

NON-NATIVE FLORA OF THE TOWN OF OMIŠ (DALMATIA, CROATIA)

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In this work the non-native flora of the town of Omiš was analysed. It numbers 84 taxa, which equals 13.68% of the complete flora of the city of Omiš (614 taxa). Non-native taxa present exclusively in culture were not analysed in this work. The most common family is *Asteraceae* s. str. (16 taxa; 19.05%) and the most common genus is *Amaranthus* with six species. The predominant life forms are therophytes (42.86%) and phanerophytes (32.14%). The prevalence of non-native taxa was recorded on arable surfaces (59 of taxa) and ruderal habitats (51 of taxa). According to the naturalisation status, the most dominant are casual taxa (57.14%) and according to the mode of introduction the most numerous are deliberately introduced taxa (63.10%). Most non-native taxa originate in America (47.62 %), followed by those that originate in Asia (29.76%).

Key words: non-native flora, urban flora, Omiš, Dalmatia, Croatia

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U radu je prikazana analiza alohtone flore Omiša koja broji 84 svojite, odnosno 13.68% ukupne flore Omiša (614 svojiti). Alohtone svojite koje dolaze isključivo u kulturi nisu obuhvaćene ovim radom. Brojem vrsta najzastupljenija je porodica *Asteraceae* s. str. (16 svojiti; 19.05%), a među rodovima se ističe rod *Amaranthus* sa šest vrsta. Od životnih oblika najzastupljeniji su terofiti (42.86%) i fanerofiti (32.14%). Najveći broj svojiti zabilježen je na obradivim površinama (59) i ruderalnim staništima (51). Prema stupnju udomaćenosti prevladavaju neudomaćene svojite (58.33%), a prema načinu unošenja najzastupljenije su namjerno unesene svojite (63.10%). Prema geografskom podrijetlu najveći broj svojiti potječe iz Amerike (47.62 %) a zatim slijede svojite azijskog podrijetla (29.76%).

Ključne riječi: alohtona flora, urbana flora, Omiš, Dalmacija, Hrvatska

INTRODUCTION

Omiš is a small town situated on the delta of the Cetina River, southeast of Split in Central Dalmatia. Recently a list and analysis of vascular flora and dendroflora, was published by TAFRA *et al.* (2012a, b). On the relatively small surface of the town and its surrounding area of ca 3.5 km² (see Fig. 1 in TAFRA *et al.*, 2012a), a total of 870 taxa of vascular plants were recorded. Among them, 256 of the taxa grow only in cultivated conditions. In this paper we analysed the non-native part of the vascular flora of the city of Omiš.

Since the 1960s a great number of works giving findings of non-native taxa from various areas in Croatia have been published (for references see Boršić *et al.*, 2008). Recently

preliminary lists of the neophytes and the invasive flora of Croatia were published (DOBROVIĆ *et al.*, 2005; BORŠIĆ *et al.*, 2008). Also proposals for Croatian national standards and criteria for treating alien flora was established (MITIĆ *et al.*, 2008). There are no published complete lists or analyses of non-native flora in certain regions or in Croatia as a whole. Literature information regarding non-native flora of the city of Omiš is scarce. There are a few works which list individual findings of neophytes from this area (TRINAJSTIĆ *et al.*, 1993; PANDŽA *et al.*, 2001; MILOVIĆ, 2004; PANDŽA & TAFRA, 2008). This work contains the first complete list and analysis of the non-native flora of the city of Omiš.

MATERIALS AND METHODS

From the complete work about the vascular flora of the town of Omiš (TAFRA *et al.* 2012), here we analysed all non-native taxa except those that are exclusively cultivated and cannot survive outside the cultivation area (marked as »cult« in TAFRA *et al.* 2012).

The nomenclature of non-native taxa analysed is in accordance with NIKOLIĆ (2013), while the nomenclature of taxa not represented in this source is in accordance with *The European Garden Flora* (WALTERS *et al.* 1984, 1986, 1989; CULLEN *et al.* 1995, 1997, 1999) which is marked by a star (*) before the name of the taxa.

For each taxon on the list of non-native flora the following information is given: life-form, habitat, geographic origin, naturalisation status. Abbreviations for different life-forms are listed before the name of the taxa, while the division of life-forms was made according to RAUNKIAER (1934): **T** – *Therophyta*, **G** – *Geophyta*, **H** – *Hemicryptophyta*, **Ch** – *Chamaephyta* and **P** – *Phanerophyta*. The letters (**a-i**) after the name of a taxon indicate the occurrence of one or more habitat types (our own classification): **a** - dry grasslands and rocky pastures, **b** - abandoned crops and meadows under anthropological influence, **c** - public green areas, **d** - trampled habitats, **e** - along roads and paths, **f** - ruderal habitats (trash dumps, heaps of soil and construction waste etc.), **g** - cultivated surfaces (gardens, olive groves, vineyards), **h** - damp habitats (river banks, canals, ditches) and **i** - the seashore.

Data about the geographic origin of non-native taxa were taken from several sources: PIGNATTI (1982), TUTIN *et al.* (1968-1980, 1993), FOURNIER (1961), CULLEN *et al.* (1995-1999), WALTERS *et al.* (1984-1989). On the basis of their status observed on the investigated area and proposals suggested by RICHARDSON *et al.* (2000), PYŠEK *et al.* (2004), BORŠIĆ *et al.* (2008) and MITIĆ *et al.* (2008), all taxa are classified into three categories depending on the degree of their naturalization: casual species (**cas**), naturalized non-invasive species (**nat**) and naturalized invasive species (**inv**).

Modes in which species were introduced into the Omiš area are arranged according to PYŠEK *et al.* (2012) and marked by the following abbreviations: **del** – deliberate (by planting), **acc** – accidental and **del-acc** – both means.

RESULTS

FLORISTIC LIST

SPERMATOPHYTA ANGIOSPERMAE

DICOTYLEDONES

Aceraceae

P Acer negundo L.; b, c, e, f; **inv**; Central & North America; **del**

Amaranthaceae

- T *Amaranthus blitoides* S. Watson; c, f, g; **nat**; North America; **acc**
 T *A. caudatus* L.; c, f, g; **cas**; South America; **del**
 T *A. cruentus* L.; f, g; **cas**; Central America; **del-acc**
 T *A. deflexus* L.; c, d, e, f, g; **nat**; South America; **acc**
 T **A. paniculatus* L.; f; **cas**; Neotropics; **del-acc**
 T *A. retroflexus* L.; c, f, g; **inv**; North America; **acc**
 T **Celosia cristata* L.; f, g; **cas**; Tropical Asia; **del**

Asteraceae

- H *Artemisia verlotiorum* Lamotte; b, c, e, f, g; **inv**; East Asia; **acc**
 T *Aster squamatus* (Spreng.) Hieron.; c, e, h, i; **inv**; Central & South America; **acc**
 T *Bidens subalternans* DC.; b, c, e, f, g; **inv**; South America; **acc**
 T *Calendula officinalis* L.; f, g; **cas**; unknown; **del**
 T *Chamomilla recutita* (L.) Rauschert; f, g; **nat**; West Asia; **del-acc**
 T *Conyza bonariensis* (L.) Cronquist; d, e, f; **inv**; Central America; **acc**
 T *C. canadensis* (L.) Cronquist; d, e, f; **inv**; North America; **acc**
 T *C. sumatrensis* (Retz.) E. Walker; c, d, e, f, g; **inv**; Tropical America; **acc**
 T *Cosmos bipinnatus* Cav.; f, g; **cas**; North America; **del**
 T *Erigeron annuus* (L.) Pers.; b, c, f, g, h; **inv**; North America; **acc**
 G *Helianthus tuberosus* L.; f, g; **nat**; North America; **del**
 T *Tagetes minuta* L.; e, f; **cas**; South America; **acc**
 T *T. patula* L.; f, g; **cas**; South America; **del**
 H *Tanacetum parthenium* (L.) Sch.Bip.; e, f, g; **cas**; West Asia; **del**
 T *Xanthium spinosum* L.; f, h; **nat**; South America; **acc**
 T *X. strumarium* L. ssp. *italicum* (Moretti) D. Löve; b, e, f, g; **inv**; North & South America; **acc**

Bignoniaceae

- P *Campsis radicans* (L.) Seen.; e, f, g; **cas**; North America; **del**

Brassicaceae

- G *Armoracia rusticana* P. Gaertn., B. Mey. et Scherb.; g, h; **cas**; unknown; **del-acc**
 T *Lepidium virginicum* L.; e, f; **cas**; North America; **acc**
 H *Raphanus sativus* L.; f, g; **cas**; unknown; **del**

Cactaceae

- P *Opuntia ficus-indica* (L.) Miller; f, g; **cas**; Neotropics; **del**
 Ch *O. vulgaris* Miller; a, b; **nat**; Tropical America; **acc**

Caryophyllaceae

- Ch *Cerastium tomentosum* L.; c, g; **cas**; Mediterranean (Italy); **del**

Chenopodiaceae

- T *Bassia scoparia* (L.) J.A. Scott; e, f, g; **cas**; Central Asia; **del**
 T *Chenopodium ambrosioides* L.; f; **cas**; Tropical America; **del-acc**

Convolvulaceae

- G *Dichondra micrantha* Urban; c, d, g; **nat**; East Asia; **del**
 T *Ipomea purpurea* Roth; e, f; **cas**; South America; **del**

Euphorbiaceae

- T *Euphorbia maculata* L.; c, d, e; **inv**; North America; **acc**
 T *E. prostrata* Aiton; c, d, e, f, g; **inv**; North America; **acc**
 P *Ricinus communis* L.; c, f, g; **cas**; Paleotropics; **del**

Fabaceae

- P *Albizia julibrissin* Durazz.; c, g; **cas**; Paleotropics; **del**
 P *Amorpha fruticosa* L.; h; **inv**; North America; **acc**
 T *Cicer arietinum* L.; g; **cas**; South-West Asia; **del**
 P *Robinia pseudoacacia* L.; b, c, e; **inv**; North America; **del**
 T *Vicia faba* L.; g; **cas**; unknown; **del**
 P *Wisteria sinensis* (Sims) Sweet; c, g; **cas**; East Asia; **del**

Juglandaceae

- P *Juglans regia* L.; c, g; **cas**; South-West Asia; **del**

Linaceae

- T *Linum usitatissimum* L.; b, g; **cas**; West Asia; **del-acc**

Malvaceae

- H *Alcea rosea* L.; c, e, f; **cas**; unknown; **del**

Meliaceae

- P *Melia azedarach* L.; c, g; **cas**; East Asia; **del**

Moraceae

- P *Broussonetia papyrifera* (L.) Vent.; f, b, c; **inv**; East Asia; **del**
 P *Morus alba* L.; c, g; **nat**; East Asia; **del**

Nyctaginaceae

- G *Mirabilis jalapa* L.; e, f, g; **cas**; Tropical America; **del**

Oenotheraceae

- H *Oenothera biennis* L.; f, g; **cas**; unknown; **del**

Oleaceae

- P *Syringa vulgaris* L.; c, g; **cas**; Europe (Balkan); **del**

Oxalidaceae

- G *Oxalis articulata* Savigny; f, g; **nat**; South America; **del**

Passifloraceae

- P *Passiflora caerulea* L.; f, g; **cas**; South America; **del**

Phytolaccaceae

- G *Phytolacca americana* L.; c, f; **inv**; North America; **del-acc**

Pittosporaceae

- P *Pittosporum tobira* (Thunb.) Aiton f.; c, g; **cas**; East Asia; **del**

Platanaceae

- P *Platanus occidentalis* L.; c, f; **cas**; North America; **del**

Polygonaceae

- P *Fallopia baldschuanica* (Regel) Holub; f, g; **cas**; East Asia; **del**

Ranunculaceae

- T *Ranunculus arvensis* L.; c, g; **nat**; Paleotemporal; **acc**

Rosaceae

- P *Prunus cerasifera* Ehrh.; c, e, g; **nat**; West Asia; **del**
 P *P. dulcis* (Miller) D. A. Webb.; b, g; **cas**; South-West Asia; **del**
 P *P. persica* (L.) Batsch; f, g; **cas**; East Asia; **del**

Scrophulariaceae

T *Veronica persica* Poir.; b, c, f, g, h; **nat**; West Asia; **acc**

Simaroubaceae

P *Ailanthus altissima* (Mill.) Swingle; b, e, f; **inv**; East Asia; **del**

Solanaceae

T *Datura innoxia* Mill.; f, g; **inv**; Central America; **del**

T *Solanum lycopersicum* L.; f, g; **cas**; Central & South America; **del**

T *Solanum tuberosum* L.; f, g; **cas**; South America; **del**

Ulmaceae

P *Ulmus pinnato-ramosa* Dieck ex Koehne; c, f; **cas**; Central Asia; **del**

Vitaceae

P *Parthenocissus quinquefolia* (L.) Planchon; e, g; **cas**; North America; **del**

P *Vitis vinifera* L.; a, b, g; **cas**; unknown; **del**

MONOCOTYLEDONES**Agavaceae**

P *Agave americana* L.; c, g, i; **nat**; North America; **del**

P *Yucca gloriosa* L.; c, g; **cas**; North America; **del**

Arecaceae

P *Phoenix canariensis* Chabaud; c, e; **cas**; North Africa (Islas Canarias); **del**

Cannaceae

G *Canna indica* L.; c, g; **cas**; Tropics; **del**

Commelinaceae

G *Commelina communis* L.; f, g; **cas**; Asia; **del**

G **Tradescantia virginiana* L.; f, h, g; **cas**; North America; **del**

Iridaceae

G *Iris germanica* L.; b, f, g; **nat**; unknown; **del**

Liliaceae

G *Allium cepa* L.; g; **cas**; West Asia; **del**

Poaceae

T *Eleusine indica* (L.) Gaertn.; c, d, e; **nat**; Asia; **acc**

H *Paspalum dilatatum* Poir.; c, h, i; **nat**; South America; **acc**

G *P. paspalodes* (Michx.) Scribn.; h; **nat**; Neotropics; **acc**

H *Setaria geniculata* (Lam.) P. Beauv.; c; **nat**; South America; **acc**

T *Triticum turgidum* L.; f; **cas**; unknown; **del**

ANALYSIS OF THE NON-NATIVE FLORA

The list of the non-native flora of Omiš contains a total of 84 taxa, which is 13.68% of the complete flora (614 taxa). Representatives of non-native flora belong to 70 genera and 38 families. All non-native taxa are Angiospermae, with a distinct domination of Dicotyledones (71 taxa; 84.52%) over Monocotyledones (13 taxa; 15.48%), see Tab. 1.

According to the number of taxa, the most abundant (Tab. 2) family is *Asteraceae* with 16 taxa (19.05%), followed by *Amaranthaceae* and *Fabaceae* each with six taxa (7.14%) and

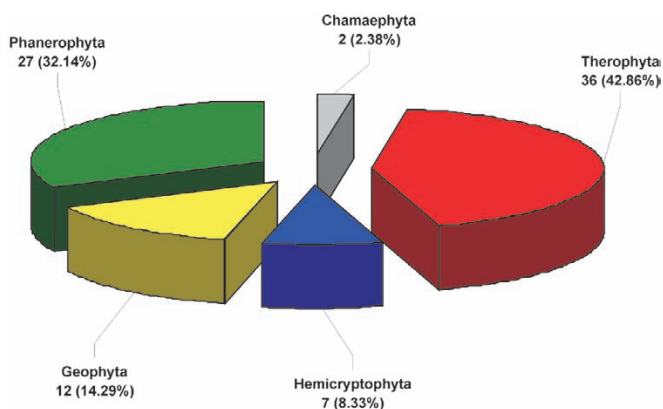
Tab. 1. Taxonomic analysis of the non-native flora of the town of Omiš

TAXA	Angiospermae					
	Dicotyledones		Monocotyledones		Total	
	No. of taxa	%	No. of taxa	%	No. of taxa	%
Families	32	84.21	6	15.79	38	100.00
Genera	58	82.86	12	17.14	70	100.00
Species & subspecies	71	84.52	13	15.48	84	100.00

Tab. 2. The most abundant families in the non-native flora of the town of Omiš

Families	No. taxa	% of total flora (84)
<i>Asteraceae s.str.</i>	16	19.05
<i>Amaranthaceae</i>	6	7.14
<i>Fabaceae</i>	6	7.14
<i>Poaceae</i>	5	5.95
<i>Brassicaceae</i>	3	3.57
<i>Chenopodiaceae</i>	3	3.57
<i>Euphorbiaceae</i>	3	3.57
<i>Rosaceae</i>	3	3.57
<i>Solanaceae</i>	3	3.57

Poaceae with five taxa (5.95%). The most abundant genera are *Amaranthus* (six taxa), followed by *Conyza* and *Prunus* (three 3 taxa) while the other genera are represented with two taxa or only one.

**Fig. 1.** Life-form spectrum of the non-native flora of the town of Omiš.

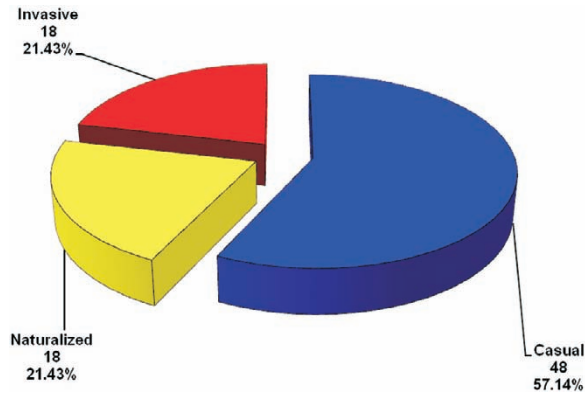


Fig. 2. Degree of naturalization of the non-native flora of the town of Omiš.

Analysis of life-forms of the non-native flora of the town of Omiš (Fig. 1) shows the domination of therophytes with 36 taxa (42.86%), followed by phanerophytes with 27 taxa (32.14%), while the least abundant are chamaephytes with only two taxa (2.38%).

According to the degree of naturalization the most prominent are casual plants with 48 taxa (57.14%), while naturalized and invasive plants are equally represented (18 taxa; 21.43%), see Fig. 2.

The analysis of habitats showed that the most taxa are presented on two (42 taxa; 50% of flora) or three (23; 27.38%) different habitats (Tab. 3). The most frequent non-native taxa (59) were noticed in cultivated habitats, then in ruderal habitats (51 taxa) and public green areas (38 taxa), see Fig 3.

According to their modes of introduction, in the area of the town of Omiš (Fig. 4), deliberately introduced plants predominate (53 of the taxa; 63.10%) over accidentally introduced taxa (24 of the taxa; 28.57%). The fewest taxa were introduced in both ways, deliberate and accidental (7 taxa; 8.33%).

Analysis of the geographical origin of non-native plants of the town of Omiš (Tab. 4) showed that the most plants originated from the Americas (40 taxa; 47.62%), among which most originate from North America. Plants that originate from Asia are also significantly represented (25 taxa; 29.76%).

Tab. 3. Distribution of non-native taxa per number of different habitats

No. of habitats	Casual	Naturalized	Invasive	Total
1	6	2	1	9
2	33	7	2	42
3	9	7	7	23
4	0	0	3	3
5	0	2	5	7
Total of taxa	48	18	18	84
Average no. of habitats	2,06	2,61	3,50	2,49

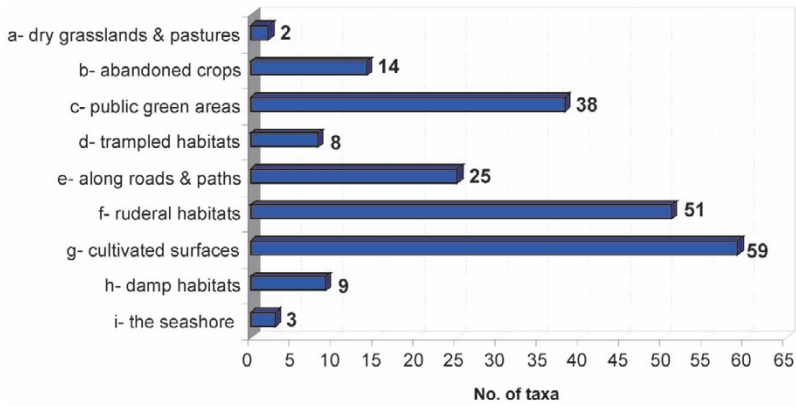


Fig. 3. Distribution of the non-native flora of the town of Omiš in different habitats.

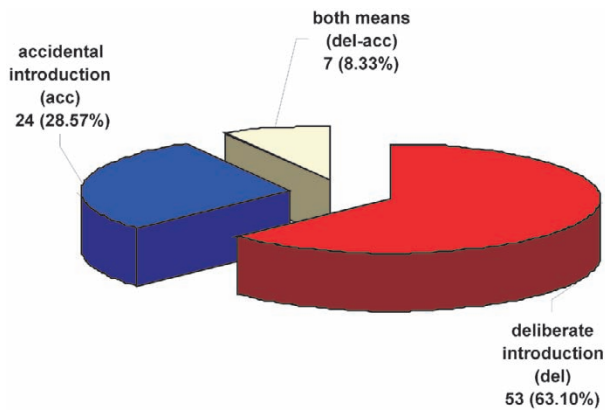


Fig. 4. Introduction modes of the non-native flora of the town of Omiš.

Tab. 4. Geographic origin of non-native plants of the town of Omiš

Geografic region /subregion		No. of taxa		%
AFRICA	North Africa	1	1	1.19
AMERICA	North America	18	40	47.62
	North & South America	1		
	Central America	3		
	Central & South America	2		
	South America	12		
	Tropical America	4		

ASIA	Asia	3	25	29.76
	East Asia	10		
	West Asia	6		
	Central Asia	2		
	South-West Asia	3		
	Tropical Asia	1		
EUROPE	Balkans		1	1.19
MEDITERRANEAN	Italia		1	1.19
PALEOTEMPORAL REGIONS			1	1.19
TROPICS & SUBTROPICS	Tropics	1	6	7.14
	Neotropics	3		
	Paleotropics	2		
UNKNOWN ORIGIN			9	10.71
TOTAL			84	100

DISCUSSION AND CONCLUSIONS

Non-native flora of the town of Omiš includes 84 taxa, are either naturalised or casually present on the researched area. Taxa present exclusively in cultivation were not analysed in this work. The percentage of non-native flora equals 13.68% of the complete flora of the town of Omiš (614 of taxa) (TAFRA *et al.*, 2012), which is in accordance with the results for other Mediterranean cities (3-20%): Patras (CHRONOPOULOS & CHRISTODOULAKIS, 2000), Rome (CELESTI GRAPOW, 1993-1994), Split (RUŠČIĆ, 2002) and Zadar (MILOVIĆ, 2008).

Non-native taxa analysed in this work belong to 38 families and 70 genera (Tab. 1), which indicates the large diversity of non-native flora, because one genus is represented by an average of 1.2 taxa. The most abundant is the genus *Amaranthus* (six taxa) which includes widely prevalent weed and ruderal species (*A. retroflexus*, *A. blitoides*, *A. prostratus*) and species that casually thrive outside cultivation (*A. caudatus*, *A. cruentus*).

Among families, the highest share goes to *Asteraceae* s.str. (19.05%), followed by *Amaranthaceae* and *Fabaceae* with a significantly lower share (both 7.14%) and *Poaceae* (5.95%). These four families together contain 39.28 % of the complete non-native flora of the researched area (Tab. 2), and also the most abundant in the non-native flora of the cities of Split (RUŠČIĆ, 2002), Zadar (MILOVIĆ, 2008), Rome (CELESTI GRAPOW, 1993-1994) and Patras (CHRONOPOULOS & CHRISTODOULAKIS, 2000).

The life-form spectrum of the non-native flora of the town of Omiš (Fig. 1) shows the domination of therophytes (42.86%) which is in accordance with the data for Zadar (MILOVIĆ, 2008), Patras CHRONOPOULOS & CHRISTODOULAKIS, 2000) and Rome (CELESTI GRAPOW, 1993-1994). The domination of therophytes is expected because they are annual plants, with a short vegetation cycle, best adapted to the constant changes in the duration and intensity of ecological factors in urban habitats. The higher abundance of

phanerophytes (32.14%) in regard to their usual amount is a consequence of the high number of non-native tree and bush taxa in horticulture, family gardens and public green areas, from which many of them escape and are able to exist casually or as naturalised in the surrounding areas (*Acer negundo*, *Campsis radicans*, *Melia azedarach*, *Parthenocissus quinquefolia*, *Ulmus pinnato-ramosa* etc.).

According to the degree of naturalization (Fig. 2) casual taxa (57.14%) are more abundant than naturalized (42.86%). Among the naturalized taxa, non-invasive and invasive plants are equally represented (21.43%). The domination of non-naturalized taxa was also recorded in the non-native flora of the cities of Zadar (MILOVIĆ, 2008), Rome (CELESTI GRAPOW, 1993-1994) and Patras (CHRONOPOULOS & CHRISTODOULAKIS, 2000). The expansion of most invasive taxa is limited to typical anthropogenic habitats (*Amaranthus* sp., *Bidens subalternans*, *Conyza* sp. div., *Euphorbia maculata*, *E. prostrata* itd.). Special attention should be paid to taxa that beside anthropogenic habitats also overwhelm natural and semi-natural habitats, especially on the edge of the Cetina (*Amorpha fruticosa*, *Ailanthus altissima*, *Broussonetia papyrifera* and *Robinia pseudoacacia*).

Although some non-native taxa are classified as invasive at a national level (BORŠIĆ et al. 2008) we recognized them as casual (e.g. *Tagetes minuta*) or naturalized non-invasive taxa (e.g. *Amaranthus blitoides*, *A. deflexus*, *Helianthus tuberosus*, *Opuntia ficus-indica*, *Paspalum dilatatum* and *P. paspalodes*) according to their behaviour observed in the investigated area of Omiš.

The division of non-native taxa according to habitat types shows that the most taxa are present on two (42; 50%) or three (23; 27.38%) different habitat types and that only nine taxa (10.71%) were registered in just a single habitat (Tab. 3). Invasive taxa grow in an average of 3.5 different habitats, which suggests that these species have a wider ecological valence in comparison to casual (2.06%) and naturalized non-invasive taxa (2.61%). The highest number of taxa (59) was recorded on arable surfaces (especially in vegetable and flower gardens near family houses) and in ruderal habitats (51 taxa), followed by public green areas (38 taxa) and roadsides and paths (25 taxa). The lowest number of non-native taxa was recorded in natural and semi-natural habitats (Fig. 3) like the sea coast (three taxa) and dry grasslands and rocky pastures (two taxa). In the beginning, non-native taxa usually colonise different types of anthropogenic habitats near the area they were introduced, while only a few are able to expand afterwards to natural and semi-natural habitats where the competition of native taxa is more strongly expressed.

The analysis of non-native taxa according to the mode of introduction in the researched area (Fig. 4) shows the domination of deliberately introduced taxa (63.10%) over accidentally introduced taxa (28.57%). The least abundant are taxa which were probably introduced in both ways (8.33%). Among the deliberately introduced taxa most species were recently introduced in horticulture, so they are classified as *neophytes* sensu PYŠEK et al. (2004), while a smaller number of species were introduced for the purpose of nutrition before the discovery of America (*Prunus* sp. div., *Armoracia rusticana*, *Raphanus sativus*), the so called *archaeophytes* sensu PYŠEK et al. (2004).

Analysis of the geographical origin of the non-native flora of the city of Omiš (Tab. 3) shows that most taxa originate from America (47.62%), while taxa that originate from Asia are also significantly represented (29.76%). The prevalence of non-native taxa which originate from America and Asia is in accordance with analyses of the non-native flora of other Mediterranean cities - Zadar (MILOVIĆ, 2008), Rome (CELESTI GRAPOW,

1993-1994) and Patras (CHRONOPOULOS & CHRISTODOULAKIS, 2000). That is expected considering the similarities in general climate conditions and the developed traffic connections between America or Asia and Europe, which also includes Croatia.

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SAŽETAK

Alohtona flora Omiša (Dalmacija, Hrvatska)

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U radu je analizirana alohtona flora Omiša koja broji 84 svojte, što je 13,68% ukupne vaskularne flore ovoga malog dalmatinskog grada smještenog na ušću Cetine. U ovaj broj nisu uključene brojne strane vrste koje na istraživanom području dolaze isključivo u kulturi.

Alohtonu floru Omiša karakterizira velika raznolikost: sadrži 84 svojte svrstane u 38 različitih porodica i 70 rodova, prosječno po jednom su rodu zastupljene samo 1,2 vrste. Najzastupljenija porodica je *Asteraceae* s. str. (19,05%) dok je rod *Amaranthus* s najvećim brojem vrsta (6). Najveći broj svojti zabilježen je na obradivim površinama, naročito u vrtovima uz obiteljske kuće (59) te ruderalnim staništima (51). Od životnih oblika najzastupljeniji su terofiti (42,86%), a zatim slijede fanerofiti (32,14%) među kojima je značajan broj subspontanijih svojti, prebjega iz kulture. Prema geografskom podrijetlu najzastupljenije su svojte iz Amerike (47,62%) a zatim slijede one azijskog podrijetla (29,76%). Prema stupnju udomaćenosti dominiraju neudomaćene svojte (58,33%), a značajna je i zastupljenost udomaćenih invazivnih svojti (21,43%) među kojima su posebno opasne svojte koje ulaze u prirodnu i poluprirodnu vegetaciju uz obale rijeke Cetine (*Amorpha fruticosa*, *Ailanthus altissima*, *Broussonetia papyrifera*, *Robinia pseudoacacia*). Prema načinu unošenja prevladavaju svojte namjerno unesene u uzgoj (63,10%) bilo u svrhe ishrane bilo kao ukrasne svojte. Ovaj podatak ukazuje na potencijalnu opasnost od nekontroliranog unošenja sve većeg broja stranih svojti u hortikulturu, jer mnoge od njih imaju potencijal za udomaćenje, a naknadno i za invazivno širenje izvan mjesta uzgoja.