

TWO NEW SPECIES OF THE GENUS *COUSINIA* FROM IRAN

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Abstract

Two new species of *Cousinia*, *C. taybadensis* and *C. khorasanica*, collected from Khorasan province in eastern Iran are described, mapped and illustrated. *C. taybadensis* can not be exactly assigned to any of the known sections, whereas, *C. khorasanica* belongs to sect. *leiocaules* Bunge due to its morphological characters discussed in the paper.

Key word: *Cousinia*, Asteraceae, Khorasan, Iran

Introduction

The family Asteraceae with 1535 genera and 23000 species is one of the largest families of angiosperms (BREMER 1994) and is considered by most taxonomist the highest in the scale of evolution. The family is divided into several tribes, which are often arranged into three subfamilies; Barnadesioideae, Cichorioideae and Asteroideae (BREMER 1994).

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The genus *Cousinia* Cass. belongs to the Arctium group tribe Cardueae subtribe Carduinae (HÄFFNER 2002, SUSANNA *et al.* 2003). The latest revision classified it into three subgenera; *Cynaroides*, *Hypacanthodes* and *Cousinia*, including 50 sections (TSCHERNEVA 1988 a, b).

In Iran, *Cousinia* is represented by more than 240 species, grouped into 50 sections (RECHINGER 1972, 1979, GHAREMAN, IRANSHAHR and ATTAR 1999, ATTAR & GHAREMAN 2000, ATTAR & GHAREMAN 2002, ATTAR, GHAREMAN & ASSADI 2000, 2001, MEHREGAN, ASSADI & ATTAR 2003 DJAVADI & ATTAR 2005), so, after genus *Asteragalus* L., *Cousinia* is the largest genus in Iran.

According to RECHINGER (1986), *Cousinia* is unique in the diversification of all parts and definitely unique in the restricted distributional area compared with high number of species. After *Senecio* with c. 1500 species and *Veronica* with c. 1000 species, *Cousinia*, with c. 662 species, is the third largest genus in Asteraceae (RECHINGER 1986). Out of these. 379 species are endemic within the Flora Iranica area, i.e. the mountainous parts of the Irano-Turanian region (although, according to the last studies the number of species is ca. 700 and the number of endemics is about 390). As the plant geographical relationships between the “Flora Iranica” area and the “central Asia mountain provinces” are much stronger than those between the Iranian and Turanian section of the Irano-Turanian flora, RECHINGER (1986) proposes the phytogeographically division of the Irano-Turanian Region into a Turanian (Aralo-Caspian), comparatively poor in species and endemics, and an Irano-Turkestanian Region, which is rich in endemics at generic, specific and infraspecific levels. Therefore, it can be considered as an important center of origin and conservation of palaeo-xeromorphic mountain floras.

According to KNAPP (1987), in the western part of *Cousinia*'s distribution, like in the eastern, four centers of diversity, but less well developed, can be distinguished; Koptedagh (66 species in Iran, 33 in Turkmenia), Elburz (66 species), the northern part of Zagros (44 species) and Azerbaijan (36 species). In Khorasan, 79 species has been listed, of which the greater part is concentrated in the mountain area of Kopetdagh (RECHINGER 1972, 1979). Here, the number of species decreases sharply towards the west, Turanian lowlands and central deserts of Iran.

This paper is on the basis of a field trip to the poorly investigated areas of Khorasan province in June 2006. In this trip many species were collected, but among them, two new species have been collected in only one locality in the east (boundray area between Iran and Afghanistan) and north (boundary area between Iran and Turkmanestan) of Khorasan province respectively (Fig. 1). Initial attempts to name them using Flora Iranica (RECHINGER 1972, 1979) and Flora of the USSR (CHERNEVA 1997), were not successful. After more studying in detail, it was concluded that they are new species to science.



Fig. 1. Distribution of the two new species of *Cousinia*.

***Cousinia taybadensis* Djavadi & Attar, sp. nova** (Figs 2-4)

Type: Iran, Khorasan province, Khaf to Taybad, 45 km to Taybad, 1400 m, 3 June 2006, Djavadi, Eskandari & Torabi, IRAN 43543 (holotypus IRAN).

Suffruticoso-caespitosa, perennis. Caulis 8-18 cm altus, breviter ramosus, foliatus, albo-eburneus, glaber. Folia coriacea, omnino spinosa, sinuato-lobata, glabra, virida; folia basalia et caulina inferiora elliptica 2-4 x 1.5-2 cm, petiolata, petiolo usque 2 cm longo suffulta, basi truncata; folia caulina triangularia 2-2.5 x 1.5-2 cm, sessilia, non decurrentia, basi subcordata, ± auriculata; nervatura centralia alba, prominens. Capitula plus minusve 35 flora, spinis inclusis 1.5-2 cm longa, 1.5 cm lata, breviter pedunculata, ad summos ramos solitaria; involucrium absque spinis c. 9 mm longum, oblongum, supra indistincte constrictum, indistincte araneosum vel glabrum; phylla plus minusve 40, 8- seriata; phylla exteriora et intermedia linearia, basi appressa, superne in spinam patulam, raro apice reflexo-hamatam abeuntia; phylla intima recta, purpurea, araneosa, acuminata, margine scariosa, quam intermedia longiora. Receptaculi setae laeves. Corolla purpurea, 15mm longa, tubo 6mm, limbo 9 mm, laciniis 3mm longis. Antherarum tubus purpurascens, glaber. Achaenia matura ignota, verisimiliter atrobrunnea, pyramidata, basi attenuata.

Perennial, suffruticose, caespitose. Stem 8-18cm tall, shortly branched, leafy, ivory white, glabrous. Leaves coriaceous, triangular or oblong, all spiny, sinuate-lobed, glabrous, deep green, basal and lower stem leaves 2-4 x 1.5-2 cm, with 2 cm long petiole, truncate at the base, stem leaves 2-2.5 x 1.5-2 cm, sessile, non decurrent, subcordate or auriculate at base; midrib thick, ivory white, prominent. Head solitary, more or less 35-flowered, including spines 1.5-2 x 1.5 cm in diam.,

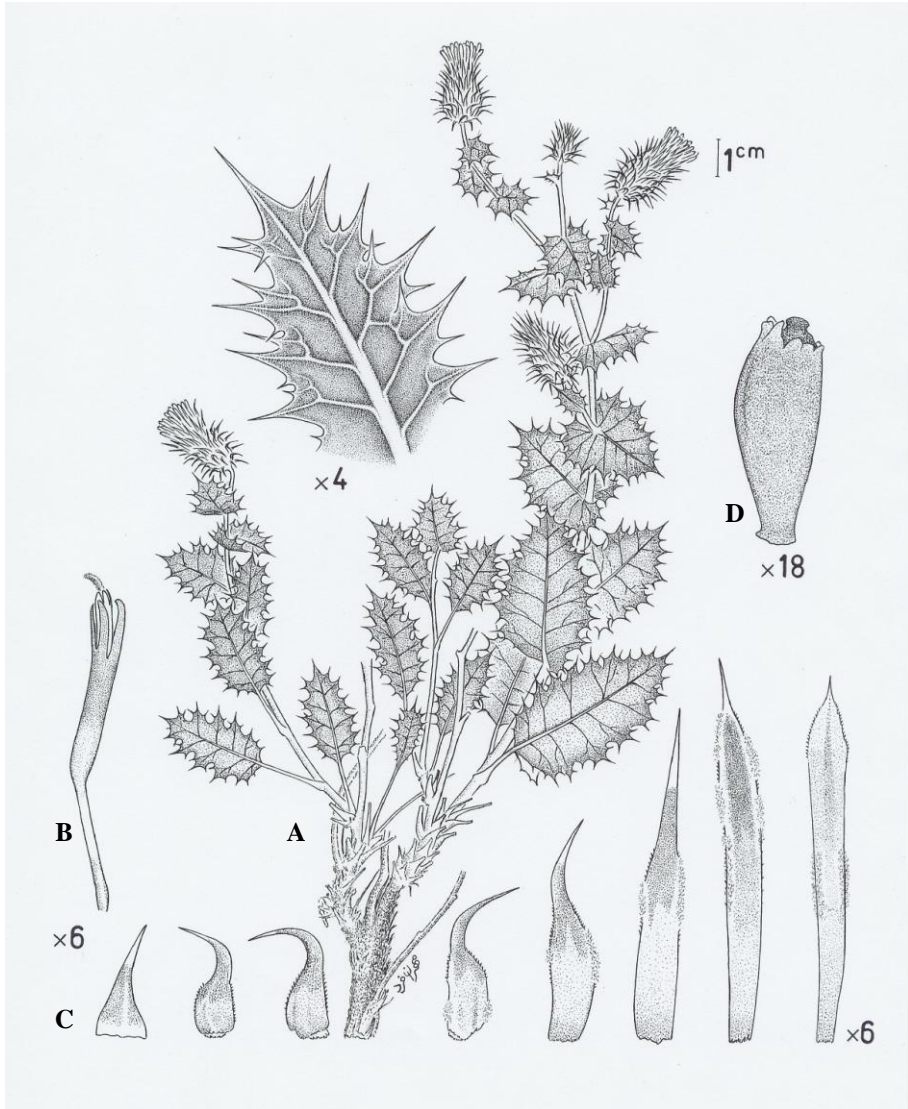


Fig. 2. *Cousinia taybadensis*: (A) Habit, (B) Flower, (C) Involucral bracts, (D) Achene.

shortly peduncled; involucre without spines 9mm long, oblong, constricted above, indistinctly arachnoid vel glabrous; bracts more or less 40, 8-seriate, outers and medians linear, appressed at base, attenuate toward apex into long reflexed or hamate spines; inners and innermost bracts erect, purple, arachnoid, acuminate, longer than medians. Receptacle bristles smooth. Corolla purple, 15 mm long, tube 6mm, limb 9mm and lobes 3 mm long. Anther tube purple, glabrous. Matured achenes not seen, but apparently deep brown, pyramidal, attenuate towards base.

Cousinia taybadensis can not be exactly assigned to any of the known sections. Although, it seems to belong to sect. *Stenocephalae* Bunge, but, it differs from all members of sect. *Stenocephalae* Bunge by the limited number of capitules, the larger size of capitule and the more high number of flowers per capitule.



Figs 3 & 4: *Cousinia taybadensis* in nature.

***Cousinia khorasanica* Djavadi & Attar, sp. nova** (Fig. 5)

Type : Iran, Khorasan province, Dargaz to Emam-Gholi, Rahman-Gholi-Baig, 1050m, 8 June 2006, Djavadi, Eskandari & Torabi, IRAN 43544 (holotypus IRAN).

Perennis. Caulis 20-22 cm longus, erectus, leviter arachnoideus, valde glabrescens, foliatus, a medio fere furcato-ramosus, polycephalus. Folia omnia tenuiter coriacea, discoloria, supra viridian, valde glabrescentia vel omnia glabra, lucida, subtus appresse albo-araneosa-tomentosa, nervatura pennato-reticulata, utrinque prominens, nervis in spinas marginales alteratim breviores et longiores excurrentibus, apice longius spinosa; folia basalia 7-8 x 3.5 cm, sessilia, non decurrentia, sinuato-lobata, lobo terminali apice rotundata, margine spinoso-dentata,

lateralibus quinquelobatis, ovato-lanceolata, lobis in spinam terminalem fere longam excurrentibus, margine spinoso-dentata; folia caulina inferiora c. 5 x 3 cm, sessilia, \pm oblonga, spinoso-dentata; folia caulina superiora sessilia, basi rotundata-cordata, acuminata, margine spinoso-dentata; folia summa decrescentia, a capitulis remota. Capitula singular, terminalia, spinis inclusis c. 2.5 cm diametro, multiflora; involucrium absque spinis c. 1.5 cm, ovatum, basi rotundatum, superne constrictum, araneosum; Involucra phylla numerosa, multiseriata, coriacea, lanceolata, e basi appresse sensim in spinam terminalem vulnerantem 5 mm longam attenuata, recurvata, exima virescentia, lateraliter utrinque spinis 2 brevioribus praedita; phylla intermedia lanceolata \pm 5 mm lata sensim in apicem acutam; phylla intima prominentia, scariosa, lineari-lanceolata, sensim acuminata, superne purpureo-violacea, araneosa. Receptaculi setae leaves. Corolla pallide rosea, c. 22 mm longa, tubo 9.5 mm, lacinis \pm 3 mm longis. Antherarum tubus roseus, glaber. Achaenia matura ignota.

Perennial. Stem 20-22 cm high, upright, slightly arachnoid, glabrescent, leafy, divaricate-furcate-branched almost in upper half, branches one-headed. Leaves leather-like, prickly along edge, green and slightly arachnoid above, mostly turning glabrous, appressed-white-tomentose beneath, nervation pinnate-reticulate, prominent on both surfaces, nerves in long and short marginal spines excurrent, terminal spine long; bottom leaves 7-8 cm long, 3.5 cm wide, sessile, lyre-shaped, apical segment rounded, prickly-toothed along margin, lateral segments 5 pairs in number, oval-broad lanceolate, sharp-pointed-prickly at apex, fine-prickly-toothed at margin; lower cauline leaves c. 5 cm long, 3 cm wide, sessile, \pm oblong; middle cauline leaves sessile, cordate at the base, dentate-spinose at margin, extended in prickles at apex; uppermost leaves \pm diminished. Heads ovate, c. 1.5 cm wide (excluding spines), c. 2.5 cm wide (including spines), 22 mm long, arachnoid. Involucral bracts numerous, leather-like, close-appressed at base, sickle-shaped-curved, spine-sharp-pointed, \pm 5 mm long; external ones terminated in 5 mm spine, with 1-2 spinules along margin; middle ones \pm 5 mm wide at the base; inner ones \pm scarious, lanceolate, sharp-pointed in thin spines, purple-coloured, densely araneose-pubescent mostly along margins. Receptacle's bristles smooth. Crollas pale pink,

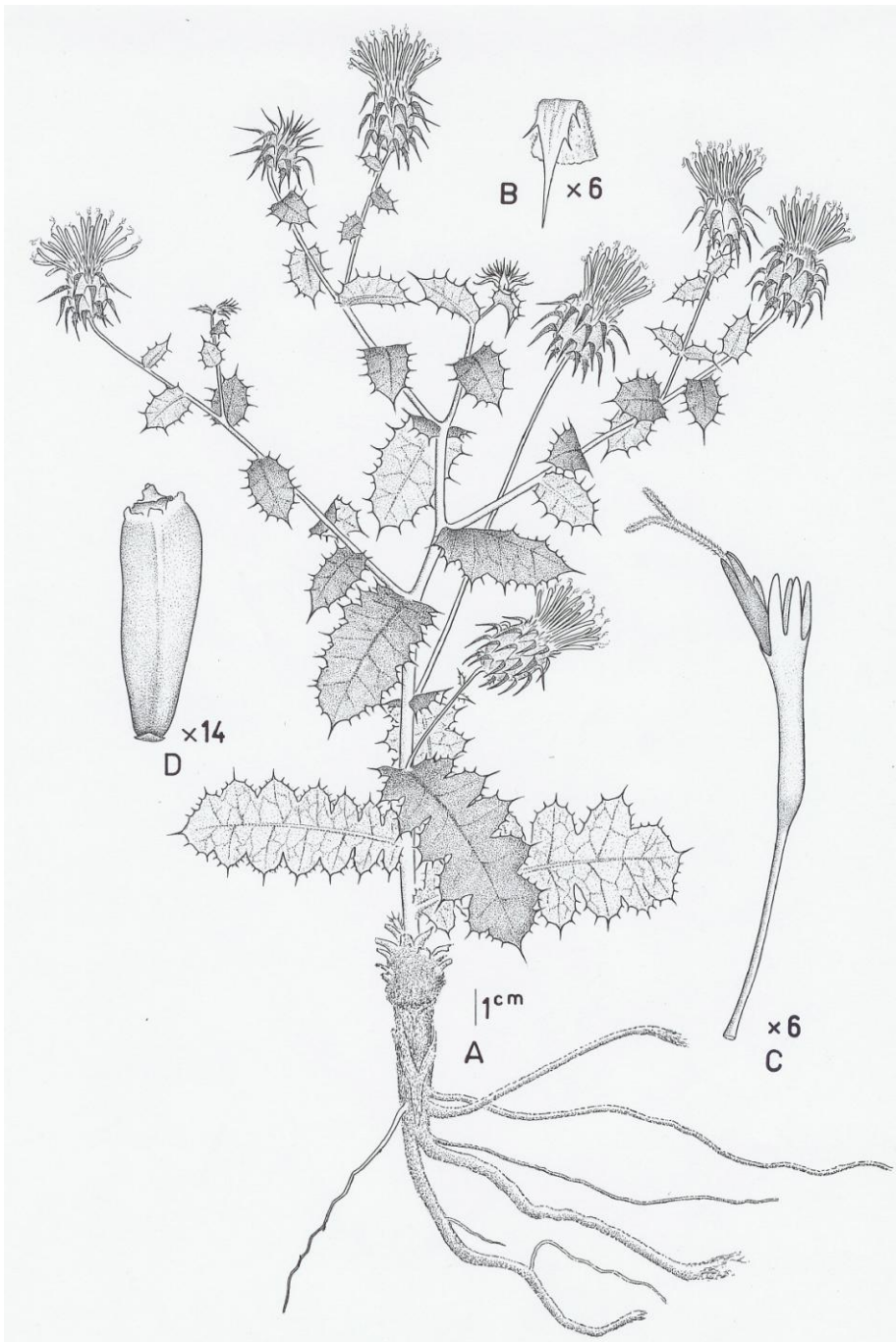


Fig 5. *Cousinia khorasanica*: (A) Habit, (B) External involucre bract, (C) Flower, (D) Achene.

c. 22 mm long, tube 9.5 mm, lobes c. 3 mm long. Anther tube purple, glabrous. Achenes (mature) not seen.

Cousinia khorasanica belongs to section *leiocaules* Bunge. The most important morphological characters of this section are as follow:

Perennial with woody polycephalous rootstocks or undershrubs. Stem short or long, glabr or later glabrescent, branched in upperpart, branches one-headed. Basal leaves short-petioled, stem leaves sessile, not decurrent, uppermost leaves diminished. Capitulum solitary, terminally, numerous or scanty, small or medium size. Heads spherical-ovate; involucre bracts from ovate base sharp-pointed in robust, arched-unbent or almost upright, long or short spines. Flowers yellow or whitish. Achenes inversely ovoid or inversely pyramidal, longitudinally striate, toothed above.

Cousinia khorasanica is related to *C. antonowii* C. Winkl. and *C. affinis* Schrenk. The three species are compared in Table 1.

Table 1. Differences between *Cousinia khorasanica*, *C. antonowii* and *C. affinis*

Species	<i>C. khorasanica</i>	<i>C. antonowii</i>	<i>C. affinis</i>
Form of plant	perennial with single stem	undershrubs with many stems	perennial with single stem
Heads	spherical	ovoid	spherical
Capitulum size (excluding spines)	15-18 mm wide	8 mm wide	18-20 mm wide
Number of involucre bracts	numerous	60-80	numerous
External bracts	with 1-2 spinules along margin	without spinules	without spinules
Number of flowers per capitula	± 50	± 25	numerous
Corollas	pale pink	light cream or whitish	pale yellow or whitish

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