

NOTES ON THE TAXONOMY OF COUSINIA SECT. HAUSSKNECHTIANAE (ASTERACEAE; CARDUEAE)

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Taxonomy of *Cousinia* sect. *Hausknechtianae* is revised. The species belonging to this section have limited distribution in high mountainous areas of C, SW and W Iran, and NE Iraq. Due to their late flowering time and remote mountainous areas of distribution, they are poorly known. Thanks to the examination of extensive collections from Zagros mountain range in recent years, species of *C.* sect. *Hausknechtianae* are now better known. In this paper three new species, i.e. *C. komidjanensis* from C Iran, *C. curvibracteata* from SW Iran and *C. rawanduzensis* from NE Iraq are described as new to science. A short diagnosis, an English description and an image of holotypes for each of these three new species are given. According to the results, *C.* sect. *Hausknechtianae* includes overall eight species endemic to Iran and N Iraq. A synopsis of all species belonging to this section, an identification key to the species and a map of distribution of species are given. In addition, *C. hergtiana* is here lectotypified.

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Key words. *Cousinia* sect. *Hausknechtianae*, taxonomy, new species, Iran, biogeography.

(Asteraceae; Cardueae) Cousinia sect. Hausknechtianae شناسی مورد آرایه شناسی

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آرایه‌شناسی *Cousinia* sect. *Hausknechtianae* (Asteraceae; Cardueae) مورد بازنگری قرار گرفت. گونه‌های این بخشه پراکنش محدودی در مناطق مرتفع کوهستانی مرکز، جنوب غربی و غرب ایران و شمال شرقی عراق دارند. به دلیل موسم گلدهی دیر هنگام و پراکندگی آنها در مناطق دورافتاده کوهستانی، این گونه‌ها کمتر شناخته شده‌اند. به دلیل بررسی نمونه‌های گیاهی زیادی که در سال‌های اخیر از کوه‌های زاگرس جمع آوری شده است، گونه‌های این بخشه بهتر شناخته شده‌اند. در این مقاله سه گونه *C. komidjanensis* از مرکز ایران، *C. curvibracteata* از جنوب غربی ایران و *C. rawanduzensis* از شمال شرقی عراق به عنوان گونه‌های جدید به دنیای علم معرفی شده‌اند. برای هر یک از این گونه‌های جدید، توصیف و تصویر تپ ا ارائه شده است. بر اساس نتایج، این بخشه کلاً شامل هشت گونه انحصاری در ایران و شمال شرقی عراق است. لیست گونه‌ها، یک کلید شناسی و نقشه پراکنش برای تمامی آن‌ها ارائه شده است.

INTRODUCTION

The genus *Cousinia* Cass. with more than 600 species worldwide, is mainly centered in SW and C Asia (Rechinger 1986; Susanna & Garcia-Jacas 2006). Since the publication of Flora Iranica, no. 90 (Rechinger 1972) as the first major comprehensive treatment of *Cousinia* in Iran, taxonomy of the genus has been changed chiefly (López-Vinyallonga et al. 2009; Mehregan & Kadereit 2009; Assadi 2009, 2011). Thanks to the extensive collections of recent years from different parts of Iran, many new species have been published and the alpha taxonomy of the genus seems to be nearing an end.

As part of the project Flora of Iran (in Farsi) that will be published by the "Institute of Forests and Rangelands" in Tehran, the whole genus is being revised by different authors (Prof. M. Assadi of TARI, Dr. F. Attar of TUH and the author). I started to study of *Cousinia* sect. *Hausknechtianae* Rech. f. in Iran from 2003.

The section *Hausknechtianae* was first published as a monospecific section by Rechinger (1972). Assigning *C. raphiocephala* Rech. f. to the section *Hausknechtianae* by Rechinger (1972, 1979) was later confirmed by Mehregan et al. (2003). This section is characterized by being tall (stems more than 50 cm

high) subshrub or perennial plant, having rigid leathery leaves, simple or branched synflorescences with sessile, 15-60 flowered capitula, involucre with more than 80 phyllaries, smooth receptacular bristles, and rose to purple flowers (Rechinger 1972; Mehregan et al. 2003 & 2010). Mehregan et al. (2003) introduced *C. gatchsaranica* Mehregan, Assadi & Attar as a new species belonging to section *Haussknechtiana*. Recently, *C. karkasensis* Mehregan & Djavadi another species from the section was introduced from central Iran (Mehregan et al. 2010).

A brief look at above mentioned species revealed that those species are restricted to high mountainous regions of Iran, and usually would flower in late summer. Those species are perennials propagating directly via seeds. Direct seed dispersal in the section *Haussknechtiana* is in contrast to wind dispersal as tumbleweeds or by exozoochory that is common in taxa like *C. sect. Cynaroideae* Bunge. In the section *Cynaroideae* and some other taxa, capitula usually remain closed and attached to the plants after maturity, and the entire plants are dispersed by wind as tumbleweeds or by exozoochory (Mehregan & Kadereit 2008; Susanna & al. 2003). In absence of pappus in mature achenes of *Cousinia*, propagating as tumbleweeds or by exozoochory is a very effective method explaining wide distribution of some species. In all species belonging to the section *Haussknechtiana*, it was observed that stems with mature capitula attached on, remain inserted to the ground until the next vegetative season. Mature capitula open on the stems and only few achenes may have the chance of long distance dispersal. This dispersal limitation may explain the very narrow distribution of some species belonging to *C. sect. Haussknechtiana*.

In this paper I will clarify an enlarged concept of *C. sect. Haussknechtiana*, introducing three new species, give a synopsis of all species plus an identification key to all species belonging to.

MATERIAL AND METHODS

All herbarium material deposited in herbaria W, B, P, JE, K, E, IRAN and TARI (all abbreviations according to Thiers 2008+) were screened in searching for plant material belong to or match the description of *C. sect. Haussknechtiana* (sensu Mehregan et al. 2003). New collections were also made from mountainous localities in Iran. In case of unknown putative material, the classical morphological examinations were also associated with a molecular analysis using ITS data that reported in a previous study (Mehregan & Kadereit 2009).

RESULTS AND DISCUSSION

After study of all material mentioned above, five recently known species plus material belonging to three yet unknown species regarded to be members of *C. sect. Haussknechtiana*. All eight species are listed below and discussions regarding their taxonomy are presented below each taxon.

Cousinia* sect. *Haussknechtiana Rech. f., Fl. Iranica 90: 187 (1972) emend. Mehregan, Assadi & Attar in Willdenowia 33: 108 (2003).

Subshrub or perennial with tall stems. Basal leaves leathery, sinuate-lobate at margins, spiny. Synflorescence simple or branched. Capitula sessile, with 15-60 flowers, with more than 85 phyllaries; exterior and middle phyllaries aculeiform or subulate. Receptacular bristles smooth. Corolla rose or purple. Achenes compressed, irregularly spotted, longitudinally obscurely striated.

Type of section: *Cousinia haussknechtii* C. Winkl.

1. ***C. haussknechtii*** C. Winkl. in Trudy Imp. S.-Peterburgsk. Bot. Sada 12: 238 (1893).

Holotype: Iran, "In m. Schahu & Avroman", 7-8000 feet, Haussknecht 569 (G-BOIS; photo seen!; fragments in LE, fid. Bornmüller in Beih. Bot. Centralbl. 32, 2: 403-404, 1914).

Note.- Rechinger (1972) could not see the holotype in herbarium G-BOIS. He accepted the Bornmüller's findings on the type material of *C. haussknechtiana*.

Syn.: *C. serotina* Rech. f. in Anz. Math.-Nat. Kl. Osterr. Akad. Wiss. 101: 349 (1964).

Holotype: Iraq: Kurdistan, Sulaimaniya Distr., Ascent to Pir Mukurun Dagh, 1200-1400 m, 19.09.1933, Eig & Duvdevani 505 (W!; isotype HUI).

Illustration. – Fl. Iranica 90: tab. 92 (1972). Here: Fig. 1.

Distribution. – NE Iraq, W Iran (Fig. 7).

The species can be easily recognised by its discolor leaves, branched synflorescence and capitula with straight phyllaries.

Further specimens studied. – Iraq: Sulaimaniya, Piere Magrun, 5500 ft., 22.10.1960, Wheeler-Haines 1855 (E); same locality, 18.07.1961, Wheeler-Haines s. n. (E).

Iran: Kurdistan, Marivan, Gardaneh-Taghah, 1800-1900 m, 03.08.1987, Fattahi 1557 (TARI); Nusud to Marivan, between Nusud and Gardane Tate, around Dezave and Hanigarmale, ca. 2900 m, 27.07.1995 Mozaffarian 74831 (TARI); Lorestan, Alashtar, Dartang, Kuh-e Garrin (TT3, 48° 21' E, 33° 56' N), 2130-2800 m, 29.06.2005, Assadi & Mehregan 88882 (TARI); Kuh-i Gerru, near Nahavand, 02.08.1909, Strauss s. n. (B, JE).

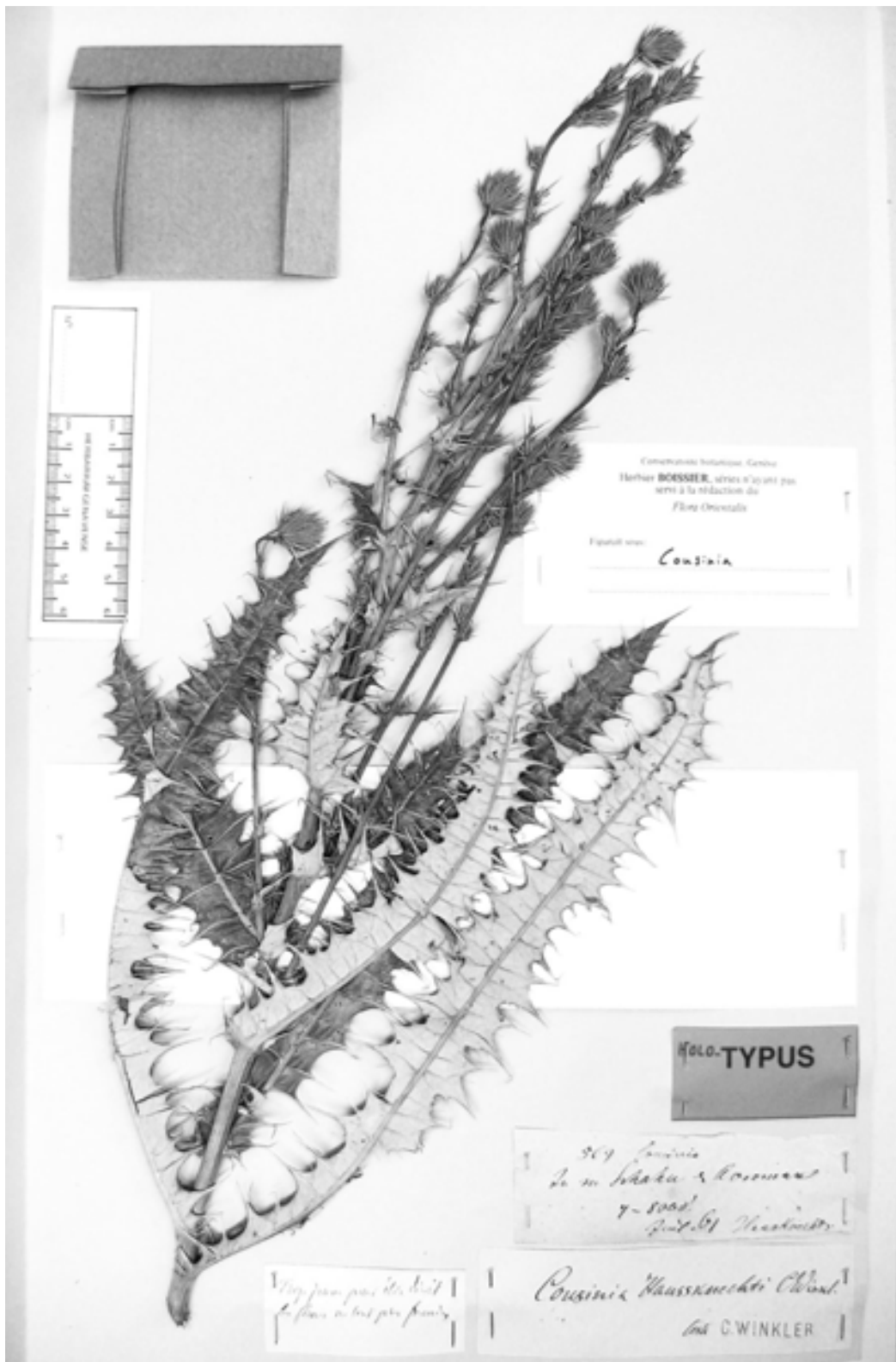


Fig. 1. Holotype of *Cousinia haussknechtii* (Haussknecht 569, G-BOIS)*

2. **C. hergtiana** Bornm. in Beih. Bot. Centrbl. 32, 2: 400 (1914).

Lectotype (designated here): Iran, "ad Dschek-ab inter Sultanabad et Kaschan, VI. 1903", Strauss, s. n. (B100088409, B!; isotypes JE!, "In monte Latetar, VII. 1897, Strauss, s. n., B100088410", B!).

Note. –The name was originally published based on the specimens from two different localities. A herbarium sheet in better condition (B100088409) is here selected as lectotype. The collection from the second locality in herbarium B as well as duplicates from both herbarium materials I observed in herbarium JE were selected as isolectotypes.

Illustration. – Fl. Iranica 90: tab. 164 (1972). Here: Fig. 2.

Distribution. – Endemic to C Iran (Fig. 7).

Cousinia hergtiana can be distinguished from other species by its concolorous, glabrous and shiny leaves, ivory white stems, and limited in number but large capitula with arcuately-recurved phyllaries.

Further specimens studied. – Iran: Arak, Mt. above the village Latedar, 2100-2600 m, 26.07.1995, Assadi 75073 (TARI); same locality, 2200-2650 m, 07.07.1985, Mozaffarian 63813 (TARI); between Sultanabad (Arak) and Kashan, mountainous valley near Dchekab, July 1903, Strauss 70 (B); Aligoudarz, Ashna Khowr, 2200-2700 m, 17.07.1969, Iranshahr 13464-E (IRAN, W).

3. **C. raphiocephala** Rech. f., Fl. Iranica 90: 319 (1972), emend. Mehregan, Assadi & Attar, Willdenowia 33: 111 (2003).

Holotype: Iran: Arak, 15 km NW Muteh, 110 km S Qom, 50° 43' E, 33° 41' N, 2200 m, 30.07.1971, Edmondson 806 (W!; isotype E!).

Illustration. – Fig. 3.

Distribution. – Endemic to C Iran (Fig. 7).

The species is characterized by concolorous, glabrous and shiny leaves, ivory white stems, usually unbranched synflorescence, and numerous capitula with straight phyllaries.

Further specimens studied. – Iran, Muteh protected region, 12 km NW Muteh, 2150 m, 18.11.2002, Mehregan 83247 (TARI; MJG); Between Qom and Kashan, 35 km from Kashan towards Qom, Sen Sen, Yahya-Abad, 1800 m, Batouli 76578 (TARI).

4. **C. gatchsaranica** Mehregan, Assadi & Attar, in Willdenowia 33: 108 (2003).

Holotype: Iran, Kohgilouieh and Boyer Ahmad Province, Gatchsaran, Mt. Khaami, N slopes, above Tol Tchegah, 2000-2100 m, 09.08.2002, Mehregan 83246 (TARI!; isotypes B!, TUH!).

Illustration. – Willdenowia 33: 109 (2003).

Distribution. – Endemic to SW Iran (Fig. 7), endemic.

Cousinia gatchsaranica is characterized by having concolorous, glabrous and shiny leaves, branched synflorescences, and capitula with arcuate to spreading phyllaries.

Further specimens studied. –Iran: Khuzistan, Dehdez, Gharoun mt, from Ab-s-valleys, 1000-1500 m, 17.05.1996, Mozaffarian 74497 (TARI); Kohgilouieh and Boyer Ahmad, 50 km E of Dehdasht, Nile Mt., 2400-3200 m, 21.07.1983, Assadi and Abuhamzeh 46504 (TARI).

5. **C. karkasensis** Mehregan & Djavadi, in Iranian J. Bot. 16: 200 (2010).

Holotype: Iran: Esfahan: Natanz, Tameh village, Mt. Karkas, 2300 m, 10.08.2003, Mehregan 96022 (TARI!; isotypes IRAN!, MJG!).

Illustration. – Iranian J. Bot. 16: 201 (2010).

Distribution. – Endemic to C Iran, Karkas Mts. (Fig. 7).

The species can be distinguished by its cocolorous glabrous leaves, white stems, branched synflorescence, and capitula with 130-160 arcuate-spreading phyllaries and 40-60 flowers.

Further specimens studied. Esfahan, Natanz, Targh, Keshe village, Karkas Mt., 33° 26' N, 51° 47' E, Pahlevani & Bahramishad 54856 (IRAN); same locality, 2900-3500 m, 26.07.2009, Pahlevani & Bahramishad 54750 (IRAN).

6. **C. komidjanensis** Mehregan, *sp. nov.* Fig. 4.

Holotype: Iran, NNW Arak, Komijan towards Vafs, Mt. Ghalanjeh, 2500 m, 01.07.2002, Mehregan 96021 (TARI!; isotypes MJG!, IAUH!, B!).

Perennis. Caulis 100 usque ultra 150 cm altus, crassus, erectus, eburneus, tenuiter sulcato-striatus, in duabus tertiis partibus inferiore foliatus; synflorescentia simplicia. Folia omnia rigida, coriacea, discoloria, superne glabra, subtus tomentosa. Capitula singularia, ca. 50-flora. Involucrum ovato-campanulatum; phylla 100-120; phylla exteriora et intermedia lineari-subulata, erecta. Receptaculi setae leaves. Corolla rosea, 16-18 mm longa. Antherarum tubus purpureus, glaber.

Description. Perennial, with glabrous, ivory white, erect, upright, thick, slightly furrowed, leafy, and unbranched stems, 100-150 cm or more high. Leaves leathery, discolorous, green above and white-tomentose beneath, deeply spiny-lobed at margins, with white prominent pinnate veins; basal and lower stem leaves up to 20x5 cm, linear-lanceolate, sessile, with spreading lobes, ending to tough, up to 12 mm long spines; middle and upper stem leaves similar to basal ones, but gradually decreasing upwards, sessile, lanceolate to ovate-lanceolate, with large lobes; upper



Fig. 2. Image of *Cousinia hergtiana* (Assadi 75073, TARI).



Fig. 3. Isotype of *Cousinia raphiocephala* (Edmondson 806, E).

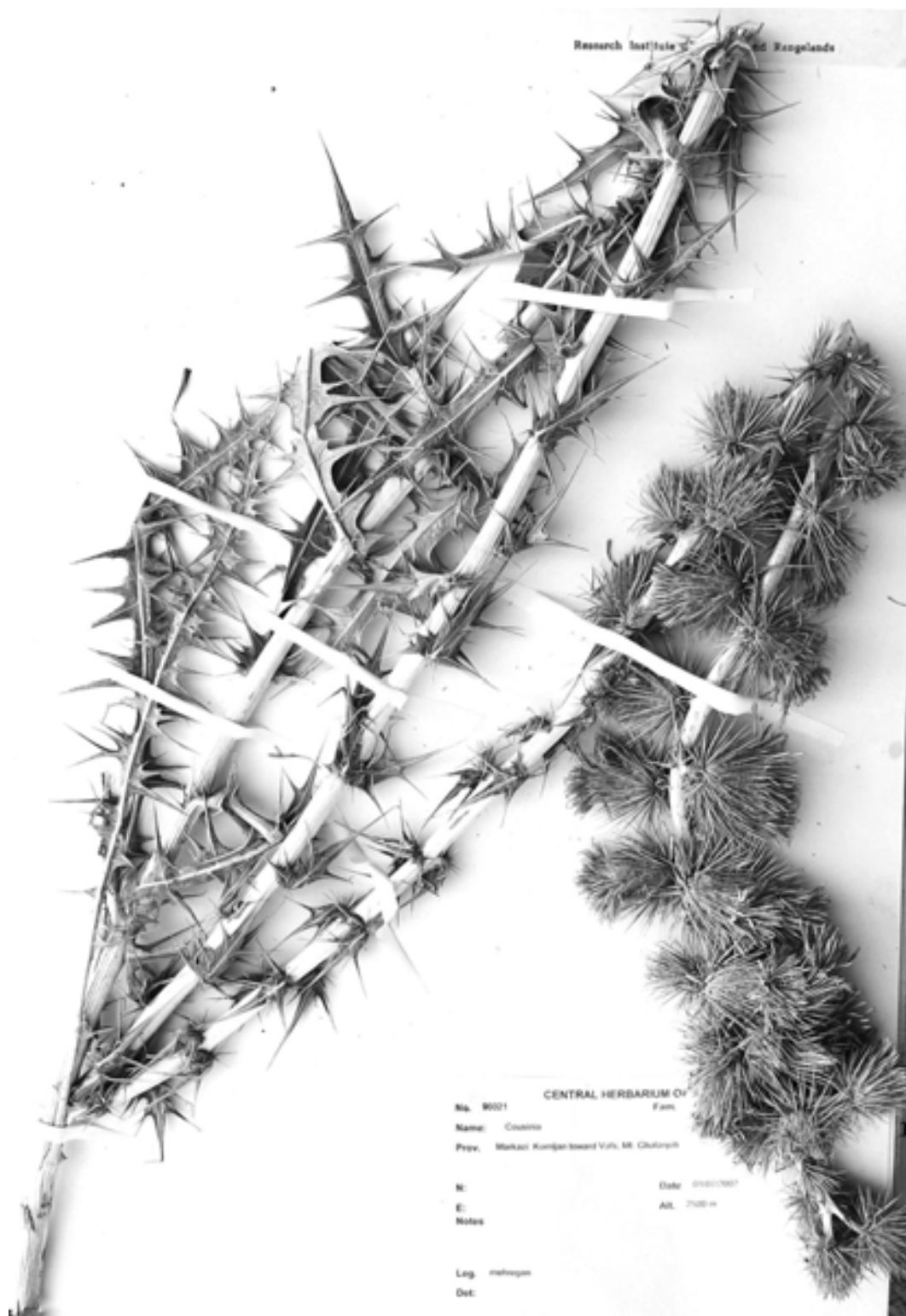


Fig. 4. Holotype of *Cousinia komidjanensis* (Mehregan 96021, TARI).

leaves very reduced, usually ovate-acuminate. Capitula singular, arranged in form of a spike, slightly arachnoid, ca. 10 mm in diameter without phyllaries, ca. 25 mm with phyllaries, ovate-campanulate, ca. 20 mm long, with 100-120 yellowish brown phyllaries, with ca. 50 flowers; outer and middle phyllaries linear-subulate, 1-1.5 mm width, straight, ending to a spine; inner phyllaries linear, membranaceous and acuminate at apex. Receptacular bristles smooth. Flowers purple, 16-18 mm long, with tube slightly shorter than limb; anthers purple. Achenes ca. 5 mm long, ca. 2 mm wide, compressed, narrowly ovate, brown, irregularly darkly spotted, longitudinally obscurely striated.

Further specimens studied. Iran: Arak, Komijan, Vafs, Mt. Ghalanjeh, 2600 m, Moussavi, Eskandari 31763 (IRAN, MJG).

Etymology. The specific epithet refers to the city of Komidjan, NNW of Arak where the type material of new species was collected.

Distribution and ecology. – *Cousinia komidjanensis* is an endemic species to central Iran, known only from Mt Ghalanjeh N of Komidjan (province Markazi, Fig. 7). It was found on stony slopes.

Relationship and delimitation. *Cousinia komidjanensis* is characterized by having unbranched, thick ivory white stems, discolorous leaves, and heads with straight linear-subulate phyllaries. As the most prominent character, only one of species belonging to *C.* sect. *Hausknechtianae*, i.e. *C. raphiocephala* has unbranched stems. *C. komidjanensis* can be distinguished from it by its lanceolate concolorous (not narrow lanceolate and discolorous) leaves, capitula with 100-120 (not 160-200) phyllaries, and ca. 50 (not 25-30) flowers.

7. *C. curvibracteata* Mehregan, **sp. nov.** Fig. 5.

Holotype: Bakhtiari, Darreh Bazoft, Kuh-e Keynou close to Leb, 2150-2400 m, 12.08.1986, Mozaffarian 58019 (TARI!; isotype TARI!).

Perennis, pluricaulis, collo residuis petiolorum comoso. Caulis erectus, usque 100 cm altus, pallidus. Folia basalia petiolo usque ad 4 cm longo suffulta, usque 25 × 4.5 cm, ambitu lineari-lanceolata, sinuato-lobata, in spinas validas vulnerantes excurrentibus, discoloria, supra viridia, subtus glabra. Synflorescentia inferne simplex, superne stricte ramosa. Capitula omnino sessilia, spinis inclusis 16-18 mm diametro, 15-25-flora; involucrem absque spinis 14-16 × 7-9 mm, oblongum vel ovatum. Phylla involucri 80-95, extima et media lineari-subulata, arcuato-recurvata vel patentia, rigida, pungentia. Setae receptaculi laeves. Corolla purpurea, 14-16 mm longa. Tubus antherarum purpureus.

Description. Perennial, subshrub. Root collars with remains of petioles of fallen leaves. Stems up to 100

cm high, glandular, becoming glabrous, yellowish white, erect, upright, slightly furrowed, leafy, racemecorymbously branched at upper half. Leaves leathery, discolorous, green and usually glabrous above, white-tomentose beneath, shallow spreading spiny-lobed at margins, with white prominent pinnate-reticulate veins; basal leaves up to 25×4.5 cm, linear-lanceolate, attenuating at base into up to 4 cm long petioles, with spreading lobes, ending to tough, up to 6 mm spines; lower and middle stem leaves similar to basal ones, but decreasing upwards, sessile, lanceolate to ovate-lanceolate, cordate at base; upper leaves very reduced, usually ovate-acuminate. Synflorescence simple below, branched above. Capitula singular, arachnoid, glandular, becoming glabrous, 7-9 mm in diameter without phyllaries, 16-18 mm with phyllaries, ovate to oblong, 14-16 mm long, with 80-95 yellowish brown phyllaries, with 15-25 flowers; outer and middle phyllaries linear-subulate, 1-1.5 mm wide, spreading-arcuate to recurved, ending to a spine; inner phyllaries linear-lanceolate, membranaceous, very finely serrate and acute at apex. Receptacular bristles smooth. Corolla purple, 13-15.5 mm long, with tube slightly shorter than limb; anthers purple. Achenes 5-6 mm long, 2.5-3 mm wide, compressed, narrowly obovate, round or truncate at apex, attenuate below, grey-brown, irregularly darkly spotted, longitudinally obscurely striated.

Further specimen studied. – Iran: Luristan, Aligoudarz towards Boznawid, Darreh Absefid, 2030-2400 m, 16.09.1996, Mozaffarian 77168 (TARI).

Etymology. The specific epithet refers to the curved form of phyllaries.

Distribution and ecology. – *Cousinia curvibracteata* is an endemic species to SW Iran, grows on the stony slopes of Zagros Mts. (Fig. 7).

Relationship and delimitation. – The new species is related to *C. gatchsaranica*, but differs from it mainly by having discolorous leaves (not concolorous) and heads with smaller involucre (7-9 × 14-16 mm vers. 9-10 × 15-20 mm of *C. gatchsaranica*).

8. *C. rawanduzensis* Mehregan, **sp. nov.** Fig. 6.

Syn.: *C. leptolepis* (Bornm. & Gauba) Rech. f. sensu Rechinger, Fl. Iranica 90: 111 (1972) p. p.

Note. Herbarium material belonging to the new species were formerly misidentified by Rechinger (1972) sub *C. leptolepis*, a narrow endemic from C Elburz in N Iran (for more details see below).

Holotype: Iraq: Erbil (Kurdistan), Mons Helgurd ad confines Persiae, ca. 36° 40' N, 44° 50' E, in valle supra pagum Nowanda, ca. 2000-2600 m, 10.-14.08.1957, Rechinger 11347 (11347 –I, W!; isotypes E!, K!, 11347-II (basal leaves only), W!).



Fig. 5. Holotype of *Cousinia curvibracteata* (Mozaffarian 58019, TARI).



Fig. 6. Holotype of *Cousinia rawanduzensis* (Rechinger 11347-I, W).

Perennis, collo residuis petiolorum comoso. Caulis erectus, usque 100 cm altus, pallidus, glabrescens. Folia basalia petiolo usque ad 5 cm longo suffulta, usque 35 × 10 cm, ambitu lanceolata vel oblanceolata, irregulariter spinoso-sinuato-lobata, cocoloria, supra et subtus glabra. Synflorescentia stricte ramosa. Capitula omnino sessilia, spinis inclusis 17-22 mm diametro, 30-50-flora; involucrium absque spinis 15-24 × 14-17 mm, oblongum vel ovatum. Phylla 90-100, extima et media linearo-subulata, erecta, rigida, pungentia. Setae receptaculi laeves. Corolla purpurea vel rosea, 14-16 mm longa. Antherarum tubus purpureus.

Description. Perennial, subshrub. Root collars with remains of petioles of fallen leaves. Stems up to 100 cm high, glandular, becoming glabrous, yellowish white, erect, upright, slightly furrowed, leafy, corymbosely and paniculately branching above. Leaves leathery, concolorous, green, glabrous and minutely glandular on both surfaces, irregularly spiny-lobed at margins, with white prominent pinnate-reticulate veins; basal leaves up to 35x10 cm, lanceolate or oblanceolate, attenuating at base into up to 5 cm long petioles, with lobes ending to tough, up to 10 mm spines; lower and middle stem leaves similar to basal ones, but gradually decreasing upwards, sessile, attenuate at base, lanceolate to ovate-lanceolate, cordate or up to 3 cm decurrent at base; upper leaves reduced, usually ovate-acuminate to triangular. Capitula singular, arachnoid, glandular, becoming glabrous, 14-17 mm in diameter without phyllaries, 17-22 mm with phyllaries, ovate to oblong, 15-24 mm long, with 90-100 yellowish brown, usually purple tinged phyllaries, with 30-50 flowers; outer and middle phyllaries linear-subulate, 1-1.5 mm width, spreading to straight, ending to a spine; inner phyllaries linear-lanceolate, membranaceous and acuminate at apex. Receptacular bristles smooth. Corolla purple or pink, 15-20 mm long, with tube shorter than limb; anthers purple or pink. Achenes ca. 6 mm long, 2.5-3 mm wide, compressed, narrowly obovate, round or truncate at apex, attenuate below, brown, irregularly darkly spotted, longitudinally obscurely striate.

Further specimens studied. – Iraq: Erbil: Hisar-i Rost (NE Rawanduz, near Persian territory), 200-2400 m, 17.05.1956, Guest & Husham 15814 (K); Chiya-i Manau, near Walza, 6000-7000 ft., 19.09.1932, Guest 2735 (K); Road track from Bardanas to Qandil range, 2500 m, 29.08.1957, Rawi & Serhang 24620 (K); Serin Mt., on the road to Qandil, 1820-2380 m, 30.07.1957, Rawi & Serhang 24010 (K); "ArlGird" Algurd Dagh, 1900-2500 m, 23.08.1948, Gillett 12470 (K); Montes Qandil ad confines Persiae, ca. 36° 30' N, 45° E, in decliv. arid. supra Pushtashan, ca. 1800-2200 m, 28.07.-01.08.1957, Rechinger 11109 (W).

Etymology. The specific epithet refers to the city of Rawanduz in NE Iraq, where the type material was collected.

Distribution and ecology. – *Cousinia rawanduzensis* is an endemic species to NE Iraq, in mountains near the border with Iran (Fig. 7). It grows in high rocky mountain slopes in the thorn-cushion zone.

Relationship and delimitation. – Specimens belonging to this species were mistakenly identified as *C. leptolepis* (*C. sect. Sphaerocephalae* Bunge), an endemic to central Elburz in N Iran. Apart from the morphological differences, two species can be separated by their habit and biogeography. Species of the section *Sphaerocephalae* are mainly monocarpic, though *C. sect. Hausknechtianae* consists of mainly perennial species. All species of *C. sect. Sphaerocephalae* are restricted to Elburz mountain ranges in N Iran while *C. rawanduzensis* is restricted to a limited area in NE Iraq (Fig. 7).

In addition, a sample from the holotype of the new species (sub "*C. sp. 11347*") was analyzed along with the material of *C. leptolepis* (collected from Tehran, Karadj, Kuh Dashteh, S slopes, 2200 m, 09.2003, Mehregan 111, deposited at MJG & TARI) in a previous molecular study (Mehregan & Kadereit 2009). Though all species belonging to the section *Sphaerocephalae* formed a monophyletic group with high posterior probability of 1.00, the new species showed no close relationship with them.

The new species is related to *C. hausknechtii*, but differs from it mainly by its concolorous (not discolorous) leaves.

Key to the species of the *Cousinia* sect. *Hausknechtianae*

1. Leaves concolorous; green and glabrous on both surfaces 2
 - Leaves discolorous; green above and white-tomentose beneath 6
2. Capitula limited in number (4-7). Involucrium 15-20 mm in diameter without phyllaries, with 150-200 phyllaries and ca. 50 flowers **C. hergtiana**
 - Plant without above combination of characters 3
3. Middle involucral bracts straight 4
 - Middle involucral bracts arcuate or recurved 5
4. Stems shiny ivory white, glabrous
 - C. raphiocephala**
 - Stems straw colored, glandulose **C. rawanduzensis**
5. Capitula with more than 130 phyllaries and more than 40 flowers **C. karkasensis**
 - Capitula with less than 115 phyllaries and less than 25 flowers **C. gatchsaranica**

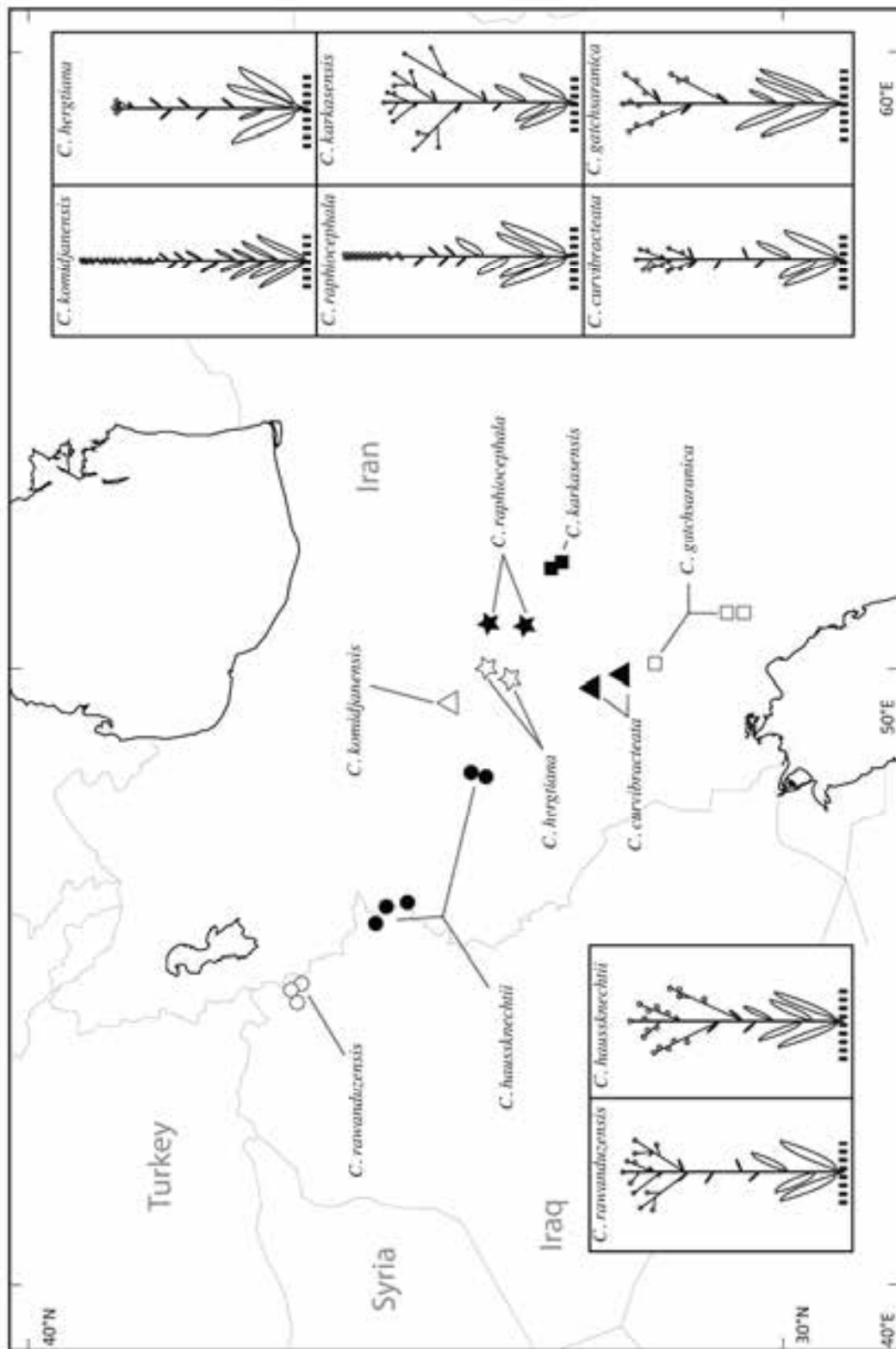


Fig. 7. Map of distribution, and schematic habit of species belonging to *Cousinia* sect. *Haussknechtianae*.

6. Stem unbranched. Capitula with ca. 50 flowers
C. komidjanensis
 - Stem branched above. Capitula with 30 flowers or less 7
 7. Involucrum 7-9 mm in diameter without phyllaries; phyllaries arcuate or recurved **C. curvibracteata**
 - Involucrum 15-20 mm in diameter without phyllaries; phyllaries straight **C. haussknechtii**

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