

Centaurea sennikoviana (Asteraceae, Cardueae), a new species from central Anatolia, Turkey

Kazem Negaresh¹, Zafer Kaya² & Mohammad Reza Rahiminejad^{1,*}

¹) Department of Biology, University of Isfahan, P.O. Box 81746-73441, Isfahan, Iran
(*corresponding author's e-mail: mrr@sci.ui.ac.ir)

²) Bartın University, Faculty of Forestry, 74100 Bartın, Turkey

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Centaurea sennikoviana Negaresh & Kaya *sp. nova* (Asteraceae) is described and illustrated from Niğde Province, central Turkey. The characters that distinguish it from the morphologically closest species are elaborated upon.

Centaurea s. lato (Cardueae, Asteraceae) with some 400–700 species, depending on the taxonomic treatment, is the largest genus in the subtribe Centaureinae (Wagenitz 1975, Bremer 1994, Wagenitz & Hellwig 1996, Hellwig 2004, Garcia-Jacas *et al.* 2006, Susanna & Garcia-Jacas 2007). The main distinguishing characters of *Centaurea* are the presence of scarious appendages on phyllaries, lateral areole at achene insertion, and sterile peripheral florets lacking staminodes (Dittrich 1968, Wagenitz & Hellwig 1996). *Centaurea* is well represented in the Mediterranean and Irano-Turanian floras (Wagenitz & Hellwig 1996, Hellwig 2004, Susanna & Garcia-Jacas 2009, López *et al.* 2011). Considering the area of its distribution along with the high number of species assigned to it, the taxonomic delineation of *Centaurea* has been obscure. Currently it is clear that the traditional *Centaurea* was polyphyletic, and it has been divided into the putatively monophyletic genera *Centaurea s. stricto*, *Rhaponticoides*, *Psephellus* and *Cyanus* (Wagenitz & Hellwig 2000, Greuter 2003, Hellwig 2004, Susanna & Garcia-Jacas 2007, 2009).

According to Wagenitz's (1975) treatment in *The Flora of Turkey*, *Centaurea* comprises 33 sections, of which sect. *Cynaroides* with 16 species is mostly restricted to small areas in this country. During our recent revision of herbarium sheets of sect. *Cynaroides* deposited in ISTE, we found specimens that resembled *C. aladaghensis* and *C. amanicola*, yet differed in certain morphological characters. After a thorough examination of relevant taxonomic literature (Wagenitz 1960, 1975, 1980, 2006, Ranjbar *et al.* 2012, 2013, Ranjbar & Negaresh 2014a, 2014b, Negaresh *et al.* 2014, Negaresh & Rahiminejad 2014) and comparison with numerous specimens deposited in 28 herbaria (*see Acknowledgements*), and a field expedition by the second author, we concluded that those specimens represent a new species.

***Centaurea sennikoviana* Negaresh & Kaya, *sp. nova* (Fig. 1)**

HOLOTYPE: Turkey. C5 Niğde: Çamardı, Nazmılı, high plateau foot, (without collector) 495 (holotype ISTE; isotype HUI!).

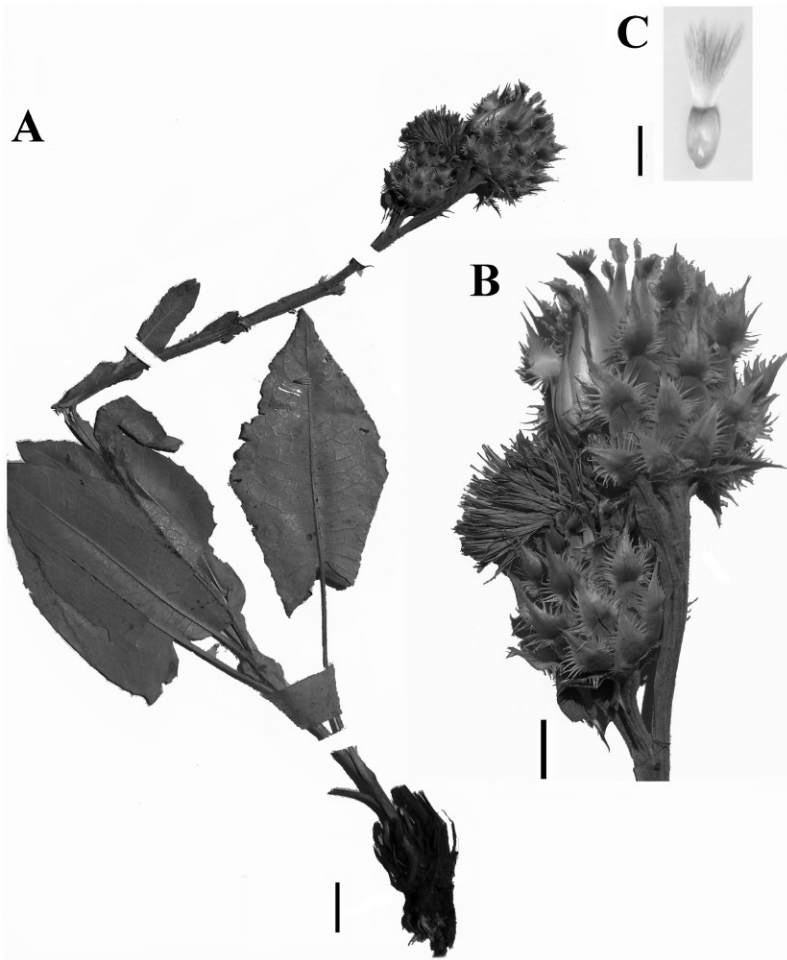


Fig. 1. *Centaurea sennikoviana* (holotype). — **A:** Habit. — **B:** Capitula. — **C:** Achene with pappus. Scale bars: **A** = 2 cm, **B** = 1 cm, **C** = 5 mm.

ETYMOLOGY: The specific epithet honours Dr. Alexander Sennikov, who is curator at the Botanical Museum, Finnish Museum of Natural History and has worked on various genera of the Asteraceae and Rosaceae for a long time.

Biennial plants, ca. 45 cm tall; collum with fibrous remnants of petioles from previous year. Stem erect, simple, ca. 3 mm in diam. at base, cylindrical, with thin yellowish striations, sparsely leafy throughout, lower part $\pm$ densely covered with stiff hairs up to 3 mm long, median part covered by arachnoid hairs mixed with scattered stiff hairs, upper part densely covered with arachnoid hairs. Leaves rigid, loosely covered with stiff and septate hairs, densely so on midrib, up to 1 mm long. Basal and lower cauline leaves petiolate, $16\text{--}24 \times 6\text{--}7$ cm, cordate, acute at apex, margins entire, sometimes remotely denticulate. Median cauline leaves petiolate or sessile,

simple, triangular-lanceolate or subpandurate, $10\text{--}13 \times 3.5\text{--}5.5$ cm, decurrent, up to 3 cm long, or with basal auricles, acute or subacuminate at apex, margins entire or remotely denticulate. Upper cauline leaves sessile, simple, $2\text{--}6 \times 0.5\text{--}2$ cm, narrowly oblong or linear, loosely covered with arachnoid hairs, acuminate or mucronate at apex, broadly decurrent, up to 5 cm long, margins entire, rarely remotely denticulate. Capitula few, 2 to 4, arranged in racemes, with short peduncles (1–2 cm long). Involucres ovoid-cupuliform, $25\text{--}35 \times 22\text{--}32\text{--}(35)$ mm. Phyllaries multiseriate, yellow-greenish when dry, imbricate, coriaceous-scarious, densely short-floccose, especially in margins; appendages small, concealing part of phyllaries only, triangular, chartaceous or membranous, pale brown; cilia 10–14 on each side, 2–3 mm long, membranous and whitish;

spine 2–5 cm long, slightly longer than adjacent cilia. Outer phyllaries broadly oblong, 3–5 × ca. 5 mm; appendages 4–5 × 4–8 mm (including cilia and spine), narrowly decurrent. Median phyllaries broadly ovate, 7–10 × 7–8 mm; appendages 7–10 × 10–12 mm (including cilia and spine). Inner phyllaries oblong-linear, 15–20 × 3–7 mm; appendages lacerate or pectinate, 4–6 × 3–7 mm. Flowers pink; central florets hermaphrodite, 25–30 mm long, corolla ca. 18 mm long, 5-lobed, lobes 5–6 mm long, with purple nerves; peripheral florets sterile, finely dissected, not radiant, 4–5-lobed, limb lobes filiform, 5–6 mm long. Achenes oblong, 6–7 mm long, 2.5–3 mm wide, smooth, pale brown or whitish, rounded at apex, glabrescent, insertion areole lateral, 0.8–1 mm long. Pappus double, persistent, multiseriate, scabrous, whitish; outer 8–9 mm long; inner shorter, 4–5 mm long.

Centaurea sennikoviana is a rare endemic in central Turkey and known only from the high plateau between Çamardı and Nazmılı in Niğde Province. The central Anatolia region is botanically interesting, as it includes the Irano-Turanian phytogeographical region and is very rich in local endemic plants (Wagenitz 1960, 1975, Akman *et al.* 2011, Koçyiğit & Bona 2013). Recently many new species were described from this region, such as *Hypericum sechmenii* (Ocak *et al.* 2009), *Hesperis turkmendaghensis* (Duran & Ocak 2005), *Verbascum eskisehirensis* (Karavelioğulları *et al.* 2009), *Scorzonera tuzgoluensis* (Dogan *et al.* 2011), and *Pseudodelphinium turcicum* (Vural *et al.* 2012). *Centaurea sennikoviana* belongs to section *Cynaroides*, which includes taxa that often have racemose or dichasial synflorescences, decurrent upper cauline leaves, ovoid to subglobose involucre, triangular to ovate or orbicular appendages, not decurrent, and usually ciliate and ending in a firm spine or spinule, and with rose, purple or yellow flowers (Negaresh *et al.* 2014, Negaresh & Rahiminejad 2014). *Centaurea sennikoviana* is similar to *C. aladaghensis* (Appendix 1), endemic to central Turkey (Wagenitz 1960, 1975), in some characters such as the length of involucre, color of flowers, indumentum, and number of cilia. There are however clear differences (see Appendix 3). *Centaurea amanicola* (Appendix 2) from central Turkey (holotype G!) is also somewhat similar to *C. sennikoviana* (cf. Appendix 3).

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ADDITIONAL SELECTED SPECIMENS EXAMINED. — *Centaurea aladaghensis*. **Turkey**. C5 Adana: Cappadocien, auf dem Masmutli Dag oberhalb Solakly, *Siehe s.n.* (B!, GB!); Pozanti, *Savran 314* (ISTE!). — *Centaurea amanicola*. **Turkey**. C6 Adana: Amanus-Gebirge, Prov. Seyhan, Distr. Osmaniye, *Huber-Morath 15888* (G!, Hb!).

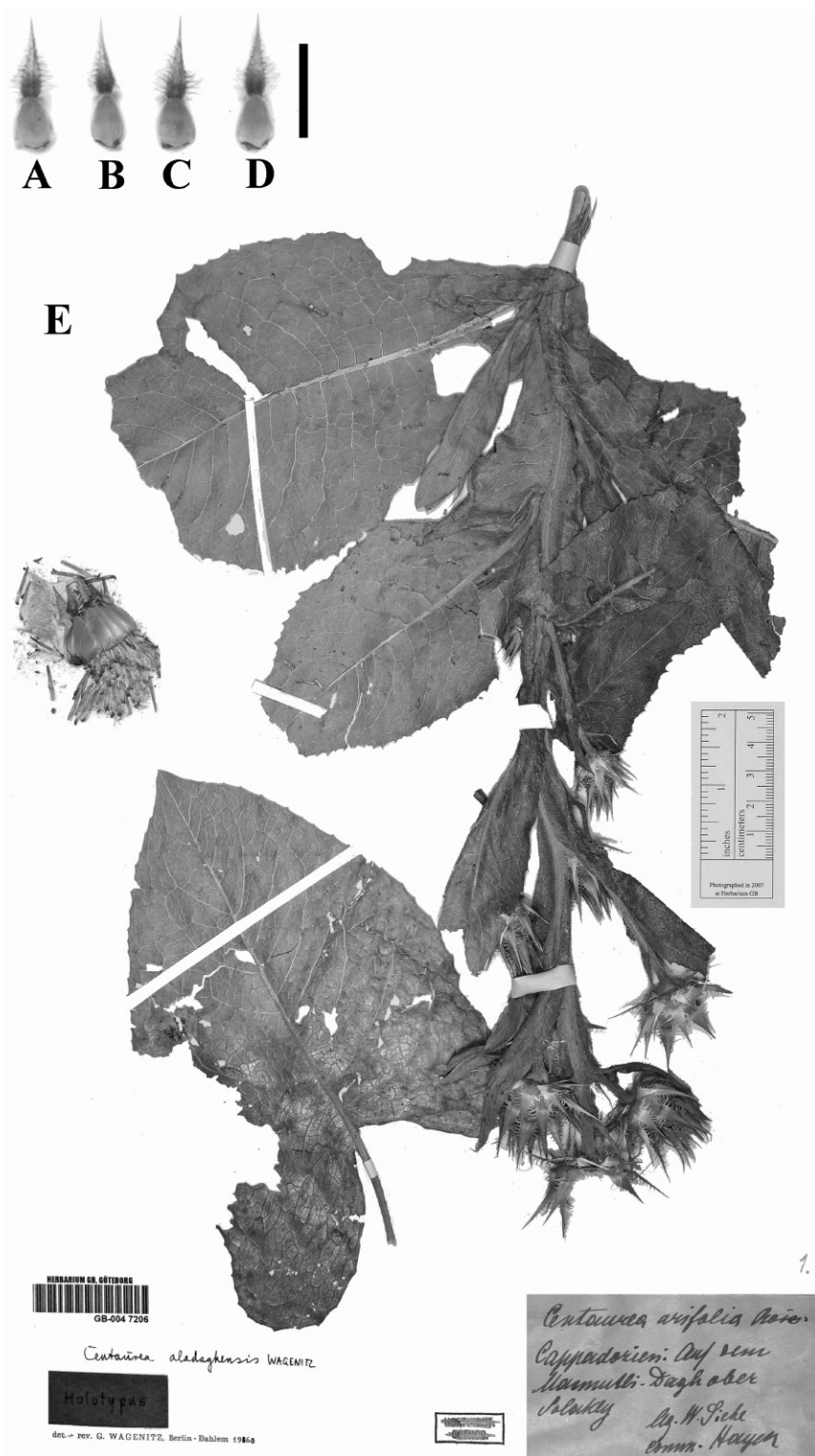
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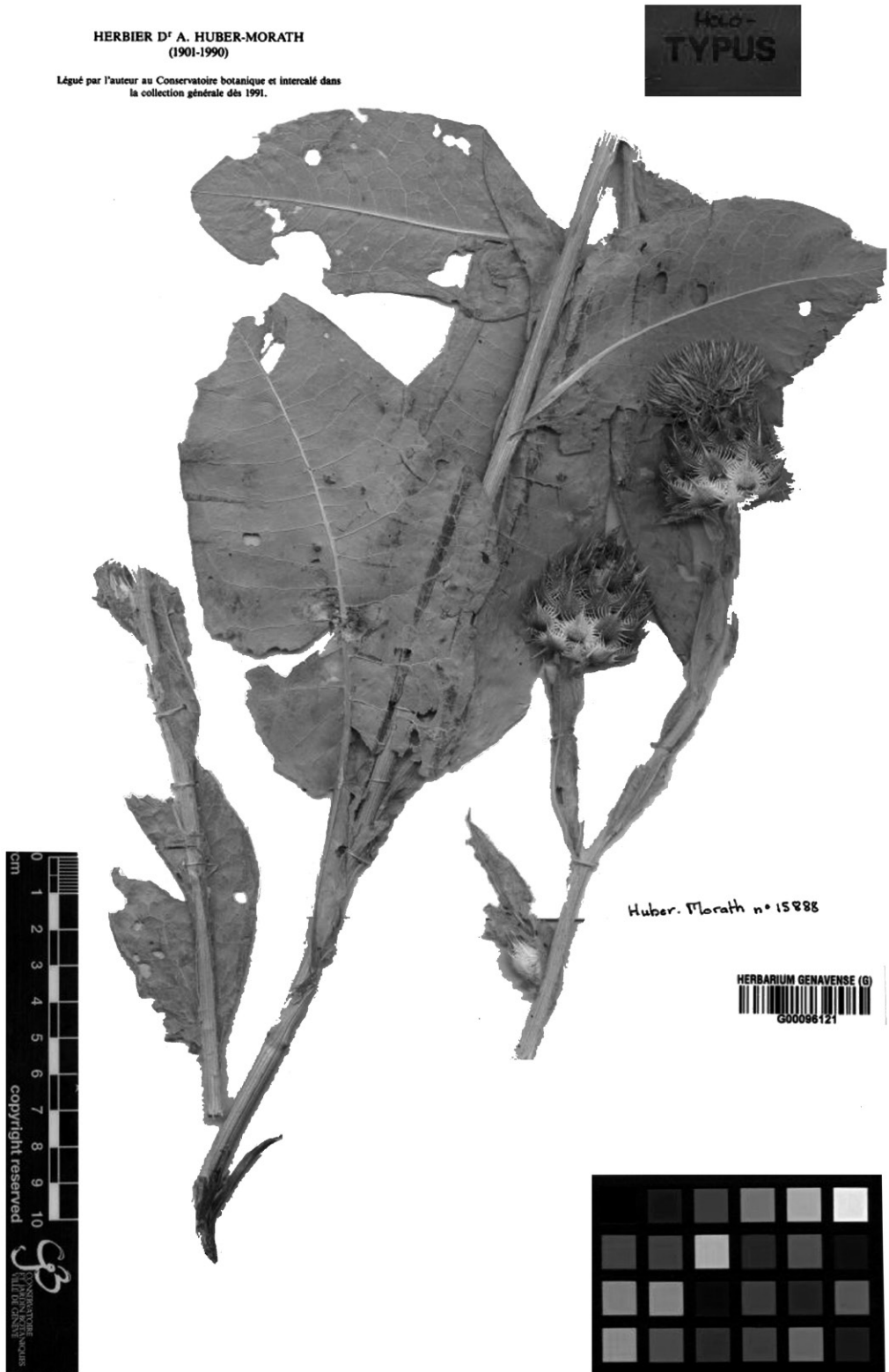
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Appendix 1. *Centaurea aladaghensis* (A–D from an isotype, F from the holotype, photographs through courtesy of B and GB). — A–D: Median phyllaries. — E: Habit. Scale bar: A–D = 2 cm.



Appendix 2. *Centaurea amnicola* (from the holotype, photographs through courtesy of G).

Appendix 3. Morphological comparison of *Centaurea sennikoviana*, *C. aladaghensis* and *C. amanicola*. Based on examined specimens and literature cited in the text.

Species	<i>C. sennikoviana</i>	<i>C. aladaghensis</i>	<i>C. amanicola</i>
Height (cm)	ca. 45	ca. 40	65–80
Stem	sparsely leafy throughout	densely leafy throughout	evenly leafy throughout
Stem ramification	simple	branched above	branched above
Basal and lower cauline leaves			
size (cm)	16–24 × 6–7	20–30 × 10–13	–
margin	usually entire, rarely remotely denticulate	distinctly denticulate or repand-dentate	entire or denticulate to repand-dentate
Median cauline leaves			
shape	triangular-lanceolate or subpandurate	obovate to oblong	oblong to broadly lanceolate
width (cm)	3.5–5.5	7–10(–11)	5–9
Upper cauline leaves	loosely arachnoid	loosely hirsute-articulate	thinly tomentose
Number of capitula	2–4	5–10	2–8
Peduncle length	1–2 cm	2–6 cm	1–1.5 cm
Involucre			
shape	ovoid-cupuliform	ovoid	ovoid to subglobose
width (mm)	22–32(–35)	18–20	25–30
Appendages	small, concealing part of phyllaries only	medium-sized, concealing a major part of phyllaries	large, totally concealing phyllaries
Appendage			
width (excluding cilia) (mm)	3–5	4–5	6–8(–9)
texture	chartaceous or membranous	thick	thick
color	pale brown	straw, brownish or dark brown	dark brown to blackish (outer ones pale brown)
shape	shortly triangular	elongate triangular, gradually tapering into spine	broadly triangular to orbicular
Median appendage length (mm)	7–10	17–19	10–12
Inner appendages	lacerate or pectinate	distinctly ciliate	ciliate
Cilia of appendages	10–14 on each side and 2–3 mm long	9–12 on each side and ca. 4 mm long	12–16(–20) on each side and 3–6 mm long
Achene length (mm)	6–7	–	5.5–6