TÜBİTAK

Turkish Journal of Botany

http://journals.tubitak.gov.tr/botany/

Research Article

Turk J Bot
(2018) 42: 197-207
© TÜBİTAK
doi:10.3906/bot-1707-29

Contributions to the taxonomy of *Lactuca* (Asteraceae) in Turkey

Murat Erdem GÜZEL[1,*], Norbert KILIAN[2], Mutlu GÜLTEPE[3], Ali KANDEMİR[4], Kamil COŞKUNÇELEBİ[1]

[1]Department of Biology, Faculty of Science, Karadeniz Technical University, Trabzon, Turkey
[2]Botanic Garden and Botanical Museum Berlin, Freie Universität of Berlin, Berlin, Germany
[3]Department of Forestry, Dereli Vocational School, Giresun University, Giresun, Turkey
[4]Department of Biology, Faculty of Science and Arts, Erzincan University, Erzincan, Turkey

Received: 13.07.2017 • **Accepted/Published Online:** 03.11.2017 • **Final Version:** 20.03.2018

Abstract: This paper presents new data on the diversity of *Lactuca* L. in Turkey based on recent collections made during revisional work. *Lactuca leucoclada* Rech.f. & Tuisl is newly recorded for Turkey, and for *Lactuca viminea* (L.) J.Presl. & C.Presl. and *Lactuca quercina* L., the presence of two distinct subspecies each in Turkey, *L. viminea* subsp. *viminea* and *L. viminea* subsp. *ramosissima* (All.) Arcang., and *L. quercina* subsp. *quercina* and *L. quercina* subsp. *wilhemsiana* (DC.) Feráková, respectively, are reported. The presence of *Lactuca macrophylla* (Willd.) A.Gray, so far only doubtfully reported from Turkey, is confirmed in the present study. Emended descriptions, type information, updated distribution maps, and microphotographs of the taxonomically important achene features are presented for the studied taxa.

Key words: Cichorieae, Lactucinae, micromorphology, new records

1. Introduction

The subtribe Lactucinae (Asteraceae, Cichorioideae, Cichorieae) in its narrow modern sense was recognized by Bremer et al. (1994) with 17 genera (including *Lactuca* L., *Scariola* F.W.Schmidt, *Cicerbita* Wallr., and *Mulgedium* Cass.). Later, Lack (2007) circumscribed Lactucinae to comprise 12 genera with 179 species. Based on molecular phylogenetic results, Kilian et al. (2009a, 2017) and Wang et al. (2013) revised the subtribe, naturally distributed in Europe, Africa, Asia, and North America, to comprise about 200 species. The generic classification has been disputed for a long time and is still not settled in view of the frequent homoplasies in morphological features that make the circumscription of morphologically meaningful monophyletic genera difficult (Kilian et al., 2017). Three of these genera are *Scariola*, *Cicerbita*, and *Mulgedium*. All of them are treated as distinct genera in *Flora of Turkey* (Jeffrey, 1975), but more recently *Scariola* and *Mulgedium* were considered as congeners of *Lactuca* by Koopman et al. (1998), Sell and Murrell (2006), Lack (2007), Kilian et al. (2009a), and Wang et al. (2013). On the other hand, *Cicerbita* in its current circumscription has been shown to be polyphyletic, and many of its current members should be treated as species of *Lactuca* (Kilian et al., 2017). In accordance with these results, all taxa, including doubtful records listed under *Cicerbita,* in *Flora of Turkey* (Jeffrey, 1975) were transferred to *Lactuca* by Kilian et al. (2009b) and Ekim (2012).

In the course of a phylogenetic and taxonomic study of the subtribe Lactucinae in its SW Asian center of diversity, we encountered a few taxa that have not been recorded for Turkey so far. The aim of this article is to report these novelties as a contribution to the knowledge of the biodiversity of the Turkish vascular plant flora.

2. Materials and methods

Specimens were collected from Turkey during field trips in 2013–2017 and stored in the herbarium of the Department of Biology at Karadeniz Technical University (KTUB). Eighty-four morphological characters compiled from relevant literature (Kirpicznikov, 1964; Jeffrey, 1975; Feráková, 1976; Rechinger, 1977; Křístková et al., 2008; Shi et al., 2011; Monge et al., 2016) were used to characterize the examined taxa. Morphological characteristics of the newly reported taxa were recorded from the vouchers and compared with samples stored in several national and international herbaria (ANK, B, HUB, ISTE, ISTEF, KTUB) and with relevant literature (Kirpicznikov, 1964; Jeffrey, 1975; Feráková, 1976; Rechinger, 1977). Morphological measurements and micromorphological photographs were done with a Leica S6D microscope. Herbarium specimens were photographed with a Canon

* Correspondence: mguzel@ktu.edu.tr

camera. Scanning electron microscopy micrographs were taken using a JEOL-JSM 6610 microscope at the Central Research Laboratory of Recep Tayyip Erdoğan University. The descriptive terminology of Jeffrey (1975), Haque and Godward (1984), and Abid and Qaiser (2015) was followed for achene features including pappus disk and carpopodium. Herbarium specimens serving as sources for the microphotographs are correspondingly documented (Figure 1). Localities were plotted on a map of Turkey using the QGIS PC program (QGIS Development Team, 2014) (Figure 2). Taxa are listed alphabetically, and Turkish names proposed according to Menemen et al. (2016) are cited.

3. Results

Lactuca leucoclada Rech.f. & Tuisl in Anz. Österr. Akad. Wiss., Math.-Naturwiss. Kl. 101: 399. 1964 ≡ *Scariola leucoclada* (Rech.f. & Tuisl) Tuisl in Ann. Naturhist. Mus.

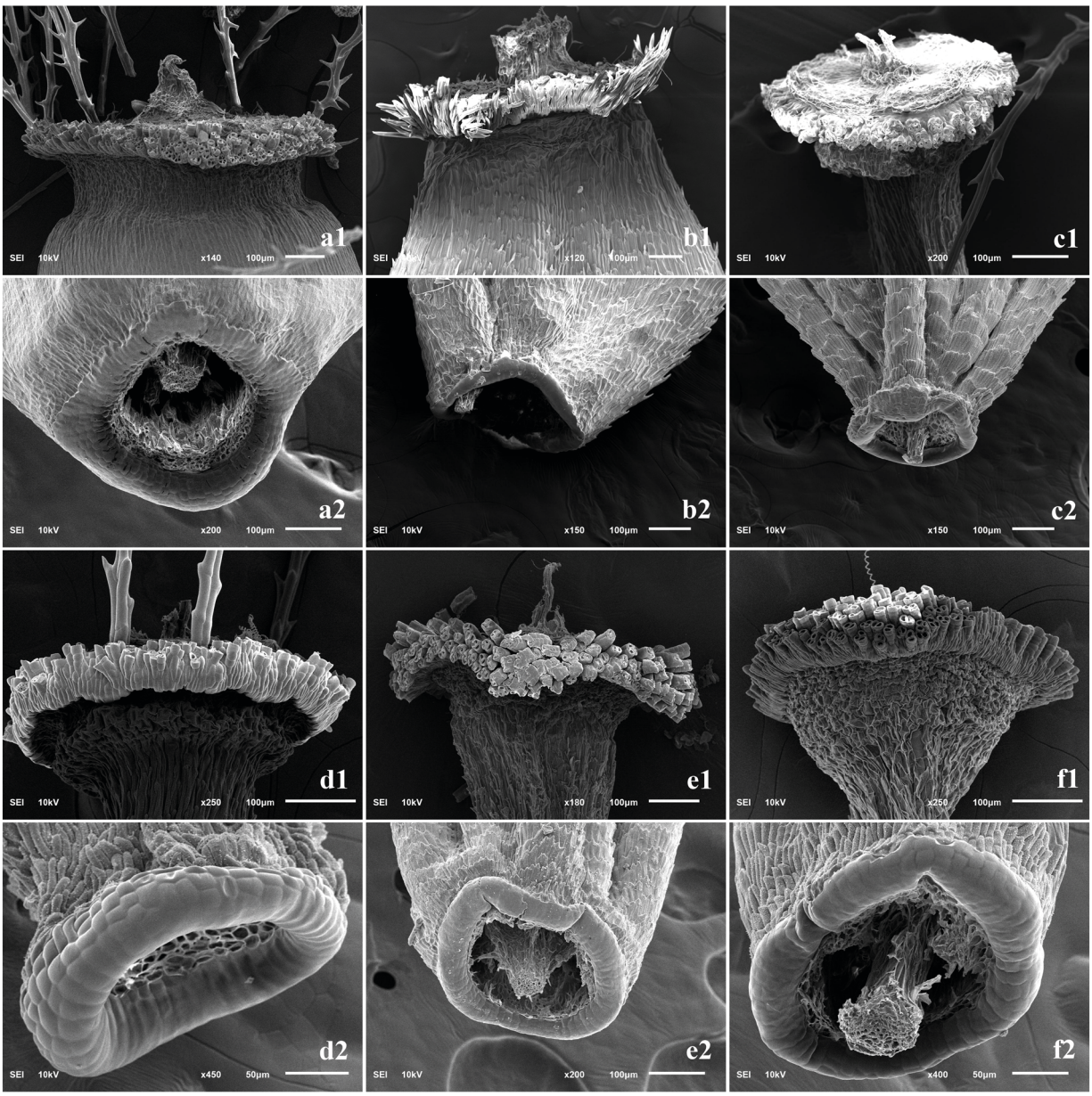


Figure 1. Achene micrographs of *Lactuca* from Turkey. *Lactuca leucoclada* (a1: pappus disk, a2: carpopodium), *Lactuca macrophylla* (b1: pappus disk, b2: carpopodium), *Lactuca quercina* subsp. *quercina* (c1: pappus disk, c2: carpopodium), *Lactuca quercina* subsp. *wilhemsiana* (d1: pappus disk, d2: carpopodium), *Lactuca viminea* subsp. *viminea* (e1: pappus disk, e2: carpopodium), *Lactuca viminea* subsp. *ramosissima* (f1: pappus disk, f2: carpopodium).

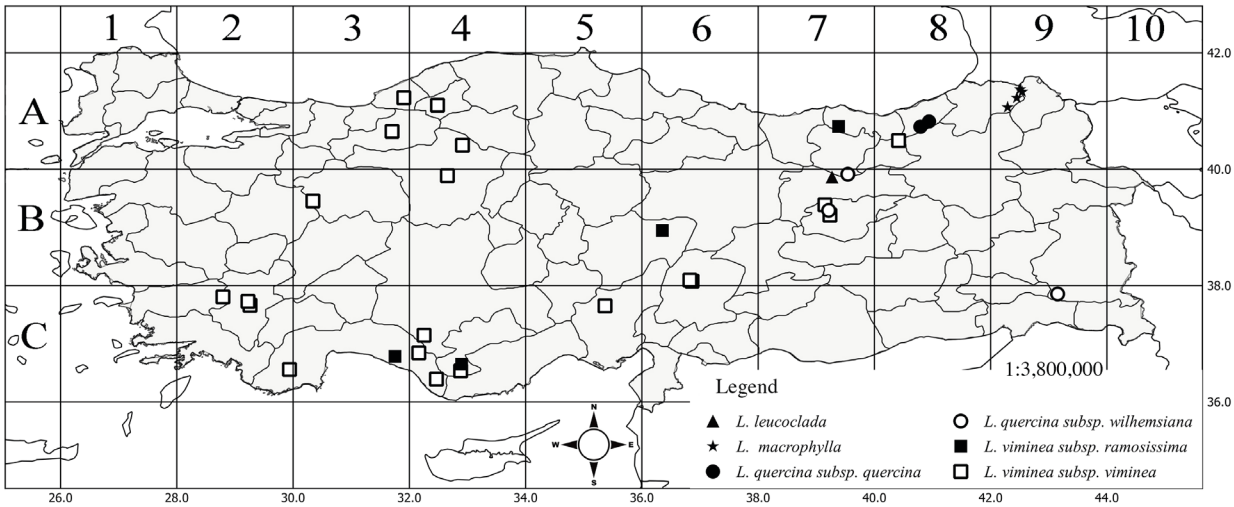


Figure 2. Distributions of the newly recorded taxa in Turkey.

Wien 72: 630. 1968. **Type:** Afghanistan., Prov. Ghorat. In declivibus borealibus montis Kuh-Tscheling-Safed-Daraq (Pirestan) a Parjuman (Partcheman) meridiem versus. substr. calc. alt.: ca. 2600–2800 m. 31.07–01.08.1962, *K. H. Rechinger* 19074 (holotype: W photo!; isotype: B!).

Annual or biennial herbs. Stem 50–75 cm high, with creeping rhizome, erect, unbranched, glabrous, striate. Leaves glabrous, margin sinuate or dentate, apex obtuse; lower cauline leaves lyrate-pinnatisect, 6–10 × 2–3 cm, petiole shorter than blade (2–3.5 cm long); middle cauline leaves obovate, 4.5–3.2 × 2.5–3 cm; with distinct decurrent auricles, 1–2 cm long. Synflorescence paniculiform, dichotomously branched, with more than 50 heads. Capitula with 5 flowers, cylindrical, at fruiting 12.5–14 × 3.5–4.5 mm; with peduncles to 3.5 cm or sessile. Phyllaries 10–12, in 4 series, margin very narrowly whitish hyaline; outer phyllaries 2.5–3.0 × 2 mm, ovate, acute with inconspicuous simple eglandular hair at apex; inner phyllaries 10–10.5 × 2–3 mm, lanceolate, obtuse with inconspicuous simple eglandular hair at apex. Flowers yellow, corolla tube c. 5.3 mm long, hairy in upper part; ligule c. 10.8 × 3.6 mm; anther tube yellowish, 5 mm long; fertile part 3.8 mm long, apical appendages 0.45 mm long, basal appendages 0.65 mm long. Style c. 9.0 mm long; branches c. 0.7 mm long. Achenes beakless, oblong-ellipsoid in outline, slightly compressed and falcate, c. 6.0 × 1.5–1.6 mm, glabrous, brownish with 4 main ribs and 8–10 inconspicuous secondary ribs, base truncate with completely annular carpopodium, corpus more or less attenuate at apex. Pappus simple, white, c. 5.0 mm long, persistent, bristles scabridulous, most of them with 3–5 cells in diameter at the base.

Illustrations: Figure 3.

Phenology: Flowering in June, fruiting in July.

Habitat: Rocky slopes, screes, and gravelly places.

General distribution: *Lactuca leucoclada* was known only from Afghanistan (Rechinger, 1977; Breckle et al., 2013). Its occurrence in Erzincan, NE Turkey, reported here, constitutes a remarkable range extension of 3600 km to the west.

Affinity: *Lactuca leucoclada* is closely related to *Lactuca viminea* and *Lactuca orientalis*, as is evident from its decurrent stem leaves. It is clearly differentiated by beakless (not beaked), brownish (not black or blackish), shorter achene (not more than 6 mm), and creeping rhizome (not taproot) from the closely related taxa.

Vernacular name in Turkey: Kaya marulu.

Examined specimens: Turkey. B7 Erzincan, from Erzincan to Refahiye, rocky slopes, 1549 m, 39°51′N, 39°16′E, 17 vii 2014, *Coşkunçelebi*&*Güzel* 253 (KTUB); Erzincan, from Erzincan to Refahiye, 08 viii 2014 *Kandemir* 10629 (KTUB).

Lactuca macrophylla (Willd.) A.Gray, Syn. Fl. N. Amer. 1(2): 444. 1884 ≡ *Sonchus macrophyllus* Willd., Sp. Pl. 3: 1519. 1803 ≡ *Cicerbita macrophylla* (Willd.) Wallr., Sched. Crit.: 434. 1822 ≡ *Agathyrsus macrophyllus* (Willd.) Sweet, Hort. Brit., ed. 2: 277. 1830 ≡ *Mulgedium macrophyllum* (Willd.) DC., Prodr. 7: 248. 1838 ≡ *Galathenium macrophyllum* (Willd.) Nutt. in Trans. Amer. Philos. Soc., ser. 2, 7: 443. 1841, **Lectotype** (designated by Sennikov 1997: 108): B-W 14552-010!, stable URL: http://herbarium.bgbm.org/object/BW14552010. =*Mulgedium grande* var. *glabrum* K.Koch in Linnaea 17: 279. 1843 ≡ *Mulgedium glabrum* (K.Koch) K.Koch in Linnaea 23: 668. 1851 ≡ *Cicerbita macrophylla* var. *glabra* (K.Koch) Kirp. in Bobrov & Tzvelev, Fl. SSSR 29: 361. 1964 **syn. nova**. – **Type:** not designated, based on material from Armenia (for a full synonymy see Kilian et al., 2009b).

Typification: Willdenow (1803) indicated that he had seen living material ("v.v.") and the folder with two

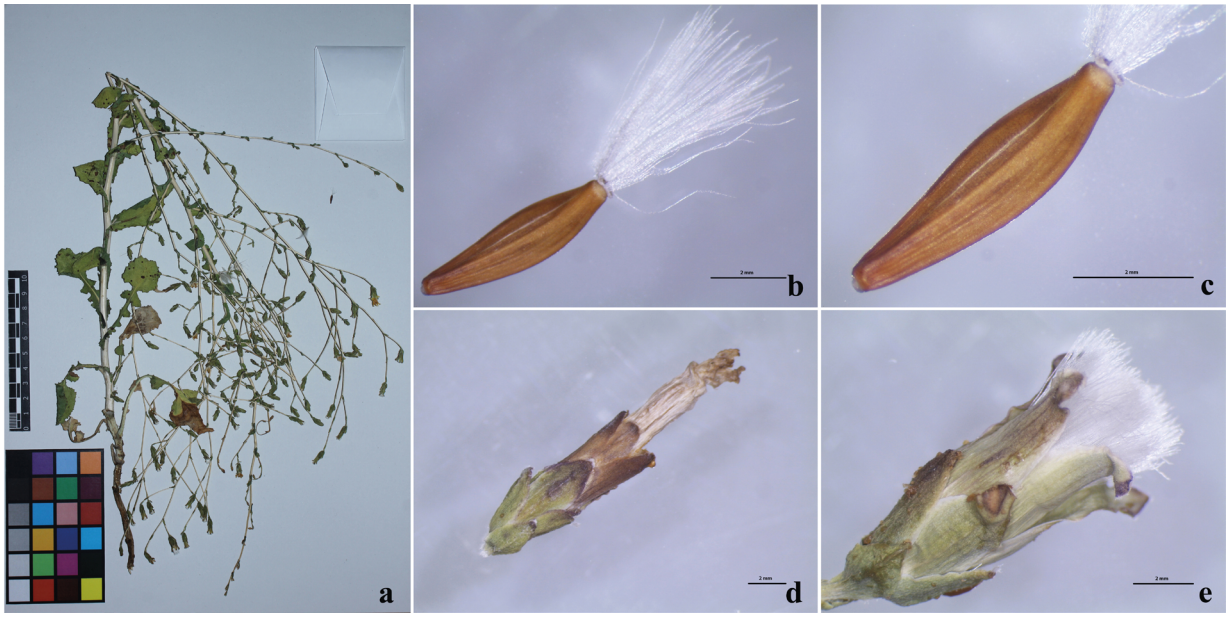


Figure 3. *Lactuca leucoclada* (*Kandemir* 10629): a- herbarium specimen; b- achene; c- corpus; d- flowering capitula; e- fruiting capitula.

sheets in the Willdenow herbarium (B-W) carries a label in Willdenow's handwriting ("Hort. Bot. Berol. / W.") indicating that the specimens were made from plants cultivated in the Botanic Garden of Berlin. This qualifies them as original material. Sennikov (1997) selected the one that was numbered for microfiche reproduction as "1141/1". Later it was barcoded as cited above. The provenance is erroneously indicated in the protologue as "America boreali" and on the folder as "Habitat in Canada". This error can be traced back to Froelich (1791). He published an unusually comprehensive description of the species based on plants cultivated in the Botanic Garden of Erlangen (Bavaria, Germany) and stated to originate from Canada. Froelich illegitimately redefined the Linnean name *Sonchus canadensis* (otherwise a synonym of *Cicerbia alpina*) for this species. Willdenow cites Froelich's publication in the synonymy, and it seems very likely that the plants came via Erlangen into the Botanic Garden Berlin.

Perennial herbs. Stem 100–190 cm high, with rhizome, erect, branched in upper part, glabrous or almost glabrous below, covered with dense glandular and eglandular hairs in upper part or rarely synflorescence branches almost glabrous, striate. Leaves covered with glandular and eglandular hairs throughout veins and margins, margin sinuate-ciliate or denticulate-ciliate, apex acute; lower cauline leaves ovate-lanceolate in outline, pinnatifid with generally 2–4 lobes, 12–60 × 11–17 cm, petiole smaller than blade (10–27 cm long) with distinct large rounded auricles and hastate-triangular base; middle cauline leaves ovate-lanceolate, 10–23 × 4.5–10 cm; sessile with rounded auricles. Synflorescence corymbiform with more than 50 heads. Capitula with 24–28 flowers, cylindrical, fruiting 12.8–14.5 × 6.5–9.2 mm; peduncle 1.7–3.5 cm long. Phyllaries 16–18, in 3 series, margin very narrowly whitish hyaline; outer phyllaries 3.4–6.3 × 0.7–1 mm, lanceolate, with glandular hairs at dorsal side; inner phyllaries 10–12.5 × 1.7–1.8 mm, lanceolate, acute with glandular hairs at dorsal side. Flowers violet to light blue, corolla tube 3.5–4.5 mm long, hairy in upper part; ligule 13.8–17.5 × 1.2–1.8 mm; anther tube yellowish, 4.1–4.8 mm long; fertile part 3.2–3.9 mm long, apical appendages 0.3–0.4 mm long, basal appendages 0.4–0.5 mm long. Style 9.8–10.5 mm long; branches c. 1 mm long. Achenes ellipsoid in outline, compressed, and slightly falcate, c. 5 × 1.5 mm, muricate (under high magnification), brownish, generally with 1–2 main ribs on each side, narrowly winged, base truncate, with completely annular carpopodium, corpus more or less attenuate at apex. Pappus double, white, inner 6.1–7.2 mm long of scabridulous bristles, most of them at their base 4–7 cells in diameter, deciduous, outer a very short (0.15–0.22 mm) series of hairs, persistent.

Affinity: Morphologically, *L. macrophylla* is similar to *L. adenophora* Boiss. & Kotschy and *L. racemosa* Willd. It is clearly differentiated by a usually longer stem (not less than 1 m) and large lower cauline leaves (usually more than 30 cm in length) from the closely related taxa. *L. macrophylla* differs from *L. adenophora* with dense (not sparsely) glandular indumentum or is rarely glabrous in upper part, and by a rhizome (not taproot) from *L. racemosa*. Achenes

of *L. macrophylla* and *L. racemosa* are apically attenuate whereas the achene of *L. adenophora* is beaked.

Illustrations: Figure 4.

Phenology: Flowering in July–August, fruiting in August–September.

Habitat: Subalpine meadows, opening of *Picea orientalis* forest.

General distribution: The taxon has a disjunct natural distribution in the Caucasus region and the southern Ural mountain range. It was introduced to Europe as a garden plant and is meanwhile naturalized in several areas (Galusko, 1980; Meusel and Jäger, 1992; Kilian et al., 2009b). In Turkey it is restricted to the western limits of the Caucasus in the NE.

Vernacular name in Turkey: Boylu marul (giant lettuce).

Examined specimens: Turkey. A9 Artvin. Ardanuç, Bülbülan, alpine, 2542 m, 41°03′N, 42°16′E, 29 viii 2013, *Coşkunçelebi*&*Güzel* 109 (KTUB); Artvin: Şavşat, Sahara National Park, under *Picea orientalis* forest, 1896 m, 41°13′N, 42°27′E, 24 viii 2014, *Coşkunçelebi*&*Güzel* 296 (KTUB); Artvin: Şavşat, Pınarlı village, Balıkgölü, opening of *Picea orientalis* forest, 2035 m, 41°21′N, 42°30′E, 13 ix 2014, *Coşkunçelebi*&*Güzel* 339 (KTUB); Artvin: Şavşat, above Karagöl, under *Picea orientalis* forest, synflorescence glandular hairy, 2208 m, 41°19′N, 42°32′E, 23 viii 2015, *Coşkunçelebi*&*Güzel* 467a (KTUB); Artvin: Şavşat, above Karagöl, under *Picea orientalis* forest, synflorescence glandular hairy, 2208 m, 41°19′N, 042°32′E, 23 viii 2015, *Coşkunçelebi*&*Güzel* 467b (KTUB).

Lactuca quercina L., Sp. Pl.: 795. 1753 ≡ *Cicerbita quercina* (L.) Wallr., Sched. Crit.: 435. 1822 ≡ *Lactucopsis quercina* (L.) Vis. & Pančić in Mem. Reale Ist. Veneto Sci. 15: 5. 1870 ≡ *Mulgedium quercinum* (L.) C.Jeffrey in Notes Roy. Bot. Gard. Edinburgh 33: 432. 1975. **Lectotype** (designated by van Raamsdonk 1997: 105): Herb. Linn. No. 950.1 (LINN).

Biennial herbs. Stem 77–182 cm high, with simple or branched tuber, erect, unbranched, glabrous, and striate. Leaves glabrous, margin denticulate, apex acute; middle cauline leaves lyrate-pinnatisect, obovate-elliptic, lobed or unlobed, 5.5–9 × 1–5.5 cm, sagittate-auriculate base, sessile; lower cauline leaves lyrate-pinnatisect, obovate-elliptic, petiolate. Synflorescence corymbiform or rarely paniculiform, with more than 50 heads or rarely less than 50 heads. Capitula with 16–22 flowers, cylindrical, fruiting 12–16 × 2–3 mm; with peduncles to 3 cm or sessile. Phyllaries 15–17, in 3–4 series, margin very narrowly whitish hyaline, generally with anthocyanin spots throughout dorsal surface; outer phyllaries 1.2–3.3 × 0.8–1.2 mm, ovate, apex acute; inner phyllaries 9–13 × 1.3–2.4 mm, linear-lanceolate, apex obtuse. Flowers yellow; corolla tube 3.4–3.7 mm long, hairy in upper part; ligule 5.7–6.9 × 0.8–1.8 mm; anther tube yellowish, 2.6–3.8 mm long; fertile part 2.2–2.4 mm long, apical appendages 0.2–0.3 mm long, basal appendages 0.2–0.3 mm long. Style 6.0–9.5 mm long; branches 1–1.5 mm long. Achenes beaked, corpus oblong-ellipsoid in outline, compressed, 5.9–9.1 × 1.1–1.4 mm, muricate (under high magnification), black with 5–6 prominent ribs on each face, base truncate, with



Figure 4. *Lactuca macrophylla* (*Coşkunçelebi*&*Güzel* 109): a- herbarium specimen; b- achene; c- corpus; d- flowering capitula; e- fruiting capitula.

completely annular carpopodium, corpus attenuate into a beak; beak 1.5–3.9 mm long, smaller than half of the corpus, of the same color as the corpus. Pappus simple, white, 4.3–6.7 mm long, deciduous, bristles scabridulous, most of them with 4–5 cells in diameter at the base.

Affinity: *Lactuca quercina* has affinities to *L. serriola* L., *L. saligna* L., and *L. georgica* Grossh. with respect to the general view of synflorescence, slender and cylindrical capitula. It is clearly differentiated by a shorter (not longer than 4 mm) and stout beak (not slender) and black achene (not brownish) from *L. serriola* and *L. saligna*. It is differentiated from *L. georgica* by unwinged (not winged) achene.

Infraspecific variation: Our studies confirm the recognition of two subspecies by Feráková (1970) also for Turkey. They can be distinguished according to the following key.

1. Achenes 5.9–7.6 mm long, beak 1.5–2.4 mm long (shorter than half of the corpus), ligule 5.7–5.9 mm long, style 6.0–7.3 mm long ……..…. **subsp. *quercina***

1 Achenes 7.8–9.1 mm long, beak 3.2–3.9 mm long (longer than half of the corpus), ligule 6.6–6.9 mm long, style 8.7–9.5 mm long ……... **subsp. wilhemsiana**

Lactuca quercina subsp. ***quercina***

Illustrations: Figure 5.

Phenology: Flowering in July–August, fruiting in August–September.

Habitat: Subalpine stony pastures.

General distribution: The taxon is naturally distributed in Europe and temperate W Asia (Meusel and Jäger, 1992). The western limit of its distribution runs through France and the western part of central Germany; the eastern limit is formed by the Caspian Sea (Lebeda et. al, 2004). It is also naturally distributed in NE Turkey at the western limit of the Caucasus.

Vernacular name in Turkey: Kaçkar marulu.

Examined specimens: Turkey. A8 Rize: Cimil, Başköy, protected areas, 2053 m, 40°43′N, 40°47′E, 18 viii 2013, *Coşkunçelebi&Güzel* 98 (KTUB); Rize: Çamlıhemşin, side of Kale-i Bala, 1668 m, 40°49′N, 40°56′E, 30, 08 ix 2013, *Coşkunçelebi&Güzel* 136 (KTUB); Rize: İkizdere, Cimil, Başköy, roadside, 2041 m, 40°43′N, 40°47′E, 15 vii 2015, *Coşkunçelebi&Güzel* 409 (KTUB).

Lactuca quercina subsp. ***wilhemsiana*** (DC.) Feráková in Folia Geobot. Phytotax. 5: 420. 1970 ≡ *Lactuca wilhemsiana* DC., Prodr. 7: 134. 1838 ≡ *Lactucopsis wilhemsiana* (DC.) Vis. & Pančić in Mem. Reale Ist. Veneto Sci. 15: 6. 1870. **Holotype:** Azerbaijan, Nakhitchevan, "inter frutices et in glareosis secus Nakitschiwantschai", [before 1832], *J. N. Szovits* s.n. (G-DC G00498778).

Typification: The taxon was described by Candolle with reference to herbarium material collected by Szovits in Nakhichevan and Georgia ["Iberia"]. A single specimen, received in 1832, is present in the Candolle herbarium (G-DC), which thus can be considered as the holotype of the name *Lactuca wilhemsiana*.

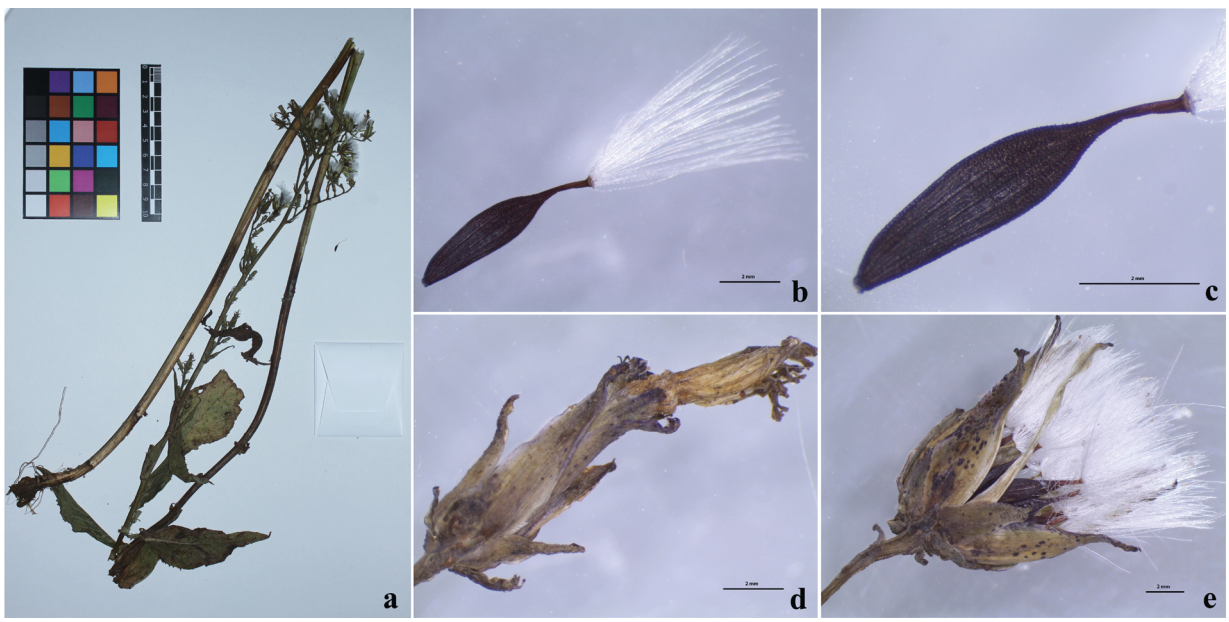


Figure 5. *Lactuca quercina* subsp. *quercina* (*Coşkunçelebi&Güzel* 98): a- herbarium specimen; b- achene; c- corpus; d- flowering capitula; e- fruiting capitula.

Illustrations: Figure 6.

Phenology: Flowering in July–August, fruiting in August–September.

Habitat: Clearings of *Quercus* sp. shrub.

General distribution: The natural distribution of this taxon is considered here to be limited to Anatolia and Caucasus according to the view of Feráková (1976, 1977). In accordance with her assumption we record subsp. *wilhemsiana* from East and Northeast Anatolia.

Vernacular name in Turkey: Meşe marulu.

Examined specimens: Turkey. B7 Gümüşhane: above Spikör village (Güzyurdu), near Pelitlik, Çitlice valley, under *Quercus* sp., *Elaeagnus sp.*, *Salix* sp., 1918 m, 39°54′N, 39°32′E, 17 vii 2014, *Coşkunçelebi*&*Güzel* 258 (KTUB); Gümüşhane: above Spikör village (Güzyurdu), near Pelitlik, Çitlice valley, under *Quercus* sp., *Elaeagnus sp.*, *Salix* sp., 1918 m, 39°54′N, 39°32′E, 17 vii 2014, *Coşkunçelebi*&*Güzel* 259 (KTUB); Tunceli: Hozat to Ovacık, under *Quercus* sp., 1735 m, 39°17′N, 39°12′E, 24 vii 2015, *Coşkunçelebi*&*Güzel* 435 (KTUB); B9 Van: Çatak, Konalga village, under *Quercus* sp. and *Juglans* sp., 1828 m, 37°51′N, 43°09′E, 02 vii 2014, *Coşkunçelebi*&*Güzel* 231 (KTUB).

Lactuca viminea (L.) J. Presl & C. Presl, Fl. Cech.: 160. 1819 ≡ *Prenanthes viminea* L., Sp. Pl.: 797. 1753 ≡ *Chondrilla viminea* (L.) Lam., Encycl. 2: 77. 1786 ≡ *Scariola viminea* (L.) F.W.Schmidt in Samml. Phys.-Ökon. Aufsätze 1: 270. 1795 ≡ *Phaenixopus vimineus* (L.) Rchb., Fl. Germ. Excurs. 2: 272. 1831 ≡ *Phaenopus vimineus* (L.) DC., Prodr. 7: 176. 1838. **Lectotype** (designated by van Raamsdonk 1997: 105): Herb. A. van Royen, sheet no. 900.344-290 (L).

Biennial herbs. Stem 8–115 cm high, woody at base, with taproot, erect, branched form middle or rarely at base, glabrous, striate. Leaves glabrous or rarely pubescent, margin entire or entire-sinuate, apex acute; lower cauline leaves runcinate-pinnatisect, 2.5–9.0 × 1–2 cm, petiole shorter than blade (0–2 cm long); almost leafless at fruiting; with persistent decurrent auricles, 0.5–2.5 cm long. Synflorescence paniculiform or rarely spiciform, dichotomously branched, with more than 50 heads, capitula pedunculate (to 5 cm) or sessile. Capitula with 4–5 flowers, cylindrical, at fruiting 16–26 × 2–7 mm. Phyllaries 10–13, in 3 series, margin very narrowly whitish hyaline; outer phyllaries 2.5–3.0 × 1.0–1.5 mm, ovate, apex acute; inner phyllaries 11–20 × 0.5–3 mm, linear-lanceolate, apex obtuse. Flowers yellow, corolla tube 4.5–6.2 mm long, hairy in upper part; ligule 6.1–8.8 × 1.4–2.8 mm; anther tube yellowish, 3.5–4.6 mm long; fertile part 2.7–3.5 mm long, apical appendages 0.2–0.4 mm long, basal appendages 0.3–0.7 mm long. Style 8.3–9.5 mm long; branches c. 1.0 mm long. Achenes beaked, corpus ellipsoid in outline, compressed, 10.5–15 × c. 1 mm, muricate (under high magnification), blackish or rarely dark brown with 5–9 prominent ribs on each face, base truncate, completely annular carpopodium with a narrow interruption, corpus attenuate into a beak; beak 4–8.5 mm long, about as long as the corpus, of the same color as the corpus. Pappus simple, white, 5.5–8.0 mm long, deciduous, bristles scabridulous, most of them with 2–4 cells in diameter at the base.



Figure 6. *Lactuca quercina* subsp. *wilhemsiana* (*Coşkunçelebi*&*Güzel* 231): a- herbarium specimen; b- achene; c- corpus; d- flowering capitula; e- fruiting capitula.

Affinity: *Lactuca viminea* is closely related to *Lactuca orientalis* as is evident from its decurrent stem leaves. It is clearly differentiated by longer (not less than 10.5 mm) and black or blackish (not light brownish) achene and herbaceous habitus (not subshrub) from *L. orientalis*.

Infraspecific variation: Feráková (1977) distinguished four subspecies in *L. viminea*, of which subsp. *ramosissima* was stated to occur scattered in the Mediterranean region from S Spain across S Italy to Greece. More recently it has been also reported for the East Aegean islands by Sida and Tan (2000). Here we report it for the first time from the Turkish mainland. It can be distinguished from the typical subspecies as given in the following key.

1. Stem 46–115 cm, herb, branched form middle part of stem, auricles 1–2.5 cm long, ... **subsp. *viminea***

1. Stem 8–30 cm, woody and branched at base, auricles 0.5–1 cm long ..... **subsp. *ramosissima***

Lactuca viminea subsp. ***viminea***

= *Lactuca decortica* Forssk., Fl. Aegypt. Arab.: 216. 1775. **Lectotype** (designated by Hepper and Friis, 1994: 131): [Turkey, "in insula Imros [= Golzcehada] & circa Constantinop." [=Istanbul], Jul-Aug 1761, Forsskål 1388] (C10002479) (C photo!).

Illustrations: Figure 7.

Phenology: Flowering in June–July, fruiting in July–August.

Habitat: Rocky slopes, screes, stony and gravelly places, roadsides, and field margins.

General distribution: The taxon is naturally distributed in S Europe, temperate W Asia, and NW Africa (Meusel and Jäger, 1992). It is widespread in Turkey.

Vernacular name in Turkey: Çukurçıtlığı (Ekim, 2012).

Examined specimens: Turkey. A3 Bolu: Yedigöller National Park, Tombulları, ca. 900 m, 12 viii 1978, *R.İlarslan* 205 (ANK); Bolu: Aladağ, Kartal kaya, ca. 2000 m, 11 viii 1960, *Khan et al.* 488 (ANK); Zonguldak: Devrek, Davulga region, ca. 600 m, 06 viii 1984, *M.Demirörs* 1237 (ANK); A4 Ankara: Çubuk, Karagöl, step, 5020 m, 04 viii 1974, *S.Erik* 733 (HUB); A8 Bayburt: Soğanlı Mountain, Üzengili village, road side, 2423 m, 40°29′N, 40°24′E, 22 viii 2016, *Coşkunçelebi&Güzel* 519 (KTUB); B3 Eskişehir: Türkmen Mountain, Kaplan Stream, rocky places, ca. 1500 m, 25 vii 1975, *T.Ekim* 3011 (ANK); B4 Ankara: Başkent Uni., E of Bağlıca campus, steppe, 1043 m, 26 viii 2008, *D.Töre* 1505 (HUB); A4 Karabük: towards Keltepe, around Eğriova Pond, road side, 1095 m, 41°06′N, 32°29′E, 5 viii 2014, *Okur 340* (KTUB); B6 Kahramanmaraş: Çardak, Berit, Ericek, ca. 1500 m, *P.H.Davis* 20384 (ANK); B6 Kahramanmaraş: Göksun, Ericek village, Yonca deresi, 1500 m, 23 vii 1997, *B.Yıldız* 1285 (HUB); B7 Tunceli: from Karaoğlan to Hozat 25 km, road side, 1959 m, 39°12′N, 39°13′E, 24 vii 2015, *Coşkunçelebi&Güzel* 430 (KTUB); Tunceli: Ovacık, throughout Kırkmerdivenler, Munzur Dağları, 1700–2200 m, 28 vii 1979, *Ş.Yıldırımlı* 2278 (HUB); C2 Denizli: Honaz Mountain, 1458 m, 37°39′N, 29°15′E, 30 vii 2013, *Coşkunçelebi&M.Gültepe* 478 (KTUB); Denizli: Babadağ, under *Pinus* sp., 1268 m, 37°48′N, 28°47′E, 10 viii 2016, *Güzel&Coşkunçelebi* 491a (KTUB); Denizli: Kara tepe, 03 viii 1947, *P.H.Davis* 13848 (ANK); Antalya: Elmalı, Çamkuyuları, Sarnıç area, Avlan Lake, above Gümüşbucağı, SW side, under *Quercus*

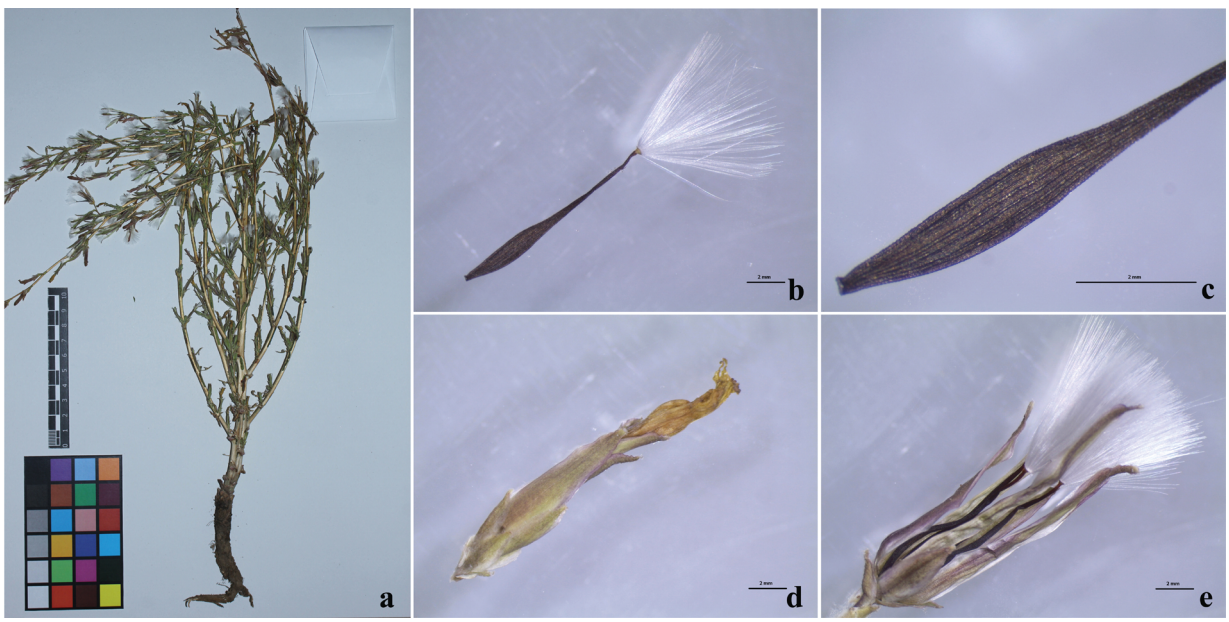


Figure 7. *Lactuca viminea* subsp. *viminea* (*Coşkunçelebi&Güzel* 519): a- herbarium specimen; b- achene; c- corpus; d- flowering capitula; e- fruiting capitula.

coccifera, ca. 1400 m, 03 vii 1974, *R.Çetik* 2293 (ANK); C4 Konya: Bozkır, Dikilitaş highland, 06 viii 1967, *R.Çetik* 1291 (ANK); Antalya: Geyik Mountain, Hanboğaz ormanı, ca. 1600 m, *P.H.Davis* 14724 (ANK); Konya: Ermenek, around Kazancı, 650–850 m, 21 vi 1984, *H.Sümbül* 3017 (HUB); Antalya: Gazipaşa, Sugözü village, Maha highland, protected area, 1450 m, 05 viii 1983, *H.Sümbül* 2370 (HUB); C5 Adana: Karsanti, Söğüt road, Sağ sahil, ca. 900 m, 04 viii 1972, *E.Yurdakulol* 97 (ANK).

Lactuca viminea subsp. ***ramosissima*** (All.) Arcang., Comp. Fl. Ital.: 424. 1882 ≡ *Prenanthes ramosissima* All., Fl. Pedem. 1: 226. 1785 ≡ *Phaenixopus ramosissimus* (All.) Cass. in Cuvier, Dict. Sci. Nat. 39: 392. 1826 ≡ *Lactuca ramosissima* (All.) Boreau in Bull. Soc. Industr. Angers 17: 19. 1846 ≡ *Scariola ramosissima* (All.) Soják in Novit. Bot. Delect. Seminum Horti Bot. Univ. Carol. Prag. 1961: 46. 1961 ≡ *Lactuca viminea* var. *allionii* Rouy, Fl. France 9: 196. 1905. **Syntypes:** France, Provence-Alpes-Côte d'Azur "In sabulosis ad maris Nicaeensis litus"; Italy, Piedmont "locis calidioribus prope la Castiglia d'Ivrea", Bellardi (in herb. Allioni, TO).

Illustrations: Figure 8.

Phenology: Flowering in July, fruiting in July–August.

Habitat: Gravelly places and bases of cliffs.

General distribution: The subspecies is scattered distributed in the European part of the Mediterranean region and in Turkey. The thus known occurrences on the Turkish mainland are shown in the distribution map.

Vernacular name in Turkey: Bodur çukurçıtlığı.

Examined specimens: Turkey. A7 Trabzon: Eskala Plateau, roadsides, 1893 m, 40°44′N, 39°22′E, 10 ix 2014, *Coşkunçelebi&Güzel* 314 (KTUB); B6 Kayseri: above Kaynar, Hınzır Mountain, ca. 1900 m, 13 ix 1979, *N.Çelik* 866 (ANK); C3 Antalya: between Antalya and Akseki, towards to Gündoğmuş, forest clearings, 241 m, 36°46′N, 31°44′E, 28 vii 2013, *Coşkunçelebi&M.Gültepe* 475 (KTUB); C4 Konya: between Ermenek and Tekeçatı, open and dry places, ca. 1450 m, 10 viii 1979, *M.Vural* 1932 (ANK).

4. Discussion

Recently several changes have been proposed for the generic classification of subtribe Lactucinae by Sell and Murrell (2006), Lack (2007), Kilian et al. (2009a), Wang et al. (2013), and Kilian et al. (2017); however, subtribe Lactucinae in Turkey had not been studied after the preparation of Cichorieae Lam. & DC. for *Flora of Turkey*, with the exception of the checklist by Ekim (2012). The subtribe consists of seven major phylogenetic lineages, but generic limits are still open questions due to convergent character evolution (Kilian et al., 2017). The same problems still continue for the Lactucinae in Turkey. Therefore, the same wide concept of *Lactuca* is adopted in this paper as in the checklist of Ekim (2012). In the present study, new country records and confirmations for Turkey together with comprehensive descriptions and micrographs of the pappus disk and carpopodium (Figure 1) of the cited taxa were provided. With our additions to the checklist by Ekim (2012), the subtribe Lactucinae is represented in Turkey with 39 taxa (36 taxa belonging to *Lactuca*, 3 taxa to *Prenanthes* L.).

During the revisional study of Lactucinae in Turkey, it was found that *Lactuca leucoclada*, known only from

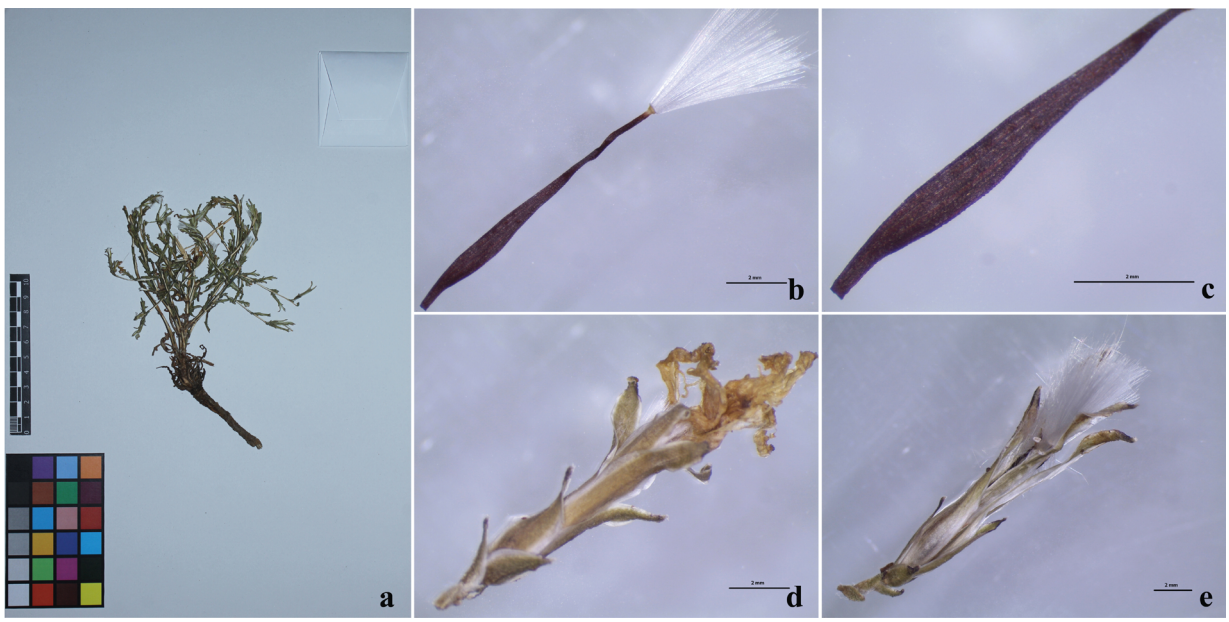


Figure 8. *Lactuca viminea* subsp. *ramosissima* (*Coşkunçelebi&M.Gültepe* 475): a- herbarium specimen; b- achene; c- corpus; d- flowering capitula; e- fruiting capitula.

Afghanistan (Rechinger, 1977; Breckle et al., 2013), is also growing in Erzincan, NE Turkey, far away from the type locality. This disjunction is very surprising, but it may indicate that the species may also occur in NE Turkey and Iran but has been overlooked so far.

Lactuca macrophylla was doubtfully recorded from Turkey under *Cicerbita* by Jeffrey (1975) and *Lactuca* by Ekim (2012) based on K.Koch specimens from A9 Artvin and A9 Erzurum; the presence of the species has not been confirmed to date. Extensive field work in the cited localities shows that *L. macrophylla* grows in the highland of the East Black Sea region of Turkey and is closely related to *L. adenophora* and *L. racemosa* based on achene and habitus. *L. macrophylla* is clearly distinct from them by having a long stem, large lower cauline leaves, and dense glandular hairs throughout the synflorescence (rarely synflorescence branches almost glabrous). Moreover, we noticed that the Şavşat population above Karagöl (Artvin) includes different morphs. While the specimen *Coşkunçelebi*&*Güzel* 467a is characterized by synflorescence covered with dense glandular hairs and produces healthy achenes, the specimen *Coşkunçelebi*&*Güzel* 467b is characterized by glabrous synflorescence and produces immature achenes. The vernacular name "Kayıp marul" means "lost lettuce" in Turkish and was given by Ekim (2012) according to its doubtful record in Turkey. Since its distribution in Turkey is now confirmed by the present authors, we suggest naming it "Boylu marul" (giant lettuce) based on its habit.

Lactuca quercina was listed for *Flora of Turkey* by Jeffrey (1975) under the genus *Mulgedim* at the species level. According to Feráková (1976, 1977), subsp. *quercina* is distributed in Europe (it possibly grows in the European part of Turkey), while subsp. *wilhemsiana* is restricted to Anatolia and the Caucasus. Ekim (2012), in contrast, reported only subsp. *quercina* for Turkey and the presence of subsp. *wilhemsiana* as doubtful for Turkey, without examining any samples in the field and/or herbaria. Extensive field works in the localities listed in *Flora of Turkey* and examination of the samples stored in several herbaria show that subsp. *wilhemsiana* is distributed in Southeast Anatolia, whereas subsp. *quercina* is distributed in the East Black Sea region of Turkey (Figure 2). The general habitus of these two subspecies are very similar, but the differences in the length of achene and beak reliably distinguish the subspecies in the field and the herbarium. According to Ekim (2012), the vernacular name of *L. quercina* subsp. *wilhemsiana* is "Istranca marulu", dedicated to the Istranca mountain range in the European part of Turkey; however, the actual distribution does not coincide with this name, so we suggest to name it "Meşe marulu", referring to its general habitat. According to Ekim (2012), the vernacular name of *L. quercina* subsp. *quercina* is "Meşe marulu", but its actual habitat is subalpine stony pastures, so we suggest to name it "Kaçkar marulu", after the Kaçkar Mountains, which is the main mountain range in the Caucasian region of Turkey.

Lactuca viminea was recorded at the species level in *Flora of Turkey* according to herbarium samples, without observing any samples in the field (Jeffrey, 1975); however, the present authors collected and observed several samples in the field and herbaria belonging to *L. viminea* that easily fell into two distinct subspecies according to their habitus and morphological traits. *L. viminea* subsp. *viminea* has a wide range of distribution throughout Turkey (Figure 2) in contrast to *L. viminea* subsp. *ramosissima*, which is mostly distributed in hot, dry, and rocky areas around the Mediterranean region of Turkey. It is recorded from the East Aegean islands as *L. viminea* subsp. *ramosissima* in *Flora of Turkey* (Sida and Tan, 2000), but not from Turkey.

Acknowledgments

We thank TÜBİTAK for support of Grant No. 159Z269 and TÜBİTAK-BİDEB 2214 for supporting the first author to study at the Botanic Garden and Botanical Museum Berlin (B). We thank the editors and three anonymous reviewers for their critical comments.

References

Abid R, Qaiser M (2015). Cypsela morphology of *Lactuca* L. and its allied genera (Cichoreae-Asteraceae) from Pakistan and Kashmir. Pak J Bot 47: 1937-1955.

Breckle SW, Hedge IC, Rafiqpoor MD (2013). In: Dittmann A, editor. Vascular Plants of Afghanistan: An Augmented Checklist. Bonn, Germany: Scientia Bonnensis.

Bremer K (1994). Asteraceae: Cladistic and Classification. Portland, OR, USA: Timber Press.

Ekim T (2012). *Lactuca* L. In: Güner A, Aslan S, Ekim T, Vural M, Babaç MT, editors. Türkiye Bitkileri Listesi (Damarlı Bitkiler). İstanbul, Turkey: Nezahat Gökyiğit Botanik Bahçesi ve Flora Araştırmaları Derneği Yayını, pp. 179-181 (in Turkish).

Feráková V (1970). A biosystematic study of critical species of *Lactuca* sect. *Lactucopsis*. Folia Geobotanica et Phytotaxonomica 5: 401-427.

Feráková V (1976). *Lactuca* L. In: Tutin TG, Heywood VH, Burges NA, Moore DM, Valentine DH, Walters SM, Webb DA, editors. Flora Europaea, Vol. 4. Cambridge, UK: Cambridge University Press.

Feráková V (1977). The genus *Lactuca* L. in Europe. Bratislava, Czechoslovakia: Komensky University Press.

Froelich JA (1791). Differentia specifica *Sonchi alpini* australis & *S. canadensis* L. evoluta. Ann Bot (Usteri) 1: 24-32 (in Latin).

Galusko AI (1980). Flora severnogo Kavkaza 3. Rostov, Russia: Isd. Rostowskogo Univ. (in Russian).

Haque MZ, Godward MBE (1984). New records of the carpopodium in Compositae and its taxonomic use. Bot J Linn Soc 89: 321-340.

Hepper FN, Friis I (1994). The plants of Pehr Forsskål's Flora Aegyptiaco-Arabica. Kew, UK: Royal Botanic Gardens.

Jeffrey C (1975). *Lactuca* L. In: Davis PH, editor. Flora of Turkey and East Aegean Islands, Vol. 5. Edinburgh, UK: Edinburgh University Press, pp. 764-783.

Kilian N, Gemeinholzer B, Lack HW (2009a). Tribe Cichorieae. In: Funk VA, Susanna A, Stuessy T, Bayer R, editors. Systematics, Evolution and Biogeography of the Compositae. Vienna, Austria: IAPT, pp. 343-383.

Kilian N, Hand R, Raab-Straube EV, editors (2009b). Cichorieae Systematics Portal. Website http://cichorieae.etaxonomy.net/portal/ [accessed 12 May 2017].

Kilian N, Sennikov A, Wang ZH, Gemeinholzer B, Zhang JV (2017). Sub-Paratethyan origin and middle to late Miocene principal diversification of the Lactucinae (Compositae: Cichorieae) inferred from molecular phylogenetics, divergence-dating and biogeographic analysis. Taxon 66: 675-703.

Kirpicznikov ME (1964). Genera 1653–1659: *Prenanthes*, *Lactuca*, *Scariola*, *Steptorhamphus*, *Mycelis*, *Cephalorrhynchus*, *Cicerbita*. In: Bobrov EG, Tzvelev NN, editors. Flora SSSR, Vol. 29. Moscow, USSR: Nauka, pp. 255-355 (in Russian).

Koopman WJM, Guetta E, Van De Wiel CCM, Vosman B, Van Den Berg RG (1998). Phylogenetic relationships among *Lactuca* (Asteraceae) species and related genera based on ITS-1 DNA sequences. Am J Bot 85: 1517-1530.

Křístková E, Doležalová I, Lebeda A, Vinter V, Novotná A (2008). Description of morphological characters of lettuce (*Lactuca sativa* L.) genetic resources. Hortic Sci 35: 113-129.

Lack H (2007). Tribe Cichorieae. In: Kubitzki K, editor. The Families and Genera of Vascular Plants, Vol. 8. Berlin, Germany: Springer-Verlag, pp. 180-199.

Lebeda A, Doležalová I, Feráková V, Astley D (2004). Geographical distribution of wild *Lactuca* species (Asteraceae, Lactuceae). Bot Rev 70: 328-356.

Menemen Y, Aytaç Z, Kandemir A (2016). Türkçe bilimsel bitki adları yönergesi. Bağbahçe Bilim Dergisi 3: 1-3 (in Turkish).

Meusel H, Jäger EJ (1992). Vergleichende chorologie der zentraleuropäischen Flora, 3. – Jena, etc.: Gustav Fischer. Website http://www2.biologie.uni-halle.de/bot/ag_chorologie/choro/index.php?Lang=D [accessed 20 June 2017] (in German).

Monge M, Kilian N, Anderberg AA, Semir J (2016). Two new records of *Lactuca* L. (Cichorieae, Asteraceae) in South America. Revista Brasileira de Biociencias 14: 117-123.

QGIS Development Team (2014). QGIS User Guide. Release 2.0. QGIS Geographic Information System. Open Source Geospatial Foundation Project. Website http://qgis.osgeo.org.

Rechinger KH (1977). Compositae II-*Lactuceae*. In: Rechinger KH, editor. Flora Iranica, No. 122: 1–5. Graz, Austria: Akademische Druck-u Verlagsanstall, pp. 180-216.

Sell P, Murrell G (2006). Tribe Cichorieae. In: Sell P, Murrell G, editors. Flora of Great Britain and Ireland, Vol. 4. Cambridge, UK: Cambridge University Press, pp. 92-421.

Sennikov AN (1997). Vidy roda *Prenanthes* i gruppy rodstva *Cicerbita* (Asteraceae) na Kavkaze. Botichesky Zhurnal 82: 106-114 (in Russian).

Shi Z, Ge XJ, Kilian N, Kirschner J, Štěpánek J, Sukhorukov AP, Mavrodiev EV, Gottschlich G (2011). Cichorieae. In: Wu ZY, Raven PH, Hong DY, editors. Flora of China, Vol. 20–21. St. Louis, MO, USA: Missouri Botanical Garden Press, pp. 195-353.

Sida O, Tan K (2000). *Lactuca* L. In: Güner A, Özhatay N, Ekim T, Başer KHC, editors. Flora of Turkey and the East Aegean Islands, Vol. 11. Edinburgh, UK: Edinburgh University Press, p. 169.

Wang ZH, Peng H, Kilian N (2013). Molecular phylogeny of the *Lactuca* alliance (Cichorieae subtribe Lactucinae, Asteraceae) with focus on their Chinese centre of diversity detects potential events of reticulation and chloroplast capture. PLoS One 8: e82692.

Willdenow CL (1803). Caroli a Linné Species plantarum exhibentes plantas rite cognitas ad genera relatas, cum differentiis specificis, nominibus trivialibus, synonymis selectis, locis natalibus, secundum systema sexuale digestas. Berlin, Germany: G.C. Nauk (in Latin).