TÜBİTAK

Research Article

Turk J Bot
34 (2010) 277-282
© TÜBİTAK
doi:10.3906/bot-0902-13

A new species of *Onosma* (Boraginaceae) from eastern Turkey

Ali KANDEMİR[1,*], Zafer TÜRKMEN[2]

[1]Erzincan University, Faculty of Education, 2430, Erzincan - TURKEY

[2]Giresun University, Faculty of Arts and Sciences, Department of Biology, Giresun - TURKEY

Received: 16.02.2009
Accepted: 21.05.2010

Abstract: *Onosma beyazoglui* Kandemir & Z. Türkmen sp. nov. (Boraginaceae) is described as a new species from the province of Erzincan in Turkey. Diagnostic morphological characters of this new species from the related species are discussed.

Key words: *Boraginaceae*, Erzincan, *Onosma*, Turkish Flora

Türkiye'nin Doğu Anadolu bölgesinden (Boraginaceae) yeni bir *Onosma* (Boraginaceae) türü

Özet: *Onosma beyazoglui* Kandemir & Z. Türkmen (Boraginaceae) Erzincan ilinden (Türkiye) bilim dünyası için yeni bir tür olarak tanımlandı. Yeni türün yakın türlerle ayırıcı morfolojik özellikleri tartışıldı.

Anahtar sözcükler: *Boraginaceae*, Erzincan, *Onosma*, Türkiye Florası

Introduction

Onosma L. (Boraginaceae-Lithospermeae) includes about 150 species distributed in Asia and Europe (El-Shazly et al. 2003). The genus has been divided into 3 sections: *Onosma, Protonosma,* and *Podonosma* (Riedl, 1978). Section *Onosma* was separated into 2 subsections according to indumentum type: *Asterotricha (*Boiss.) Gürke and *Haplotricha* (Boiss.) Gürke (Riedl, 1978). Based on the current knowledge, in Turkey there are 97 species, 4 varieties, 1 hybrid species, 50 endemic species, and 1 endemic variety in the genus *Onosma* and the degree of endemism for the genus in Turkey is 50% (Yıldırımlı, 2000; Riedl et al., 2004; Akçin, 2007; Binzet & Orcan, 2009).

In this paper, the new species *Onosma beyazoglui* Kandemir & Z. Türkmen from eastern Anatolia is described. It has setae on leaves arising from glabrous tubercles and belongs to sect. *Onosma* subsect. *Haplotricha (*Boiss.) Gürke.

Onosma beyazoglui Kandemir & Z. Türkmen **sp. nov.** - Figures 1 and 2.

* E-mail: akandemir@erzincan.edu.tr

Figure 1. The general appearance of *Onosma beyazoglui* in nature.

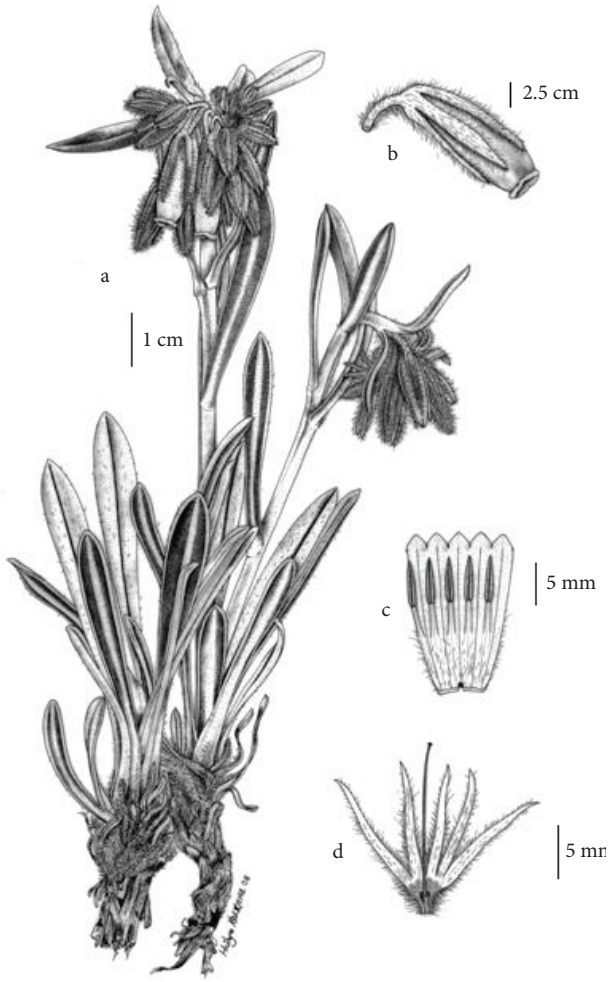

Figure 2. *Onosma beyazoglui*; a. Habit, b. Flower, c. Corolla, d. Calyx .

Type: Turkey, B7 Erzincan: 100th km from Erzincan to İliç, 28.v.2008, 39º34′244′′N, 38º37′268E, 1020 m, *Kandemir* 9087 (holotype: KTUB; isotypes: ISTE, GAZI ANK).

Diagnosis: Affinis *O. discedens*, sed foliis basalibus 37-57 mm longis ac 2.5-5.5 mm latis (nec 55-120 mm longis ac 5-12 mm latis), corollis luteis, 13-15 mm longis ac infra cum pilis longis (nec albidis ad cremeis, 16-22 mm longis ac pilis omnibus eadem longis), annulis pilis (nec glabris) differt.

Perennial. Stem ascending to erect, 8-17 cm, grayish-hairy, clothed at base with remains of leaves. Leaves crowded at base; basal leaves 37-57 × 2.5-5 mm, linear, lanceolate, oblanceolate to spathulate with strongly revolute margins, surface at first silvery-gray, turning greenish later, covered with densely adpressed setae with glabrous tubercles (haplotrichous state); cauline leaves 28-42 × 2.5-3.5 mm, sessile to subsessile with densely adpressed hairs. Inflorescence with many-flowered cymes. Bracts similar to upper leaves, smaller 12-14 mm long. Pedicels 3.5-4.5 mm at anthesis, densely white-hairy. Calyx lobes 10.5-12 × 1-1.5 mm, free to base, linear with patent to adpressed long and short setae. Corolla yellow, 13-15 mm, cylindrical to sub-cylindrical densely villous, with short hairs above and long below; annulus distinctly hairy. Anthers included, c. 4.5-5.5 mm. Filaments c. 6.5 mm. Style 15-16 mm. Nutlets unknown. Pollen type syncolporate, shape subprolate. Fl. 5.

Distribution – The species is only known from the type locality. Its habitat is a gypsum steppe where it grows along with *Onosma sintenisii* Hausskn. ex Bornm., *Gypsophilla lepidioides* Boiss., *Achilla sintensii* Hub.-Mor., *Teucrium multicaule* Montbret & Aucher ex Bentham, *Scorzonera aucherana* DC., *Chrysothesium stellerioides* (Jaub. & Spach) Hendrych,

Salvia euphratica Montbret & Aucher ex Bentham subsp. *leiocalycina* (Rech. fil.) Hedge and *Salvia divaricata* Montbret & Aucher ex Bentham.

Other specimen examined. – *Onosma discedens* Hausskn. ex Bornm. (Figure 3): B7 Erzincan: Armenia Turcica, Eğin (Kemaliye) ad Euphratem fluv. in collibus ad Salihli, 29.v.1890 *Sintenis* 2770 (holo JE-photo); B7 Erzincan: Kemaliye, Salihli, Pass of Çimento, 1502 m, 39°31.29′N, 38°28.23′E, 16.vi.2005, serpentine, *Kandemir* 6962; B7 Erzincan: Kemaliye, 3 km from Salihli to Erzincan, 1470 m, 05.vı.2007, serpentine, Kandemir 8002; B7 Erzincan: Kemaliye, 1 km from Salihli to Erzincan, 1450 m, 07.vı.2009, serpentine, Kandemir 10107; –*Onosma polyphyllum* Ledeb. Rossia, Tauria, collected by *A. Callier* in 1896, Coll no: 15, Herb. No: 3435, 3 sheets (E); –*Onosma procerum* Boiss. B9 Bitlis: Reşadiye to Pelli, 2300 m, *P.H.Davis*. 22404 (E); C8: Mardin: 34 km from Midyat to İdil, 900 m, *P.H.Davis*. 42870 (E).

Figure 3. The general appearance of *Onosma discedens* in nature.

***Etymology*:** Named in honour of the eminent Turkish biologist Prof. Dr. Osman Beyazoğlu (Biology Department, Faculty of Arts and Sciences, Karadeniz Technical University in Turkey).

Relationships. – The samples of genus *Onosma* were collected in Erzincan province in May 2008. At first, using the descriptions of the relevant taxa in the Flora of Turkey (Riedl, 1978), their status could not be established. Through the examination of the relevant herbarium material in E and with the help of several botanists with a good knowledge of the genus in Turkey, it was concluded that the specimen should be described as a new species in *Onosma*.

O. discedens is a local endemic species for Turkey and grows in Kemaliye/Erzincan (Kandemir, 2009). The new species is closely related to it; especially in terms of indumentum on the leaves and the general appearance of the plant. Yet, *O. beyazoglui* differs from *O. discedens* (Figure 3) in terms of morphological features as clearly indicated in the Table. One of the characteristics used to distinguish the species in the genus is whether annulus is hairy (Riedl, 1978; Attar & Hamzehʾee, 2007). The annulus of *O. beyazoglui* is hairy whereas that of *O. discedens* is glabrous.

O. discedens, is related to the Caucasian/ Crimean *O. polyphyllum* Ledeb. (Figure 4). *O. polyphyllum* specimens were studied in E and it was also compared with *O. beyazoglui*. *O. polyphyllum* is low sub-shrub and has falcately curved basal leaves, glabrous and 20-23 mm long corolla and glabrous

Figure 4. The photo of *Onosma polyphyllum* in E.

nectariferous ring (annulus) while *O. beyazoglui* is herbaceous and has straight basal leaves and hairy corolla with 13-15 mm long. *O. polyphyllum* also grows mainly on limestone and is a relic species on Crimean Mountain. *O. beyazoglui is* more similar to *O. discedens* than O. *polyphyllum*.

Four *Onosma* species with hairy annulus grow in Turkey: *O. bulbotrichum* DC., *O. allepicum* Boiss., *O. xanthotrichum* Boiss., and *O. procerum* Boiss. (Riedl, 1978). If a new species is diagnosed using a diagnostic key of the genus in the Flora of Turkey, the key helps us reach *O. procerum* (Figure 5). *O. beyazoglui* is quite different from *O. procerum* except that its annulus is

Figure 5. The photo of *Onosma porocerum* in E.

Table. The morphological differences between *Onosma beyazoglui* and *O. discedens*.

Characters	*Onosma beyazoglui*	*Onosma discedens*
Stem	To 17 mm long and ascending to erect	To 33 mm long and erect
Basal Leaves	37-57 mm long and 2.5-5.5 mm wide	55-120 mm long and 5-12 mm wide
Corolla	Yellow, 13-15 mm long, fully hairy outside, longer hairs below	Whitish to cream and 16-22 mm, hairy upper, glabrous below, uniform hair length
Annulus	Distinctly hairy	Glabrous
Habitat	Gypsum steppe	Serpentine

hairy. *O. procerum* is different just because it is 20-55 cm long, the stem is finely branched above, the leaves are not crowded in base, the setae are patent setose with large tubercles, the colour of the leaves is green and finally the inflorescence is pseudopaniculate. Besides, *O. procerum* grows in eroding banks, slopes in *Quercus* shrubs, rocky places, and ruins while *O. beyazoglu* grows in gypsum.

Recommended IUCN threat category. – We estimate that the species may undergo a reduction of over 80% of the population size within the next few years, and thus it is strongly threatened with extinction in the wild if no protection measures are taken. We therefore recommend the classification of *O. beyazoglui* as "Critically Endangered (CR)" according to the IUCN criteria A3 and B2 (IUCN 2001).

Acknowledgements

We want to thank Prof Dr. Ahmet DURAN, who wrote the Latin descriptions, and Hülya Korkmaz, who drew the figure of the new specimen. I also thank Dr. David Harris, the curator of E Herbarium, for his help during the visit of the first author to Edinburgh.

References

Akçin ÖE (2007). The morphological and anatomical properties of endemic *Onosma armenum* DC. (Boraginaceae). *Int J Nat Soc Sci* 1: 37-43.

Attar FI & Hamzehˈeeb B (2007). *Onosma bisotunensis* (Boraginaceae), a new species from western Iran. *Novon* 17: 279-281.

Binzet R & Orcan N (2009). Anatomical and palynological investigations on endemic *Onosma mersinana* Riedl, Binzet & Orcan. *Pak J Bot* 41: 503-510.

El-Shazly A, Abdel-Ghani A & Wink M (2003). Pyrrolizidine alkaloids from *Onosma arenaria* (Boraginaceae). *Biochem Syst and Ecol* 31: 477-485.

IUCN (2001). IUCN Red List categories and criteria, version 3.1. – Gland & Cambridge: IUCN Survival Commission.

Kandemir A (2009). The rediscovery of some taxa thought to have been extinct in Turkey. *Turk J Bot* 33: 113-122.

Riedl H (1978). *Onosma* L. In: Davis PH, (ed.), *Flora of Turkey and the East Aegean Island*s, Vol. 6, pp. 326-378. Edinburgh: Edinburgh University Press.

Riedl H, Binzet R & Orcan N (2004). A New species of *Onosma* (Boraginaceae–Lithospermeae) from southern Turkey. *Edin J Bot* 61: 127–130.

Yıldırımlı Ş (2000). The chorology of the Turkish species of Boraginaceae Family. *The Herb J Bot* 7: 257-272.