

Jurinea kemahensis (Asteraceae), a new species from East Anatolia, Turkey

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Received 3 Apr. 2013, final version received 14 Nov. 2013, accepted 28 Nov. 2013

Dogan, B., Kandemir, A., Osma, E. & Duran, A. 2014: *Jurinea kemahensis* (Asteraceae), a new species from East Anatolia, Turkey. — *Ann. Bot. Fennici* 51: 75–79.

A new species *Jurinea kemahensis* B. Dogan, Kandemir & A. Duran (Asteraceae) is described from East Anatolia, Turkey. It grows in calcareous crevices in the Kemah district (Erzincan province) in the East Anatolia. It is morphologically fairly similar to *J. tortumensis*, and its diagnostic morphological characters are discussed. The ecology and distribution of *J. kemahensis* are also presented. The pollen characteristics and achene surface of *J. kemahensis* and *J. tortumensis* were examined by SEM.

The genus *Jurinea* is one of the larger genera within Asteraceae, comprising about 200 species (Susanna *et al.* 2006). *Jurinea* is naturally distributed in central Asia, Iran, Turkey and the Mediterranean region. The genus belongs in the monophyletic tribe Cardueae, which contains the subtribes Carduinae, Centaureinae, Carlininae, Cardopatiinae and Echinopinae, *Jurinea* being placed in Carduinae (Susanna *et al.* 2006).

Jurinea has 19 species within the Mediterranean and Irano-Turanian phytogeographic regions of Turkey (Danin & Davis 1975, Dogan *et al.* 2007). Eight of the species are endemic to Turkey, thus the endemism percentage is 42.1% (Danin & Davis 1975, Dogan *et al.* 2009, Dogan *et al.* 2010a, Dogan *et al.* 2010b). The numbers of species in the neighboring areas are as follows: 152 in the former USSR (Iljin 1962), 37 in Iran (Rechinger & Wagenitz 1979, Mirtadzadini *et al.* 2011) and 17 in Europe (Kozuharov 1964).

During a field trip in 2012, some specimens of *Jurinea* were collected from Erzincan Province, East Anatolia. After studying the specific descriptions of *Jurinea* in Iljin (1962), Kozuharov (1964) and Rechinger and Wagenitz (1979) as well as by comparing our material with specimens in the herbaria GAZI, HUB, KNYA, EGE, ISTE, E, K, G, B, W, VANF and ANK, it was concluded that they represented an undescribed species.

In the description below, each numerical value is the average of ten measurements from different specimens. Our specimens of *J. kemahensis* were examined and compared with specimens of the morphologically similar *J. tortumensis* and *J. alpigena*.

Pollen grains were prepared for examination by light microscopy according to Wodehouse (1935), and the measurements were made with an Olympus BX-50 microscope. The pollen

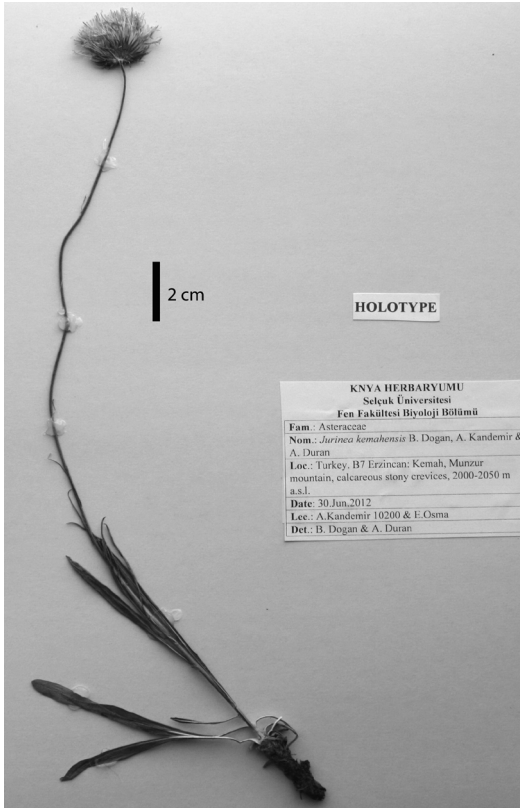


Fig. 1. Holotype of *Jurinea kemahensis*.

diameter measurements are based on ca. 50 samples and the other characters on approximately ten. For the SEM study, the pollen grains and achene surfaces were coated with gold, and the micrographs were obtained using a SEM-Zeiss LS-10 microscope. The descriptive terminology of Erdtman (1969) was followed.

Jurinea kemahensis B. Dogan, Kandemir & A. Duran, *sp. nova* (Figs. 1, 2, 3A–C, 4A and B)

TYPE: Turkey. B7 Erzincan, Kemah, Munzur mountain, calcareous crevices, 2050 m a.s.l., (UTM) 37.488804E, 43.71431N, 30 July 2012, *Kandemir 10200* & *E. Osma* (holotype KNYA; isotypes GAZI, ANK, ISTE, NGBB).

Perennial herbs, 23–35 cm tall; stem erect, old ones remaining present at plant base, arachnoid, 1.3–1.8 mm diam. below, simple, without a woody base. Basal leaves entire, lanceo-



Fig. 2. *Jurinea kemahensis* in its natural habitat.

late, 4–11 × 0.4–0.9 cm, obtuse, with revolute margin, white-woolly arachnoid beneath, light green above, sparsely arachnoid, median vein evident; stem leafless or with few minute leaves, linear to filiform, 1–3 × 0.1–0.2 cm. Capitula solitary on peduncles, 2.4–2.6 × 2.8–2.9 cm. Involucre subglobose, 2.2–2.4 × 2.7–2.9 cm; phyllaries 6-seriate; outer phyllaries patent, lanceolate, arachnoid, margins minutely dentate, 8–9 × 1–1.2 mm; inner phyllaries 16–17 × 1–1.3 mm, upper part lilac, glabrous; paleas yellowish, linear, 3–4 mm long, sometimes 3–4 toothed. Corolla lilac, 5-lobed, lobes 3–4 mm long, with glandular hairs, tubes 10–12 mm long; stamens 13–16 mm long, anthers 7–9 mm long; styles 18–20 mm long, with two branches. Achenes smooth, longitudinally striate, 2–3 mm long, brownish, coronulate, umbo depressed. Pappus persistent, scabrous, 3–8 mm long. Flowering in June–July, fruiting in July–August.

Jurinea kemahensis appears to be endemic to East Anatolia and belongs in the Irano-Turanian floristic element. Specimens were collected from Kemah (Erzincan Province), where the

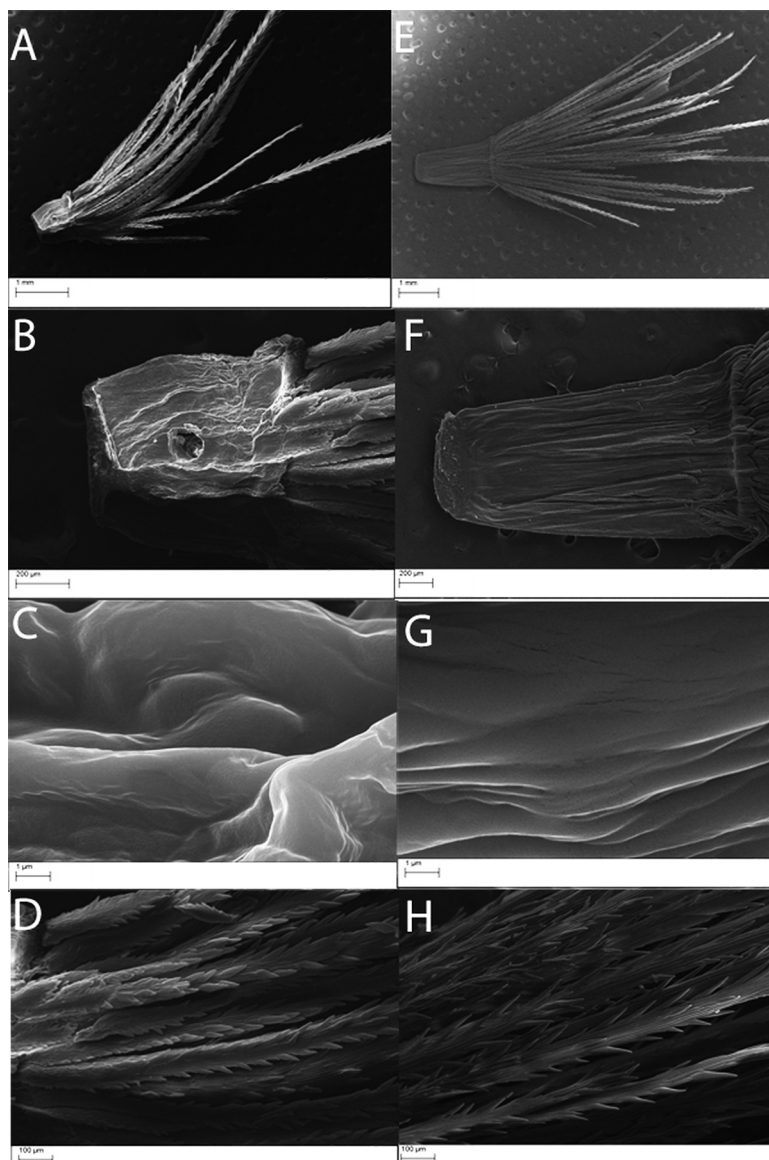


Fig. 3. SEM-micrographs of achenes. — **A–D:** *Jurinea kemahensis* (from the holotype). — **A and B:** General shape. — **C:** Details of surface. — **D:** Pappi. — **E–H:** *J. tortumensis* (from A. Duran 6170, KNYA). — **E and F:** General shape. — **G:** Details of surface. — **H:** Pappi.

species appears to be rare. It grows in calcareous crevices, with *Campanula ptarmicifolia*, *C. munzurenensis*, *Omphalodes luciliae*, *Tanacetum argenteum*, *Potentilla speciosa* and *Psephellus pyrrhoblepharus*.

The achene surface of *J. kemahensis* is transversely rugose and the pappus is scabrous whereas in *J. tortumensis* the achene surface is longitudinally rugulose and the pappus is barbelate (Fig. 3). The pollen grain characteristics of *J. kemahensis* and *J. tortumensis* are compared in Table 1 and Fig. 4.

Jurinea kemahensis is closely similar to *J. tortumensis*, and to a lesser extent to *J. alpigena*. There are however clear differences from both of those species (Table 2).

Palaeopalynological data show that Anatolia had a dense vegetation cover in the last interglacial period (Gemici 1993). The topography of Turkey has since changed many times, introducing different microclimates in the tectonic valleys (Gemici 1993). The East Anatolia region is a botanically interesting area within the Irano-Turanian phytogeographical region. The

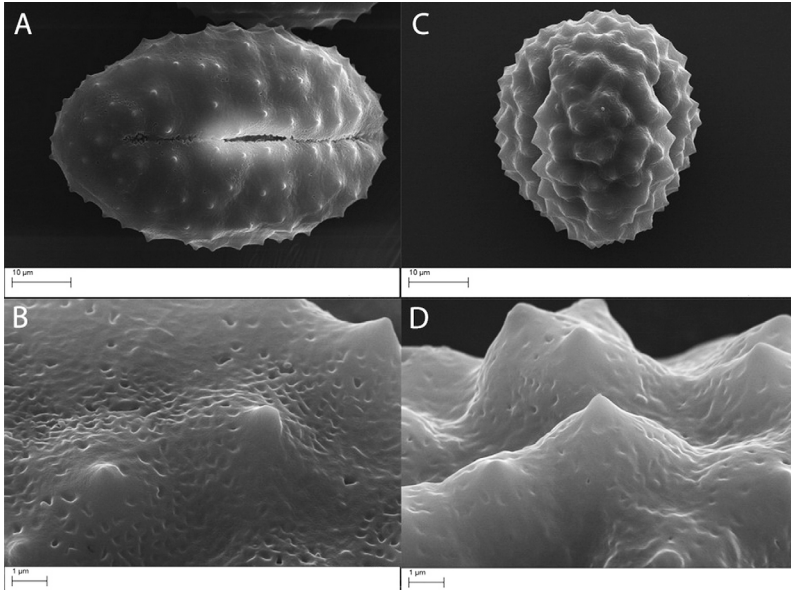


Fig. 4. SEM-micrographs of pollen grains. — **A** and **B**: *Jurinea kemahensis* (from the holotype). — **A**: General shape. — **B**: Details of surface. — **C** and **D**: *J. tortumensis* (from *A. Duran 6170*, KNYA). — **C**: General shape. — **D**: Details of surface.

Table 1. Pollen morphology of *Jurinea kemahensis* and *J. tortumensis* (values in μm).

Pollen morphology	<i>J. kemahensis</i>	<i>J. tortumensis</i>
Polar axis (<i>P</i>)	55.1 ± 1.6	40.3 ± 1.8
Equatorial axis (<i>E</i>)	38.2 ± 1.5	36.1 ± 1.7
<i>PIE</i>	1.44	1.11
Colpus length	44.3 ± 1.2	35.4 ± 1.3
Exine thickness	1.8 ± 0.7	1.8 ± 0.6
Intine thickness	0.8 ± 0.2	0.8 ± 0.1
Ornamentation	perforate	perforate
Shape	prolate	prolate spheroidal

area is very rich in endemic plants (Akman *et al.* 2011). Recently numerous papers were published describing new species from this region, such as *Ferula mervynii* (Sağiroğlu & Duman 2007), *Silene dumanii* (Kandemir & Genç 2009), *Jurinea tortumensis* (Dogan *et al.* 2010a), *Campanula hacerae* (İlçim *et al.* 2011), *Silene gevasica* (Hamzaoğlu *et al.* 2011), and *Rhabdosciadium urusakii* (Akalın & Akpulat 2012).

ADDITIONAL SPECIMENS EXAMINED. — *Jurinea tortumensis*: **Turkey**. A8 Erzurum: Tortum to Erzurum *A. Duran 6170*

Table 2. Morphological comparison of *Jurinea kemahensis*, *J. tortumensis* and *J. alpigena*.

Character	<i>J. kemahensis</i>	<i>J. tortumensis</i>	<i>J. alpigena</i>
Stems	23–37 cm	20–30 cm	15–40 cm
Basal leaves	entire, lanceolate, arachnoid, light green, 0.4–0.8 cm wide	mostly undulate, sometimes slightly pinnatifid, glabrous, dark green, 1–2 cm wide	mostly entire to pinnatisect, arachnoid-pilose, green, 2–3 cm wide
Cauline leaves	linear to filiform, 1–3 × 0.1–0.2 cm	linear to filiform, 1–2 × 0.5–1 cm	linear to filiform, 0.5–1.5 × 0.1–0.2 cm
Capitula	2.4–2.6 × 2.8–2.9 cm	2.8–3.1 × 2.5–2.7 cm	3.5–4.2 × 2.6–3 cm
Phyllaries	6-seriate	5-seriate	5-seriate
Outer phyllaries	8–9 mm long	4–5 mm long	10–12 mm long
Inner phyllaries	16–17 mm long, upper part lilac	14–15 mm long, upper part green	12–16 mm long, upper part green
Paleas	3–4 mm long	1–2 mm long	3–5 mm long
Corolla	lilac	lilac	brigh purple to pink
Achenes	brownish	dirty-white	dark-yellowish
Pappus	3–8 mm long, scabrous	6–10 mm long, barbellate	5–7 mm long, barbellate
Habitat	calcareous crevices	on serpentine substrate	rocky and sandy beaches, rocky slopes

(KNYA). — *Jurinea alpigena*: **Turkey**. A4 Karabük: Yenice, Keltepe, *F. Holtz* 290 (EGE), *B. Doğan* 1015 (KNYA), *B. Doğan* 1510 (KNYA); A8 Rize: İkizdere, near Anzer village, *A. Güner* 7096 (GAZI, HUB); Çamlıhemşin, Hisarcık to Sıraköy, *A. Güner* & *M. Vural* 6521 (HUB); Artvin: Yusufeli, Demirkent, *N. Demirkuş* 2406 (HUB).

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