

# Three new alien species in the flora of Croatia

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## Abstract

During field research in 2022 in the area of Kvarner and Istria, the spontaneous appearance of three non-native species (*Catalpa ovata*, *Oenothera lindheimeri*, *Salvia hispanica*) outside the area of primary cultivation was observed. These species are ornamental plants, food plants or part of the park dendroflora. It seems that these species appear as casual, but monitoring in the next years will show whether their naturalization will be successful.

**Keywords:** allochthonous species, neophytes

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## Abstract

Tijekom terenskih istraživanja na području Kvarnera i Istre uočena je spontana pojava tri strane vrste izvan područja primarnog uzgoja i upotrebe (*Catalpa ovata*, *Oenothera lindheimeri*, *Salvia hispanica*). Ove su vrste izvorno ukrasne biljke, dio su parkovne dendroflore ili se koriste kao hrana. Čini se da je njihova nazočnost na prirodnim staništima povremena, ali će praćenje ovih vrsta u narednom periodu pokazati hoće li njihova naturalizacija biti uspješna.

**Ključne riječi:** alohtone vrste, neofiti

Findings of introduced species are possible at any time, especially in tourist areas. The Kvarner bay is a touristic hot spot where interesting finds have already been made (e.g. Király & al. 2021). During field research in 2022 in the area of Kvarner and Istria, the spontaneous appearance of alien species was observed.

The study area includes the coastal area from Lovran to Opatija. The data of the field research were entered into the Zobodat database (Biology Center Linz, ZOBODAT 2022). For each locality, the altitude, and geo-coordinates in the WGS 84 projection were determined. The voucher specimens collected during recent studies are deposited in the Herbarium Biocenter, Oberösterreichische Landeskultur GmbH (LI), Linz.

## Species list

### *Catalpa ovata* G. Don

First published in: Gen. Hist. 4: 230 (1837) (Bignoniaceae)

Native to: China (North-Central part, South-Central part, Southeastern part, Inner Mongolia, Manchuria, Qinghai, Xinjiang)

Introduced into: Austria, Belgium, Bulgaria, Croatia, Germany, Hungary, Italy, Japan, Korea, Romania, USA (Connecticut, District of Columbia, Maryland, Massachusetts, Minnesota, Missouri, Nebraska, New York, Ohio, Ontario, Pennsylvania, Vermont, West Virginia, Wisconsin) (POWO 2022, GBIF 2023; see also literature and find below).

#### Croatia:

Primorje-Gorski Kotar County, Ičići, Beach of Hotel Ičići. One tree, about 1.5 m tall (Fig. 1), but cut in the past; between shore rocks; probably escaped from surrounding gardens or parks. 1.9.2022. Coord.: 45° 19' 0" N, 14° 17' 28" E, ± 30 m, 7 m asl.; LI Herbarium Id. 3447673.

First imported to Europe in 1848, but has often been confused later with *Catalpa bignonioides* Walter. Sub-spontaneous occurrences are rare, but recorded,

amongst others in Belgium and several cities of Germany, Austria moreover, in south-western Hungary in Baranya County (e.g. Stöhr et al. 2007, Lippert & Meierott 2018, Dudáš et al. 2021, Hohla & Király 2021, Hand et al. 2022). In Croatia this species appears to be casual (status casual according to Mitić et al. 2008). For identification of the Croatian plant the key in Roloff & Bärtels (2018) was used. The leaves are significantly 3-lobed.

### *Oenothera lindheimeri* (Engelm. & A. Gray) W. L. Wagner & Hoch

First published in: Syst. Bot. Monogr. 83: 213 (2007) (Onagraceae)

(= *Gaura lindheimeri* Engelm. et A. Gray)

Native to: USA (Louisiana, Texas)

Introduced into: Australia, Austria, Belgium, Corse, Croatia, Ecuador, France, Great Britain, Greece, Italy, Japan, Portugal, Seychelles, South Africa (Cape Provinces, Northern Provinces), Spain, Sweden, USA (Alabama) (POWO 2022, GBIF 2023; see also literature and find below).

#### Croatia:

Primorje-Gorski Kotar County, Ika, Hotel Ikador, on the sea shore. One plant; in a crack of the sea wall (Fig. 1); escaped from gardens above, about 20-30 meters away. 1.9.2022. Coord.: 45° 18' 8" N, 14° 16' 55" E, ± 30 m, 7 m asl.; LI Herbarium Id. 3447659.

*Oenothera lindheimeri* is widely grown for ornament in Europe and locally escaped in few countries e. g. Austria (Pflugbeil & Moosbrugger 2016), France (Tison & Foucault 2014), Germany (Hand & al. 2022), Greece (Raab-Straube & Raus 2016), Italy (Galasso & al. 2018) and Sweden (Jonsell & Karlsson 2010). Raab-Straube (2018) also reports occurrences from Croatia by Rottensteiner (2014), but Rottensteiner only writes about cultivation of *Oenothera lindheimeri*. Therefore the occurrence in Ika seems to be the first adventive one in Croatia. In Croatia this species appears to be casual (status casual according to Mitić et al. 2008). For identification of the Croatian plant the key in Tison & Foucault

(2014) was used. *Oe. lindheimeri* has white flowers; this and shape of the leaves and flowers are unique.

### ***Salvia hispanica* L.**

First published in: Sp. Pl.: 25. 1753 (Lamiaceae)

Native to: Colombia, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua;

Introduced into: Austria, Bahamas, Belgium, Bolivia, Bosnia and Herzegovina, Bulgaria, Croatia, Cuba, Czech Republic, Germany, Great Britain, Italy, Jawa, Slovenia, Spain, Sweden, USA (Florida, Texas), Venezuela (POWO 2022, GBIF 2023; see also literature and finds below).

#### **Croatia:**

Primorje-Gorski Kotar County, Opatija, on the southwest edge of Park Angiolina, on a building site. One plant; no cultivated plants in the vicinity; spontaneous. 1.9.2022. Coord.: 45° 20' 8" N, 14° 18' 29" E, ± 50 m, 16 m asl.; Herbarium: LI Upper Austrian State Museum Austria, Linz, Id. 3447666.

Primorje-Gorski Kotar County, Ičići, N Plaza Ičići, on a building site. One plant (Fig. 1); no cultivated plants in the vicinity; spontaneous. 1.9.2022. Coord.: 45° 18' 49" N, 14° 17' 12" E, ± 30 m, 8 m asl.; LI Herbarium Id. 3447642.

Seeds of *Salvia hispanica* are used as a kind of „super food“. „Chia“ is commonly available in grocery stores.

Escape to ruderal habitats from food remains or as accidental dispersal of seeds is likely, especially with sewage. The first sub-spontaneous occurrences of *Salvia hispanica* in Europe were reported from the Czech Republic in 2013 and several further localities of occurrence have been found in the last few years in Austria, Belgium, Bosnia and Herzegovina, Germany, Italy, Spain, Sweden and Slovenia (POWO 2022, Maslo & Šarić 2020). Within only five years, the species has expanded from a few localities and is now distributed throughout Europe, although occurrences are still considered ephemeral. Up to now, assessments are not congruent and this taxon is considered to be a casual, ephemeral, rare alien species, but also potentially invasive species (Šilc et al. 2020). From today's perspective *S. hispanica* is likely to be casual in Croatia (status casual according to Mitić et al. 2008).

For identification of the Croatian plants the plant portrait of Wood et al. (2022) was used. Although these plants didn't flower, the identification was clear, because of the typical, distinctive shape of stems: erect, simple or sparingly branched, quadrangular, deeply sulcate between the prominent, rounded angles, appressed pubescent with whitish hairs.

The authors suggest to the botanical community to pay attention to these species and recommend integration into the Flora Croatica database (Nikolić 2015-onward) as a basis for future monitoring.



**Figure 1.** Three new species in the flora of Croatia spontaneously developed outside the area of primary introduction: *Catalpa ovata* on Ičići locality (A), *Oenothera lindheimeri* on Ika locality (B), *Salvia hispanica* on Ičići locality (C) (foto M. Hohla).



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