

Contribution to the knowledge of *Lactuca* L. (Asteraceae) in the United Arab Emirates

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Abstract. We present new data on the distribution of *Lactuca* species and review the currently documented data on the genus in the United Arab Emirates (UAE). *L. serriola* L. is recorded for the first time from Abu Dhabi Emirate. *L. dissecta* D. Don, *L. serriola*, and *L. orientalis* (Boiss.) Boiss. were already reported from other emirates. Detailed morphological descriptions, types, distribution maps, and a key to *Lactuca* species in the UAE are included. We also highlight the deficiency of the documentation with herbarium specimens in the UAE.

Key words: alien species, Arabian Peninsula, *Lactuca*, United Arab Emirates, herbarium specimens

1. Introduction

The genus *Lactuca* Linnaeus (1753: 795) is included in the subtribe *Lactucinae* Dumont., which is naturally distributed in Europe, Africa, Asia, and North America. It comprises about 200 species (Kilian *et al.* 2009, 2017; Wang *et al.* 2013). Members of the genus are usually described as weeds inhabiting roadsides, wastelands, and other disturbed places. *Lactuca* species are mainly annual or perennial herbs with white latex, capitula often in paniculiform synflorescences, achene body subcompressed to compressed, and beak usually present (Shih & Kilian 2011).

So far, the genus *Lactuca* has been represented by 3 species with inadequate documentation in the UAE (Jongbloed 2003; Karim & Fawzi 2007; Feulner 2011). During recent botanical surveys in Abu Dhabi Emirate, specimens of a naturally occurring *Lactuca* species in an urban habitat were collected. After a detailed examination of the collected plant material, and a review of the taxonomic literature, the species was identified as *Lactuca serriola*, which is rare in Abu Dhabi.

The aim of this article is to confirm the presence of *L. serriola* in Abu Dhabi with accessible specimens and document the currently available data on

Lactuca recorded from the UAE as a contribution to the knowledge of the diversity of the vascular flora of the country.

2. Material and methods

Vegetation surveys were carried out in various urban habitats of the emirate in 2018-2021 to document alien and native species present. The studied sites included locations on Abu Dhabi Island, in its mainland suburbs, and in Al Ain city. The field attributes were collected using IOS-based ArcGIS Collector App, synchronized with the Environment Agency – Abu Dhabi (EAD) plant database. The distribution map of the species was prepared using ArcGIS 10.8.2 (ESRI 2019) (Fig. 1). Literature analysis (Boulos 2002; Jongbloed 2003; Karim & Fawzi 2007; Feulner 2011) as well as scrutiny of the vouchers deposited in the herbarium of the United Arab Emirates University (ABDH) were carried out for identification of specimens collected from the field. The global distribution of the species was traced with the help of herbarium specimens deposited in B, KTUB, and through a literature review (Kilian *et al.* 2009; Bano & Qaiser 2011; POWO 2021). The voucher material is stored in the EAD.

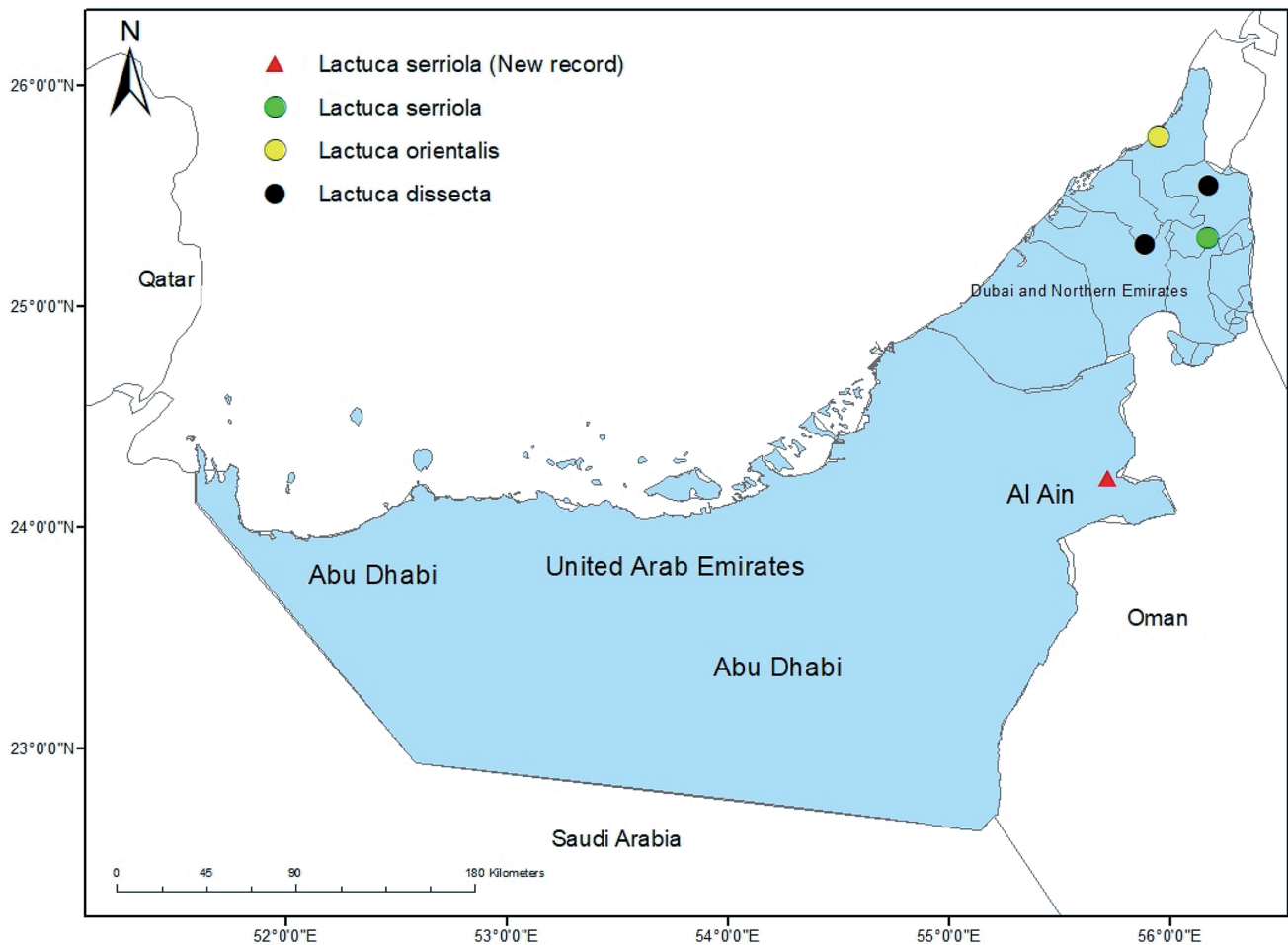


Fig. 1. Distribution map of *Lactuca* species in the UAE. The red triangle represents the confirmed record of *Lactuca serriola* from Abu Dhabi Emirate

3. Results

Lactuca serriola L., Cent. Pl. 2: 29. 1756. (Figs. 2-3)
 Lectotype (designated by Prince & Carter 1977: 337): Herb. Linn. No. 950.3 (LINN [web!])

Description: Herb, annual, 40-60 cm high. Flowering stems erect, whitish, glabrous, unbranched or branched from near base. Cauline leaves oblong or obovate, pinnatifid or runcinate, margin spinulose, glabrous or rarely subglabrous below, glaucous on both surfaces. Lower cauline leaves narrowly elliptic, pinnatisect or not divided, margin spinulose. Upper cauline leaves auriculate with acute auricles, 2-4-lobed or unlobed, and midrib abaxially often prickly setose. Synflorescence paniculiform, with 30-50 heads. Capitula with 15-20(25) florets, narrowly cylindrical, 12-16 mm × 2-3 mm in fruiting; with peduncles up to 3 cm long. Phyllaries 15-17; outer phyllaries 1.2-3.3 mm × 0.8-1.2 mm, ovate, apex acute; inner phyllaries 9-13 mm × 1.3-2.4 mm, linear-lanceolate, apex obtuse. Florets yellow; corolla tube 3.4-3.7 mm long, hairy in upper part; ligule 5.7-6.9 mm × 0.8-1.8 mm; anther tube yel-

lowish, 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, 3 mm × 1 mm, brown with 5-6 prominent ribs on each face, corpus abruptly contracted into a filiform beak, 4 mm long, longer than corpus. Pappus uniseriate, white, bristles scabridulous, 5 mm long, deciduous.

New record: United Arab Emirates, Abu Dhabi, Al Ain, Toad wadi, 24°13'33.62"N, 55°42'56.51"E; 259 m; 10 Apr 2021; *Sabitha Sakkir* leg.; EAD830, EAD831, EAD832.

Additional material examined: United Arab Emirates, Sharjah, north of Masafi, 500 m; 20 Apr 1991, *Fawzi M Karim* leg.; 05305, 05308, 05310 (ABDH).

Flowering and fruiting: February-June.

Habitat and ecology: The species is distributed in a humid and reconstructed urban area in Abu Dhabi. The population size is small, with about 30-40 individuals spread within a distance of 2 km (Figure 1).

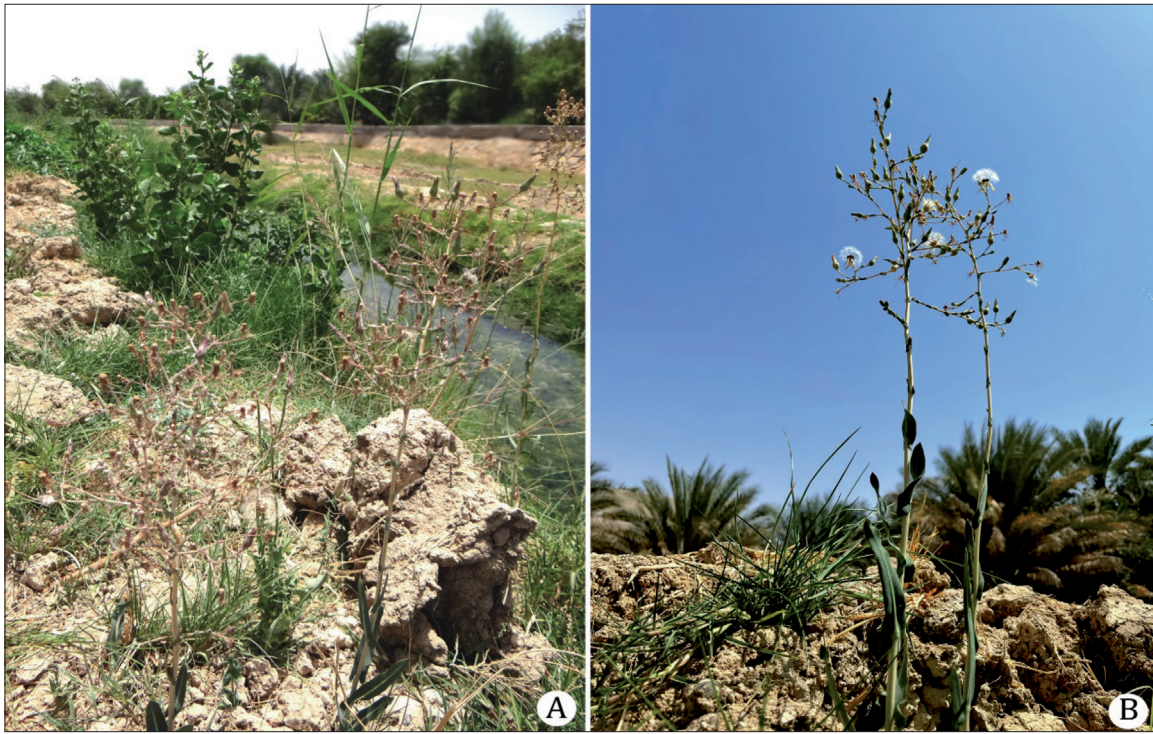


Fig. 2. The new location of *Lactuca serriola* L. in the Abu Dhabi Emirate (photograph by M. A. Mansouri)
 Explanations: A – habitat, a valley in an urban area, B – habit

Associated species are *Pluchea dioscoridis* (L.) DC., *Heliotropium curassavicum* L., *Sporobolus spicatus* (Vahl) Kunth, *Ipomoea aquatica* Forssk., *Phragmites australis* (Cav.) Trin. ex Steud., and *Rhynchosia minima* (L.) DC.

Regional occurrence: north of Masafi and Abu Dhabi

Vernacular name in UAE: *khas al hemer* (خس الحمار) (Karim & Fawzi 2007)

Global distribution: Africa, Asia (temperate and tropical, Australasia, Europe, North America, South America (Kilian *et al.* 2009). In the Arabian Peninsula, the species has been reported from Kuwait (Boulos & Al-Dosari 1994), Saudi Arabia (POWO 2021), and Qatar (Abdel Bary 2012).

Lactuca dissecta D. Don, Prodr. Fl. Nepal. 164. 1825.

Type: Nepal “Hab. in Nepaliâ”, Wallich (Kilian *et al.* 2009).

Description: Annual herbs, ca. 40 cm tall. Stem solitary, erect, simple or divaricately branched from its base. Leaves glabrous, base sagittal to auriculate clasp stem. Lower and middle stem leaves obovate or elliptic, pinnatipartite to subpinnatisect, margin entire or sparsely dentate. Upper stem leaves lanceolate to linear-lanceolate. Synflorescence corymbiform, with several to numerous capitula, ca. 15 florets; peduncle capillaceous, usually longer than capitulum. Involucre narrowly cylindrical and ca. 0.6 cm long at anthesis,

ovoid to 1.3 cm × 0.3-0.4 cm in fruit. Phyllaries abaxially purplish red, glabrous, apex acute; outer phyllaries ovate to linear-lanceolate, approaching inner phyllaries to 3/4 their length; inner phyllaries ca. 5. Florets blue to bluish purple, rarely pale yellowish. Achene body pale brown to blackish, obovoid, ca. 2.5 mm long, compressed, with 3 ribs on either side, beak white, filiform, 4-4.5 mm long. Pappus 3-4 mm long, white, deciduous (Shih & Kilian 2011).

Flowering and fruiting: March-May (Jongbloed 2003).

Habitat: Mountains, fields and wadis, i.e. valleys (Jongbloed 2003; Feulner 2011).

Vernacular name in UAE: *khas brey* (خس بري) (Jongbloed 2003).

Regional occurrence: Wadi Wa’eeb and Wadi Ashwani in the northern emirates (Jongbloed 2003).

Global distribution: India, Central Asia, Afghanistan, and Pakistan (Bano & Qaiser 2011). In the Arabian Peninsula the species has been reported from the United Arab Emirates, Oman, and Saudi Arabia (POWO 2021).

Material examined: Tajikistan, Varzob Gorge, 30.VII.1991, *N. Kilian* 2547 (B); Afghanistan, Khost, 1850 m, 6 June 1967, *Rechinger* 35633 (B).

Lactuca orientalis (Boiss.) Boiss., Fl. Orient. 3:819. 1875.

Syn type: EGYPT “Sinai”, *Schimper* #s.n.

Syntype: IRAN "Perse", *Aucher & Olivier* #s.n.
 Syntype: LEBANON "Liban", *Aucher* #s.n. (*Kilian et al.* 2009).

Description: Subshrubs (10)20-60 cm tall, glabrous or subglabrous, spinescent, branched from

base. Stems whitish, rigid, intricately and divaricately branched. Leaves glaucous green. Basal leaves rosulate, sinuate-dentate to pinnately lobed. Stem leaves similar to basal leaves but smaller, less incised. Capitulum solitary, terminal and pedunculate or lateral and sessile,



Fig. 3. Morphological details of *Lactuca serriola* L. (photograph by S. Sakkir)

Explanations: A – phyllaries, B – capitulum showing peduncle and bracts, C – ray flowers, D – capitulum soon after pollination, E – receptacle, F – matured capitulum, G – achenes, H – single achene showing beak and pappus

with 4 (or 5) florets. Involucre narrowly cylindrical, 0.7-1.0 cm long at anthesis, up to 1.5 cm in fruit. Phyllaries green to bluish purple; outer phyllaries ovate, abaxially pubescent; inner phyllaries 3 (or 4), apex obtuse. Florets pale yellow. Achene 7-8 mm; body brownish, narrowly ellipsoid, with 5-6 ribs on either side; beak stout, 2-3 mm long. Pappus 7-8 mm long, caducous (Shih & Kilian 2011).

Flowering and fruiting: August-September (Bano & Qaiser 2011).

Habitat: Mountains, silt among rocks, and wadis (Feulner 2011).

Vernacular name in UAE: *khas sharqi* (خس شرقي).

Regional occurrence: Occasional, 500-1900 m. In silt among rocks, including field margins and wadi beds in Ru'us al-Jibal range (Feulner 2011).

Global distribution: Syria, Lebanon, Armenia, Turkey, Iran, Central Asia, Afghanistan, Pakistan, India, and Tibet (Bano & Qaiser, 2011). In the Arabian Peninsula, the species has been recorded from Oman and United Arab Emirates (POWO 2021).

Material examined: Iran, Isfahan, 30 Sep 1998, Weber s.n. (B); Turkey, Bayburt, rocky slopes, 1800 m, 28 Jul 2013, Coşkunçelebi & Güzel 51 (KTUB).

A key was prepared for easy identification of *Lactuca* species recorded in the UAE.

1. Perennial subshrub, stem intricately and divaricately branched, achene beak stout *L. orientalis*
- 1* Annual herb, stem erect, achene beak filiform 2
2. Flowers bluish purple, rarely yellowish, achenes with 3 ribs on each face *L. dissecta*
- 2* Flowers yellow, achenes with 5-6 prominent ribs on each face *L. serriola*

4. Discussion

The genus *Lactuca* is native to Europe and the Mediterranean region, so it has been reported from the Arabian Peninsula: Saudi Arabia, Oman, Qatar, and Kuwait (Kilian *et al.* 2009). The first record of the genus in the UAE was *Lactuca serriola* reported from the northern emirates, north of Masafi in 1991 (Karim 1995). Much later, *L. dissecta* was found in the UAE, also in the northern emirates (Jongbloed 2003). Finally, *L. dissecta* and *L. orientalis* were recorded in the Ru'us al-Jibal range, a geographically distinct area among the mountains of the UAE and Oman (Feulner 2011). The presence of *L. serriola* in Abu Dhabi was mentioned by Karim and Fawzi (2007) but could not be traced in any Abu Dhabi herbarium specimens. The new record confirms the presence of the genus *Lactuca* in Abu Dhabi Emirate and provides evidence for the extent of its distribution.

Lactuca serriola is usually found along roadsides, in abandoned fields, and other disturbed areas. The confirmed record of the species from Abu Dhabi is also from such a habitat. The species might have been introduced accidentally there, but the pathway is not clear. Human-mediated introduction is strongly suspected, as the habitats where it was recorded are urban. Moreover, the increased trade and transport from other parts of the world typically facilitate the introduction and establishment of plants that are otherwise climatically dissimilar to the region (Gherardi & Angiolini 2004). Chances of survival and rapid spread are further enhanced as these species are self-pollinated. In a similar manner, many tropical American invasive weeds have been recently introduced into the country (Gairola *et al.* 2015; Sakkir *et al.* 2021).

The lack of proper documentation of the UAE flora is evident. Recently, many new records of plant species in the UAE have been published in predatory journals, without proper documentation of the specimens. Although there are passing mentions of the presence of 3 species of *Lactuca* in the UAE in floras and other publications (Jongbloed 2003; Karim & Fawzi 2007; Feulner 2011), with no further details, we failed to trace the relevant herbarium specimens except *L. serriola* north of Masafi. Even though we could not examine physically *L. dissecta* and *L. orientalis* originating from the UAE, we confirm their correct identification based on photographs published in the relevant literature (Jongbloed 2003; Feulner 2011). However, to standardize the procedure and rule out potential misreporting, we would like to emphasize the role of herbarium records. In this regard, digitization of herbarium specimens of the UAE and an online database of flora are highly recommended, to make them easily accessible to the researchers globally.

The Environment Agency – Abu Dhabi Herbarium (EAD), which is one of two UAE herbaria listed in *Index Herbariorum* (Thiers 2019), has started initial steps to digitize its specimens. The new *Lactuca* and other records evidently show that the UAE need more comprehensive botanical studies to document more completely plant diversity.

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