

***Linaria pelisseriana* (L.) Mill. – a new alien species in the Czech Republic**

Petr Kocián

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Abstract: The paper reports on a find of the Mediterranean species *Linaria pelisseriana* at the cargo terminal of Kopřivnice freight station (NE Moravia, Czech Republic), which is the first record of this species in the Czech Republic.

Key words: *Linaria pelisseriana*, railway flora, floristics, neophyte, first record.

Introduction

The genus *Linaria* (Plantaginaceae) includes ca. 150 (annual or perennial) species worldwide, mostly distributed in the northern hemisphere except America. The diversity centre of the genus is situated in the Mediterranean region (Sutton 1988). In the Euro-Mediterranean flora, the genus is represented by about 90 species (Marhold 2011). Until recently, six species of the genus *Linaria* had been reported for the flora of the Czech Republic: the common archaeophyte *L. vulgaris*, the casual archaeophyte *L. arvensis*, the endangered native *L. genistifolia* and two casual neophytes, *L. maroccana* and *L. repens*. *L. purpurea* is occasionally cultivated as an ornamental plant and escapes now and then from cultivation (Danihelka et al. 2012). In 2014, the Mediterranean *Linaria pelisseriana* (L.) Mill. was discovered at the cargo terminal of Kopřivnice freight station in the north-eastern part of the Czech Republic (Fig. 1). It is the first record of this species in the Czech Republic. The discovery was made during the author's ongoing botanical survey of railway flora in the north-eastern part of the Czech Republic.

Materials and methods

Nomenclature of taxa (except for the species of *Linaria* section *Pelisserianae*) follows the Checklist of vascular plants of the Czech Republic (Danihelka et al. 2012). Phytogeographical regional characterisation refers to the Flora of the Czech Republic (Skalický 1988). Mapping grids correspond to the Central European floristic mapping network (Slavík 1971). Coordinates in WGS-84 and elevation are derived from the internet map application www.mapy.cz. A collected herbarium specimen is deposited in the Herbarium of the Department of Botany and Zoology, Faculty of Science, Masaryk University, Brno (BRNU).

Description of the species

Linaria pelisseriana (L.) Mill., Gard. Dict. ed. 8, no. 11 (1768) [syn.: *Antirrhinum pelisserianum* L., Sp. Pl.: 615 (1753)]

Annual herb, glaucous, glabrous; fertile stems 1–7 (–13), (8–) 15–70 cm, erect, slender, usually simple; sterile stems 1–9, procumbent to ascending. Leaves of fertile stems 10–40 × 0.5–1 mm, linear, obtuse, alternate, the lowermost sometimes verticillate; leaves of sterile stems obovate to broadly elliptic, subacute to obtuse, opposite or verticillate. Inflorescence consisting of 2–20 (–40) flowers, densely arranged when in flower, becoming lax when in fruit. Bracts 3–6 mm. Pedicels erect, 3–7 mm in flower and fruit. Calyx-lobes subequal, 3.5–5 × 0.8–1.1 mm, linear-lanceolate, acute or acuminate, sometimes tinged purple, margins scarious towards the base. Corolla 15–20 mm, purplish-violet or rarely magenta, the palate lilac or white; tube 0.8–1.1 mm broad at mouth; adaxial lip erect, with long parallel lobes, adaxial lip sinus 1.6–3 mm; abaxial lip sinus 0.4–1 mm; spur 7–9 mm, 0.7–1.1 mm broad at base, subulate, straight, subequalling rest of corolla. Capsule 2.5–3.5 × 3.5–5 mm, depressed-



Fig 1: *Linaria pelisseriana*: a – plant, b – flower detail, c – habitat – railway tracks at cargo terminal, Kopřivnice freight station (11. V. 2014). Photo Petr Kocián.

globose or broadly cordate, emarginate, glabrous; loculi dehiscing into 3 valves. Seeds 0.8–1 (–1.8) mm, deltate- to elliptic-orbicular, greyish brown (Fig. 2); wing 0.08–0.15 mm broad, lacinate, composed of long, dorsi-ventrally compressed, unicellular papillae; disc deltate-orbicular, the ventral face convex, papillate, the papillae short or long, often white, the dorsal (hilar) face flat or concave, minutely papillate or smooth; peri-clinal wall of testa-cells tabular or scarcely concave, often with dorsi-ventrally compressed marginal papilla, reticulate, the junction of anticlinal walls of testa-cells prominently raised, smooth (Sutton 1988).

Linaria pelisseriana flowers from May to July in Spain (Sáez 2009) and from March to June in Italy (Pignatti 1982).

Chromosome number $2n = 24$, reported by Sáez (2009).

Linaria pelisseriana belongs to section *Pelisserianae* Valdés, which includes three taxa: *L. pelisseriana*, *L. triornithophora* (L.) Willd., and *L. dumanii* Duran & Menemen (Sáez 2009, Fernández-Mazuecos et al. 2013, Duran & Menemen 2002). According to Fernández-Mazuecos et al. (2013) the seeds in section *Pelisserianae* are dorsiventrally compressed and this pattern of seed development appears to be a synapomorphy of this section.

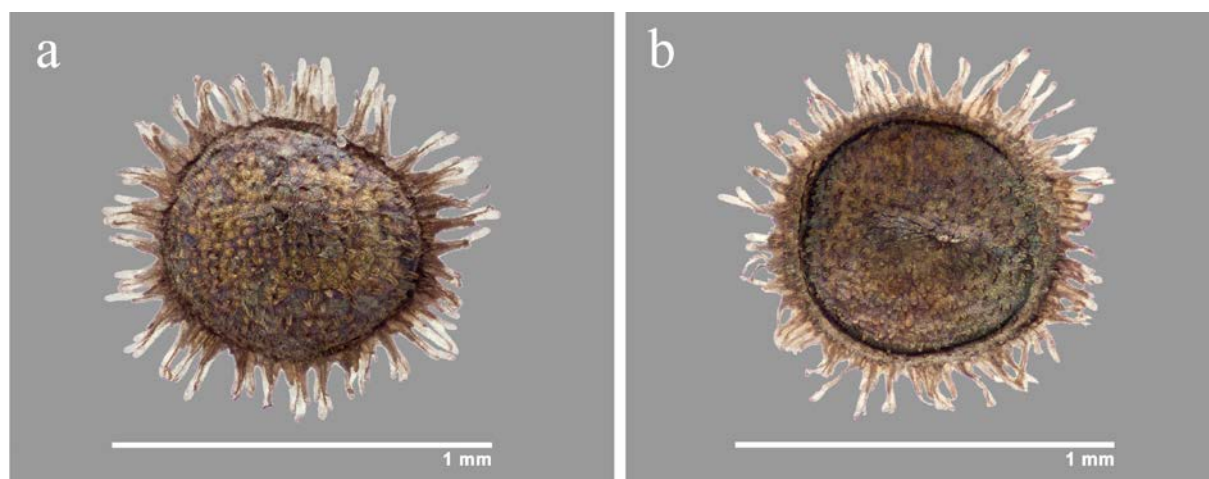


Fig 2: Seed of *Linaria pelisseriana*: a – ventral side, b – dorsal side (seed collected from the locality at Kopřivnice freight station). Photo Aleš Sedláček.

Distribution

Linaria pelisseriana is widespread in the Central and Eastern Mediterranean region and Western Europe. It is a rather weedy species of sandy and rocky places, often found in cultivated fields (Sutton 1988). Marhold (2011) reports the species from Spain, France, Italy, Croatia, Serbia, Bosnia and Herzegovina, Macedonia, Bulgaria, Greece, Cyprus, Turkey, Jordan, Lebanon, Israel, Tunisia and Algeria. It is also present in the British Isles (Stace 1997) and the Transcaucasus (Kupriyanova 1997). In the Iberian Peninsula, it is found only in south-eastern Spain, where it grows on therophytic pastures, fields, embankments and in open scrubs, on mostly siliceous, sandy or rocky soils. It occurs up to 400 m a.s.l. (Sáez 2009). In France, it occurs mainly in the south and west of the country (Tela Botanica 2014) and also in Corsica (Pignatti 1982). In Italy, it grows mainly in the western part of the Apennine Peninsula and in Sardinia and Sicily and occurs up to 1000 m a.s.l. (Pignatti 1982, Nimis et al. 2014). In Serbia, it is distributed mainly in the south-eastern part of the country and in Kosovo (Tomović et al. 2003). In Cyprus, the species is distributed in the north-western parts of the island and is considered a vulnerable species (Hadjikyriakou & Makris 2003, Christofides 2009). In Great Britain, it was recorded in the wild in Jersey in 1837, where it was seen sporadically at scattered localities until 1955. It is often regarded as a native to

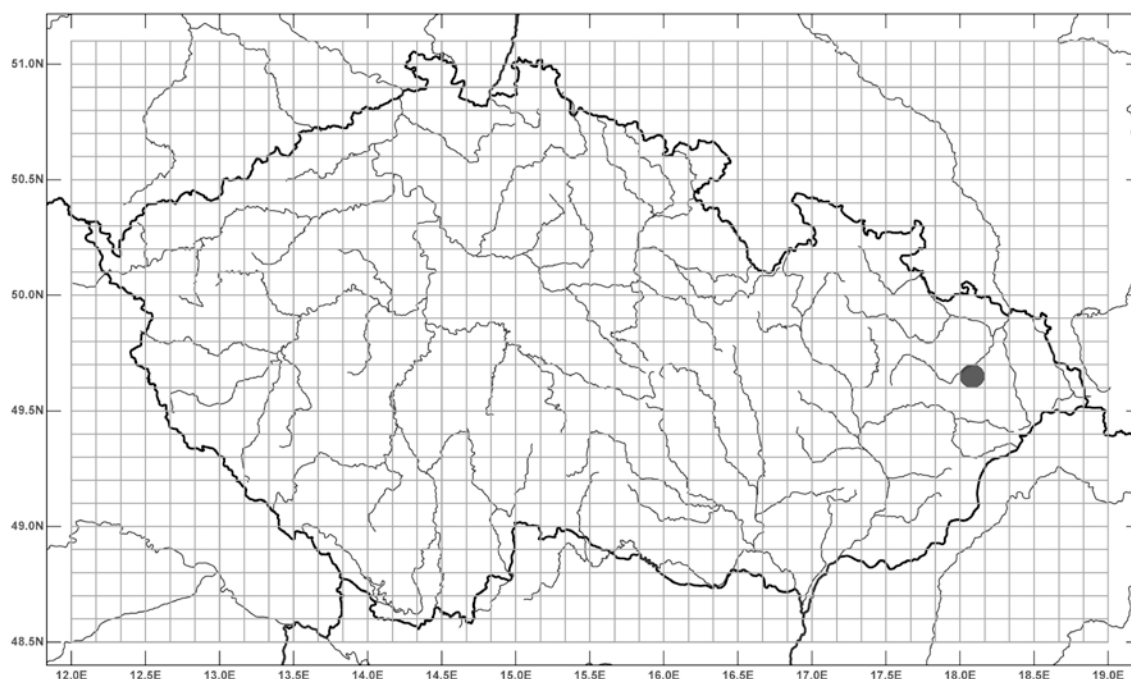
the island of Jersey, but it is more likely to be an alien. It is considered a rare casual in central and southern Britain and grows there on hedge banks, rough ground and rocky places (Online Atlas of the British and Irish flora 2014, Stace 1997).

Linaria pelisseriana was introduced to Australia and New Zealand. In Australia it occurs in the south-east and east of the country where it is widely naturalised. It is considered a minor environmental weed in the state of Victoria and other parts of south-eastern Australia. The species is a common weed of white box grassy woodlands and riparian shrubland in the highland areas of Victoria. In New South Wales it commonly grows in disturbed places along roadsides and railway lines, but it also invades pastures, native grasslands and open woodlands (Weeds of Australia 2014).

The distribution of *Linaria pelisseriana* is regarded to be Mediterranean-Atlantic (Online Atlas of the British and Irish flora 2014).

Description of the locality in the Czech Republic

Linaria pelisseriana was found at the following locality: Kopřivnice (Nový Jičín District), Kopřivnice freight station, railway tracks of cargo terminal, 49°36'44.3" N, 18°8'54.4" E, 308 m a.s.l. (11. V. 2014 leg. P. Kocián, BRNU). The locality is situated in phytogeographical region 76a Moravská brána vlastní, in floristic mapping grid square 6374 (Map 1).



Map 1: Record of *Linaria pelisseriana* in the Czech Republic.

Four plants of *Linaria pelisseriana* were growing on gravelly railway track ballast in the cargo terminal. Close associates were *Geranium purpureum*, *Geranium robertianum* (juv.), *Veronica arvensis*, *Lactuca serriola* (juv.), *Senecio vernalis*, *Senecio vulgaris*, *Bromus tectorum*, *Saxifraga tridactylites*, *Echium vulgare* (juv.), *Conyza canadensis* (juv.), *Senecio viscosus* (juv.), and *Medicago lupulina*.

The Kopřivnice freight station is known for its relatively rich flora in contrast with other railway stations in the area, which is due to intensive goods transport to the cargo terminal and also to the use of the railway for transport from the limestone quarry in the nearby town of Štramberk. In the past years among others the following species were recorded there:

Amaranthus albus, *Ambrosia artemisiifolia*, *Vulpia myuros*, *Linaria genistifolia* (Kocián 2010, Kocián unpubl.).

Discussion

Kopřivnice freight station is a small freight station located along the regional railway line from Studénka to Hostašovice (line no. 325) in the north-eastern part of the Czech Republic. The station comprises of a small intermodal rail-to-truck terminal which operates containerized cargos from different European cargo stations. However with its capacity of only 400 TEU (TEU = unit of cargo capacity) the cargo terminal is one of the smaller cargo terminals in the country and it is mainly used as intermodal terminal for regional operators. In the light of these circumstances the find of *Linaria pelisseriana* at this small freight station was rather surprising.

Linaria pelisseriana was most likely introduced to the site by train cargo transportation while unloading cargo containers from trains in the terminal. The origin of the diaspores is uncertain. Not only native species but also alien species (e.g. *Amaranthus albus*, *Ambrosia artemisiifolia*, *Geranium purpureum* and *Senecio inaequidens*) use railway lines as corridors for their successful dispersal over long distances. *Linaria pelisseriana* is spreading along railway lines in some parts of Australia. However, it has not been reported in the literature as a railway plant in Europe yet. There are neither records from neighbouring countries Germany, Poland, Slovakia, and Austria to date (cf. Rothmaler 2005, Tokarska-Guzik et al. 2012, Marhold & Hindák 1998, Fisher et al. 2008) nor from the Czech Republic (cf. Danihelka et al. 2012). Since *Linaria pelisseriana* is widespread in the Mediterranean region, it must have been introduced to the location by cargo trains from southern Europe, possibly from Italy. However, it cannot be ruled out that the species is growing elsewhere along the railway network and is overlooked (mainly at intermodal railway stations or marshalling yards) either in the Czech Republic or bordering countries, from which the diaspores originate.

Conclusion

The find of the Mediterranean species *Linaria pelisseriana* at the cargo terminal of Kopřivnice freight station is the first record of this species in the Czech Republic and as far as we know also in the Central European countries bordering the Czech Republic. *Linaria pelisseriana* should currently be considered a casual in the flora of the Czech Republic.

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***Linaria pelisseriana* (L.) Mill. – nový zavlečený druh v České republice**

V roce 2014 byl během probíhajícího průzkumu nádražní flóry na severovýchodě ČR zaznamenán autorem příspěvku v prostoru nákladového nádraží Kopřivnice mediteránní druh *Linaria pelisseriana* (L.) Mill., který dosud nebyl z území ČR uváděn.

Na lokalitě, v prostoru překladištního termiálu nákladového nádraží Kopřivnice, se vyskytovali čtyři jedinci na kamenitém svršku koleje, kde dochází k překládce kontejnerů z nákladních vlaků do prostoru terminálu. Společně zde rostly tyto druhy: *Geranium purpureum*, *Geranium robertianum* (juv.), *Veronica arvensis*, *Lactuca serriola* (juv.), *Senecio vernalis*, *Senecio vulgaris*, *Bromus tectorum*, *Saxifraga tridactylites*, *Echium vulgare* (juv.), *Conyza canadensis* (juv.), *Senecio viscosus* (juv.) a *Medicago lupulina*.

Nákladové nádraží Kopřivnice je malé nákladové nádraží, jehož součástí je i regionální překladištní kontejnerový terminál. Zavlečení bylo jistě spojeno s nákladní železniční dopravou přepravující kontejnery se zbožím do terminálu. Zdroj diaspor pravděpodobně pochází ze Středozeří, patrně z Itálie. Není však vyloučeno, že *Linaria pelisseriana* roste na železniční síti buď v České republice nebo v okolních zemích (především na překladištních nákladových nebo seřaďovacích nádražích), byla dosud přehlížena a diasporu pocházejí odtud.

Protože druh nemá české jméno, je navrženo jméno lnice Pelisserova.

Author's address: Petr Kocián, Nerudova 5, CZ-74101 Nový Jičín, Czech Republic,
e-mail: petr.kocian@kvetenacr.cz