

A TAXONOMIC REVISION OF COUSINIA CASS. SECT. CHAETOCEPHALAE (ASTERACEAE)

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The series *Cousinia* sect. *Leptocephalae* ser. *Chaetocephalae* is raised to sectional rank as a comb. nov. It is characterized from the closely related section *Leptocephalae* by having solitary heads at the top of stems and branches, sessile stem leaves and yellow corolla. Three species namely *Cousinia crassipes*, *C. attariae* and *C. chaetocephala* are included in the new section. *C. attariae* is described as a new species from the mountains near Esfarayen in Khorasan province.

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بازنگری تاکسونومیک بخش جدید *Cousinia* sect. *Chaetocephalae* از تیره Asteraceae

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سری *Cousinia* sect. *Leptocephalae* ser. *Chaetocephalae* به سطح بخش با نام *Cousinia* sect. *Chaetocephalae* ارتقاء می‌یابد. این بخش با بخش نزدیک خود به نام sect. *Leptocephalae* با داشتن کپه منفرد در انتهای شاخه‌ها و ساقه‌ها، برگهای ساقه‌ای بدون کشیدگی در امتداد ساقه و جام گل زرد تشخیص داده می‌شود. از این بخش سه گونه *Cousinia crassipes*, *C. attariae*, *C. chaetocephala* تشخیص داده می‌شود. گونه *C. attariae* به عنوان گونه جدید از کوه‌های اسفراین در استان خراسان معرفی می‌شود.

INTRODUCTION

The genus *Cousinia* Cass. has recently been the subject of taxonomic studies for preparing *Cousinia* as a part of the project Flora of Iran by the author and his colleagues F. Attar from College of Science, University of Tehran (TUH) and I. Mehregan from Islamic Azad University (Assadi 1989). In the recent years many new species have been described by various authors (Attar & Ghahreman 2006; Mehregan & Kadereit 2008; Attar & Mirtadzadini 2009; Mehregan & Assadi 2009; Assadi 2009; Attar & Djavadi 2010). The number of species has been estimated from 600 to 700. However, great controversy is on the circumscription of the species and accordingly number of species (Attar & Ghahreman 2006 and Mehregan & Kadereit 2009). Delimitation of the genus in sectional level is another problem. However, due to lack of knowledge, less has been paid to sectional changes but this is the subject of controversy. In few cases, some species have been transferred from the other genera to *Cousinia*. Mehregan & Assadi (2009) transferred *Jurinea pungens* to the genus *Cousinia* in a newly described section *Argentae*, while describing the new species *C. kadereitii* Mehregan & Assadi in the same section.

Among the studied specimens, a specimen seemed to be interesting and not fitting to any of the known species. These specimens seemed to be affinities of *C. chaetocephala*. The present species was included in the series *Cousinia* sect. *Leptocephalae* Tschern. ser. *Chaetocephalae* Tschern. by Tscherneva (1962) in Flora of the USSR. Rechinger (1972) in Flora Iranica excluded *C. chaetocephala* from the sect. *Leptocephalae* and cited it as species of uncertain position.

The aim of this paper is to circumscribe sectional rank of *C. chaetocephala* and to revise the section and its contents taxonomically.

MATERIALS AND METHODS

Field trips were made to different places of Iran mainly also in the type localities from 1975 afterwards. The herbarium specimens of TARI and partly TUH herbarium were studied. Different Floras and taxonomic revisions were used for the identification of materials (Bunge 1865; Winkler 1892; Tscherneva 1962; Rechinger 1972; Rschinger 1979) Photographs of many type materials were prepared by my colleague I.

Mehregan from Islamic Azad University. Type materials of the new species are preserved in TARI.

RESULTS AND DISCUSSION

During the studies, it seemed *Cousinia* sect. *Leptocephalae* as described by Tscherneva (1962) is quite heterogeneous by having following characters: heads solitary or congested, ovoid or narrowly cylindrical; corolla pink, flesh colored or yellow; leaves sessile or long decurrent. Based on the variations of these characters Tscherneva (1962) divided the section into three series, i. e. ser. *Leptocephalae*, ser. *Hypopoliae* Tschern. and ser. *Chaetocephalae* Tschern. Among them ser. *Chaetocephalae* by having solitary heads, yellow corolla and sessile leaves clearly differs from the other two series and therefore comparing to the characters of the other sections of the genus needs to raise its rank to sectional level.

***Cousinia* sect. *Chaetocephalae* (Tschern.) ex Assadi, comb. nov.**

Syn.: *Cousinia* sect. *Leptocephalae* Tschern. ser. *Chaetocephalae* Tschern. in B. K. Schishkin and E. G. Bobrov Fl. U.S.S.R. 27: 151 (1962).

Differt a sectionis *Stenocephalae* Bge. capitulis ad apices ramis singularibus, foliis caulinis petiolatis, sessilibus vel amplexicaulis supermis deficientibus.

Typus. *Cousinia chaetocephala* Kult.

Plants perennial, woody at the base. Leaves leathery, spiny toothed or lobed at the margin, concolor or discolor; stem leaves amplexicaule or shortly decurrent. Capitula 1-4, single at the apex of branches, making a ±corymbose panicle, including spines 1-4 cm in diam.; lateral capitula exceeding the alar capitulum. Involucrum ovate, arachnoid. Bracts 70-120 in number, spiny at the apex; lower and middle bracts deflexed. Flowers 20-40. Corolla yellow. Anther tube purple, glabrous. Receptacle bristles smooth. Achene obpyramidate, flat, longitudinally ribbed, with or without apical teeth; seta of pappus scabrous.

1- Middle involucral bracts erect ca. 2 cm long. Capitula including spines 3-4 cm in diam. Basal leaves 14-22 cm. long; lobes with 1-2 pairs of teeth

1. *C. crassipes*

Middle and lower involucral bracts deflexed, up to 1.5 cm. long. Capitula including spines up to 2.5 mm in diam. Basal leaves smaller; lobes not as above 2

2- Basal leaves broadly elliptic, ca. 3-5 cm broad, rounded, nearly concolor on both surfaces. Capitula including spines 1.5-2.5 cm in diam.

2. *C. attariae*

Basal leaves narrowly elliptic, 1-3 cm broad, acute, discolor on both surfaces. Capitula including spines 1-1.5 cm in diam.

3. *C. chaetocephala*

1- *C. crassipes* Kult. Acta Univ. As. Med. Ser. 8 b (7): 2 (1929). Fig. 1.

Plant perennial. Stems 35-50 cm high, hairy. Basal leaves numerous; petioles 6-9 cm long; blades 8-13 cm long, 1.5-5 cm broad, lanceolate, lobed at the margin, densely hairy, green grey, concolor, rounded or truncate at the base; lobes with 4 mm long spines at the apex and 1-2 pairs of lateral teeth. Lower stem leaves similar to the basal leaves but smaller; middle and upper leaves decreased in size, amplexicaule or shortly decurrent, lanceolate or in upper part ovate cordate. Capitula including spines 3-4 cm in diam. Involucre 25 cm long, ovate, arachnoid. Involucral bracts 70; lower bracts shorter, spreading or reflexed, subulate-lanceolate; middle bracts ca. 2 cm long, subulate-linear, spiny at the apex; inner bracts shorter, narrowly oblanceolate, membranous, spiny at the apex, scabrous at the margin. Flowers 30-40. Corolla 16 mm long, yellow, with 5 mm long tube, 11 mm long limb and 4 mm long teeth. Anther tube purple and glabrous. Receptacular bristles entire. Achene ca. 5 mm long, obpyramidate, brown, longitudinally striate, without teeth at the apex. Bristles of the pappus scabrous, longer than the achenes.

Specimen seen. Khorasan: Kalate Naderi, Gharasou, 1450 m, Assadi & Mehregan 92013.

The type material of *C. crassipes* has not been studied by the author. The description of the collected specimens differs partly from the original description of *C. crassipes*, by having upright stems 40-55 cm high (not ascending ca. 20 cm high); lanceolate or narrowly elliptic leaves lobed at the margin (not ovate oblong sinuate pinnatifid) and 7-12 x 3-5 cm basal leaves (not 6 x 3.5). However, the specimens have been collected near the type locality and the differences could well be due to the variation of the species.

C. crassipes was described by Kultiassov (1929) under the section *Homalochaetae* C. Winkl. questionably. Rechinger (1972) regarded the species under the same section together with *C. czerniakowskiae* Kult. and *C. horrida* Kult. The section *Homalochaetae* is mainly a Central Asian section with the characters clearly different from *C. crassipes*. i. e. corolla pink. Therefore, *C. crassipes* is excluded from the section *Homalochaetae* and included in newly described sect. *Chaetocephalae*. Studies showed that *C. horrida* and *C. czerniakowskiae* should also be excluded from the sect. *Homalochaetae* (not published).

2- *Cousinia attariae* Assadi & Joharchi, sp. nov. Fig. 2.

Planta perennis, caulibus numerosis, basi indurati foliis numerosis, 34 cm alta. Synflorescentia 3-4 capitulata, corymbosa. Folia basalia cum petiolis 13 cm longis; laminae 5-7 cm longae, 3-4 cm latae, late ellipticae, margine spinoso-dentatae spinis ca. 4 mm longis, supra et



Fig. 1. *Cousinia crassipes* ($\times 0.58$); flower ($\times 12$).



Fig. 2. *Cousinia attariae* ($\times 0.5$); flower ($\times 1.5$).

subtus arachnoideae, canescenti-viridae, apice rotundatae, basi asymmetricae, nervis prominentibus; petioli ca. 5 cm longi; folia caulina inferiora foliis basalibus similis sed minora; folia media et superiora diminuta, amplexicaulia, cordata vel breviter usque ad 3 m decurrentia, gradatim evanescentia. Capitula singulares, pedunculis longis, spinis inclusis 1.5-2.5 cm diam. Involucrum ca. 2 cm longum, spina exclusa 1-1.5 cm diam., ovatum, dense arachnoideum. Phylla ca. 100-120, intima excepto arcuatim reflexa, apice spinis flavis 2-6 mm longis; phylla inferiora minora, subulata; phylla media ca. 15 mm longa, subulato-lineararia, extus carinata, intus canaliculata; phylla intima 17 mm longa, oblanceolata, membranacea, margine scabra. Flora ca. 30. Corolla 13 cm longa, tubo 5, limbo 9 et laciniis ca. 1.5 mm longis, flavis. Antherarum tubus purpureus, glaber. Receptaculi setae leaves. Achaenia ignota.

Typus. Khorasan, Esfarayen, Shahjahan mountain area, Sarcheshmeh village, 1700 m, Mozaffarian 48040 (holotypus TARI); SW Ghuchan, Khosravieh (Khorveh), N 37 14; E 50 01, 1500 m, 19.06.1985, Joharchi & Zangoee 13608; SW Ghuchan, between Bash-Mahalleh and Agh-Cheshmeh, 1950 m, Joharchi & Zangoee 13583 (a fragment).

The new species is related to *C. chaetocephala* Kult. but differs from it by having basal leaves broadly elliptic, 3-5 cm broad (not narrowly elliptic, 1-3 cm broad), rounded at the apex (not clearly discolor), capitula 3-4 together (not 1-2 rarely 3), including spines 1.5-2.5 cm diam. (not 1-1.5).

The new species is named in the honor of my colleague Dr. F. Attar from University of Tehran who has made a great contribution to the knowledge of *Cousinia* taxonomy.

3- *C. chaetocephala* Kult., Acta Univ. Asiae Mediae ser. 8b, Bot. no. 7: 3 (1929). Fig. 3.

Plant perennial, with numerous stems, woody at base with numerous basal leaves, 12-25 cm high. Stems cream, with woolly indumentum, ca. 2 mm in diam. at the base, branched from the middle. Capitula 1-3. Basal leaves including petioles 5-10 cm long; blade 4-7 cm long and 1-3 cm broad, narrowly elliptic, spiny toothed at the margin with ca. 5 mm long spines, on the lower side densely arachnoid, gray, on the upper side with less hairs, greenish gray, acute, asymmetric at the base; lower stem leaves similar to basal leaves; middle and upper leaves decreased in size, amplexicaule or shortly decurrent at base, ovate or lanceolate. Capitula including spines 1-1.5 cm in diam. Involucre 1.5 cm long and 0.8-1 cm in diam., ovate, densely arachnoid. Involucral bracts 80-100, arcuately deflexed, at the apex with ca. 3 mm spines; lower bracts smaller; middle bracts 10 mm long, subulate-linear, keeled on the dorsal surface, canaliculate on the inner surface; inner bracts 13 mm long, oblanceolate, membranous,

scabrous at the margin and on the back. Flowers 20-30 in number. Corolla 13 mm, tube ca. 4, limb ca. 9 and teeth ca. 2 mm long, yellow. Anther tube purple, glabrous. Receptacular bristles glabrous. Achene ca. 5 mm long longitudinally nerved with 4 unequal apical teeth, brown; bristles of pappus scabrous, equaling the achene.

Specimens seen. Khorasan: 16 km N. of Ghouchan, on the road to Darrehgaz, 1750-2000 m, Assadi & Maassoumi 21401; mountains N. of Ghuchan, above the village Zubaran (EG4), 1700 m, Assadi & Hamdi 85626; the same locality, Babakhanlou & Pabot 19874.

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Fig. 3. *Cousinia chaetocephala* ($\times 0.77$); flower ($\times 4$).