

ACANTHOLIMON SAADII (PLUMBAGINACEAE), A NEW SPECIES FROM IRAN

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Acantholimon saadii is described as a new species, the specimens of the new species have been collected from a locality in Fars province. The new species belongs to *Acantholimon* sect. *Tragacanthina* subsect. *Stenostoma* and is most closely related to *Acantholimon karelinii*, a species confined to N. and NW. of Iran and adjacent areas in Caucasus and Turkey. The differences are in the length of calyx and bracteole characters. An identification key is prepared for the species of subsection *Stenostoma* to include the new species. *Acantholimon saadii* extends the distribution of the subsection *Stenostoma* from Kashan area as the southernmost distribution in Isfahan province to Fars province.

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Key words: *Acantholimon*, sect. *Tragacanthina* subsect. *Stenostoma*; new taxon; identification key; Fars province; Iran

گونه جدید *Acantholimon saadii* (Plumbaginaceae) از ایران

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گونه جدید *Acantholimon saadii* که نمونه‌های آن از استان فارس جمع‌آوری شده است، معرفی می‌گردد. گونه جدید به بخش *Acantholimon* sect. *Tragacanthina* subsect. *Stenostoma* تعلق دارد و نزدیک‌ترین گونه به آن *A. karelinii* است. انتشار گونه اخیر به شمال غرب و شمال ایران و همچنین نواحی نزدیک به این منطقه در قفقاز و شمال ترکیه محدود می‌گردد. اختلاف دو گونه در ویژگی‌های کاسه و برگ‌ها است. یک کلید شناسائی شامل گونه جدید برای زیربخش *Stenostoma* ارائه می‌گردد. گونه جدید انتشار *Stenostoma* subsect. *Stenostoma* را از کاشان به عنوان جنوبی‌ترین محدوده انتشار زیربخش به استان فارس توسعه می‌دهد.

INTRODUCTION

Acantholimon Boiss. (Plumbaginaceae) described by Boissier (1846) with 22 species. Bunge (1872) revised the genus and raised the number of species to 83 of which 45 were from Iran. Mobayen (1964) prepared a monograph on the genus *Acantholimon* and 119 species were recognized by him of which 84 were from Iran. Rechinger and Schiman-Czeika (1974) in Flora Iranica area reported 164 species, 84 from Iran. Recently some more new species were described from

Iran (Assadi 2003; Assadi 2004; Assadi 2005a; Assadi & Mirtadzadini 2006). Assadi (2005b) revised the genus for the Plumbaginaceae account for the Flora of Iran and introduced 79 species from Iran. Assadi (2006) studied distribution pattern of the genus in Iran, in this study 82.3% of the species were recognized as endemics, that means the genus *Acantholimon* has the highest number of endemics in Iran comparing to the other large genera of Iran. In a phylogenetic study (Moharrek et al. 2017) came to the conclusion that

several other genera of Plumbaginaceae should be transferred to *Acantholimon*, among them *Cephalorrhizum* M. Pop. as an Iranian genus is worth mentioning. Meanwhile, they questioned infrageneric classification of the genus as an artificial. It seems further studies are needed till the taxonomic position of the genus including the genus and subgeneric circumscription get stabilized. Khajoei Nasab & Khosravi (2019) studied areas of endemisms in Iran. They recognized four areas of endemisms in Iran.

Acantholimon s. str. is recognized among the Plumbaginaceae genera with cushion form habit, spiny leaves and head-like stigmas.

The aim of this paper is to describe a new species of the genus *Acantholimon* from Iran, Fars province.

MATERIALS AND METHOD

The second author in a collecting program in Fars province collected herbarium materials and offered them to TARI herbarium. He gave the *Acantholimon* specimens to the first author as the author of Flora of Iran (Assadi 2005b) to confirm his identification. We both studied the specimens and compared them with any possible affinities. Details of characters measured or qualified and they did not fit to any species of the genus. Also, Plumbaginaceae Flor Iranica (Rechinger & Schiman-Czeika 1974) was used as another important literature of the area. Finally. It was concluded that one of the collections is a new species, which is described here.

RESULTS AND DISCUSSION

The specimens studied by having soon deciduous vernal leaves, 1-flowered spikelets, non-hairy calyx throat and not funneled form calyx limb belong to Sect. *Tragacanthina* Bge. subsect. *Stenostoma* Bge. However, morphological characters of the specimens differ from all of the other species of this section and therefore they are described as a new species and compared with all relatives.

Acantholimon saadii Assadi & Zeraatkar, **sp. nov.** figs. 1-2.

Sect. *Tragacanthina* subsect. *Stenostoma* Bge.

Plant with tufts of up to 50 cm in diameter, except the puberulent calyx tube, otherwise glabrous. Vernal leaves 10-20 mm long, ca. 2 mm broad, linear, broadly membranous at the base, brown in the middle, mucronate at the apex, soon recurved and deciduous; aestival leaves 1.5-5.5 cm long, 0.5 mm broad, spiny, spreading; stem leaves ca. 5 mm long, subulate, mucronate at the tip, broadly membranous at the margin, amplexicaul. Flowering stems 25-30 cm high, much exceeding the tuft, branched. Inflorescences spike-like with zigzag axis. Spikelets 10-11 mm long,

one flowered, at the lower part of inflorescence shorter than the internodes, somewhat longer than the internodes above. Bracts ca. 7 mm long, up to the middle of spikelets, subulate, mucronate, amplexicaul. Bracteoles 2, ca. 9 mm long, as long as the calyx tube, broadly membranous at the margin, rounded at the apex, shortly mucronate. Calyx 12 mm long, tubular; tube 9 mm long; limb 3 mm long, minutely expanded, white, with purple nerves, plicate, shallowly 10 toothed at the apex; nerves reaching to the margin of calyx limb. Petals ca. 15 mm long, spatulate, pink; claw 12 mm long; limb 3 mm long, elliptic, red. Filaments ca. 12 mm long; anthers ca. 2 mm long. Capsule ca. 5 mm long, cylindrical, 5-nerved. Seeds ca. 5 mm long, narrowly cylindrical. Styles 5, 10 mm long; stigma capitate.

Type: Iran, Fars province, Dorudzan area, near Jahanabad and Fotohabad, Charkho Mt., N: 30 06 14, E: 52 33 44, 1750 m, A. Zeraatkar 86295 (holotypus TARI).

Affinities. The new species is related to *Acantholimon karelinii* (Stschegl.) Bge. by having tubular calyx and deciduous vernal leaves, but differs from it by having longer calyx ca. 12 mm long (not 9-10 mm) and longer bracteoles to the summit of calyx tube (not to the middle). Moreover, the new species grows in Fars province while *A. karelinii* grows in Azerbaijan and Gilan (Rudbar area) provinces. The new species has a disjunction distribution comparing to all species of the group concerned as the southern distribution of them extended to Kashan area from Isfahan province.

Habitat: The species grows in a woodland of mainly *Amygdalus scoparia* Spach and *Acer monspessulanum* L. species. Some of the other components are *Allium scabriscapum* Boiss. & Kotchy, *A. subnotabile* Wendelbo, *Prangos ferulacea* (L.) Lindl., *Ferula ovina* (Boiss.) Boiss., *Smyrniium cordifolium* Boiss., *Cephalorrhynchus microcephalus* (DC.) Schchian, *Scorzonera mucida* Rech. f., *Rindera lanata* (Lam.) Bunge, *Silene coniflora* Nees ex Oth in DC., *Astragalus ajubensis* Bunge, *Roemeria hybrida* (L.) DC. subsp. *hybrida*, *Poa bulbosa* L., *Delphinium saniculifolium* Boiss., *Verbascum pseudo-digitalis* Nab., *Daphne mucronata* Royle, *Geranium stepporum* Davis., *Rheum persicum* Los., *Gagea gageoides* (Zucc.) V. Ved., *Colchicum shimperi* Janka, *Cephalaria dichaeophora* Boiss., *Sameraria stylophora* (Jaub. & Spach) Boiss., *Lamium persepolitanum* (Boiss.) Jamzad, *Biebersteinia multifida* DC., *Pistacia khinjuk* Stocks, *Eryngium billardieri* F. Delaroche, *Helichrysum glanduliferum* Sch.-Bip., *Convolvulus leiocalycinus* Boiss., *Astragalus penetratus* Maassoumi, *Ajuga chamaecistus*

Ging. ex Benth. subsp. *euphrasioides* (Boiss.) Rech. f., *Nepeta depauperata* Benth. in DC., *Amygdalus elaeagnifolia* Spach. subsp. *elaegnifolia*, *Cerasus microcarpa* (C. A. Mey.) Boiss., *Verbascum austroiranicum* Hub.- Mor.

Etymology: The specific epithet comes from the great Iranian Poet and prose writer Sheikh Mosleholdin Saadi Shirazi buried in Shiraz city, the center of Fars province.



Fig. 1. *Acantholimon saadii* in its habitat. Photographs by Amin Zeraatkar.



Fig. 2. *Acantholimon saadii* ($\times 65.0$); spikelet ($\times 3.2$).

Conservation status. *Acantholimon saadii* is known only from the type locality, where one small population consisting of less than 50 plants was observed. It grows at an altitude 1750 m and no plant of the species are seen in the higher altitudes. Therefore, it seems the species is classified as 'critically endangered' (CR) due to the number of mature individuals known < 50, small extent of occurrence (EOO < 1.5 km²) and habitat reduction in the area due to mines. (IUCN 2019).

An identification key is prepared for the species of *Acantholimon* section *Tragacanthina* subsect. *stenostoma* in Iran.

1. Calyx 12-16 mm long, distinctly 10-lobed or toothed at the tip.....*A. heratense* Bge.
- Calyx 9-12 mm long, distinctly 5-lobed or indistinctly 10 toothed..... 2
2. Calyx lobes 5; lobes between the calyx nerves. Bracts half as long as the bracteoles*A. quinquelobum* Bge.
- Calyx 5-lobed or 10-toothed, if 5-lobed, lobes along the calyx nerves. Bracts equaling or shorter than the bracteoles..... 3
3. Calyx with 10 indistinct teeth 4
- Calyx with 5 teeth..... 5
4. Calyx ca.12 mm long. Bracteoles as long as the calyx tube.....*A. saadii* Assadi & Zeraakar
- Calyx 9-10 mm long. Bracteoles up to the middle of calyx tube.....*A. karelinii* (Stscheegl.) Bge.
5. Bracts and bracteoles±equaling, up to the one third of the calyx from base *A. curviflorum* Bge.
- Bracts and bracteoles unequal. Bracteoles up to the middle of calyx.....*A. hystrix* Stapf

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