Onosma sulaimanica, a new record for the flora of Iran

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Abstract. In this article the collection of specimens related to Onosma sulaimanica from Kordestan Province, Iran, was confirmed and reported for the first time. Therefore, the species is recorded for the flora of Iran. This species is placed in the sect. Onosma, subsect. Onosma, ser. Wheeler-hainesii. A diagnostic key of related taxa belonging to series Wheeler-Hainesti and Aleppica, and the photos, micrographs and a distribution map of the species were also presented.

Keywords. Kordestan, Middle East, section Onosma, Shahu, subsection Onosma
INTRODUCTION
Onosma L. is a species-rich genus (Boraginaceae, tribe Lithospermeae) and includes about 170 species all around the world (Naqinezhad & Attar, 2016; Cecchi & Selvi, 2009; Kolarčík et al., 2010). The genus is distributed across Europe to East Asia and is especially well-distributed in Western and Central Asia, the Mediterranean area, Anatolia and Southeast Europe (Kolarčík et al., 2010). Iran, Turkey (Anatolia) and Central Asia are the diversity centers of the genus Onosma (Tiwari et al., 2011). Onosma species grow in xeric, dry, clifty, sunny, rocky, sandy and steppe habitats (Peruzzi & Passalacqua, 2004).

Riedl (1967) recognized three sections for genus Onosma in Flora Iranica: Protonosma Popov (O. rostellata Lehm.), Podonosma (Boiss.) Gurcke (O. orientalis L.) and Onosma with two subsections: Onosma (with about 50 taxa) and Asterotricha (Boiss.) Gurcke (with about 14 taxa). Onosma orientalis has changed to Podonosma orientalis (L.) Feinbrun now. Genus Onosma contains about 60 species in Flora Iranica region based on Riedl’s work (Riedl, 1967).


The most important characters for delimiting of species are found to be indumentum type of lower leaves, inflorescence shape, bract shape, corolla length and its changing color, indumentum of corolla’s outside, anther and filament length and hairy or glabrous nectariferous annulus (Riedl, 1967).

MATERIALS AND METHODS
During the study of genus Onosma related specimens stored in the herbarium of Kordestan Agricultural and Natural Resources Research and Education Center (HKS) were examined. Among them some interesting specimens belong flora of Iraq were found which previously not reported from Iran. For determine of specimens we used some literature resources such as Flora of Iran (Parsa, 1949), Flora Iranica (Riedl, 1967) and Flora of Iran (Khatamsaz, 2002). Moreover, specimens studied were compared to the pictures of type specimens. Indumentum of the specimens was photographed by a Dino-Lite digital microscope AM413T and the measurement was done by means of the integrated software of the device. The specimens were photographed with a Canon PowerShot SX260 HS camera.

RESULTS
During floristic investigations in W Iran, Kordestan Province, some interesting specimens were collected. Based on Flora Iranica treatment for the genus (Riedl, 1967), these specimens were determined as Onosma sulaimanica Riedl that is a new record for the flora of Iran. Therefore, the total number of taxa within the genus Onosma in Iran reached to 65 taxa by the addition of this reported species. According to Riedl (1967), Onosma sulaimanica belongs to sect. Onosma, subsect. Onosma, series Wheeler-hainesii. The most diagnostic characters of series Wheeler-hainesii including: annulus densely hairy, calyx with 5 linear free segments, anthers free along length (Riedl, 1967). Series Wheeler-hainesii Riedl belongs to series Aleppica Riedl considering their habit, hairy nectariferous annulus, anther and filament length, free calyx lobes, corolla color and indumentum type of lower leaves.


Perennial, up to 30 cm tall. Stem branched, patent white setose. Lower and median leaves 35-80 × 5-10 mm, lorate-lanceolate; margin revolute; indumentum consists of patent-pressed setae with glabrous tubercles, between setae sparsely pubescent. Cymes a compact scorpioid, with lateral branches, few-flowered, to 30 mm in diam.; lower bracts to 20 × 5 mm; pedicels up to 5 mm long; flowering calyx 14-17 mm; corolla yellowish white, 17-20 mm long, clavate-campanulate, outside papillose; lobes 4.5 × 3.5 mm; filaments 8 mm long; adnate to 6 mm above corolla base; anthers 6-7 mm long; annulus densely hairy. Nutlets not seen.

Examined specimens: Iran. Kordestan Province: Saqzez, Kanijegeni, 1450 m, 11.6.2004, Maroofi & Fani 6831 (HKS!); southern west of Sanandaj, Shahu area, Esparez village, 1150 m, Kaffash 3080.
Figure 1. A. *Onosma sulaimanica* and B. *Onosma bulbotricha*. A part of inflorescence showing bract, calyx and corolla.

Figure 2. *Onosma sulaimanica*: A. upper surface, B. lower surface, showing adpressed tubercled setae.

Figure 3. Distribution map of *Onosma sulaimanica*. 
Onosma sulaimanica is close to *O. bulbotricha* DC. and *O. cyrenaica* Durand & Barr. var. *straussii* Riedl. Based on their habit, indumentum type of lower leaves, stamen status, hairy annulus nectariferous. Considering their similarities, a diagnostic key is presented for delimiting of species.

Diagnostic key of taxa of series *Wheeler-Hainesii* Riedl and *Aleppica* Riedl in Iran

1. Corolla pink; pedicel up to 9 mm long........................... *O. cyrenaica* var. *straussii*
   -Corolla white or yellowish-white ...................... 2
2. Flowering calyx 14-16 mm long; corolla’s outside papillose; corolla lobes 4.5 mm width at base................................. *O. sulaimanica*
   -Flowering calyx 15-20 mm long; corolla’s outside glabrous or pubescent, corolla lobes narrower at base ........................................... *O. bulbotricha*

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**REFERENCES**


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