گزارش شاهی ویرجینیایی (تیره کلمیان) از فلور ایران

لیلا ممی‌زاده و علیرضا نقی‌نژاد*

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چکیده. در طول مطالعات فلوریستیک و پوشش گیاهی در بخش‌های مختلف منطقه هیرکانی (خزری) شمال ایران، گونه *Lepidium virginicum* (تیره کلمیان) برای اولین بار از ایران گزارش می‌گردد. علاوه بر نقشه پراکنش گونه در ایران، کلید شناسایی برای نه گونه یک‌ساله یا دوساله از سرده *Lepidium* از ایران ارائه می گردد.

واژه‌های کلیدی. آسیا، چلیپائیان، گیاه بیگانه، مازندران، مناطق شهری

Lepidium virginicum L. (Brassicaceae), a new record for the flora of Iran

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Abstract. In the framework of floristic and vegetation studies of different parts of the Hyrcanian region of northern Iran, *Lepidium virginicum* L. (Brassicaceae) is reported here for the first time for the flora of Iran. Along with a distribution map for the species, an identification key is provided for the nine annual or biennial species of *Lepidium*, already reported from Iran.

Keywords. alien plant, Asia, Cruciferae, urban areas, Mazandaran

INTRODUCTION

Lepidium is one of the largest genera of the Brassicaceae consisting of about 260 species distributed worldwide, except Antarctica. It is regarded as one of the most natural genera in the family due to having angustiseptate fruits and simple trichomes when they are present (Al-Shehbaz, 2017).

According to Hedge (1968), six annual species of *Lepidium* are reported from *Flora Iranica* area (*L. aucheri* Boiss., *L. sativum* L., *L. vesicarium* L., *L. perfoliatum* L., *L. pinnatifidum* Ledeb. and *L. ruderale* L.). *L. campestre* (L.) R.Br. is added from Arasbaran protected area (Assadi, 1983). Moreover, two species from the genus *Coronopus* were moved to *Lepidium* as *L. squamatum* Forssk. and *L. didymium* L. (Al-Shehbaz, 2004; Fakhr Ranjbari, 2017). Therfore, total number of annual *Lepidium* species occurring in territory of Iran reaches eigth.

Two populations of *Lepidium virginicum* were collected in the urban areas of Babolsar, Mazandaran Province during a floristic and phytosociological investigation in the lowland and submontane Hyrcanian region. The species is hereby reported for the first time for Iran.

MATERIALS AND METHODS

Fieldwork was carried out in May-August 2017. The morphological features of the species were noted from the plant material collected during the field studies. The specimens were identified using botanical literatures of Iran and other areas (Boissier, 1867; Bush, 1939; Hedge, 1965, 1968;

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Jafri, 1973; Al-Shehbaz, 1986; De Carvalho e Vasconcellos *et al.*, 1993; Zhou *et al.*, 2001; Al-Shehbaz & Gaskin, 2010; Fakhr Ranjbari, 2017). All characters of the specimens were surveyed by means of a stereomicroscope (Zeiss Stemi 2000-C). Digital herbaria of Vienna (W), Edinburugh (E), Kew (K), Berlin (B) and Natural History Museum of Paris (P) were carefully assessed. The materials recorded here were deposited in HUMZ.

RESULTS AND DISCUSSION

Lepidium virginicum L. in Sp. PI. 645 (1753). (Figs. 1-3).
Synonym: *L. iberis* L. in Sp. PI. 645 (1753).
Type: Herbarium Linneaus No. 824.18 (lectotype designated by Marais).
Mazandaran Province, Babolsar, on the road of Babolsar to Babol, Imam Khomeini str., 36˚ 41' 18.05" N; 52˚ 39' 02.55" E, -22 m a.s.l., 29 June 2017, L. Mamizadeh 8050-HUMZ.

Description

Annual herb, 15-40 cm long. Stems usually simple from base, erect, branched above, puberulent with antrorse/retrorse, sub-appressed indumentums, 0.07-0.2 mm long, deciduous in elder materials. Basal leaves not-rosetted, early-deciduous, obovate or spathulate. Cauline leaves shortly petiolate; leaf blade oblanceolate or linear, 1-3 cm ×2-5 mm, attenuate or subcuneate toward base, leaf margin entire to serrate, not lobed, antrose puberulent along margins and midrib and rarely elsewhere. Inflorescence much elongated, with rather dense erect to ascending flowers; rachis and pedicels are puberulent with tiny curved, antrorse/retrorse, cylindric sub-appressed indumentums. Fruiting pedicels slender, spreading, 2.7-4.2 mm × 0.3 mm, glabrous abaxially. Sepals oblong to ovate, ca. 0.8 × 0.5 mm. Petals white, spatulate to oblanceolate, attenuate at base, 1 × 0.3-0.4 mm, rounded at apex. Stamens 2; filaments 0.8-1 mm long; anthers ca. 0.2 mm long. Fruit orbicular, glabrous, 2.5-3 mm in diam., narrowly winged apically, apex emarginate; apical notch ca. 0.3-0.5 mm long; width of the lower part of apical notch 0.2-0.3 mm long; style ca. 0.15-0.2 mm long, included in apical notch. Seeds reddish brown, ovate-oblong, narrowly winged, 1.5 × 0.9-1 mm, seed wing in the basal part 0.3-0.4 mm width.

Taxonomic remarks

Lepidium virginicum is closely related and frequently misidentified with *L. ruderale*, but differs from the latter by having petals, orbicular fruit and lyrate basal leaves (Table 1; Figs. 3). It also differs from *L. pinnatifidum* by having smaller style and glabrous fruits. Seeds are reddish brown and winged in *L. virginicum* vs. dullish yellow and wingless in *L. pinnatifidum* and *L. ruderale*. *L. virginicum* is classified in sect. *Dileptium* DC. This section is characterized by mostly winged fruit, free style, not amplexicaule leaves, 2-4 stamens. Based on a morphometric analysis of some species of this section, quantitative characters of density of the pedicels, length of stem hair, width of the silicle, width of the lower part of the apical noth, length of the beak and width of the wing in the basal part of the seed are regarded as diagnostic characters to distinguish *L. virginicum* from the most closely related species (Wąsowicz & Rostański, 2009).

Table 1. Comparison between *Lepidium virginicum* and its most similar species.

Characters	*L. virginicum*	*L. ruderale*	*L. pinnatifidum*
Leaves	lower leaves lyrate	lower leaves bipinnate	basal leaves pinnatifid
Petals	present, white, obovate-spatulate	absent	rudimentary (sometimes absent)
Fruit	orbicular, winged at apex, apical notch 0.2-0.5 mm	orbicular-elliptic, winged at apex, apical notch 0.1-0.2 mm	elliptic-oval to sub-orbicular, wingless, hardly emarginated
Style	0.1-0.2 mm, included in apical notch.	obsolete (or 0.1 mm, included in apical notch)	as long as notch or longer
Seed	reddish brown, winged	dark yellow, wingless	dark yellow or dark rufous, wingless

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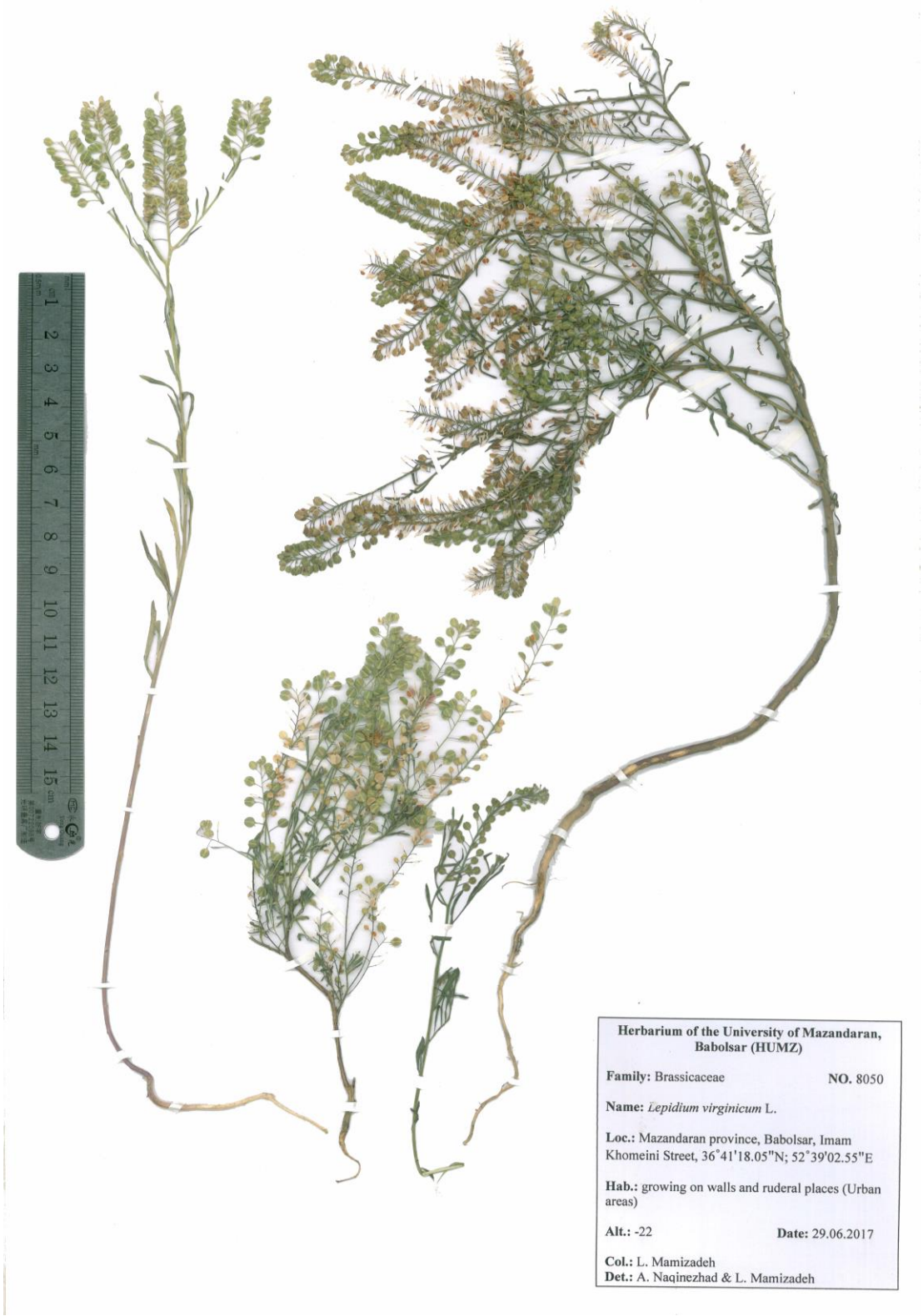

Fig. 1. *Lepidium virginicum*.

Distribution and habitat

Lepidium virginicum grows on the urban biotopes of the coastal city of Babolsar. The most important accompanying species included *Artemisia annua* L., *Conyza bonariensis* (L.) Cronquist, *Coronopus didymus* (L.) Sm., *Cynodon dactylon* (L.) Pers., *Heliotropium europaeum* L., *Lophochloa phleoides* (Vill.) Rchb., *Oxalis corniculata* L. and *Sonchus oleraceus* (L.) L.

Lepidium virginicum is native to N America and has been introduced and widely naturalized elsewhere (De Carvalho e Vasconcellos *et al.*, 1993; Zhou *et al.*, 2001). In Europe, this is one of the most widespread alien plants occurring in more than 80% of all European countries (Pyšek *et al.*, 2009). The distribution of the species is still expanding (e.g. Protopopova *et al.*, 1994; Ilyinska, 2014; Stoyanov & Vladimirov, 2015). The nearest recorded localities of the plant to Iran are NE Turkey (Davis *et al.*, 1988) and Pakistan (Jafri, 1973).

Phenology. Flowering and fruiting from May to July.

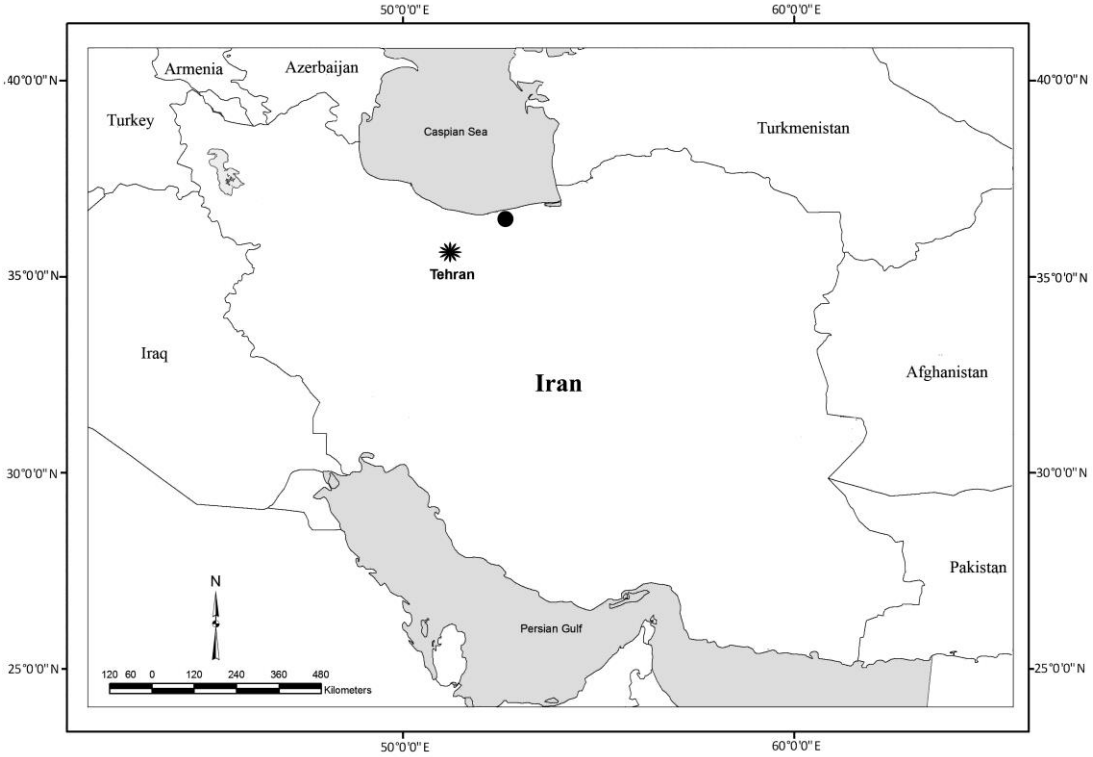

Fig. 2. Distribution map of *Lepidium virginicum* in Iran (●).

Fig. 3. Inflorescence (left) and seeds (right) of *Lepidium virginicum*.

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Determination key for annual/biennial *Lepidium* species of Iran

1-Fruits distinctly costate……..……..2
1-Fruits without distinct veins……..…3
2-Fertile stamens 6……...…..***L. squamatum***
2- Fertile stamens 2……***L. didymum***
3- Fruiting pedicels adpressed…….……4
3- Fruiting pedicels spreading…….……5
4- Fruits 2.5-3 mm long, cotyledons entire..***L. aucheri***
4- Fruits 5-6 mm long, cotyledons trifid..***L. sativum***
5-Stems with prominent turbinate swellings at nodes……. ……. ***L. vesicarium***
5-Stems not as above……..……6
6-Cauline leaves amplexicaule……..……..7
6-Cauline leaves non amplexicaule……..……...8
7- Cauline leaves ovate–orbicular, flowers yellow... ……....***L. perfoliatum***
7- Cauline leaves oblong–lanceolate, flowers white ……..……...***L. campestre***
8- Fruits ovate, petals absent……..…….***L. ruderale***
8- Fruits orbicular, petals present…...***L. virginicum***

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