



**A new record for the flora of Turkey: *Carduus transcaspicus* Gand. subsp. *macrocephalus* (Arènes) Kazmi**

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**Abstract**

Distribution of *Carduus transcaspicus* Gand. subsp. *macrocephalus* (Arènes) Kazmi in Turkey is determined. Differences between *C. transcaspicus* subsp. *macrocephalus* and relatives are discussed. In addition, description, localities, distribution map and key of allied species are given.

**Key words:** compositae, morphology, new record, revision, taxonomy

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**Türkiye florası için yeni bir kayıt: *Carduus transcaspicus* Gand. subsp. *macrocephalus* (Arènes) Kazmi**

**Özet**

*Carduus transcaspicus* Gand. subsp. *macrocephalus* (Arènes) Kazmi'nin Türkiye'deki yayılışı belirlenmiştir. *Carduus transcaspicus* subsp. *macrocephalus* ile yakın akraba türleri arasındaki farklılıkları tartışılmıştır. Ayrıca, betimi, lokaliteleri, yayılış haritası ve akraba türleri ile ayırım anahtarları verilmiştir.

**Anahtar kelimeler:** compositae, morfoloji, revizyon, taksonomi, yeni kayıt

**1. Introduction**

The genus *Carduus* L. is annual to perennial and spiny member of *Asteraceae* (tribe: *Cardueae*), including ca. 90 species distributed in Eurasia (mainly in the Mediterranean region), Northern Africa, West Asia and introduced in America and Australia (Tamamschian, 1963; Davis, 1975; Kadereit and Jeffrey, 2007).

The most recent revisionary study on *Carduus* species grown in Turkey was carried out by Davis (1975) for the Flora of Turkey. In Flora of Turkey, 16 species (28 taxa) of which 4 (9 taxa) are endemic to Turkey and 4 doubtfully recorded species were given. The members of the genus were established as 16 species (27 taxa) in the checklist of Turkish *Carduus* species, by Arabacı (2012).

After the Flora of Turkey and supplements, a number of taxa belonging to different genera have been recorded for the flora of Turkey (Doğan and Duran, 2010; Dönmez and Uğurlu, 2010; Öner et al., 2010). The comprehensive revisionary study on the Turkish *Carduus* species was performed by the authors since 2008. During the field studies carried out in the year 2012, some interesting specimens were collected from Van province, in Turkey (Figure 1). The specimens could not be identified using the Flora of Turkey and its supplements (Davis, 1975; Davis et al., 1988; Güner et al., 2000). Hence, the records in the floras of neighbouring countries and other relevant literature were examined (Boissier, 1875; Hayek and Markgraf, 1931; Tamamschian, 1963; Kazmi, 1964; Franco, 1976; Rechinger, 1979; Greuter, 2006-2009; Arabacı, 2012). In addition, the specimens were compared with the *Carduus* specimens deposited in B, E, EGE, G, ISTE, ISTF, K, KNYA, LE, VANF, W and WU herbaria. After all throughout studies we have concluded that these specimens belong to *Carduus transcaspicus* Gand. subsp. *macrocephalus* (Arènes) Kazmi. Differences between this newly recorded taxon and relatives are discussed. In addition, description, localities, distribution map and key of allied species are given. Collected plant materials were deposited in the Herbarium of İnönü University (INU), in Malatya.

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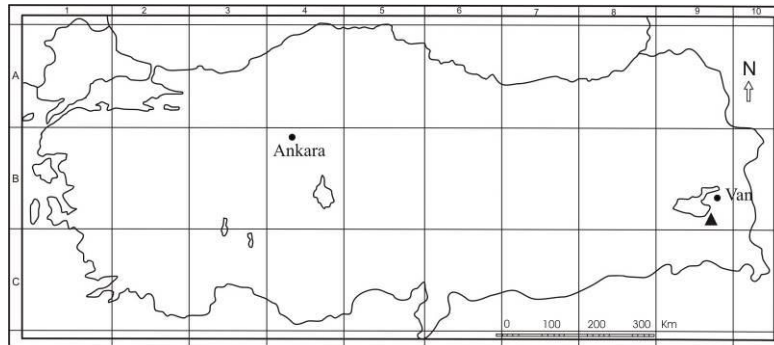


Figure 1. Distribution of *Carduus transcaspicus* subsp. *macrocephalus* (▲) in Turkey

*Carduus transcaspicus* Gand. in Bull. Soc. Bot. France 65:37 (1918) (Figures 1 and 2).

Syn.: *C. nigrescens* Vill. subsp. *hamulosus* (Ehrh.) Arènes var. *persicus* Arènes, in Mém. Mus. Nat. Hist. Nat. Paris Nouv. Sér. 24: 203 (1949).

**subsp. *macrocephalus*** (Arènes) Kazmi, in Mitt. Bot. Staatssamml. München 5: 405 (1964). Proposed Turkish name / **çengelli kangal**.

Syn.: *C. nigrescens* Vill. subsp. *hamulosus* (Ehrh.) Arènes var. *macrocephalus* Arènes, in Mém. Mus. Nat. Hist. Nat. Paris Nouv. Sér. 24: 302 (1949).

*C. uncinatus* M. Bieb. subsp. *transcaspicus* Rech. f., in Ann. Naturh. Mus. Wien 54: 15 (1944) non *C. transcaspicus* Gandog.



Figure 2. *Carduus transcaspicus* subsp. *macrocephalus*. A – habit, B – median cauline leaf, C – capitulum

**Type:** *Persia borealis* (Iran). *jugi Elbursensis* in reg. subalpine, in valle Lur ad pagum Getschesär, c. 2200 m, 18.vi.1902, J. & A. Bornmüller 7288 (holotype G photo!; isotype P, W!).

Perennial. Stem 50-100 cm, erect to ascending, narrowly winged in middle, branched almost from base, ribbed-sulcate, subglabrous below, sparsely arachnoid above. Basal leaves 18-23 × 2-4 cm (including 5-8 cm petiole), linear in outline, pinnately lobed, lobes oblong to broadly triangular, obtuse, with apical spine up to 1.5 mm, subglabrous above, sparsely arachnoid beneath; cauline leaves diminishing from base to inflorescence, median cauline leaves 10-15 × 1.5-4 cm, oblong to linear in outline, pinnatisect to 1/2 to 4/5, lobes 5-7 pairs, oblong to ovate-triangular, subacute, spine weak, up to 2.5 mm, subglabrous above, sparsely arachnoid beneath; peduncles 5-15(-20) cm long, white tomentose, narrowly winged below, unarmed and leafless above. Capitula solitary, 2.5-4 × 3-5 cm. Involucres 1.5-2.5 × 2-3.5 cm, subglobose, umbilicate; phyllaries 8-10 seriate; outer 5-9 × 0.5-1 mm, linear-lanceolate, recurved in distal 1/2, with 0.8-1 mm apical spine, sparsely arachnoid; median 10-15 × 1.5-2 mm, narrowly ovate to lanceolate, abruptly narrowed into uncinately recurved prolongation in distal 1/2, with c. 1 mm apical spine, glabrous; inner 18-22 × 1-1.3 mm, linear, patent to flexuous at the apex, with 0.5 mm apical spine, glabrous. Corolla purple, 18-22 mm, unequally 5 lobed to 1/4-1/3, shorter lobes 4-5 mm, longer lobes 6-7 mm; style 9-11 mm, exerted or not, shortly bilobed; filaments 2-2.5 mm, hairy, anthers 6-7 mm, acute. Achenes 3-5 × 1.5-2 mm, oblong, yellowish-brown, slightly asymmetric, compressed, umbo c. 0.4 mm, ring stramineous, narrow. Pappus 12-17 mm, scabrous, whitish.

Flowering and fruiting period from June-July.

**Distribution in Turkey:** B9 Van. 4 km from Gevaş to Van, 1640 m, grassland, 05.vii.2012, T.Arabacı 2745 & S.Köstekci (INU!).

**General distribution:** Iran.

Three *Carduus* taxa grown in Turkey are closely relatives by habit, leaf spines (weak and short less than 3 mm) and involucre characteristics. A species key of this group, in which the most useful characters are considered, is given below:

1. All phyllaries adpressed ..... *C. adpressus*
1. Outer and median phyllaries recurved at least at apex
  2. Biennial; outer and median phyllaries recurved towards apex ..... *C. hamulosus*
  2. Perennial: outer and median phyllaries abruptly narrowed into uncinately recurved prolongation in distal 1/2 ..... *C. transcaspicus* subsp. *macrocephalus*.

#### 4. Conclusions

*Carduus transcaspicus* s.l., *C. hamulosus* s.l., and *C. uncinatus* s.l. are problematic species complex of the genus *Carduus*. There are some treatments on the taxonomy of this group (Tamamschian, 1963; Kazmi, 1964; Franco, 1976; Rechinger, 1979). These three species differ in terms of hairiness of stem, leaves, involucre, shape and size of phyllaries. *C. transcaspicus* subsp. *macrocephalus* is similar to *C. hamulosus* but it is easily distinguished from *C. hamulosus* by its median phyllaries that uncinately recurved in distal 1/2 (not recurved at apex). It differs from *C. uncinatus* by its perennial habit (not biennial), subglabrous leaf upper surface (not hairy-pubescent-arachnoid) and subglabrous involucre (not arachnoid) (Table 1).

Table 1. Comparison of diagnostic characters used to distinguish new species and allied taxa

Species	<i>C. transcaspicus</i> subsp. <i>transcaspicus</i>	<i>C. transcaspicus</i> subsp. <i>macrocephalus</i>	<i>C. hamulosus</i> s.l.	<i>C. uncinatus</i> s.l.
Habit	perennial	perennial	biennial	biennial
Stem	50-100 cm, arachnoid below, densely white tomentose above	50-100 cm, subglabrous below, sparsely arachnoid above	20-60(-100) cm, sparsely arachnoid	up to 100 cm, white tomentose
Leaves	glabrous-pilose-sparsely arachnoid above, densely arachnoid beneath	subglabrous above, sparsely arachnoid beneath	sparsely hairy above, grey-tomentellous below	arachnoid-hairy-pubescent above, tomentose below
Involucre	sparsely or densely arachnoid	glabrous or sparsely arachnoid	subglabrous	arachnoid
Median phyllaries	sometimes ± widely divaricates or ± subrecurved	abruptly narrowed into uncinately recurved prolongation in distal 1/2	recurved towards apex	uncinately recurved in distal 1/2
Capitula (cm)	2.5-4 × 3-5	2.5-4 × 3-5	2-4 × 2.5-5	2-3 × 2.5-4
Corolla (mm)	19-22	18-22	16-25	21-23
Achene (mm)	30-40	30-50	30-40	20-40
Papus (mm)	14-17	12-17	11-17	10-14

*Carduus uncinatus* was given as doubtful record with three specimens in Flora of Turkey (Davis, 1975). One of these specimens was recorded from Kırklareli by Hermann. But no Turkish material has been seen by Davis and the authors. Detailed field studies performed in Thrace, but the distribution of *C. uncinatus* in this locality could not be confirmed. The other specimens collected by *Huet* from Erzurum and *Hewitt* (565) from Ağrı were examined by Davis and indicated as a somewhat intermediate specimen between *C. hamulosus* Ehrh. and *C. uncinatus*. After our investigations based on the photo of *Hewitt* (565), we have concluded that this specimen is a variant of *C. hamulosus*.

The main differences between *C. transcaspicus* subsp. *transcaspicus* and subsp. *macrocephalus* are seen in plant indumentum and phyllaries shape. *C. transcaspicus* subsp. *macrocephalus* differs from subsp. *transcaspicus* by its glabrous to sparsely arachnoid stem, leaves and involucrel phyllaries. Further, its median phyllaries abruptly narrowed into uncinately recurved prolongation in distal 1/2 whereas in subsp. *transcaspicus* median phyllaries are sometimes  $\pm$  widely divaricates or  $\pm$  subrecurved (Table 1). The specimens collected from Turkey are quite similar to subsp. *macrocephalus*. Thus, the distribution of *C. transcaspicus* subsp. *macrocephalus* in Turkey is firstly recorded by this study.

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#### Appendices

##### Additional specimens examined

*Carduus hamulosus* Ehrh. – Turkey: Ağrı North of Doğubeyazit, 5300 ft., mixed pastures, 03.vi.1971, *Hewitt* 565 (E photo); A9 Kars: 14 km from Kars to Selim, 1700 m, 16.vii.2007, T.Arabacı 2593-b (INU).

*C. hamulosus* subsp. *hystrix* (C. A. Mey.) Kazmi: – in pratis siccis montium Talüş (Talysh), 105-150 m, *C.A.Meyer* (type: LE photo); B9 Van: 83 km from Doğubayazit to Van, 1900 m, 28.vi.2008, B.Yıldız & T.Arabacı 2679 (INU); B10 Iğdır: Ağrı Mountain, Korhan plateau, 2150 m, 13.viii.2007, T.Arabacı 2604 & T.Dirmenci (INU).

*C. transcaspicus* subsp. *macrocephalus* – Iran: In montibus inter Budjnürd et Morawe Tappeh, 25-27. vii.1937, *K.H.Rechinger* 1905 (type of *C. uncinatus* M.Bieb subsp. *transcaspicus* Rech.f.: W).

*C. transcaspicus* Gand. subsp. *transcaspicus* – Iran: Iter transcaspico-persicum. Regio transcaspica, Kisil-Arwat, Karakala, in pratis subalpinis montis Snndsodagh, 18.05.1901, *P. Sintenis* 1734 (type: G photo, W).

*C. uncinatus* M.Bieb: – Caucasus (type: LE photo).

*C. uncinatus* subsp. *davisii* Kazmi – Crimea: Distr. Yalta, above Nikita, 350 m, limestone quarry, 02.06.1959, *Davis* 33329 (type: K photo).

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