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Lactuca aculeata (Asteraceae), a crop wild relative new to Europe

Abstract

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The wild lettuce, *Lactuca aculeata*, a close relative of the widespread *L. serriola* and the cultivated lettuce *L. sativa*, has been found on the islands of Limnos and Lesbos (North Aegean region, Greece). The new records are the westernmost of this East Mediterranean taxon and represent the first ones for the Aegean and Europe. Along with locality data, we provide information on habitat preferences and co-occurring species.

Key words: Aegean, crop wild relative, Greece, floristics, stubble fields.

Introduction

Lactuca aculeata Boiss. & Kotschy (Asteraceae) belongs to a group of species taxonomically most closely related to the cultivated lettuce *L. sativa* L. (Zohary 1991). The distribution of *L. aculeata* as far as known so far includes parts of northern, central, southern and chiefly eastern Turkey (Güzel, pers. comm.) and the Near East (Syria, North Israel, northern Iraq, north-western Iran). Cohen & Liston (1986) and Zohary (1991) presented distribution maps of the scattered records.

L. aculeata is similar to the widespread *L. serriola* L. but differs in its stem which is aculeate throughout (instead of being prickly only at base) and in its leaves which are setulose on both surfaces above and beneath. Cohen & Liston (1986) provide an instructive detailed drawing of the plant, and diagnostic photos can be found on the Online Flora of Israel website (Danin & Fragman-Sapir 2016+).

The present paper informs about our new records of *L. aculeata* on the North Aegean islands of Limnos and Lesbos, west of the known distribution range. The morphology, habitat and species composition of the new populations are also defined.

Material and methods

This study is a by-product of the Terra Lemnia project, which aims to conserve and promote sustainable, traditional agro-pastoral practices on the island of Limnos (<https://terra->

lemnia.net/en/). Autumnal vegetation sampling on the island of Limnos (North Aegean, Greece) and, less extensively, on Lesbos (East Aegean) provided evidence of a number of new members of the local floras. The field surveys took place in mid-October 2019 and repeatedly from around the turn of September till November 2020. We studied the vegetation by plot-wise sampling of late-seasonal vegetation in favourable condition and collected representative plants for further examination. Among others, we collected a total of nine relevés with *L. aculeata*, five on Limnos and four on Lesbos. Plant specimens collected by Erwin Bergmeier are currently stored in the author's private herbarium (herb. EB) and those of Stefan Meyer will be incorporated in the herbarium collections of the National and Kapodistrian University of Athens (ATHU).

Results and discussion

Lactuca aculeata was found in small numbers in various sites in the central and chiefly eastern parts of Limnos, and scattered on Lesbos in the south near the Gulf of Kalloni. The plants found are robust overwintering biennials, or spring-germinating annuals, erect up to 170 cm (Fig. 1). The whitish stem is variously densely aculeate throughout up to the synflorescence. The stem-leaves are obovate-oblong, usually shorter and broader than in *L. serriola*, glaucous, rigid, spinous-ciliate on both sides; mostly unlobed, entire or denticulate, they resemble *L. serriola* f. *integrifolia* (S.F. Gray) S.D. Prince & R.N. Carter, unlike the lobed or pinnatifid leaves as in the common *L. serriola* f. *serriola*. The lower leaves are cordate-semiamplexicaul at base with auricles; the mid-rib is strongly spinose-setose. As in *L. serriola*, the stem-leaves are often held vertically. The synflorescence is a more or less elongate pyramidal panicle, with appressed auricled bracts. The involucre in the examined plants is 8-12 mm long, its bracts are glabrous and usually violet-tinged. Flowers are pale yellow (only late flowering seen). Ripe achenes are compressed, ribbed, 3.5-4.5 mm, with several pale bristles near apex, abruptly contracted into a pale beak 3-4 mm, and with pappus of simple white hairs to 7 mm.

Specimens and observations

- Limnos, between Kalliopi and Keros Beach, 39°54.5'N 25°20.5'E, 10 m. Edge of stubble. 2019-10-16, *Bergmeier 19-464* (herb. EB).
- Limnos, between Ag. Dimitrios and Atsiki, 39°54.512'N 25°10.736'E and 39°54.516'N 25°10.703'E, 65 m. Edge of vineyard. 2020-09-27, *Bergmeier 20-48* (EB).
- Limnos, 2.5 km south of Atsiki, 39°56.155'N 25°14.124'E, 30 m. Fallow field. 2020-09-27, *Bergmeier 20-60* (EB).
- Limnos, east of Kalliopi, 39°54.671'N 25°19.790'E, 10 m. Field edge and road verge. 2020-10-01, *Bergmeier 20-139* (EB). Further nearby in 39°54.704'N 25°19.847'E, 10 m, and 39°54.757'N 25°19.842'E, 12 m; 1-year fallows; 2020-10-01, Bergmeier & Meyer, obs.
- Limnos, Kondias, 39°52.313'N 25°09.070'E, 12 m. 1-year fallow. 2020-10-02, Bergmeier & Meyer, obs.
- Limnos, near Kondias, 39°51.988'N 25°09.345'E, 1 m. Stubble (barley) field. 2020-10-02, Bergmeier & Meyer, obs.
- Lesbos, appr. 1.7 km E of Polichnitos, 39°4.708'N 26°12.129'E, 65 m. Stubble field. 2020-10-09, Meyer, obs.
- Lesbos, appr. 1.6 km SW of Skamioudi, 39°7.239'N 26°11.233'E, 1 m. Stubble field. 2020-10-09, Meyer, obs.



Fig. 1. *Lactuca aculeata*, from upper left to lower right. Habit; lower part of synflorescence; upper part of stem with cauline leaves; branch of synflorescence with flower head. Photos: 1-3: U. Bergmeier, 27-09-2020 and 1-10-2020; 4: S. Meyer, 9-10-2020.

Lesbos, appr. 1.45 km SW of Skamioudi, 39°7.215'N 26°11.361'E, 5 m. Stubble field. 2020-11-27, Meyer, obs.

Lesbos, appr. 1.45 km SW of Skamioudi, 39°7.149'N 26°11.679'E, 7 m. Stubble field. 2020-11-27, Meyer, obs.

Habitat and vegetation

We found *Lactuca aculeata* on lowland field edges (cereals, vineyards), one- to two-year arable fallows, and mostly on stubble. The soils were deep, chiefly sandy or gravelly alluvial. Habitats other than arable include farm road verges and open sandy slopes disturbed by livestock and rabbits. Similar synanthropic habitat conditions, yet moreover semi-natural rocky environments, have been reported from north-eastern Israel (Zohary 1991: 32). Common plant species co-occurring with *L. aculeata* found in three or more relevés on Limnos and Lesbos include *Carthamus dentatus* (Forssk.) Vahl, *Centaurea solstitialis* L., *Chondrilla juncea* L., *Chrozophora tinctoria* (L.) A. Juss., *Cichorium intybus* L., *Cynodon dactylon* (L.) Pers., *Daucus carota* L., *Dittrichia graveolens* (L.) Greuter, *Dittrichia viscosa* (L.) Greuter, *Helminthotheca echiioides* (L.) Holub, *Polygonum arenarium* Waldst. & Kit., *Sorghum halepense* (L.) Pers., *Sonchus asper* (L.) Hill, and *Verbascum sinuatum* L. *Lactuca serriola* is more widespread on the islands but co-occurs with *L. aculeata* in a few sites, with sporadic intermediate forms suggesting that the two species are (partly) interfertile (as also observed by Zohary 1991 and Lebeda & al. 2012). Beharav & al. (2010) and Lebeda & al. (2012) reported that *L. aculeata* is also fully interfertile with cultivated lettuce.

The species composition of relevés with *L. aculeata* found on the two Aegean islands suggests that it is a constituent of zoo-anthropogenic open herblands in dry heavily disturbed ruderal sites. It may be assessed as a sporadic constituent of the vegetation of stubble fields rich in summer-annual herbs of the *Atriplicion* Passarge 1978 (*Sisymbrietea*), but it occurs in xerophytic ruderal communities of biennial and short-lived perennial plants too (closest is the alliance *Inulo viscosae-Agropyron repentis* Biondi & Allegrezza 1996; *Artemisieteae vulgaris*) (for nomenclature and definition of phytosociological syntaxa see Mucina & al. 2016).

Concluding remarks

Beharav & al. (2010) and Lebeda & al. (2012) found little morphological variation in *L. aculeata* populations in north-eastern Israel (see also Danin & Fragman-Sapir 2016+), and specimens collected in the Aegean islands of Limnos and Lesbos fall into the morphological range defined there as well as in the Flora of Turkey (Jeffrey 1975) and in Boissier's original description in the Flora Orientalis (Boissier 1875). In particular, the cauline leaves appear to be more uniform in shape among most plants of *L. aculeata* than among those of *L. serriola*, which is otherwise the most similar species in terms of habit, growth form, phenology and habitat.

L. aculeata is the third species of the genus *Lactuca* L. found on Limnos (Panitsa & al. 2003; Baliouis & al. 2014; a dot in the *L. viminea* map by Strid 2016 might be erroneous and possibly refers to *L. saligna*) and the fifth on Lesbos (Strid 2016). It is unlikely to be

a recent introduction, first because *L. aculeata* occurs on two different islands, second because it is more or less widespread on both islands though uncommon and, third, although restricted to anthropogenic habitats, it is fully established and should be regarded as a native species. It was probably overlooked by previous botanical observers, owing to its overall similarity to *L. serriola* and its seemingly trivial habitat. It should be looked for in western Turkey, from where it is not yet known (Güzel, pers. comm.).

L. aculeata is uncommon on the islands and the number of plants observed in any one reference plot (local population size) is small, rarely exceeding twenty individual plants in a locality. Nevertheless, due to its invariably synanthropic habitat (arable and fallows) it does not for the time being seem to be vulnerable on Limnos and Lesbos, provided the non-intensive agriculture including long stubble phases and rotational fallow is retained.

L. aculeata is a significant constituent of the Greek and European flora, not least because it is a wild close relative to cultivated lettuce, *L. sativa*. As our records of the former species from Limnos and Lesbos represent the westernmost known occurrences, these populations may turn out to be of interest for lettuce breeding.

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