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Research Paper

***Centaurea mesopotamica* (Asteraceae, Cardueae), A New Record for the Flora of Iran**

Kazem Negaresh * 

Assistant Professor, Department of Horticultural Science, Faculty of Agriculture, Agricultural Sciences and Natural Resources
University of Khuzestan, Mollasani, Iran
negaresh@asnrkh.ac.ir

Abstract

The genus *Centaurea* s. l. is one of the largest genera of the family Asteraceae that includes 400-700 species in the world. Due to taxonomic confusions, this genus has recently been divided into four genera: *Centaurea* s. str., *Rhaponticoides*, *Psephellus*, and *Cyanus*. In Iran, the genus includes 112 species in 31 sections, of which 51 are endemic. For taxonomic study of *Centaurea* sect. *Mesocentron*, extensive collection of distribution areas of *C.* sect. *Mesocentron* was conducted in SW Iran. Plant specimens were collected by conventional methods and identified based on reliable sources. As observations, *C. mesopotamica* is reported as a new record from the flora of Iran. It is easily distinguished from the other species of *C.* sect. *Mesocentron* in Iran by having sessile main stem and not decurrent cauline leaves. In addition, a note about the previous typifications of *C. mesopotamica* is presented. Finally, a key identification to all species of *C.* sect. *Mesocentron* in Iran is presented.

Keywords: *Centaurea*, New Record, Khuzestan, Taxonomy.

1. Introduction

Centaurea L. s. l. is one of the largest genera of the family Asteraceae. It is a taxonomically difficult genus and comprises 400-700 species (Wagenitz, 1975; Dittrich, 1977; Bremer, 1994; Wagenitz & Hellwig, 1996). *Centaurea* s. l. is considered as a non-monophyletic genus, and recent approaches have separated it into more natural genera, namely *Centaurea* s. str., *Cyanus* Mill., *Psephellus* Cass. and *Rhaponticoides* Vaill. (Wagenitz & Hellwig, 2000; Greuter, 2003; Hellwig, 2004). It is mainly distributed in Europe, the Mediterranean region, and SW Asia, with some introductions in other more or less distant regions (López et al., 2011). *Centaurea* is the second largest genus in the family Asteraceae in Iran (Negaresh, 2018), so that currently, it is represented by 112 species in 31 sections (Wagenitz, 1980; Ghahremaninejad et al., 2012; Ranjbar & Negaresh, 2013a, 2013b, 2014; Hilpold et al., 2014; Negaresh et al., 2014; Negaresh & Rahiminejad, 2014, 2015, 2018), of which 51 are endemic, so the endemism rate is about 45%. *Centaurea* sect. *Mesocentron* (Cass.) DC. is one of the smallest sections of the genus in Iran. In Flora Iranica (Wagenitz, 1980) it was represented by 3 species, of which 2 taxa, *C. solstitialis* L. subsp. *solstitialis* and *C. pseudosinaica* Czerep. are found in Iran. With the report *C. mesopotamica* Bornm. as a new record for the flora of Iran, the number of *C.* sect. *Mesocentron* species in Iran increases to three.

2. Materials and methods

During my field studies in SW Iran, specimens belonging to *Centaurea* sect. *Mesocentron* were collected and identified using Flora Iranica (Wagenitz, 1980) and other relevant taxonomic literature (e.g. Wagenitz, 1975, 2006, 2019). In addition, numerous sheets from the herbaria BASU, B, BM, C, CAS, E, FUMH, G, GOET, HKK, HLS, HKS, HUI, JE, K, LD, LE, M, P, PH, PR, S, US, W and WU were examined. All vegetative and floral parts were measured in a dry state and some parts were observed and measured under a stereo microscope.

3. Results and discussion

*Corresponding author

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Centaurea mesopotamica Bornm., Beih. Bot. Centralbl. 20, 2: 170 (1906). [Figures 1 and 2.](#)

Type: Syria. Him: Palmyra, inter Hith et Assah el Deir, 1 May 1894, *Strauss s.n.* (holotype: JE00025626!).

Description: Annual plant, with a very short main axis (terminal capitulum sessile or with a peduncle to 4 cm tall) and several prostrate to ascending basal branches, whole plant usually green; branches 5-25(-30) cm long, simple or branched, with 2-4 (rarely more) capitula, densely covered with arachnoid-tomentose, mixed with short hirsute hairs. Leaves thin; basal leaves petiolate, lyrate or pinnatilobed, lanceolate in outline, 4-12 × 1-2 cm, mostly dentate, acute at apex, sparsely covered with short hirsute hairs; cauline leaves simple, sessile, narrowly lanceolate or linear, 1-3 × 0.3-0.5 cm, distinctly dentate, mucronate at apex, densely covered with arachnoid-hirsute and sessile gland hairs, the upper ones shorter than capitula. Involucres ovoid, 12-15 × 8-10(-12) mm. Phyllaries multiseriate, herbaceous, imbricate, yellowish-green, covered with densely tomentose hairs. Appendages concealing part of phyllaries only, pale purple or pale brown or straw-coloured, ending in a spine (6-)10-20(-25) mm long with 2-3(-4) pairs of lateral spinules 2-4 mm long in lower part. Flowers whitish or creamy in vivo, yellowish in sicco; central florets hermaphroditic, 12-13 mm long, corolla 5-5.5 mm long, 5-lobed, with orange nerves, stigma exerted from corolla up to 2 mm, branches of style spreading; peripheral florets sterile, inconspicuous, finely dissected, not radiant, shorter than central ones, 4-lobed, limb lobe filiform, ca. 3 mm long. Achenes oblong, glabrous, 2-2.5 mm long, 0.8-1 mm wide; insertion areole lateral, small, ca. 0.3 mm long. Pappus persistent, multiseriate, scabrous, whitish, 2.5-4 mm long, bristles of inner rows very shorter than others.



Figure 1. *Centaurea mesopotamica* in the field of Iran (photo provided by the author). A and B: habit. Scale bars: A and B = 10 cm.

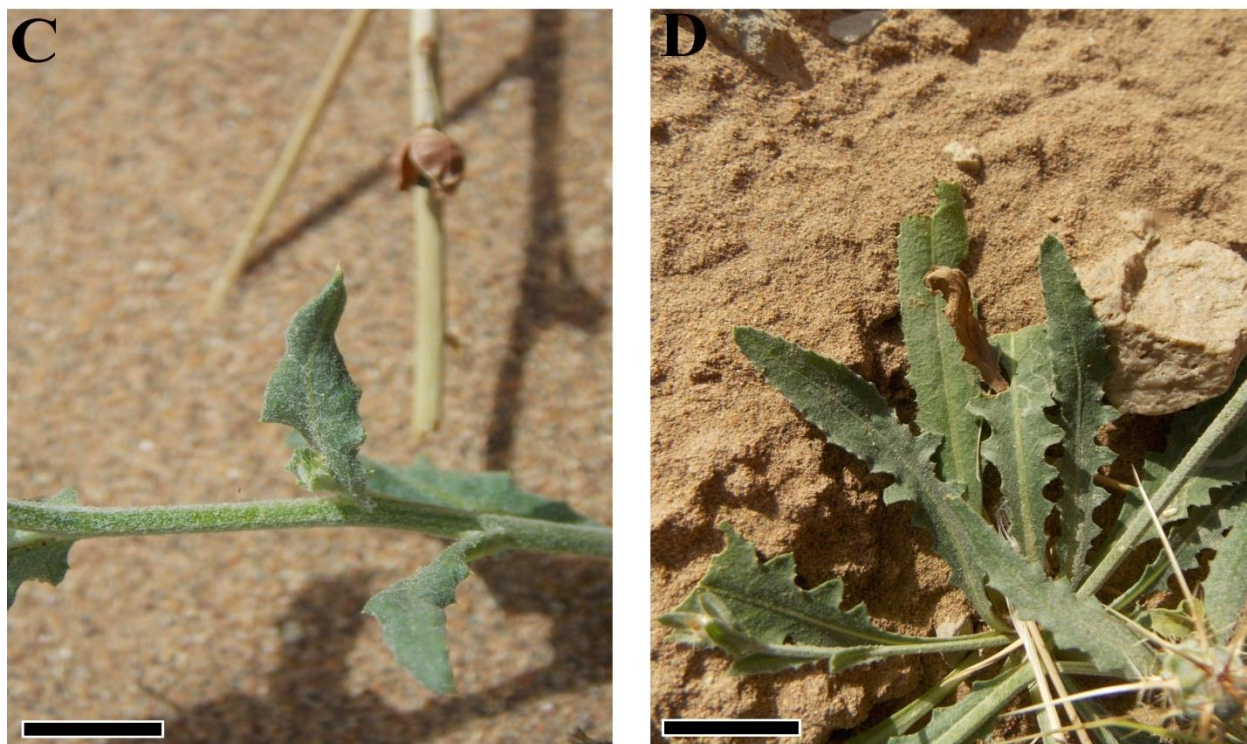
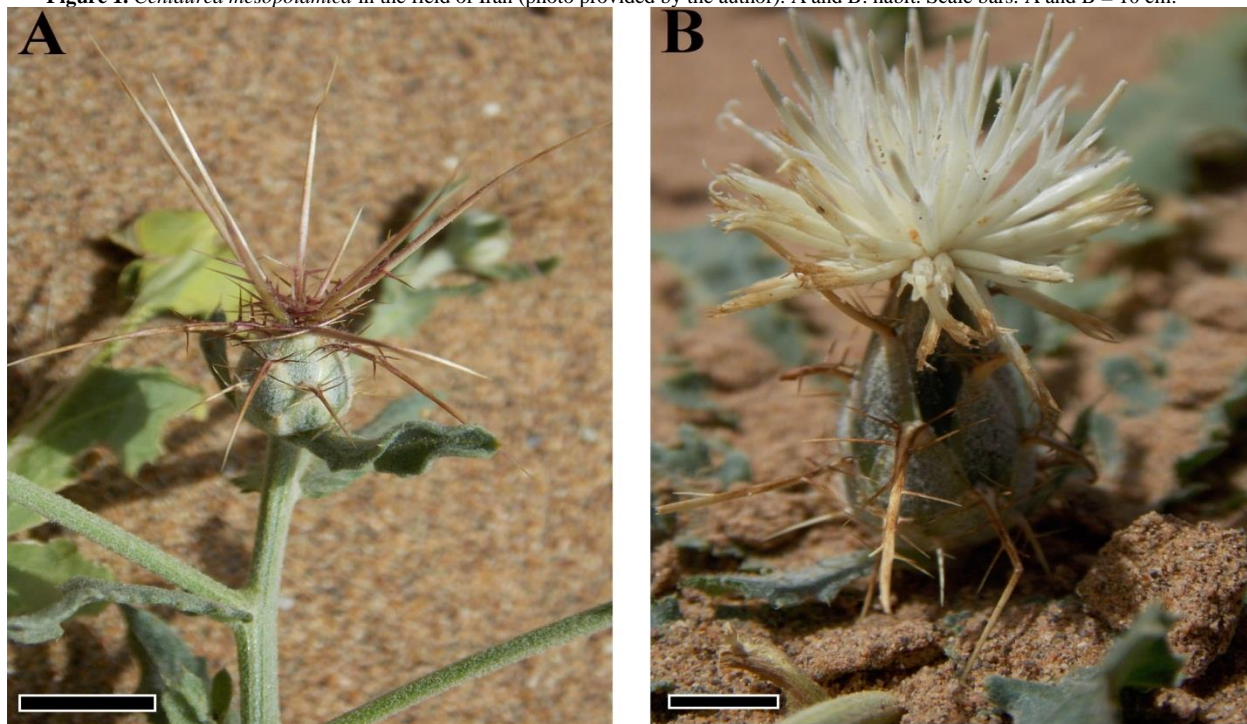


Figure 2. *Centaurea mesopotamica*. A: close up of involucre; B: close up of capitulum; C: cauline leaf; D: basal leaves. Scale bars: A = 5 cm, B = 5 mm, C and D = 2 cm.

Specimens examined: Iran. Khuzestan province: Bostan, NW Bostan, 10 km after Bostan, Mish Dagh mountains, Tang-e Allaho Akbar, 31° 46' 50.40" N, 48° 7' 35.80" E, 55-80 mm, 9 April 2025, *Negaresh et al. 912* (KHAU!); *Negaresh et al. 913* (KHAU!); *Negaresh et al. 921* (KHAU!).

Nomenclatural note: Bornmüller (1906) in the protologue of *Centaurea mesopotamica* cited “in planitie fluvii Euphrat inter Hith

et Anah et inter Deir et Palmyra; 1 et 10. V. 1904., Strauss". In *Flora Iranica*, Wagenitz (1980) cited "Typus (syntypi): In planitie fluvii Euphrat inter Hith er Anah et inter Deir et Pdmyra", 1. et 10. V. 1904, Strauss, JE!". In his account, Wagenitz (2006) mentioned "Type: Syria. inter Hith et Anah et inter Deir-Palmyra, I.V.1894, Th. Strauss (holotype?, JE)". Pertaining to the type specification provided in the protologue, one specimen was traced at herbarium JE (JE00025626) that handwritten "Him: Palmyra, inter Hith et Assah el Deir, 1 May 1894, Strauss". Since there is only one specimen of *Strauss* at the herbarium JE, it must be recognized as the holotype (Figure 3).



Figure 3. Holotype of *Centaurea mesopotamica* deposited at JE.



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Distribution, habitat and ecology: *Centaurea mesopotamica* makes a new record to Iran (Figs. 1 and 2). It is generally occurs in Iraq, Jordan, Syria, Kuwait and Saudi Arabia (Wagenitz, 2019). *Centaurea mesopotamica* grows primarily in the desert or dry shrubland biome and occasional in the alluvial plain, at elevations of 50-650 m (Figure 4). In addition, some other plants that occurred with the species are *Carduus getulus* Pomel, *Centaurea bruguieriana* (DC.) Hand.-Mazz. subsp. *belangeriana* (DC.) Bornm., *Launaea mucronata* (Frossk.) Musch. subsp. *mucronata*, *Leontodon laciniatus* (Betrol.) Widder ex Bornm., *Notobasis syriaca* (L.) Cass., *Prosopis juliflora* (Swartz) DC., *Trigonella stellata* Frossk., *Pennisetum divisum* (J.F.Gmel.) Henrard, *Hordeum marinum* Huds., *Bromus madritensis* L. var. *madritensis*, *Teucrium oliverianum* Ging. ex Benth., *Plantago ciliata* Desf., *Aegilops umbellulata* Zhuk., *Calligonum intertextum* Rech. f. & Schiman-Czeika, *Emex spinous* (L.) Campd., *Atriplex leucoclada* Boiss., *Bassia hyssopifolia* (Pall.) Kuntze, *Cornulaca monacantha* Delile, *Halocharis sulphurea* (Moq.) Moq., *Hammada salicornica* (Moq.) Iljin, *Salicornia inermis* Forssk., *Salicornia lachnantha* (Botsch.) Botsch., *Suaeda acuminata* (C. A. Mey.) Moq.



Figure 4. Habitats of *Centaurea mesopotamica* in Iran.

Taxonomic remarks: *Centaurea mesopotamica* belongs to *C.* sect. *Mesocentron*, which includes taxa with annual habit, usually copiously branched with numerous small to medium-sized capitula, decurrent cauline leaves, ovoid involucre, phyllaries ending to spine with basal or lateral spinules, often yellow flowers and small achenes (Wagenitz, 1975, 1980). In Flora Iranica (Wagenitz, 1980), *C.* sect. *Mesocentron* encompasses three species, of which two taxa, *C. solstitialis* subsp. *solstitialis* and *C. pseudosinaica* are found in Iran. *Centaurea mesopotamica* is distinguished from both species by having sessile main stem and not decurrent cauline leaves.

Key to the species of *C.* sect. *Mesocentron* in Iran

1. Plant with a very short main axis (terminal capitulum sessile or with a peduncle to 4 cm tall) and several prostrate to ascending basal branches; cauline leaves not decurrent *C. mesopotamica*
 - Plant with elongated main stem, branched from near base or middle part; cauline leaves decurrent 2
2. Habit taller, 15-80 cm height; stem and leaves indumentum tomentose; cauline leaves decurrent into narrow entire wings; achenes 2-3 mm long *C. solstitialis* subsp. *solstitialis*
 - Habit shorter, up to 30 cm height; stem and leaves indumentum puberulous; cauline leaves decurrent with dentate wings; achenes 3-3.5 mm long *C. pseudosinaica*

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