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

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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


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% (Yıldırımli, 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.
Type: Turkey, B7 Erzincan: 100th km from Erzincan to İliç, 28.v.2008, 39°34′244′′N, 38°37′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 spatulate 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 sintensis Hub.-Mor., Teucrium multicaule Montbret & Aucher ex Bentham, Scorzonera aucherana DC., Chrysothesium stelleroides (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.vi.2007, serpentine, Kandemir 8002; B7 Erzincan: Kemaliye, 1 km from Salihli to Erzincan, 1450 m, 07.vi.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. beyazoğlui 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 & Hamzehée, 2007). The annulus of O. beyazoğlui 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. beyazoğlui. O. polyphyllum is low sub-shrub and has falcately curved basal leaves, glabrous and 20-23 mm long corolla and glabrous...
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 procerum* in E.
A new species of *Onosma* (Boraginaceae) from eastern Turkey

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

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

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. beyazoglu* as "Critically Endangered (CR)" according to the IUCN criteria A3 and B2 (IUCN 2001).

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**References**


