4-6 pairs
Secondary segments of leaf lamina	1-3 pairs	4-8 pairs	4 or 5 pairs
Achenes	creamy brown, 2-2.5 mm long	dark brown, 3-3.5 mm long	-

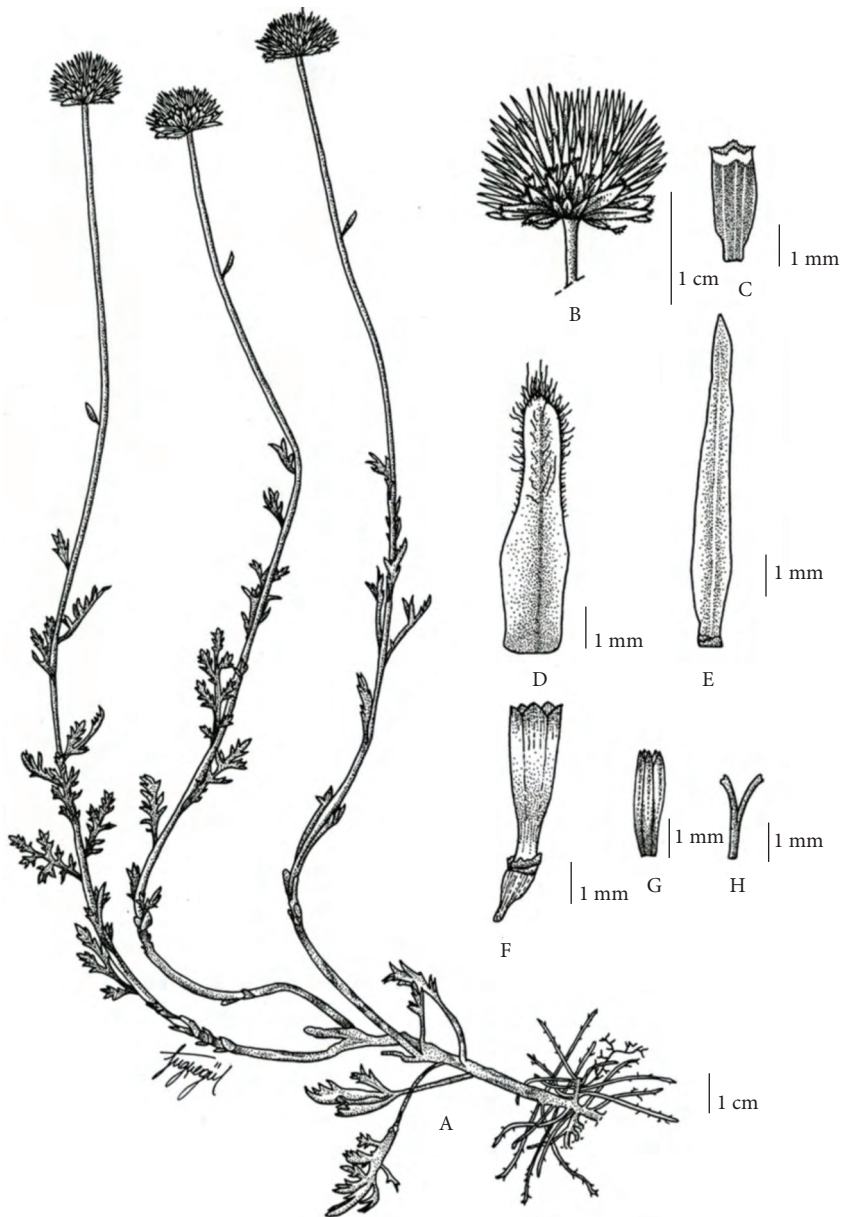


Figure 1. *Cota hamzaoglu*. A - habit, B - capitulum, C - achene, D - inner phyllary, E - palea, F - central flower, G - marginal flower, H - style.

Involucre 15-20 mm wide; phyllaries imbricate, the outer ones narrowly lanceolate, $3-4 \times 1-1.5$ mm; the inner ones oblong to lanceolate, $6-7 \times 1-1.5$ mm, with a narrow brownish ciliate margin, the distal half hairy outside. Corolla bright yellow, that of marginal flowers 5-lobed, shorter than central ones. Central flowers 5-lobed, $3.5-4 \times 0.5-1$ mm; tube inflated at maturity in basal part; lobes obtuse at apex. Style bifurcate, 2-2.2 mm long. Paleae orange-yellow, subulate, $8-9 \times 1-1.5$ mm, 4.5-5 mm longer than

central flowers. Achenes creamy brown, prismatic, dorsiventrally compressed, transversely rhombic in cross section, 2-2.5 mm long, obscurely 10-ribbed; corona crenulate, 0.25-0.5 mm long.

Chromosome number: $2n = 18$; Fl. 7-8, Fr. 9-10, among *Juniperus* and *Vaccinium* subalpine shrubs, 1900-2200 m.

Conservation status: This species is known from only a single locality with an extent of occurrence



Figure 2. The capitulum of *Cota hamzaoglu*.



Figure 3. The appearance of *Cota hamzaoglu* in nature.

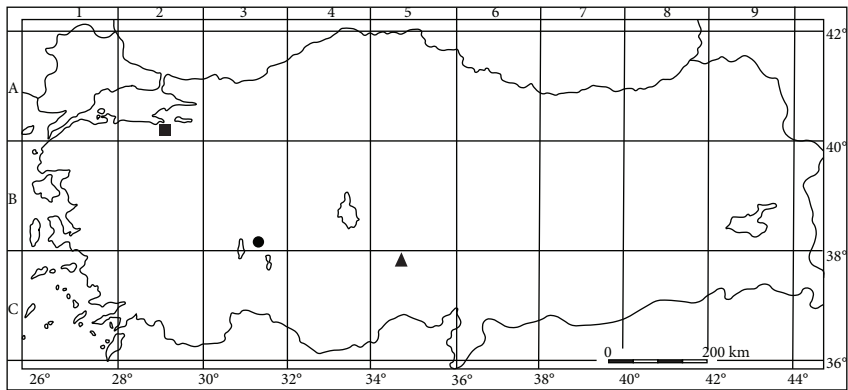


Figure 4. Distribution of *Cota hamzaoglu* (■), *C. oxylepis* (▲), and *C. fulvida* (●) in Turkey.

estimated to be less than 100 km², an area of occupancy estimated to be less than 10 km², and a continuing decline projected in the extent of occurrence, area of occupancy, extent and quality of habitat, and number of mature individuals. For these reasons, it should be classified as ‘Critically Endangered’ (CR) based on criteria B1ab(i,ii,iii,v) + 2ab(i,ii,iii,v) + C2a(i,ii) (IUCN, 2001).

Distribution and ecology: Endemic to Uludağ. The new species grows among the subalpine shrubs of *Daphne oleoides* Schreb., *Vaccinium myrtillus* L., and *Juniperus communis* L. var. *saxatilis* Pall. Companion herbaceous taxa and shrubs include: *Festuca cyllenica* Boiss. & Heldr. subsp. *uluana* Markgr.-Dann., *F. punctoria* Sm., *Gypsophila olympica* Boiss., *Hypericum confertum* Choisy subsp.

confertum, *Jasione supina* Sieber ex Spreng. subsp. *supina*, *Olymposciadium caespitosum* (Sm.) H.Wolff, and *Thymus praecox* Opiz. The distribution of the new species is very limited in a restricted area of Uludağ, Bursa Province, with approximately 250 mature individuals; criterion C2a(ii) (Figure 4).

Etymology: The new species is named in honour of the Turkish botanist Prof. Dr. Ergin Hamzaoglu (Education of Biology Department, Gazi University, Ankara), who drew our attention to this plant for the first time.

Additional specimens seen (paratypes): Turkey, A2 Bursa: Uludağ, above hotels, between cable cars, and near an old wolfram mine, 2100 m, 29.07.2006, E.Hamzaoglu 4403 & A.Aksoy, Ü.Budak (Bozok Univ. Herb., GAZI); Bursa: Uludağ, around Kuşaklıkaya,

2100-2200 m, among *Juniperus communis* shrubs, 07.08.2003, R.Daşkın 17911 & Ö.Yılmaz (BULU, GAZI); Bursa: Uludağ, between Kuşaklıkaya and wolfram mine pathway, 1900-2000 m, among *Juniperus communis* shrubs, 29.07.2004, R.Daşkın 20562, Ö.Yılmaz & E.Erdoğan (BULU).

Specimens of similar species examined: *Cota oxylepis*: C5 Niğde: Ulukışla, Maden village, around Bulgarmaden, 2100 m, rocky slopes, 25.07.2007, U.Özbek 2655 & M.E.Uzunhisarcıklı (GAZI); Niğde: Ulukışla, supra Bulgarmaden, *B.Balansa s.n.* (isotype, K, image). *Cota fulvida*: B3 Konya: Sultandağ, in jugis alpinis supra Engeli, 1850 m, 28.06.1899, J.Bornmueller 4656 (holotype E, image; isotype K, image).

Discussion

Cota hamzaoglui is similar to *C. oxylepis* and *C. fulvida*. *Cota oxylepis* is distributed around the village Maden in the Ulukışla district of Niğde (C5), while the distribution of *C. fulvida* is around the Sultan Mountains in the Akşehir district of Konya (B3). Although field studies were carried out for 3 years, *C. fulvida* could not be found and collected. Therefore, *C. fulvida* was compared with *C. hamzaoglui* and *C. oxylepis* using an image of the holotype (E) and an isotype (K), as shown in the Table. *Cota hamzaoglui* is presumably closely related to *C. oxylepis* and *C. fulvida*,

but differs from *C. oxylepis* by the densely lanate (not subglabrous to sparsely lanate) indumentum of the lower surface of the leaf lamina, primary segments of the lamina in 3 or 4 pairs (not 4-8 pairs), secondary segments in 1-3 pairs (not 4-8 pairs), and creamy brown achenes, 2-2.5 mm long (not dark brown, 3-3.5 mm long). *Cota hamzaoglui* differs from *C. fulvida* by its sparsely lanate (not sericeous) indumentum, leaf lamina 1-2.5 cm long, 0.5-1 cm wide (not 1.5-5 cm long, 0.75-1.5 cm wide), primary segments of the lamina in 3 or 4 pairs (not 4-6 pairs), and secondary segments in 1-3 pairs (not 4-8 pairs). A comparison of the diagnostic morphological characters of *C. hamzaoglui*, *C. oxylepis*, and *C. fulvida* is given in the Table.

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