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IRAJ MEHREGAN[1]

Cousinia saloukensis (Asteraceae, Cardueae), a new species from NE Iran

Abstract

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Cousinia saloukensis, a narrow endemic from NE Iran, is described as a species new to science, illustrated and its affinities are discussed. A high morphological similarity between the new species and the eastern members (mainly in E Afghanistan) of *C.* sect. *Eriocousinia* is contradicted by a relationship with species of sect. *Serratuloides* revealed in a previous nrITS phylogeny. In view of the incongruent molecular and morphological evidences, the new species is, for the time being, not assigned to any of the known sections.

Additional key words: *Compositae, Cousinia* sect. *Eriocousinia, Cousinia* sect. *Serratuloides,* taxonomy, phylogeny

Introduction

With its more than 600 species (Susanna & Garcia-Jacas 2006), the genus *Cousinia* Cass. *(Asteraceae; Cardueae)* is one of the 50 larger genera of flowering plants (Frodin 2004). It is also the second largest genus of flowering plants in Iran. Representing more than 200 species in the country, it is mainly distributed in four centres of biodiversity: in the W (Zagros), NW (Azerbaijan), N (Elburz) and NE (Kopetdagh) (Rechinger 1972, 1979; López-Vinyallonga & al. 2009).

Thanks to the extensive collections of herbarium material made in recent years, and also to using SEM microscopy and molecular analyses, the genus has been studied widely and many new taxa have been introduced to science (Assadi 2009; Mehregan & al. 2010). The available molecular analyses of *Cousinia* s.str. (*C.* subg. *Cousinia*) so far could resolve some of the phylogenetic relationships among its species and solve some taxonomic problems (López-Vinyallonga & al. 2009; Mehregan 2009; Mehregan & Kadereit 2009; Mehregan & Assadi 2010), but further work is needed.

As part of a collaborative project with Prof. M. Assadi (Herbarium of the Research Institute of Forests and Rangelands, Tehran, TARI; all herbarium abbreviations according to Thiers 2008+) and Dr F. Attar (University of Tehran) the author has started to revise *Cousinia* sect. *Eriocousinia* Tscherneva in Iran for the "Farsi" Flora of Iran published by the TARI herbarium. Species of *C.* sect. *Eriocousinia* are characterised by caespitose-perennial habit, leathery pinnately lobed leaves, usually numerous stems with many-flowered, large and usually arachnoid heads (Rechinger 1972). According to Rechinger (1972, 1986), *C.* sect. *Eriocousinia* comprises 14 species in the Flora Iranica region, 11 of them in the eastern part (mainly E Afghanistan) and three in Iran.

Among collections from NE Iran made in 2002, I found material of a *Cousinia* species that clearly shared morphological characters with the eastern species of *C.* sect. *Eriocousinia,* but does not match the description of any known species in the genus. It has become evident that it represents a species new to science. The area was visited again in 2009 and more material was collected.

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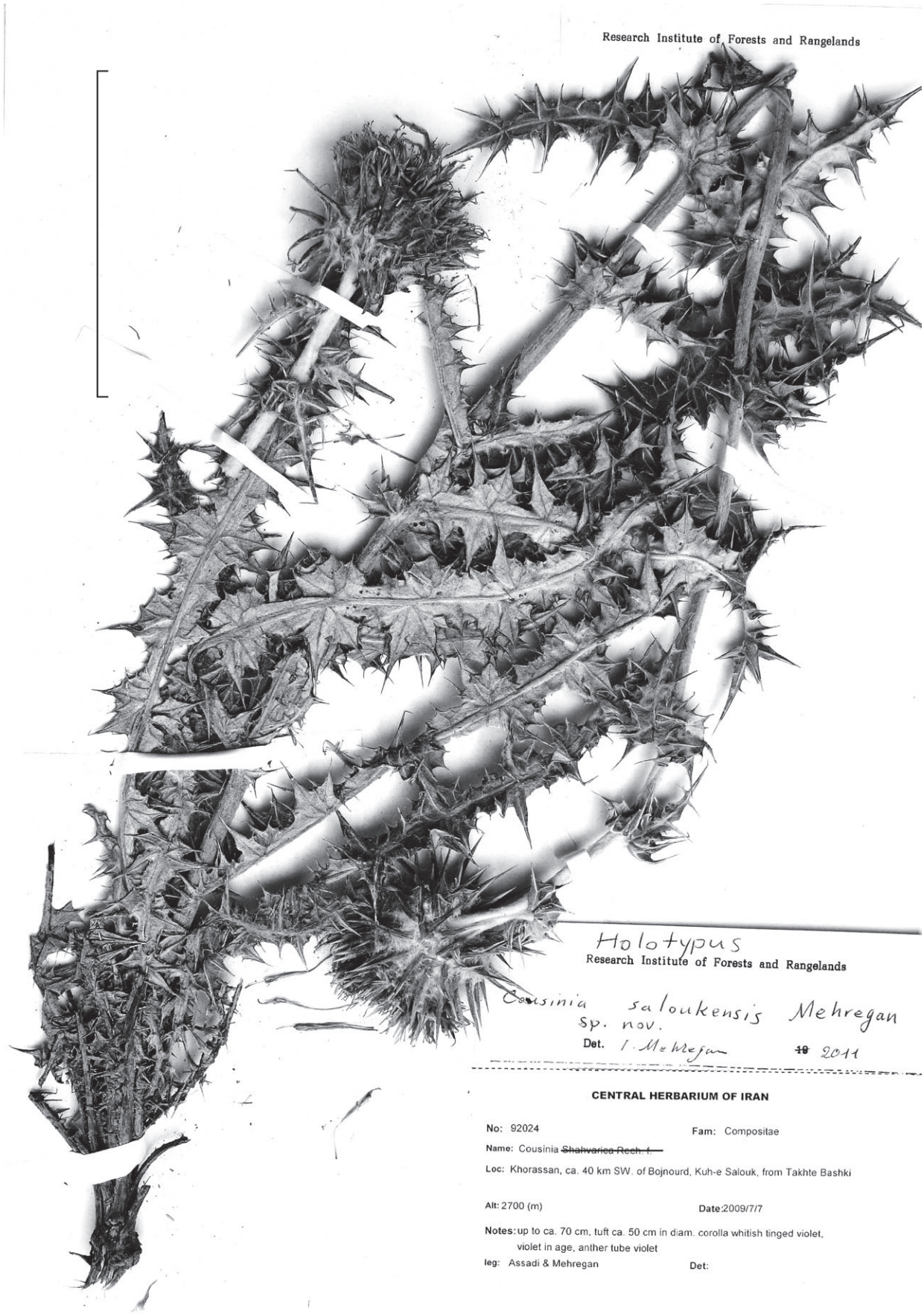


Fig. 1. *Cousinia saloukensis* – holotype at TARI; scale bar = 10 cm.

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Cousinia saloukensis Mehregan, **sp. nov.**
Holotype: Iran, Khorassan, c. 40 km SW of Bojnourd, Kuh-e Salouk, from Takhte Bashk, 2700 m, 7.7.2009, *Assadi & Mehregan 92024* (TARI; isotypes: B, IAUH, K) – Fig. 1–2.

Caespitosa-perennis, pluricaulis. Caules floriferi numerosi, erecti vel erecto-ascendentes, simplices, monocephali. Folia basalia coriacea, spinoso-pinnato-lobata, lineari-lanceolata; folia caulia decrescentia. Capitula solitaria, subglobosa, basi depressa; involucrum absque spinis 30–40 mm diametro, spinis inclusis 60–70 mm diametro, arachnoido-tomentosa; phylla 55–70; exteriora et intermedia lineari-subulata, usque 30 mm longa, in spinas rigidas attenuata, erecto-patentia vel recurvata; intima erecto-patentia. Flores 80–100; corolla 25–28 mm longa, purpurea; antherarum tubus concoloris. Achaenia ignota.

Description — Caespitose perennial, with numerous, relatively thick, unbranched, ascending-erect or erect stems foliate up to heads, up to 70 cm high, covered with grey tomentose indumentums. *Leaves* leathery, discolorous, green and sparsely tomentose above, densely grey tomentose beneath; *basal leaves* linear-lanceolate, up to 30 cm long and to 6 cm wide, attenuate towards the base, spinose-lobate at margin; *cauline leaves* resembling basal ones, decreasing in size upwards, sessile, amplexicaul or cordate at base. *Heads* single, terminal, 30–40 mm in diameter without phyllaries, 60–70 mm in diameter with phyllaries; involucrum ± spherical, depressed at base, covered with arachnoid-tomentose hairs, usually with 55–70 phyllaries and 80–100 flowers; *outer and middle phyllaries* linear-subulate, up to 30 mm long, 4–5 mm wide at base, spreading-erect to slightly recurved, ending in a rigid spine; *inner phyllaries* linear, subulate at apex, membranaceous at margin, pale brown. *Receptacular* bristles rough. *Flowers* purple or pale purple, 25–28 mm long, with the tube slightly longer than the limb; *anther tube* concolorous, purple. *Mature achenes* not seen.

Etymology — The specific epithet refers to Mt Salouk (Kuh-e Salouk), SW of Bojnourd (Khorassan, NE Iran), where the type material was collected.

Distribution and habitat — Endemic to NE Iran, Khorassan Province (Fig. 3), on rocky slopes in stony soil, among cushion-forming *Astragalus* sp., *Acantholimon* sp. and *Ononis spinosa* L.

Conservation status. — Some material was first collected from a small population of individuals in 2002. The population is well protected because it is situated in the Salouk Protected Area and no obvious decline in population size was observed during revisiting the area after seven years in 2009. The individuals seem to reproduce well (Fig. 2). Regarding the small geographical range of *Cousinia saloukensis,* its conservation status can be categorised as "vulnerable", with an area of occupancy of less than 10 km^2 meeting criterion B2 (IUCN Standards and Petitions Subcommittee 2011).

Further specimens seen — Iran: Khorassan: Locus typicus, 17.7.2002, *Mehregan 103* (MJG; analysed as "*Cousinia* sp. (103)" in Mehregan & Kadereit 2009).

Systematic affinities — Morphologically *Cousinia saloukensis* is most similar to *C. polyneura* Rech. f. of *C.* sect. *Eriocousinia* from eastern Afghanistan. This lat-



Fig. 2. *Cousinia saloukensis* at its type locality – A: mature individuals along with young plants; B: flowering head.

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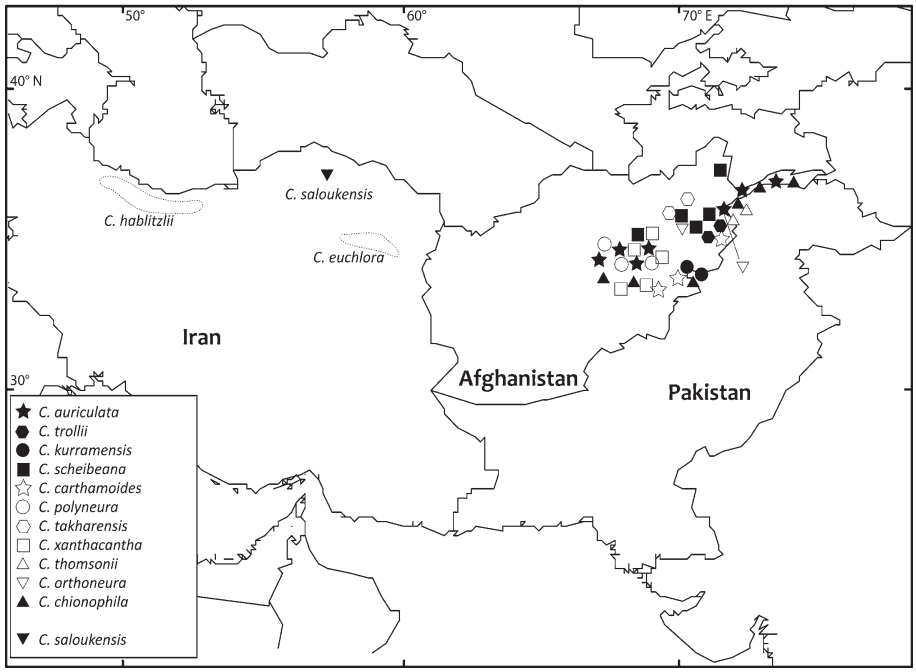


Fig. 3. Distribution of *Cousinia* sect. *Eriocousinia* sensu Rechinger (1972, 1986) in the Flora Iranica area. Each occurrence symbol represents herbarium specimens from either one locality or more localities in adjacent areas (data mainly from Rechinger 1972, 1986).

ter species, however, has clearly smaller heads (including phyllaries 2.5–3 cm in diameter against 6–7 cm in the new species) and flowers (c. 15 mm long against 25–28 mm in the new species). All species of *C.* sect. *Eriocousinia* but *C. kumarensis* Bornm. have scabrous receptaclular bristles.

The distribution of *Cousinia* sect. *Eriocousinia* in the Flora Iranica area shows an apparent disjunction between species from the western and eastern region (Fig. 3). The eastern species are mainly centred in E Afghanistan.

Material of *Cousinia saloukensis* was included in a previous analysis of the ITS region of nrDNA. Surprisingly the phylogenetic analysis revealed a close relationship with *C. hypoleuca* Boiss. and *C. concolor* Bunge of *C.* sect. *Serratuloides* (Mehregan & Kadereit 2009: fig. 3, indicated "*C.* sp. (103)"). This result is, however, paralleled by other cases. López-Vinyallonga & al. (2009) analysed some species of *C.* sect. *Eriocousinia* from both eastern and western regions, using nuclear and chloroplast markers. The results showed no close relationship between the species of the two regions and revealed that *C.* sect. *Eriocousinia* is not monophyletic. As an example, *C. gmelinii* C. Winkler (syn. to *C. hablitzii* C. A. Mey.; Assadi, in press) clusters with two species of *C.* sect. *Serratuloides* Bunge (*C. crispa* Jaub. & Spach and *C. pinarocephala* Boiss.; bootstrap support = 98 %; combined nuclear and chloroplast DNA), and therefore must be excluded from sect. *Eriocousinia*. Mehregan & Kadereit (2009, ITS alone) showed that also *C. euchlora* Bornm. & Rech. f. has no close affinity with species from Afghanistan. With its leathery lanceolate leaves, linear and entire phyllaries, and smooth receptacular bristles *C. euchlora* is also morphologically more similar to some species of *C.* sect. *Serratuloides*.

Cousinia hablitzii and *C. euchlora* can morphologically well be treated as members of *C.* sect. *Serratuloides* (Assadi, in press), because they share the smooth receptacular bristles, which strictly characterise this section. *C. saloukensis,* in contrast, has scabrid receptacular bristles, and would thus be an odd exception in this section.

In view of the contradicting molecular and morphological evidences, it appears premature to assign the new species to either section. For the time being, I therefore refrain from a sectional assignment of the new species. The case again indicates the need for a comprehensive molecular analysis of *Cousinia* s.str. including both nuclear and chloroplast markers and focusing on the phylogenetic relationships with respect to the current sections.

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