NOTES ON THE FLORA OF IRAN: 1. ASPARAGUS (ASPARAGACEAE) AND NITRARIA (ZYGOPHYLLACEAE)

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Asparagus lycaonicus P.H. Davis (Asparagaceae), a species hitherto known only from E Central Turkey, is reported from Iran. A review of Nitraria (Zygophyllaceae) in Iran together with critical comments on the account of the genus in Flora Iranica are given, and Iranian records of N. komarovi Iljin & Lava are referred to Atraphaxis suadifolia Jaub. & Spach (Polygonaceae).

Keywords. Atraphaxis, Flora of Iran, halophytes, Irano-Turkish disjunction, Liliaceae.

INTRODUCTION

This paper is a continuation of the author’s studies on Iranian halophytes (Akhani & Ghorbanli, 1993; Akhani, 1996). It provides supplementary and critical notes on accounts of the genera Asparagus and Nitraria in Flora Iranica (El-Hadidi, 1972; Browicz, 1990).

Asparagus lycaonicus P.H. Davis new to Iran

Asparagus lycaonicus P.H. Davis, Notes Roy. Bot. Gard. Edinburgh 41: 48 (1983). Type: E Central Anatolia, west of Tuz Gölü, Konya, Cihanbeyli, Boluk Gölü, 1010m, 4 viii 1960, Khan, Prance & Ratcliffe 438 (holo. E!, iso. K!). Fig. 1A.

Additional specimen examined. IRAN. Ostan-e Markazi (Arak), SE of Kavir-e Meyghan, near the margin of Arak salt lake, 25 ix 1986, H. Akhani 1124 (hb. Akhani, hb. Shahid Beheshti Univ.). Fig. 1B–D.

The material cited was found 15 years ago on highly saline soils associated with Aeluropus littoralis (Gouan) Parl., Climacoptera turcomanica (Litw.) Botsch., Petrosimonia glauca (Pall.) Bunge, Halanthium rariflorum C. Koch and Atriplex verrucifera M. Bieb. As the account of Asparagus in Flora Iranica (Browicz, 1990) had not then been published, I consulted the Flora of Turkey (Davis, 1984). Surprisingly, my specimen matched well the description of Asparagus lycaonicus described and hitherto known only from E Central Anatolia. During a herbarium visit to Kew and Edinburgh in April and May 1997, the identity of the Iranian collection was confirmed by comparison with the types of A. lycaonicus.

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Fig. 1. A. *Asparagus fucoseus*, isotype (K); B–D, Iranian collection (H. Akhani 1124): B, entire sheet; C, enlarged flowering plant; D, enlarged fruiting plant.
Asparagus lycaonicus seems to be an isolated species, distantly related to A. griffithii Baker, another halophytic species known from a few localities in C and NE Iran (Browicz, 1990; Akhani, 1998). According to the Convention on the Conservation of European Wildlife and Natural Habitats (http://www.ecnc.nl/doc/europe/legislat/bernappl.html), A. lycaonicus is a strictly protected species.

The disjunction of this species (c.1600km) is of great phytogeographical interest. A somewhat similar distribution pattern has already been reported for Microcnemum coralloides (Loscos & Pardo) Buen (Chenopodiaceae) and Arabidopsis parvula (Schrenk) Schulz (Cruciferae) (Akhani, 1988; Hedge, 1997). Recently Freitag & Özhatay (1997) and Freitag et al. (1999) added a new subspecies of Salsola canescens (Moq.) Boiss. from SW Anatolia and reported Anabasis aphylla L. from NW Central Anatolia (Ankara Province) with somewhat similar disjunctions. Zarre (2000) cited Astragalus dipodurus Bunge, which is distributed in S Central Anatolia and N of Uromieh Lake in Iranian Azerbaijan, as another example. Although several interpretations are possible for such disjunctions, the most satisfactory one traces them back to the drier climatic conditions during the Pleistocene and early Holocene, when the dominant vegetation consisted of Artemisia and species of Chenopodiaceae (Bottema & van Zeist, 1989).

**The Genus Nitraria in Iran**

In Flora Iranica, El-Hadidi (1972: 9–11) reported three species of Nitraria from Iran: N. sibirica (DC.) Pall., N. komarovi Iljin & Lava and N. schoberi L. However, the author had apparently overlooked the monograph of the genus by Bobrov (1965), resulting in some misinterpretation of the species occurring in Iran. Unfortunately El-Hadidi’s account was uncritically accepted by Akhiani (1993) in her treatment of the Zygophyllaceae for the new Flora of Iran in Farsi. Based on field and herbarium studies, the present author accepts only two species in Iran, N. retusa and N. schoberi, which can easily be separated using the following key:

1a. Leaves obovate, or broadly spathulate, to 20mm long, 1–2 times as long as broad; some leaves retuse, dentate or crenate at apex

  1. N. retusa

1b. Leaves linear-oblanceolate, or narrowly spathulate, to 50mm long, 3–5 times as long as broad; all leaves entire, obtuse at apex

  2. N. schoberi

1. **N. retusa** (Forssk.) Aschers. in Verh. Bot. Ver. Prov. Brandenb. 18: 94 (1876).
Type: Egypt, Alexandria, 1 iv 1761, Forsskål 463 (C).
Syn.: Peganum retusum Forssk., Fl. Aegypt.-Arab.: 211 (1775).

Additional specimen. Khuzestan, Mahshahr, Khure Doragh, 5m, Howeizeh & Dinarvand 4050 (hb. Research Center of Natural Resources, Ahvaz, n.v.).

This species is newly reported from Iran by Howeizeh & Dinarvand (2000). Although the specimen has not been seen, their illustration and a record close to the Iranian border in Iraq (Browicz, 1996) almost certainly confirm its occurrence in Iran.
2. **N. schoberi** L., Syst. Nat. ed. 10: 1004 (1759). Type: 624.1 (hb. LINN.) (cf. Ghazanfar in Fl. W. Pakistan 66: 4 (1974)).

Specimens examined. **Arak (Ostan-e Markazi)**. Davoodabad, 6 vii 1968, *Abai & Mojib* 14089 (W); NW of Kavir-e Meyghan, stabilized sand, 1650m, 11 vi 1986, *H. Akhani* 945 (hb. Shahid Beheshi Univ.). **Azerbaijan**. Uromieh Lake, Ashk Island, c.1280m, 21 vi 1991, *H. Akhani* 7503 (MMTT); western coasts of Uromieh Lake, 25km NE of Uromieh, Zanbil, 14 ix 1990, *Khara* (MMTT); Ardal to Astara, 5mi E of Ardabil, 5000ft, waste ground near cornfield and sand, 6 vi 1962, *P. Furse* 2460 (K, W, sub. *N. sibirica*); between Marand and Khoi, 1200m, *Gauba & Sabeti* 703 (W). **Esfahan**. ESE of Kashan, c.8–10km NW of Abu-Zeid Abad, sand dunes, 900m, 9 ix 1989, *H. Akhani* 5764 (MMTT); 5km NW of Robat-e Turk towards Delijan, river bed dominated by *Tamarix*, 16 xi 1991, *H. Akhani* 7899 (MMTT). **Kerman**. In alveo lapidoso supra Nehbid (Nabid), inter Kerman et Bam, 2250m, 6 v 1948, *Rechinger, Aellen & Esfandiari* 3567 (W).

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**Nitraria schoberi** is sporadically but widely distributed on sandy-saline soils in C, NE and NW Iran (see Browicz, 1996); some populations appear to be in danger.

In *Flora Iranica*, *N. schoberi* is represented by var. *caspica* Pall. and var. *roborowskii* (Komar.) Hadidi. In herbarium LINN there are two specimens of *N. schoberi* with the same number: 624.1. One has already been chosen as the lectotype of the species. The other, bearing the name var. *caspica*, seems to show no reliable differences to distinguish it from the lectotype. This is probably a polymorphic species in which any infraspecific classification is unsatisfactory.

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**Excluded species**

*N. sibirica* (DC.) Pall., Fl. Ross. 1: 80 (1784).

El-Hadidi (1972: 10) reported *N. sibirica* from Azerbaijan, based on the two specimens *Aucher* 4535 and *Furse* 2460. The Furse collection from Ardabil to Astara has been studied at Kew and Vienna. The specimens are rather spiny and I found no significant differences from Iranian populations of *N. schoberi*, which are sometimes spiny. According to Bobrov (1965), *N. sibirica* is restricted to the mountains of Siberia from the Tobol river to Abakan and to Central Asia from Lake Balkhash to Transbajkalia and the Tibetan mountains. Therefore phytogeographical data also suggest that its occurrence in NW Iran is unlikely.
N. komarovii Iljin & Lava, Priroda 5–6: 117 (1944). Type: ‘Krasnowodsk’, coll. ign. (LE, n.v.).

The citation of *N. komarovii* from Iran and the relevant photograph (tab. 10, 2) in *Flora Iranica* (El-Hadidi, 1972) (Fig. 2) refer to a specimen from Azerbaijan: 32km E of Mianeh, 1650m, *Bowles Scholarship Exp.* 1572. Based on my repeated but
unsuccessful attempts in 1987 and 1989 to re-collect this species there, and careful study of the figure selected by El-Hadidi, I am persuaded that this plant doesn’t belong in the Zygophyllaceae at all, but is actually a member of the Polygonaceae. This interpretation was confirmed when I checked the specimen in Kew, eight years later. The specimen figured by El-Hadidi (1972) is in fact the rare endemic Atraphaxis suaedifolia Jaub. & Spach. This narrow endemic has been reported twice: firstly the type collection near Tabriz (Rechinger & Schiman-Czeika, 1968) and secondly by Assadi & Wendelbo (1977) from 20km along the Tabriz–Ahar road at 1450m, 14 v 1975, Wendelbo & Assadi 17119 (W).

According to Bobrov (1965), N. komarovii differs from N. schoberi in its narrower and longer linear-spathulate leaves with narrowed bases and narrower inflorescence. It is reported from three small coastal areas on the Caspian Sea: Krasnovodsk, the Apserson Peninsula and the delta of the Volga river. From 10–11 ix 1994 I travelled along the SE Caspian coast of Turkmenistan, near Chelekeh, c.60km S of Krasnovodsk, in search of N. komarovii. There I observed Nitraria schoberi as the dominant shrub on sandy and saline soils in several different forms obviously caused by varying conditions of salinity and water supply. Usually plants growing at a greater distance from the coast were characterized by smaller fruits and denser indumentum. The shape of leaves and inflorescence proved to be highly polymorphic, as shown in the specimens H. Akhani 10101, 10116 and 10120 (hb. Akhani). Therefore they cannot be considered as constant specific characters, and N. komarovii is most likely just a form of N. schoberi. Nevertheless, final judgement requires examination of the type, which has not been seen by the present author.

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