

**A new contribution to the knowledge of the vascular flora of the Krka National Park (North Dalmatia, Croatia)**

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**Abstract**

The most recent research of the vascular flora of the Krka National Park was conducted in the period from 2010 to 2015. 105 plant taxa, new for the flora of the Park, were recorded. Alongside 1080 previously recorded, the complete vascular flora of the Park now consists of more than 1180 taxa and represents more than 20 % of the total Croatian flora. Among the recorded taxa, five are endemic: *Onosma stellulata*, *Ophrys liburnica*, *Peltaria alliacea*, *Thymus bracteosus* and *Vincetoxicum hirundinaria* ssp. *adriaticum*. Five taxa are considered as

threatened: *Vaccaria hispanica* (CR), *Ophrys apifera* (EN), *Urtica pilulifera* (EN), *Orchis provincialis* ssp. *pauciflora* (VU) and *Orchis tridentata* (VU). The most of non-native taxa, recorded in this study, are casual garden escapes but three of them are considered to be invasive plants in Croatia: *Abutilon theophrasti*, *Datura innoxia* and *Solidago gigantea*. In the upcoming period, special attention should be given to *S. gigantea* because of its possible spread in habitats along the river banks.

**Keywords:** endemic plant species, garden escapes, invasive plants, river of Krka, threatened plants

**Milović, M. (2015): Novi prilog poznavanju vaskularne flore Nacionalnog parka Krka (Sjeverna Dalmacija, Hrvatska). Glas. Hrvat. bot. druš. 4(1): 22-29.**

**Sažetak**

Nova istraživanja vaskularne flore Nacionalnog Parka Krka obavljena su u razdoblju od 2010. do 2015. Zabilježeno je 105 vrsta i podvrsta novih za floru Parka. Zajedno s prethodno zabilježenim svojstama, ukupna flora u Parku je sada više od 1180 svojiti što je više od 20% ukupne flore Hrvatske. Među novozabilježenim svojstama je pet endema: *Onosma stellulata*, *Ophrys liburnica*, *Peltaria alliacea*, *Thymus bracteosus*, *Vincetoxicum hirundinaria* ssp. *adriaticum*. Pet svojiti ima jednu od kategorija ugroženosti: *Vaccaria hispanica* je kritično ugrožena

(CR), *Ophrys apifera* i *Urtica pilulifera* su ugrožene (EN), a *Orchis provincialis* ssp. *pauciflora* i *Orchis tridentata* su osjetljive svojite (VU). Od stranih svojiti prevladavaju povremeni prebjezi iz kulture, ali su pronađene i tri svojite koje se smatraju invazivnima u Hrvatskoj (*Abutilon theophrasti*, *Datura innoxia* i *Solidago gigantea*). Uočena je opasnost od mogućeg invazivnog širenja svojite *S. gigantea* na staništima uz obale rijeke.

**Ključne riječi:** endemi, invazivne biljke, prebjezi iz uzgoja, rijeka Krka, ugrožene biljke

**Introduction**

The Krka National Park is situated in Croatian littoral, in the southern part of the northern Dalmatia (Fig. 1). The river of Krka between the old fortresses Trošenj and Nečven to Šibenik Bridge, including the lower course of the Čikola tributary, were proclaimed a national park in 1985 with the total area of 142 km<sup>2</sup>. In 1997, the boundaries

and area of the park were revised. The park was shifted more to the upper course of the river and now embraces an area extending approximately from the town of Knin to the town of Skradin. Consequently, the total area of the Park has been reduced and now comprises 109 km<sup>2</sup>.

Although the Krka River was proclaimed as a national park due to its geomorphologic and hydrological values, this area also exhibits exceptional botanical richness and was identified as Important Plant Area (IPA) in Croatia (Milović 2010). The first serious research of the flora of the river Krka and its surroundings began in the early 19th century (Visiani 1826, 1842-1852) and has continued until today (Marković et al. 1993, Milović & Mitić 2009, Sedlar et al. 2010). In the period between 1989 and 1991, extensive research of the vascular flora was carried out, resulting in the first comprehensive floristic list containing in total 860 plant taxa (Marković et al.

1993). In addition, a detailed overview of floristic and vegetation surveys conducted until 1990 was also presented. The floristic findings thereafter (Milović 2007, Milović & Mitić 2009, Sedlar et al. 2010), following the boundary changes in 1997, have been analysed by Milović & Mitić (2009) and Sedlar et al. (2010) resulting in a total of 1080 plant taxa.

The most recent field research conducted in the period from 2010 to 2015 resulting in a significant number of new records of vascular plants for the Krka National Park is presented in this study.

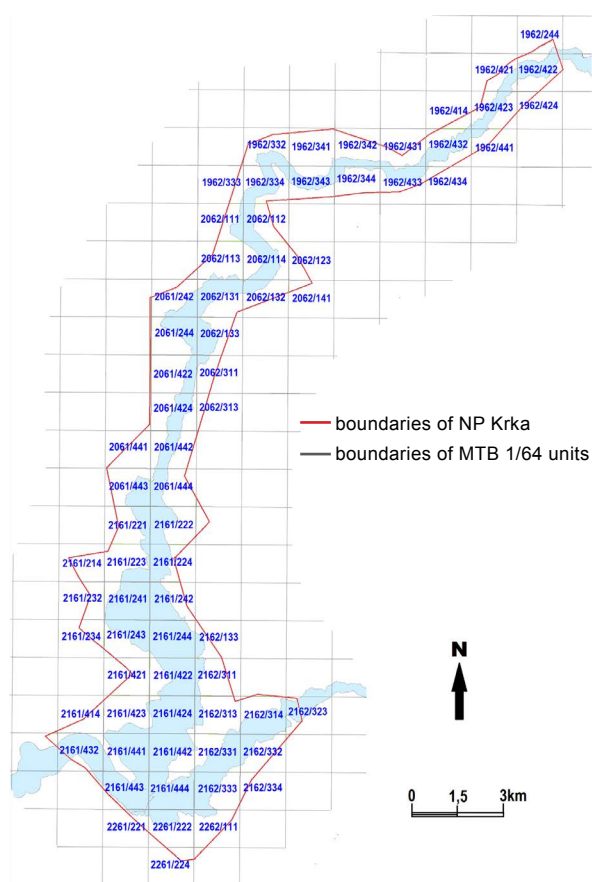


**Figure 1.** Geographical position and boundaries of the Krka National Park.

## Material and methods

Field surveys were conducted from 2010 to 2015 in the whole area of the Park. Taxa were determined using the standard determination keys, books and guides: Tutin et al. (1968–1980, 1993), Pignatti (1982), Domac (1994), Delforge (2006). Taxa that have been found only in cultivation are not taken into account. The nomenclature used follows Nikolić (2016a). The taxa in the list are given in alphabetical order of genera and species. Names of taxa (species, subspecies and family)

are followed by the codes of their associated MTB 1/64 units. Basic MTB 1/64 units approximately form rectangles with average measurements of 1,5 x 1,4 km and average area of 2,1 km<sup>2</sup>. GPS receiver GARMIN etrex Vista HCx and 1:25 000 topographic maps were used for determination of the position and boundaries of the mapping units. The study area is comprised of 71 MTB 1/64 units (Fig. 2).



**Figure 2.** The Krka National Park with MTB 1/64 unit codes.

Endemic taxa were defined according to Nikolić et al. (2015) and the threatened taxa according to Nikolić & Topić (2005) and Nikolić (2016b). Strictly protected plants are identified those listed in the Ordinance on Strictly Protected Species (Anonymous 2013). The category „invasive plants“ were attributed to the taxa included in the Preliminary check-list of invasive alien species in Croatia proposed by Boršić et al. (2008). Terminology dealing with residence time of alien plants (archaeophytes / neophytes) and with degree of its naturalisation (casual, naturalised and invasive) are used from Richardson et al. (2000). The data of geographic origin of the alien species are taken from Pignatti (1982) and Celesti-Grapow et al. (2009). These information are provided in the column Remarks in Table 1.

Plant taxa that have been previously recorded by Marković et al. (1993), but on localities outside the recent boundaries of the Park (in the area southern of Skradin Bridge) are marked with an asterisk (\*).

## Results and discussion

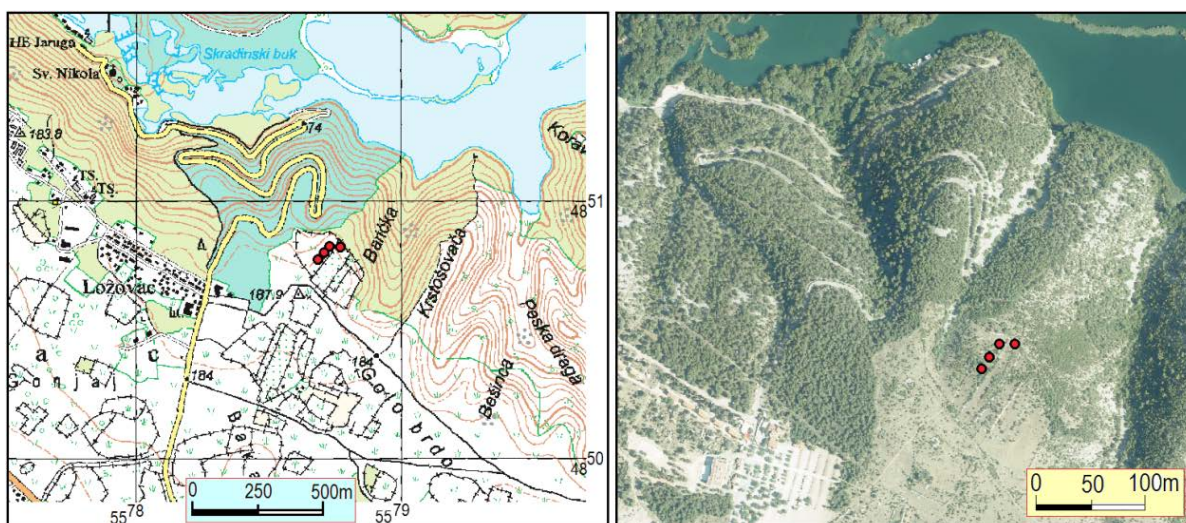
In this study 105 new records of vascular plant taxa for the Krka National Park were presented (Table 1). Among them, four taxa were identified to the subspecies level (*Carex flacca* Schreb. ssp. *flacca*, *Consolida regalis* S.F. Gray ssp. *paniculata* (Host) Soó, *Pastinaca sativa* L. ssp. *urens* (Req. ex Godr.) Čelak and *Picris hieracioides* L. ssp. *hieracioides*), and are therefore listed as new for the Park, although they have been registered before by Marković et al. (1993) and Sedlar et al. (2010) at species level. Eleven of registered plant taxa have been previously recorded by Marković et al. (1993) but on localities outside the recent boundaries of the Park (Tab1).

Among all, the presence of four endemic taxa (*Onosma stellulata*, *Peltaria alliacea*, *Thymus bracteosus*, *Vincetoxicum hirundinaria* ssp. *adriaticum*) and one stenoendemic species (*Ophrys liburnica*) must be stressed.

The Red List category Critically Endangered (CR) was assigned to one species (*Vaccaria hispanica*) and categories Endangered (EN) and Vulnerable (VU) were assigned to two species each: *Ophrys apifera* (EN), *Urtica pilulifera* (EN), *Orchis provincialis* ssp. *pauciflora* (VU) and *Orchis tridentata* (VU). In addition, four taxa (*Anacamptis pyramidalis*, *Himantoglossum adriaticum*, *Orchis laxiflora* ssp. *laxiflora* and *Peltaria alliacea*) were considered as Near Threatened (NT) and *Vincetoxicum hirundinaria* ssp. *adriaticum* was classified as of Least Concern (LC).

*Himantoglossum adriaticum* (Orchidaceae) is on the list of plant species protected by the Bern Convention (Anonymous 1996) and by Habitats Directive Annex II and IV (Anonymous 2004). Several individuals of this orchid were found in the area of Žurića Brdo (MTB 2161/441), but a large population of approximately 300 individuals was found in 2015 on dry grassland, northeastern of the Park entrance near the village of Lozovac (MTB 2261/222) (Fig. 3).





**Figure 3.** The village of Lozovac – site of the large population of *Himantoglossum adriaticum*, on topographic map 1:25 000 and ortho-photo map 1:5 000.

Among the recorded taxa, 24 are considered to be non-native, nine were archaeophytes and 15 neophytes. The most of archaeophytes has been deliberately introduced into the cultivation but nowadays often occur outside of culture as casual garden escapes (*Lactuca sativa*, *Raphanus sativus*, *Ricinus communis* and *Ziziphus jujuba*) as well as fully established plants (*Morus nigra*, *Prunus cerasus* and *Satureja hortensis*).

The most neophytes are casual garden escapes (*Albizia julibrissin*, *Calendula officinalis*, *Cerastium tomentosum*, *Ipomoea purpurea*, *Melia azederach*, *Oxalis articulata*, *Solanum lycopersicum*, *S. tuberosum*, *Tagetes patula* and *Zea mays*). Three are considered to be invasive in Croatia (*Abutilon theophrasti*, *Datura innoxia* and *Solidago gigantea*).

In the study area, *A. theophrasti* and *D. innoxia* were found to grow on anthropogenic habitats in settlements and their surroundings, but *S. gigantea* was found on wet meadows and abandoned areas along the riverbanks and has a much greater potential of invasive spread. *Solidago gigantea* has long been known as an invasive plant in the continental part of Croatia, while it is very rare in the Croatian

coastal area (Nikolić et al. 2014). The plant was found at two sites in the northeastern part of the Park (below locality of Tanjina glava and in the area of Liver) in the summer of 2015. At both sites, populations consist of 100-200 individuals. These two localities in the Krka National Park, along with two previously recorded sites in area of Tijarica (Plazibat 2002) and in surroundings of Vrgorac (Vukojević & Vitasović-Kosić 2012), are the only finding sites of *S. gigantea* in Dalmatia.

### Conclusion

During this research 105 records of plant taxa new for the Krka National Park were recorded whereas the total number of taxa of its flora now increased to over 1180, which represents more than 20 % of Croatian flora. New findings of alien species recorded in this study indicate the potential risk of invasive spread of some of them into the area of the national park which can endanger its fragile ecosystems, particularly in the coastal area along the river.

**Table 1.** New records of vascular plants for the Krka National Park.

No.	Taxa	Family	MTB 1/64 unit codes	Remarks
1.	<i>Abutilon theophrasti</i> Medik.	Malvaceae	1962/432	neophyte; invasive; temporal Asia
2.	<i>Albizia julibrissin</i> Durazz.	Fabaceae	2161/214	neophyte; casual garden escape; temporal Asia
3.	<i>Allium lusitanicum</i> Lam.	Amaryllidaceae	2061/422	-
4.	<i>Allium oleraceum</i> L.	Amaryllidaceae	2161/214; 2161/223; 2162/311	-
5.	<i>Alyssum montanum</i> L.	Brassicaceae	1962/424; 2962/123	-
6.	<i>Anacamptis pyramidalis</i> (L.) Rich.	Orchidaceae	2062/311; 2161/442; 2162/331	Near Threatened (NT) and strictly protected

No.	Taxa	Family	MTB 1/64 unit codes	Remarks
7.	<i>*Anchusa italica</i> Retz.	Boraginaceae	2161/232; 2161/441	-
8.	<i>Aphanes arvensis</i> L.	Rosaceae	2161/221	-
9.	<i>*Arbutus unedo</i> L.	Ericaceae	2161/243; 2161/244	-
10.	<i>Artemisia campestris</i> L.	Asteraceae	1962/244	-
11.	<i>Asperula arvensis</i> L.	Rubiaceae	2061/422	-
12.	<i>Asperula purpurea</i> (L.) Ehrend.	Rubiaceae	1962/244	-
13.	<i>*Aster linosyris</i> (L.) Bernh.	Asteraceae	2061/422; 2061/424	-
14.	<i>*Brachypodium phoenicoides</i> (L.) Roem. et Schult.	Poaceae	1962/344; 2062/111; 2062/114; 2162/323	-
15.	<i>Bunium ferulaceum</i> Sibth. et Sm.	Apiaceae	2062/133; 2261/222	-
16.	<i>Calendula officinalis</i> L.	Asteraceae	2262/111	neophyte; casual garden escape; unknown origin
17.	<i>Carex flacca</i> Schreb. ssp. <i>flacca</i>	Cyperaceae	1962/342; 2061/242; 2161/241; 2161/242; 2161/423; 2161/432; 2161/443; 2162/314	Marković et al. (1993) as <i>C. flacca</i> Schreb.
18.	<i>Centaurea triumfetti</i> All.	Asteraceae	1962/341; 2261/222	-
19.	<i>Cerastium brachypetalum</i> Pers. ssp. <i>brachypetalum</i>	Caryophyllaceae	2061/443; 2161/221	-
20.	<i>Cerastium tomentosum</i> L.	Caryophyllaceae	2161/214	neophyte; casual garden escape; Italy
21.	<i>Consolida regalis</i> S.F. Gray ssp. <i>paniculata</i> (Host) Soó	Ranunculaceae	1962/332; 1962/334; 2061/443; 2162/314; 2162/332	Marković et al. (1993) as <i>C. regalis</i> S.F. Gray
22.	<i>Crepis foetida</i> L. ssp. <i>foetida</i>	Cichoriaceae	2062/112; 2062/114; 2161/223; 2161/241; 2161/421; 2161/423; 2161/424; 2162/314; 2261/221; 2262/111	-
23.	<i>Datura innoxia</i> Mill.	Solanaceae	2262/111	neophyte; invasive; Central America
24.	<i>Daucus carota</i> L. ssp. <i>major</i> (Vis.) Arcang.	Apiaceae	1962/332; 1962/334; 2062/111; 2062/112; 2962/123; 2062/132; 2161/232; 2161/444; 2162/334; 2261/224	-
25.	<i>Equisetum telmateia</i> L.	Equisetaceae	1962/422; 2161/423	-
26.	<i>Eryngium campestre</i> L.	Apiaceae	1962/422; 1962/433;	-
27.	<i>Euphorbia chamaesyce</i> L.	Euphorbiaceae	1962/333; 1962/422;	-
28.	<i>Filago vulgaris</i> Lam.	Asteraceae	2061/441; 2061/442; 2962/123; 2062/133; 2062/311; 2161/421; 2161/424; 2161/432;	-
29.	<i>Fumaria parviflora</i> Lam.	Fumariaceae	2161/441; 2162/334	archaeophyte; naturalised; Mediterranean, Asia
30.	<i>Fumaria petteri</i> Reichenb. ssp. <i>thuretii</i> (Boiss.) Pugsley	Fumariaceae	2162/323	-
31.	<i>Gagea pusilla</i> (Schmidt) Schult. et Schult.f.	Liliaceae	2262/111	-
32.	<i>Galium murale</i> (L.) All.	Rubiaceae	2161/232	-
33.	<i>Geranium tuberosum</i> L.	Geraniaceae	2162/334	-
34.	<i>Gladiolus italicus</i> Mill.	Iridaceae	2162/334	strictly protected
35.	<i>Heracleum sphondylium</i> L. ssp. <i>ternatum</i> (Velen.) Brummitt	Apiaceae	1962/422	-
36.	<i>Himantoglossum adriaticum</i> H.Baumann	Orchidaceae	2161/441; 2261/221	Near Threatened (NT) and strictly protected; Natura 2000 species
37.	<i>Ipomoea purpurea</i> Roth	Convolvulaceae	2262/111	neophyte; casual garden escape; South America
38.	<i>Lactuca sativa</i> L.	Cichoriaceae	2062/132	archaeophyta; casual garden escape; Africa
39.	<i>Lathyrus hirsutus</i> L.	Fabaceae	2161/241	-

No.	Taxa	Family	MTB 1/64 unit codes	Remarks
40.	<i>Lathyrus sativus</i> L.	Fabaceae	2162/334	in culture and subsponaneously
41.	<i>Lathyrus venetus</i> (Mill.) Wohlf.	Fabaceae	2061/424	-
42.	<i>Leontodon crispus</i> Vill. ssp. <i>crispus</i>	Cichoriaceae	2161/414; 2162/334; 2262/111	-
43.	<i>Leontodon tuberosus</i> L.	Cichoriaceae	2161/224	-
44.	<i>Linaria genistifolia</i> (L.) Mill. ssp. <i>dalmatica</i> (L.) Maire et Petitm.	Scrophulariaceae	2162/314	-
45.	<i>Malus pumila</i> Mill.	Rosaceae	1962/423; 2161/214; 2161/421; 2161/422; 2162/333	in culture and subsponaneously
46.	<i>Matricaria trichophylla</i> (Boiss.) Boiss.	Asteraceae	2162/314	-
47.	<i>Matthiola incana</i> (L.) R. Br.	Brassicaceae	1962/424; 1962/432; 1962/441; 2062/132; 2161/441; 2162/332; 2261/221; 2262/111	in culture and subsponaneously
48.	<i>Melia azederach</i> L.	Meliaceae	2161/243	neophyte; casual garden escape; East Asia
49.	<i>Minuartia verna</i> (L.) Hiern	Caryophyllaceae	2061/442	-
50.	<i>Morus nigra</i> L.	Moraceae	2062/132; 1962/432	archaeophyte; naturalised; West Asia
51.	<i>Nepeta cataria</i> L.	Lamiaceae	1962/433	-
52.	<i>Nerium oleander</i> L.	Apocynaceae	2062/132; 2161/214; 2161/241; 2161/243; 2161/442; 2161/443; 2162/333; 2262/111	-
53.	<i>Onobrychis caput-galli</i> (L.) Lam.	Fabaceae	2161/223; 2161/244;	-
54.	<i>Ononis natrix</i> L.	Fabaceae	2161/214;	-
55.	* <i>Onosma stellulata</i> Waldst. et Kit.	Boraginaceae	1962/414	endemic and strictly protected
56.	<i>Onosma visianii</i> Clementi	Boraginaceae	1962/244; 1962/424; 1962/434; 1962/441	-
57.	<i>Ophrys apifera</i> Huds.	Orchidaceae	1962/424; 1962/434; 2161/232; 2161/442; 2162/334; 2262/111	Endangered (EN) and strictly protected
58.	<i>Ophrys liburnica</i> Devillers et Devillers-Tersch.	Orchidaceae	2161/222	stenoendemic and strictly protected
59.	<i>Orchis coriophora</i> L.	Orchidaceae	2061/244	strictly protected
60.	<i>Orchis laxiflora</i> Lam. ssp. <i>laxiflora</i>	Orchidaceae	2061/244; 2161/242; 2162/314	Near Threatened (NT) and strictly protected
61.	<i>Orchis provincialis</i> Balb. ssp. <i>pauciflora</i> (Ten.) Camus	Orchidaceae	2061/442; 2061/444	Vulnerable (VU) and strictly protected
62.	<i>Orchis tridentata</i> Scop.	Orchidaceae	2161/232	Vulnerable (VU) and strictly protected
63.	<i>Ornithogalum pyramidale</i> L.	Liliaceae	2062/132; 2161/224	-
64.	* <i>Ornithogalum refractum</i> Kit. ex Schltr.	Liliaceae	2162/333	
65.	<i>Oxalis articulata</i> Savigny	Oxalidaceae	2161/214; 2161/243; 2162/334; 2262/111	neophyte; casual garden escape; South America
66.	<i>Papaver strigosum</i> (Boenn.) Schur	Papaveraceae	2062/114; 2161/242; 2161/244; 2162/311; 2162/323; 2261/222	-
67.	<i>Pastinaca sativa</i> L. ssp. <i>urens</i> (Req. ex Godr.) Čelak	Apiaceae	1962/334; 1962/422; 2062/114	Sedlar et al. (2010) as <i>P. sativa</i> L.
68.	<i>Peltaria alliacea</i> Jacq.	Brassicaceae	2162/332	endemic; Near Threatened (NT); strictly protected
69.	<i>Picris hieracioides</i> L. ssp. <i>hieracioides</i>	Cichoriaceae	1962/244; 1962/332; 1962/333; 1962/344; 1962/433; 2061/442; 2062/114; 2062/132; 2062/133; 2161/234; 2161/241; 2161/243; 2162/323; 2261/224; 2262/111	Marković et al. (1993) as <i>P. hieracioides</i> L.
70.	<i>Pinus pinaster</i> Aiton	Pinaceae	2161/234; 2261/224	-
71.	<i>Plantago afra</i> L.	Plantaginaceae	2161/432	-
72.	* <i>Prasium majus</i> L.	Lamiaceae	2161/432	-
73.	<i>Prunus cerasus</i> L.	Rosaceae	1962/422; 2062/132; 2161/243; 2161/441	archaeophyta; naturalised; Southwest Asia

No.	Taxa	Family	MTB 1/64 unit codes	Remarks
74.	<i>Ranunculus ficaria</i> L. ssp. <i>ficariiformis</i> (F. W. Schultz) Rouy et Fouc.	Ranunculaceae	1962/422	-
75.	<i>Raphanus sativus</i> L.	Brassicaceae	2161/441	archaeophyta; casual garden escape; Southwest Asia; Paleotropics
76.	<i>Ricinus communis</i> L.	Euphorbiaceae	2161/243	archaeophyta; casual garden escape; Paleotropics
77.	<i>Romulea bulbocodium</i> (L.) Sebast. et Mauri	Iridaceae	2261/221; 2262/111	-
78.	<i>Salvia argentea</i> L.	Lamiaceae	2162/334	-
79.	* <i>Sanquisorba minor</i> Scop. ssp. <i>minor</i>	Rosaceae	1962/414; 2062/132; 2062/313; 2161/214; 2161/222; 2161/242; 2162/332	-
80.	<i>Satureja hortensis</i> L.	Lamiaceae	1962/422	archaeophyte; naturalised; Mediterranean
81.	* <i>Scorzonera laciniata</i> L.	Cichoriaceae	1962/432; 2061/244; 2062/114; 2062/132; 2062/133; 2161/223; 2161/244; 2161/441; 2162/332; 2162/334	-
82.	<i>Senecio jacobaea</i> L.	Asteraceae	2162/331	-
83.	<i>Sideritis montana</i> L.	Lamiaceae	2161/222	-
84.	<i>Solanum lycopersicum</i> L.	Solanaceae	1962/432; 2061/443; 2062/132; 2161/214; 2161/241; 2161/243; 2161/423	neophyte; casual garden escape; Central and South America
85.	<i>Solanum tuberosum</i> L.	Solanaceae	1962/342; 1962/432; 2062/132; 2161/223; 2162/334	neophyte; casual garden escape; South America
86.	<i>Solanum villosum</i> Mill. ssp. <i>alatum</i> (Moench) Dostál	Solanaceae	2261/224	-
87.	<i>Solidago gigantea</i> Aiton	Asteraceae	1962/433; 1962/422	neophyte; invasive; North America
88.	<i>Tagetes patula</i> L.	Asteraceae	2161/243; 2262/111	neophyte; casual garden escape; South America
89.	<i>Tanacetum parthenium</i> (L.) Sch.Bip.	Asteraceae	1962/432; 2161/243	neophyte; casual garden escape; West Asia
90.	<i>Thymus bracteosus</i> Vis. ex Benth.	Lamiaceae	2161/214; 2161/221	endemic; strictly protected
91.	<i>Tordylium maximum</i> L.	Apiaceae	1962/343; 2061/422; 2062/114; 2062/132; 2161/442	-
92.	<i>Trifolium striatum</i> L. ssp. <i>tenuiflorum</i> (Ten.) Arcang.	Fabaceae	1962/432; 1962/441	-
93.	<i>Urtica pilulifera</i> L.	Urticaceae	2061/443; 2061/444	Endangered (EN) and strictly protected
94.	<i>Vaccaria hispanica</i> (Miller) Rauschert	Caryophyllaceae	2162/323	Critically Endangered (CR) and strictly protected
95.	<i>Valerianella dentata</i> (L.) Pollich	Valerianaceae	2261/222	-
96.	<i>Velezia rigida</i> L.	Caryophyllaceae	2161/424; 2261/222	-
97.	<i>Vicia faba</i> L.	Fabaceae	2162/334; 2262/111	in culture and subspontaneously
98.	<i>Vicia lutea</i> L.	Fabaceae	2062/114; 2062/132; 2161/244	-
99.	<i>Vicia narbonensis</i> L.	Fabaceae	2161/441	-
100.	<i>Vinca major</i> L.	Apocynaceae	2161/243; 2162/333	-
101.	* <i>Vincetoxicum hirundinaria</i> Medik. ssp. <i>adriaticum</i> (Beck) Markgr.	Asclepiadaceae	1962/244; 1962/424; 2061/442; 2062-311; 2161-244; 2162/331	endemic; Least Concern (LC) and strictly protected
102.	<i>Viola tricolor</i> L.	Violaceae	2161/441	in culture and subspontaneously
103.	<i>Zannichellia palustris</i> L.	Zannichelliaceae	1962/343; 2062/114	-
104.	<i>Zea mays</i> L.	Poaceae	1962/342; 1962/344; 1962/423; 1962/433; 2161/214; 2161/423	neophyte; casual garden escape Central America
105.	<i>Ziziphus jujuba</i> Mill.	Rhamnaceae	2161/243; 2161/441; 2262/111	archaeophyte; casual garden escape; Temporal Asia



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