FOUR NEW SPECIES OF THE GENUS COUSINIA CASS. (ASTERACEAE) FROM IRAN

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Four new species of the genus Cousinia are described from Iran. C. barezica is based on a specimen collected from Barez mountain chains. The species belongs to the section Spinuliferae and related to C. longifolia and C. sicigera. It however, differs from both by having discolored leaves. C. isfahanica another new species from the section Rigidissimae is related to C. rigidissima and C. auranti both from Afghanistan. This species has been based on a specimen collected from Isfahan, Semirom. C. maassoumii is described from adjacent localities of Delijan and Arak cities. It is from the section Pugioniferae and most closely related to C. macroptera but having different leaf and indumentum characters. C. pseudocandolleana is described based on specimen from Khorasan province. It is closely related to C. candolleana an endemic of Hamadan province, but differs from it by having stem and stem leaf characters.

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Introduction

The genus Cousinia Cass. has been subject to taxonomic studies for the preparation for the treatment for the Flora of Iran (Assadi 1989) by the author, F. Attar (Tehran University) and I. Mehregan (Institut fuer Spezielle Botanik, Johannes Gutenberg-Universitat Mainz, Germany). The author has revised several sections of the genus in Iran including sections Spinuliferae, Rigidissimae, Myriotomae, and Pugioniferae Bunge. In this project several localities in Iran have been visited and herbarium specimens of TARI and TUH have been studied and named. In many cases images of type specimens were observed. Flora Iranica (Rechinger 1972 & 1979) was the main reference for the identification of the specimens. However, local Floras suitable for the identification of Iranian materials were studied (Cherneva 1962 and Huber-Morath 1975).
Also, original descriptions in many cases were used in identifications. The new species are referred to relevant sections based mainly on Flora Iranica account (Rechinger l. c.). However, delimitation of the sections seems to be somewhat artificial, therefore in this paper less attention is paid to the sectional circumscription of the new taxa based on the characters of the sections but rather to compare them with the closest affinities. Attar (2000), Attar & Ghahreman (2006), Attar, Ghahreman, Mahdigholi & Sheidai (2007), Mehregan (2008) and Mehregan & Kadereit (2008) have recently been revised parts of the genus. The herbarium specimens are preserved in TARI and TUH.

The aim of this paper is to describe four new species of the genus Cousinia in Iran.

Cousinia barezica Assadi, sp. nov. (Fig. 1).

Sect. Spinaliferae Rech. f.

Planta perennis, ca. 80 cm alta, foliis discoloribus. Caulis a medio ramosus, albus, nitidus, synflorescentia paniculato-ramoso. Folia basalia ca. 20 cm longa, spinis inclusis 4 cm latis, anguste lineari-lanceolata, marginie lobis alternativum magni et parvo usque ad 2/3 divisa, subtus arachnoideo-tomentosa, grisea, supra glabra, virideo-flava; loborum spinae 5-10 cm longae. Folia caulina infima foliis basibus similia sed breviora, amplexicaula, sursum apicem gradatim decrescentia. Capitula spinis inclusis 2.5-3 cm diametro; stipites capitulae aequantes vel longiores. Involucrum ca. 1.5 cm longum, spinis exclusis 1 cm diametro, cylindricum, sursum apicem vix attenuatum, arachnoideum. Phylla 47, inaequalia; exteriora breviora, patentia: phylla intermedia ca. 1.5 cm longa, subulata, marginie late membranacea, ciliata, apice spinis patentes, spinae marginalis 3-5 jugis; phylla intima 1.2 cm longa, lanceolata vel anguste oblanceolata, apice spinosa, marginie late membranacea et pubescentia, interdum purpurea. Flores ca. 20. Corolla 13 mm longa, palae or pale violet; tube 7-8 mm long; lobes ca. 3 mm long. Anther tube glabrous. Achene ca. 7 mm long, obpyramidal, cream with dark brown blotches, compressed, with indistinct lateral nerves; seta of pappus unequal, scabrous. Receptacular seta glabrous.

The new species belongs to the sect. Spinaliferae and more closely related to C. longifolia and C. sicigera, but it differs from both of them by having leaves discolor, glabrous above and densely arachnoid tomentose below (not glabrous on both sides). It also differs from C. longifolia by having capitula ca. 3 cm in diam. (not 6-9 cm), middle bracts ca. 1 cm long (not 3-4 cm) and amplexicaule stem leaves (not shortly decurrent), from C. sicigera by having spinulose involucral bracts (not spineless bracts).

Cousinia isfahanica Assadi, sp. nov. (Fig. 2).

Sect. Rigidissimae Rech. f.

Planta perennis, monocarpica, ca. 1.6 m alta, basi petiolis et rachidibus vetis emarcidis, parte arachnoideo-tomentosa. Caulis singulis, supra medium ramosus, glabrous, infra medium pilosus, synflorescentia paniculata. Folia basalia ca. 15 cm longa, 8 cm lata, pinnata; segmenta 40, ca. 20-50 cm longa, 1-2 mm lata, anguste linearia, apice spinosa, marginie revoluta, subtus arachnoideo-tomentosa alba, nervis distinctis, supra laxe arachnoideo-tomentosa, viridia. Folia caulina basalis simila sed minor, gradatim decrescentia. Capitula 10 mm diametro. Involucrum absque spinis 1.5 cm diametro, ovatum, sparsim arachnoideo-tomentosum. Phylla ca. 37, inaequalia; exteriora ca. 3.5 mm longa, ovata, apice spinosa; phylla intermedia ca. 12 mm longa, oblongo-ovata vel ovata, apice abrupte spinis ca. 3 mm longis terminata, patentia, recurvata, marginie scabra; phylla intima ca. 12 mm longa, truncata, marginie scabra vel ciliata, apice ligulata, brunnea. Floris 20. Corolla 9 mm longa, cremea; tubus 2 mm longus; lobi 2.5 mm longi.
Fig. 1. Cousinia barezica (× 0.8). Bracts (× 1.6); flower (× 2.4); achene (× 1.1).
Fig. 2. *Cousinia isfahanica* (× 0.58). Details (× 2.3).
Antherarum tubus dilute violaceous, glaber. Achaenia immatura 3 mm longa, obpyriformia, leviter compressa, nervis indistinctis; pappi setae achaenium aequantes, scabrae. Receptacula setae glabrae.

_Typsus_. Isfahan: Semirom, Vanak. 2250 m. 12.08.1987, Mozaffarian 62147 (holotypus TARI).

Plant perennial, monocarpic. ca. 1.6 m high, covered at base with old remnants of petiole and leaf rachis of basal leaves, partly covered by arachnoid hairs. Stem single, branched from the middle, making a broadly paniculate synflorescence, hairy below, glabrous above. Basal leaves ca. 15 cm long, 8 cm wide, pinnate; segments up to 20 in each side, ca. 20-50 cm long and 1-2 mm wide, narrowly linear, spiny at the apex, revolute at the margin, white arachnoid-tomentose below with a distinct nerve, green arachnoid-tomentose above, rachis revolute at the margin, with similar indumentum of segments. Stem leaves similar to the basal leaves, but smaller, gradually decrease in size, bract-like below the capitula. Capitula ca. 10 mm in diameter, often with long stalk much longer than the capitula length. Involucrum ca. 1.5 cm long, ca. 1 cm in diam., ovate, sparsely arachnoid tomentose, involucral bracts ca. 37, unequal; lower bracts ca. 3-5 mm long, ovate, spiny at the apex; middle bracts ca 12 mm long, oblong ovate or obovate, turned outwards, abruptly terminate to a 3 mm long spine at the apex, yellow green below, green above, scabrous at the margin; inner bracts ca. 12 mm long, oblong, truncate at the apex, scabrous to ciliate at the margin, pale with ligulate brown apex. Flowers 20. Corolla 9 mm long, cream in dry state; tube 2 mm long; terminal lobes 2.5 mm long. Anther tube pale violet, glabrous. Immature achene 3 mm long, obpyriform, nearly compressed, with indistinct nerves; pappus as long as the achene, yellow green above, green below, scabrous at the margin; wings

_Cousinia maassoumii_ Assadi, sp. nov. (Fig. 3).

Sect. _Pugioniferae_ Bunge

Planta perennis, monocarpa, 32-35 cm alta, arachnoido-tomentosa vel villosa, cinerescentia. Caulis singulis, a basi ramosus, synflorescentis paniculato-corymbosis, arachnoido-tomentosa vel basi villosa, cremeo-flava. Folia basalia usque ad 20 cm longa et 2 cm lata, anguste lanceolata, petiolata, margine usque ad medium lobata; lobi inaequales, lobi secundarii 1-3, minutis, spinis usque ad 5 mm longis terminates, subtus cinerescentes, dense arachnoido-tomentosi, supra sparsim arachnoidea, griseo-viridia. Folia caulina sursum apicem decrescentia, ad capitulum attingentes, continue decurrentia, margine lobata spinis 5 mm longis terminata. Capitula spinis inclusis 1.5 cm diametro. Involucrum 10-13 mm longum, spinis inclusis 7 mm diametro. Phylla 36, inaequalia; phylla exterior breviora, recurvata; phylla intermedia 1.5-1.8 cm longa, absque spinis lateralibus; phylla interna linearo-oblongeolata, ca. 1 cm longa, membranacea vel coriacea, apice breviter spinosa, hirsuta, erecta. Flores 33. Corolla 11 mm longa, violacea; tubus 3.5 mm longus; limbus 7.5 mm longus; laciniae 2.5 mm longae. Antherarum tubus violaceus, glaber. Achaenia 4 m longa, oblique obpyramidata, compressa, venis marginalibus 2 distinctis, venis lateralibus 2 indistinctis, basi attenuata, apice dentibus 4, transversaliter asperata; pappi setae achaenio vix breviora, scabrae. Receptacula setae glabrae.


Plant perennial, monocarpic, 32-35 cm high, hairy, arachnoid or villosa, greyish, with single stem. Stem branched from the base, with paniculate-corymbose synflorescence, arachnoid or villos at lower base, creamish-yellow. Basal leaves up to 20 cm long and 2 cm broad, narrowly lanceolate, petiolate, whitish densely arachnoid-tomentose below, less dense above, petiolate, lobed at the margin; lobes unequal, often with 1-3 secondary small lobes, terminated to 5 mm long spin. Stem leaves decreasing toward the apex, reaching to the capitula, continuously decurrent; wings

IRAN. J. BOT. 15 (1), 2009

M. Assadi 40
Fig. 3. *Cousinia maassoumii* (× 0.62). From left to right flower (× 1), inner bract (× 1.8), middle bract (× 1) and achene (× 3).
of stem ca. 5 mm wide, lobed at the margin; lobes terminating to 5 mm long spines. Capitula including spines 1.5 cm in diam. Involucre 1-1.3 cm long and excluding spines 0.7 cm wide, ovate, arachnoid. Involucral bracts ca. 36, unequal; outer bracts smaller and curved; middle bracts 1.5-1.8 cm long, subulate, ovate at the lower third, spiny above, without marginal spines; inner bracts 1 cm long, linear-oblanceolate, membranous to coriaceous, shortly spiny at the tip, covered by short hairs, erect. Flowers 33. Corolla 11 mm long, violet; tube 3.5 mm long; limb 7.5 mm long; lobes 2 mm long. Anther tube violet, glabrous. Achene 4 mm long, oblique obpyramidate, compressed, with 2 marginal and 2 indistinct lateral veins, transversally rugose, attenuate at base, with 4 teeth at the apex; bristles of pappus somewhat shorter than the achene, scabrous. Receptacular bristles smooth.

The new species with the following characters is included in the section Pugioniferae Bunge. Capitula small, middle bracts without marginal spines, flowers few, corolla 10 mm long, violet, receptacular bristles smooth, achenes small with longitudinal veins and bristles of pappus scabrous. It is most closely related to C. macroptera C. A. Mey. occurring only in Azerbaijan province, but differs from it by having narrow lanceolate leaves and greenish habit. In C. macroptera leaves are obovate or broadly elliptic and the habit of plant is grayish white.

**Cousinia pseudocandolleana** Assadi, sp. nov. (Fig. 4). Sect. *Myriotomae* Rech. f. Perennial, 27 cm high, many stemmed, with upright thick root, partly covered with dense or somewhat scattered indumentum. Stem branched above the middle, 3 mm in diam. at the base, glabrous, creamish white, bearing corymbose synflorescence. Basal leaves numerous, up to 7 cm long, 3-4 cm wide, pinnatisect; segments up to 6 pairs, 10-20 mm long and 2 mm wide, linear, shortly spiny at the tip, revolute at the margin, densely white tomentose on the lower side, greenish and less densely hairy above; rachis with ca. 2 mm wing along the margin, with similar indumentum of the leaf segments. Stem leaves gradually decreasing in size upwards, pinnatisect below, simple above with 1-2 pairs of spines at the base, bract-like in the synflorescence, with similar indumentum of basal leaves. Capitula with 1-10 cm peduncle, 8 mm in diam., ovate. Involucre 10 mm long, 8 mm in diam., glabrescent or sparsely arachnoid. Bracts 30-35, unequal, imbricate, with spiny hooded apex; lower bracts short, ovate; middle bracts ca. 7 mm long, ovate lanceolate, lanceolate or ob lanceolate, greenish; inner bracts ca. 10 mm long, linear-lanceolate, spiny at the apex, straw-colored. Flowers 15-25. Corolla 13 mm long, cream; tube 5 mm long; limb 8 mm long; lobes 2.5 mm long. Anther tube violet, 9 mm long with 2 mm tails at the base. Achene 3 mm long, obpyramidate, nearly flat, with 2 marginal and 2 lateral longitudinal veins, with 4 teeth at the apex. Style ca. 13 mm long, divided to 2 hairy branches ca. 2 mm long.

The species belongs to the sect. *Myriotomae* Rech. f. and most closely related to *C. candolleana* Jaub. & Spach but differs from it by having many stems ca. 27 cm long and 3 mm in diam. at the base (not single stemmed more than 100 cm long and 7-10 mm in diam. at the base), middle stem leaves simple with 1-2 pairs of spines at the base (not without spines). Moreover, *C. candolleana* is an endemic of Hamadan area, whereas *C. pseudocandolleana* is from NE. Iran at Khorasan province. *C. myriotoma* Rech. f. & Koeie should be another relative from Afghanistan, Heart. In fact, the type specimen of the new species was named *C. myriotoma* by Rechinger (1979). However, the new species differs from *C. myriotoma* more to all what mentioned for *C. candolleana* by having pinnatisect leaves (not bi- or tripinnatisect), corolla cream (not rose), receptacular bristles glabrous (not scabrous), involucral bracts deflexed and hooked (not only turned outwards) and etc.
Fig. 4. *Cousinia pseudocandolleiana* (× 0.63). Flower (× 6); bracts from right to left inner (× 2.4), middle and lower (× 3); achene (× 6.5).
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References
New Cousinia species

IRAN. JOURNAL. BOT. 15 (1), 2009