A COMPARISON OF URBAN FLORA IN SPLIT, DUBROVNIK, AND MOSTAR

USPOREDBA URBANE FLORE U SPLITU, DUBROVNIKU I MOSTARU

UDK: 581.92:712(497.5 Split)
581.92:712(497.5 Dubrovnik)
581.92:712(497.6 Mostar)

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Urban flora sampled in the coastal cities of Split and Dubrovnik (Croatia) and in Mostar (Bosnia and Herzegovina) was represented by 325, 243, and 106 vascular plant taxa (species and subspecies), respectively. Similarity coefficients between the flora of Split and Dubrovnik, Split and Mostar, and Dubrovnik and Mostar were, respectively, 41.8, 17.9, and 19.0%. Fifty-one taxa were common among all three cities. The Mediterranean floral element dominated all three, with the families *Asteraceae*, *Poaceae*, and *Cichoriaceae* having the highest number of taxa. According to Raunkiaer's life-form spectrum, therophytes dominated Split (48%), while hemicryptophytes were more common in Dubrovnik (36%) and Mostar (39%). In total, 62 (Split), 41 (Dubrovnik), and 19 (Mostar) taxa of alien (allochthonous, non-native) plants were identified. Most were neophytes originating in the Americas (Split, 65.5%; Dubrovnik, 73%; Mostar, 52.6%). The urban flora of Split and Dubrovnik is Mediterranean and, in both quality and quantity, is comparable to that of cities in central and southern Italy. Differences among the three cities may be explained by historical differences in the nature and intensity of human impacts.

Key words: urban flora, Split, Dubrovnik, Mostar.

INTRODUCTION – Uvod

The field of urban ecology has developed rapidly over the last few decades (*see* Sukopp, 2002 for an historical overview). Interest in urban flora may be attributed partly to the fact that cities have been found to be remarkably rich in species, a result of high habitat diversity (Gilbert 1989) and the introduction of alien (*syn.*: allochthonous, exotic, introduced, non-native, non-indigenous plants) species (Pyšek 1998).

According to Mitić et al. (2008), alien plants include taxa introduced and grown outside of their natural area of distribution, including gametes, seeds, and

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propagules. Their introduction may be intentional or unintentional, or they may have arrived without any human intervention.

Research on the flora of large cities in central and southern Europe increased notably in the second half of the 20th century (cf. Chronopoulos and Christodoulakis 2003, Celesti-Grapow et al. 2006). Urban species now have been enumerated for at least seventy-seven European cities (Pyšek, 1993). Outside of Europe, urban ecology has been studied intensively in North America (cf. McKinney 2006).

As in other habitats subjected to human or natural disturbances, native and alien species often have different distributions and respond to different environmental factors (Pyšek et al. 2005). Based on data for 54 cities (Pyšek 1998), alien species generally are more abundant in urban centers than in outlying parts of the city or the surrounding countryside. These species, often introduced in the more densely populated city centers (Kowarik 1990), take advantage of the higher degree of human activities in these areas (Chocholoušková and Pyšek 2003).

The present paper compares the urban flora of three cities in south-eastern Europe: Split and Dubrovnik, both on Croatia's eastern Adriatic coast; and the inland Bosnian city of Mostar. The objectives are to determine the degree of floral similarity and to analyze the current plant assemblages in terms of life forms and floral elements, with particular attention to the origin of alien plants.

Study cities

Like most urban areas of the world, the population in each of the three cities in this study has increased over recent decades. The municipality of Mostar (8.9 km^2) had a population of 127,066 in 2005. According to the 2001 census, Split, with a 16 km^2 urban zone, had a population of 188,694; this grew to an estimated 221,456 in 2005. Dubrovnik (14.3 km^2) had a population of 43,770 in 2001 but, although it is a smaller municipality, its status as a popluar tourist venue demands that its urban infrastructure accommodate a transient seasonal population that increases its effective size several-fold. Each city, to different degrees, thus is experiencing the variety of challenges that attend urban expansion.

The urban landscapes of these cities are very heterogeneous, both in terms of geography (climate, geology, soil, morphology) and land use. The climate is typically Mediterranean in Split (43°30'N, 16°26'E; average annual temperature of 16°C and average annual rainfall of 795 mm) and Dubrovnik (42°39'N, 18°04'E; average annual temperature of 16°C and average annual rainfall of 1,294 mm). Mostar (43°20'N, 17°48'E), less than 90 m above sea level and less than 60 km from the Adriatic Sea, has a modified Mediterranean climate with an average annual temperature of 14.7°C and an average annual rainfall of 1,489 mm.

According to the Biogeographic Map of Europe (Rivas-Martínez et al. 2004), Split and Dubrovnik are in the Mediterranean Region, Eastern Mediterranean Subregion, Adriatic Province, and Epiro-Dalmatian Sector; Mostar is in the Euro-Siberian Region, Alpino-Caucasian Subregion, Apennino-Balkan Province, and Illyrian Sector.

MATERIAL AND METHODS – Materijal i metode rada

Collections and field observations were carried out in the urban areas of Split (1996 – 2007, 17 localities), Dubrovnik (2005 – 2007, 16), and Mostar (2003, 22). The total surface area investigated was, respectively, 8.0, 7.1, and 6.2 km^2.

The identified flora are listed alphabetically as genera and lower taxa (Table 1). Nomenclature follows the *Flora Europaea* (Tutin 1968-1980, 1993). Floral element is indicated after the family and life-form abbreviations (Raunkiaer 1934, P – Phanerophytes, Ch – Chamaephytes, H – Hemicryptophytes, G – Geophytes, T – Therophytes, Hy – Hydrophytes) are given after the floral element. Analysis of life forms and floral elements was made according to Pignatti (1982), Jasprica and Kovačić (1997a, b), Ruščić (2003), and references therein.

Species associations were quantified with the Jaccard similarity index (Jaccard 1908):

$$JI = 100\,[a / (a + b + c)]$$

where *a* is the number of species present in both cities; *b* is the number in city 1, but absent in city 2; and *c* is the number in city 2, but absent in city 1. Double absences do not contribute to similarity. Statistical analyses were performed with PRIMER v5 (Clarke and Gorley 2001).

RESULTS – Rezultati

The number of vascular plant taxa (species and subspecies) observed were: 325 in Split, 243 in Dubrovnik, and 106 in Mostar (Table 1). Similarity coefficients between flora in Split and Dubrovnik, Split and Mostar, and Dubrovnik and Mostar were, respectively: 41.8, 17.9, and 19.0%. Fifty-one taxa were common to all three cities.

The families with the highest number of taxa in all three cities were *Asteraceae*, *Poaceae*, and *Cichoriaceae* (Table 2). In addition, *Fabaceae* and *Scrophulariaceae* each had more than 10 taxa in Split and Dubrovnik.

Table 2. List of families and their number of taxa in the urban flora of the cities.
Tablica 2. Lista prodica broj taksona u urbanoj flori gradova

Families	Split	Dubrovnik	Mostar
Aceraceae	1	2	-
Adiantaceae	1	3	-
Agavaceae	1	1	-
Alismataceae	1	-	-
Amaranthaceae	7	7	1
Anacardiaceae	-	1	-
Apiaceae	6	10	3
Apocyanaceae	2	1	1
Araceae	1	1	1

Araliaceae	1	1	1
Arecaceae	1	-	-
Aspleniaceae	2	2	-
Asteraceae	**46**	**29**	**19**
Bignoniaceae	1	1	1
Boraginaceae	4	2	1
Brassicaceae	27	9	3
Cactaceae	1	1	-
Campanulaceae	1	1	-
Cannabaceae	1	-	-
Cannaceae	1	1	-
Capparaceae	1	1	-
Caprifoliaceae	1	1	1
Caryophyllaceae	14	7	3
Chenopodiaceae	5	5	2
Cichoriaceae	**20**	**13**	**10**
Clusiaceae	1	1	-
Commelinaceae	1	1	-
Convolvulaceae	5	4	1
Crassulaceae	6	3	-
Cucsutaceae	-	-	1
Cucurbitaceae	1	1	-
Cupressaceae	1	-	-
Cyperaceae	1	2	-
Dipsacaceae	3	3	1
Euphorbiaceae	10	7	2
Fabaceae	22	11	7
Fumariaceae	2	-	-
Geraniaceae	6	2	-
Iridaceae	-	1	-
Lamiaceae	7	13	9
Lauraceae	1	1	-
Liliaceae	4	3	-
Linaceae	1	-	-
Malvaceae	2	2	-
Meliaceae	1	1	1
Moraceae	3	3	-
Nyctaginaceae	1	1	-
Onagraceae	2	-	-
Oxalidaceae	4	2	2
Papaveraceae	1	-	-
Passifloraceae	1	1	-

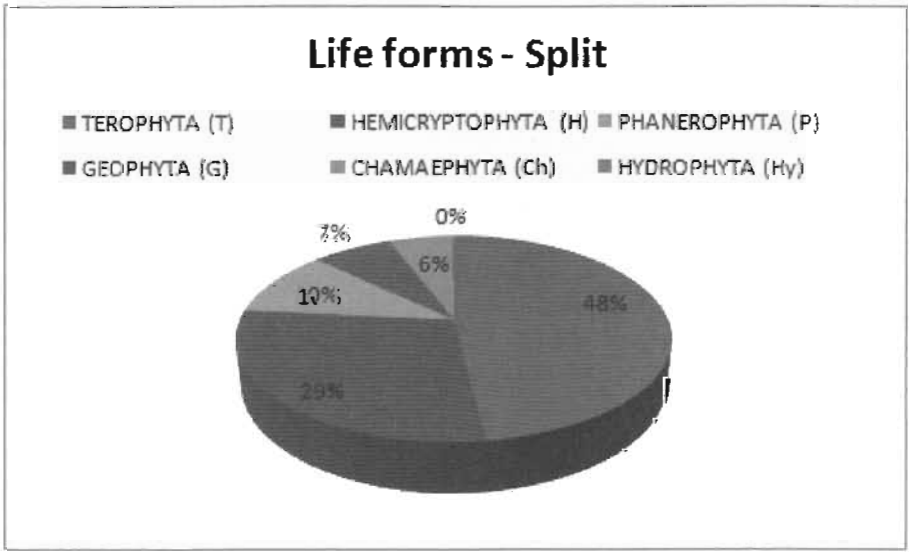
Phytolacaceae	1	1	-
Pinaceae	2	1	-
Plantaginaceae	2	2	2
Platanaceae	-	-	1
Plumbaginaceae	1	1	-
Poaceae	**33**	**30**	**10**
Polygonaceae	4	2	2
Polygonaceae	1	2	1
Polypodiaceae	1	1	-
Portulaceae	1	1	-
Primulaceae	2	3	-
Ranunculaceae	2	3	1
Resedaceae	3	2	1
Rosaceae	5	5	5
Rubiaceae	2	3	-
Sapindaceae	1	-	-
Saxifragaceae	1	1	-
Scrophulariaceae	11	10	4
Simaroubaceae	1	1	1
Solanaceae	7	6	2
Theligonaceae	-	1	-
Ulmaceae	2	2	1
Urticaceae	3	2	-
Valerianaceae	1	1	-
Verbenaceae	1	1	1
Violacea	1	-	1
Vitaceae	1	1	-
Zigophyllaceae	1	1	-

Mediterranean floral elements dominated all three cities, contributing 26% to the flora in Split, 35.4% in Dubrovnik, and 24.5% in Mostar (Table 3).

Table 3. Analysis of the floral elements in the three cities.
Tablica 3. Analiza flornih elemenata u tri grada

Floral elements / Cities	Number of taxa and percentage		
	SPLIT	DUBROVNIK	MOSTAR
Mediterranean	83 (26%)	86 (35.4%)	26 (24.5%)
Cultural and Adventive	81 (25%)	59 (24.3%)	25 (23.6%)
Widespread plants	73 (22.5%)	57 (23.5%)	24 (22.6%)
Eurasian	20 (6.2%)	20 (8.3%)	14 (13.2%)
European	12 (3.7%)	5 (2.0%)	6 (5.7%)
Southern European	49 (15.1%)	7 (2.9%)	5 (4.7%)
Central European	2 (0.6%)	5 (2.0%)	2 (1.9%)
Circumholarctic	2 (0.6%)	2 (0.8%)	2 (1.9%)
Illyrian-Balkan	1 (0.3%)	-	-
Eastern European-Pontian	2 (0.6 %)	2 (0.8%)	2 (1.9%)
Total	325 (100%)	243 (100%)	106 (100%)

Therophytes dominated Raunkiaer's life-form spectrum in Split (48%), while hemicryptophytes were more common in Dubrovnik (36%) and Mostar (39%) (Figure 1). Hydrophytes were not found in either Dubrovnik or Mostar.



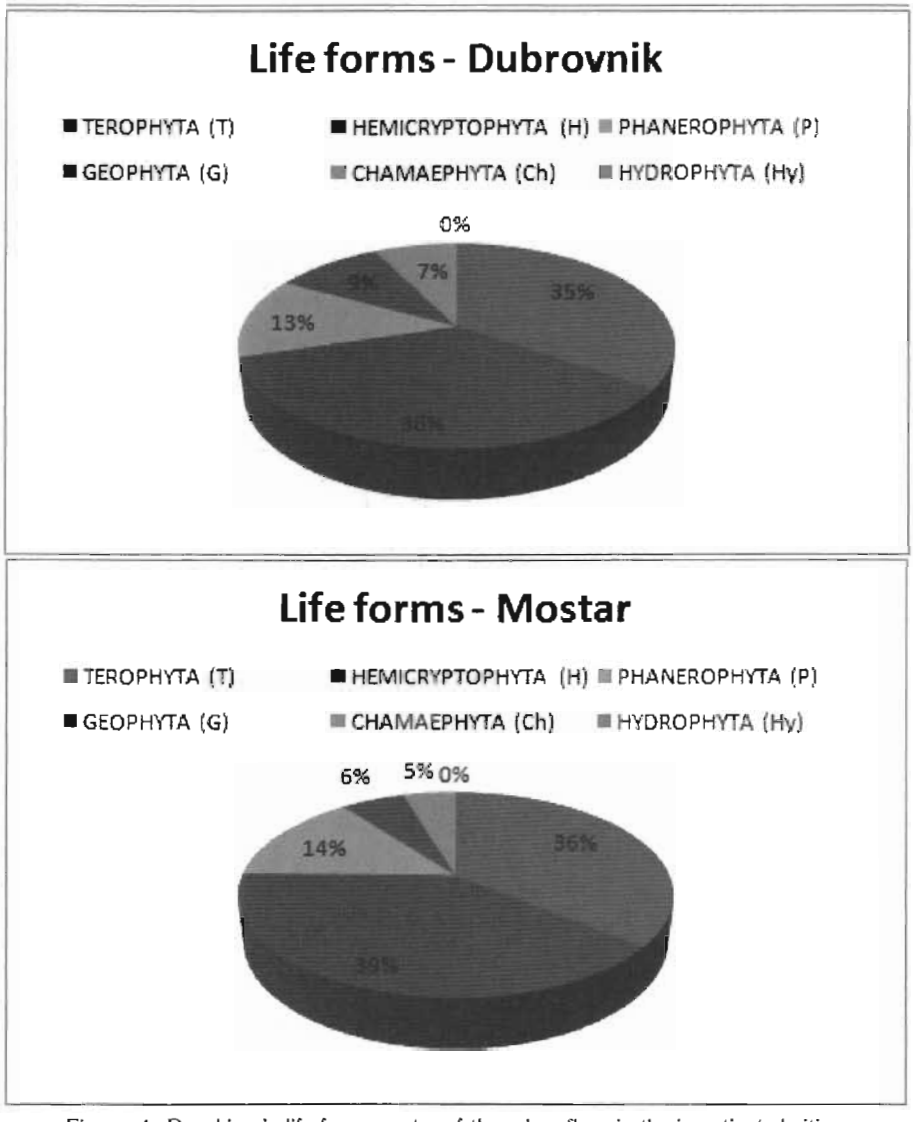


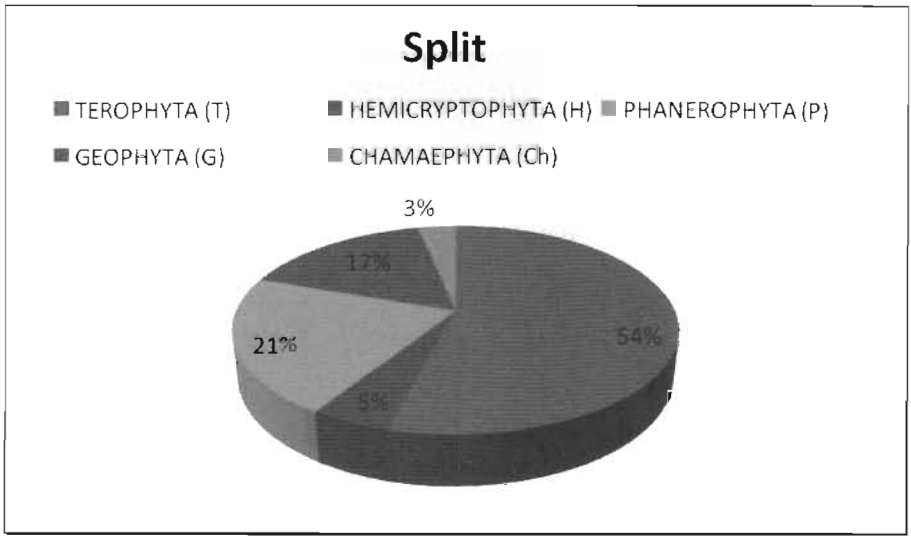
Figure. 1. Raunkiaer's life-form spectra of the urban flora in the investigated cities.
Slika 1. Raunkiaerov izgled životnog spectra urbane flore u istraživanim gradovima

In total, 62, 41, and 19 taxa of alien plants were identified, respectively, in Split, Dubrovnik, and Mostar (Table 4), contributing 18.4, 16.8, and 17.9% to the total flora.

Table 4. Origin of adventive plants in the investigated cities.
Tablica 4. Podrijetlo biljaka u istraživanim gradovima

Origin	Number of taxa		
	SPLIT	DUBROVNIK	MOSTAR
Africa	**2**	**1**	**1**
South and North Africa	2	1	1
America	**40**	**30**	**10**
North America	15	12	3
South and Tropical America	18	12	6
North and South America	5	5	1
Central and South America	2	1	0
Asia	**13**	**7**	**6**
East Asia, Central Asia and China	10	5	4
South and West Asia	3	2	2
Paleotropical	**1**	**0**	**1**
Tropical / Subtropical	**2**	**2**	**1**
Western Mediterranean	**2**	**1**	**0**
Western European	**1**	**0**	**0**
Total	**61**	**41**	**19**

Most alien taxa were neophytes, of which taxa originating in the Americas dominated: Split, 65.5%; Dubrovnik, 73%; and Mostar, 52.6%. In contrast, archaeophytes were much less common and mainly of Asiatic origin. Therophytes were the most important alien plants: Split, 54%; Dubrovnik, 46%; and Mostar, 58% (Figure 2).



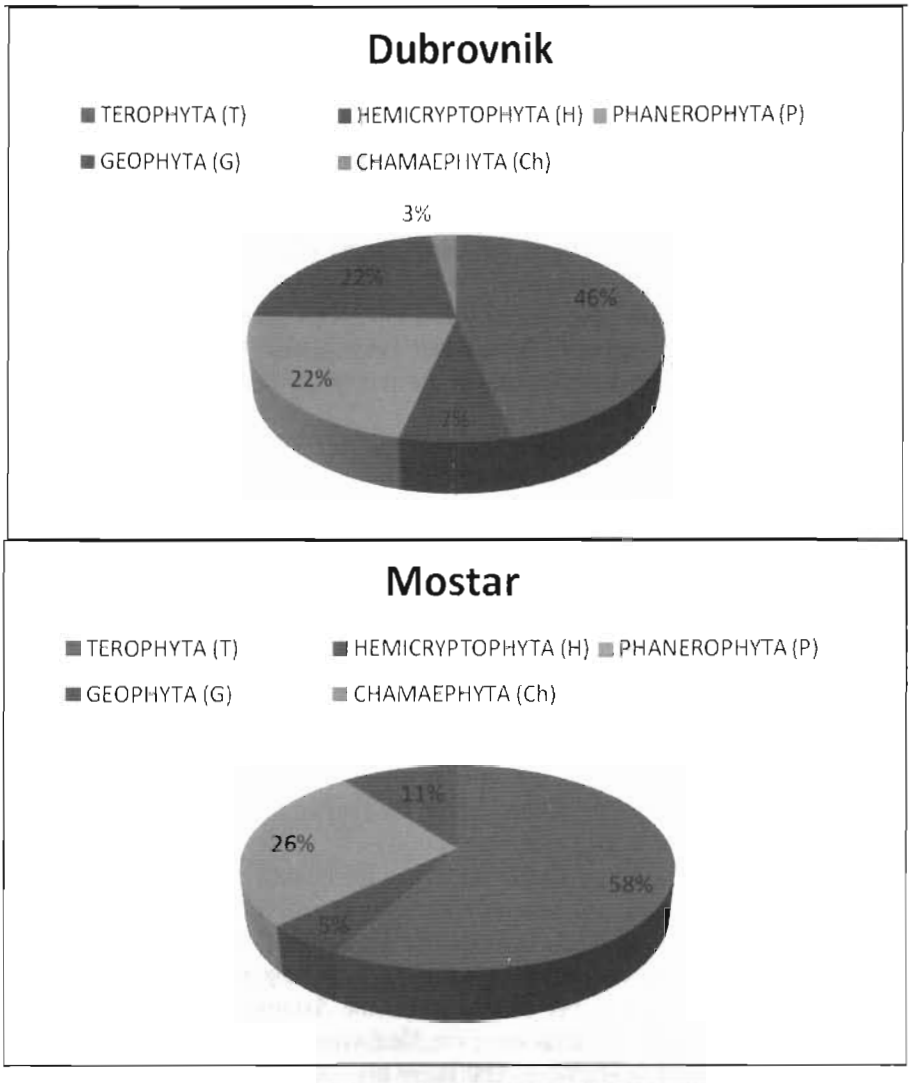


Figure 2. Raunkiaer's life-form spectra of alien flora in the investigated cities.
Slika 1. Raunkiaerov izgled životnog spectra strane flore u istraživanim gradovima

DISCUSSION – Rasprava

From a botanical standpoint, cities can be viewed as intensively managed landscapes that favor a distinct species assemblage (Haeupler 1974, Kühn et al. 2004). This assemblage may be more diverse than those outside of the city, owing in part to the relatively high environmental heterogeneity that most urban environments provide (Gilbert 1989).

Split and Dubrovnik are typical Mediterranean cities with urban flora comparable to that of the coastal urban areas of central and southern Italy (cf. Celesti-Grapow et al. 1996, Celesti-Grapow and Blasi 1998, Hruska et al. 2003). Differences between the coastal cities in this study and Mostar may be explained at least partly by historical differences in the type and intensity of human impact that each has experienced. For example, for centuries the Adriatic cities experienced a regular exchange of people and goods through their seaports. Mostar, on the other hand, has been a regional rail and road hub and an important waypoint for transport between the coast to the hinterland.

Much more recently (since 1992), foreign troops and their equipment have affected the urban landscape of Bosnia and Herzegovina. In fact, Trinajstić and Jasprica (1998) have cited this as one of the vectors by which *Eleusina tristachya* was introduced into the Balkans.

The rapid increase in tourist traffic over the last decade certainly has had an impact on the urban flora of these cities, both in terms of habitat modification and even the introduction of alien species. This is a very important topic that deserves closer analysis than can be offered here.

The number of taxa in different parts of the cities varied according to the degree of urbanization and habitat types (Ruščić 2003, Jasprica et al. 2008). Knapp et al. (2008) found that high species richness in urban areas is accounted for by closely related species that occupy functionally similar habitats. A number of studies have demonstrated that environmental modifications characteristic of human settlements provide distinctive 'niche opportunities' (*sensu* Shea and Chesson, 2002). For instance, species with higher temperature requirements and tolerance of arid environments tend to occur in city centers, where the "urban heat-island effect" is more pronounced (Godefroid 2001; McKinney 2006).

Asteraceae, Poaceae, and *Cichoriaceae* had the highest number of taxa. Unfortunately, information on urban flora of other eastern Adriatic cities yet is undocumented, so comparison currently is limited to Mostar and Sarajevo in Bosnia and Herzegovina. According to Tomović-Hadžiavdić and Šoljan (2006), Mostar and Sarajevo had the highest number of taxa within the *Asteraceae, Poaceae, Cichoriaceae,* and *Fabaceae.* The dominance of the Mediterranean element is supported by the high contribution of therophytes. This is not unexpected, as their short life-cycles and high number of easily dispersed seeds make therophytes very effective colonizers.

Urban flora has been enriched significantly by alien species. The proportion of aliens in Central European cities typically varies between 20-60%, with a mean of 40% (Pyšek 1998 for 54 cities). In the present study, they contributed 16.8 to 18.4% of identified flora. The proportion of non-native taxa increases with city size (Klotz 1990; Pyšek *i sur.* 2004); high species diversity thus is more pronounced in large industrial cities (Pyšek 1993).

It recently was pointed out that cities are naturally rich in native species owing to their heterogeneous geological substrate that, on average, is more diverse than a randomly selected plot from the surrounding extra-urban area (Kühn *i sur.* 2004).

This makes their flora prone to the loss of native species and the spread of aliens; and this, in turn, encourages biotic homogenization (McKinney and Lockwood 1999, Olden et al. 2004).

Geographic origin analysis suggests that most alien spieces in this study originated in the Americas, both North and South. This agrees with the conclusion of Boršić et al. (2008) for invasive alien plants in Croatia. Indeed, plants from the Americas have been spreading more vigorously during the last decades (cf. Trinajstić and Jasprica 1998, Šilić and Šolić 1999, Pandža *i sur.* 2001, Stančić 2007, Pandža and Tafra 2008, etc.). On the other hand, the relatively small percentage of aliens of Eurasian and Mediterranean origin may be explained by the fact that these taxa are archaeophytes: That is, with the passage of time since their original introduction, they have become a constitutive part of the local vegetation and so now are considered native.

In the case of Dubrovnik, full interpretation of its urban floral diversity must incorporate an analysis of the city's activities when it was an important thalassocracy. During this time, ships and emmisaries of the Republic frequently returned to port from their far-reaching travels with exotic plants collected along the Mediterranean littoral and beyond (V. Lupis, *pers. comm.;* for review see Đurasović 1998).

Additionally, the botanical garden of the small island of Lokrum, lying only 700 m offshore of the City, is home to a variety of exotics – many from the Americas – intentionally transplanted to the region when the island was the property of Emperor Maximillian (Adamović, 1911). More detailed analysis will be required to evalute the extent to which the Ragusan Republic served as the port-of-entry for floral elements now established in the Balkan Peninsula.

Additional research on the urban flora in Croatian and Bosnian cities is underway and will advance knowledge of the expansion of aliens in this region. This, in turn, will further understanding of the processes that determine the urban ecology Southeastern European cities.

ACKNOWLEDGEMENTS

Research funding of Dubrovnik's urban flora came from the City of Dubrovnik. The first author thanks Nike Sudarević and Marija Crnčević for their very useful contributions and help. The authors thank the two anonymous reviewers for their helpful comments. Thanks are also extended to Dr. Nick Staresinic for helpful comments and improving the English.

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Table 1. Raunkiaer's life-form spectra of the urban flora in the investigated cities.
Tablica 1. Raunkiaerov izgled životnog spectra urbane flore u istraživanim gradovima

Taxon	Family	Floral element	Life form	Origin	Cities
Acer negundo L.	*Aceraceae*	Cultivated and adventitious	P	North America	S
Achillea millefolium L.	*Asteraceae*	Centraleuropean	H		D, M
Achillea setacea Waldst. & Kit.	*Asteraceae*	South European-Mediterranean	H		S
Adiantum capillus-veneris L.	*Adiantaceae*	Mediterranean-Atlantic	G		D
Agave americana L.	*Agavaceae*	Cultivated and adventitious	Ch	North America	S, D
Agrimonia eupatoria L.	*Rosaceae*	Circum-Holarctic	H		M
Ailanthus altissima (Mill.) Swingle.	*Simaroubaceae*	Cultivated and adventitious	P	East Asia	S, D, M
Ajuga chamaepitys (L.) Schreb.	*Lamiaceae*	Circum-Mediterranean	T		S, D
Albizzia julibrissin Durazz.	*Fabaceae*	Cultivated and adventitious	P	Paleotropical	M
Alcea rosea L.	*Malvaceae*	Cultivated and adventitious	H		S, D
Alisma lanceolatum With.	*Alismataceae*	Widespread	Hy		S
Alliaria petiolata (Bieb.) Cavara & Grande	*Brassicaceae*	European	H		S
Allium commutatum Guss.	*Liliaceae*	Circum-Mediterranean	G		D
Allium neapolitanum Cyr.	*Liliaceae*	Circum-Mediterranean	G		S
Allium subhirsutum L.	*Liliaceae*	Circum-Mediterranean	G		S
Alyssum murale Waldst.& Kit.	*Brassicaceae*	Illyrian-Balkan	T		S
Amaranthus albus L.	*Amaranthaceae*	Cultivated and adventitious	T	North America	S, D
Amaranthus cruentus (Lesp. & Thév.) N.Terracc.	*Amaranthaceae*	Cultivated and adventitious	T	North and South America	S, D
Amaranthus deflexus L.	*Amaranthaceae*	Cultivated and adventitious	T	South America	S, D
Amaranthus graecizans L.	*Amaranthaceae*	Cultivated and adventitious	T	North and South America	S, D
Amaranthus powellii S. Watson	*Amaranthaceae*	Cultivated and adventitious	T	North and South America	S, D
Amaranthus retroflexus L.	*Amaranthaceae*	Cultivated and adventitious	T	North and South America	S, D, M
Amaranthus viridis L.	*Amaranthaceae*	Cultivated and adventitious	T	South America	S, D
Ambrosia artemisiifolia Torr. & A.Gray	*Asteraceae*	Cultivated and adventitious	T	North America	S, D
Anacyclus clavatus (Desf.) Pers.	*Asteraceae*	Circum-Mediterranean	T		S

Anagallis arvensis L.	*Primulaceae*	Widespread	T		S, D
Anagallis coerulea Schreb.	*Primulaceae*	Widespread	T		S, D
Anchusa variegata (L.) Lehm.	*Boraginaceae*	East Mediterrean	T		S
Anthemis arvensis L.	*Asteraceae*	Circum-Mediterranean	T		M
Anthemis austriaca Jacq.	*Asteraceae*	Southeast European	T		D
Anthemis cotula L.	*Asteraceae*	Southern European	T		S
Antirrhinum majus L.	*Scrophulariaceae*	Eurasian	Ch		S, D, M
Arenaria leptoclados (Reich.) Guss.	*Caryophyllaceae*	Eurasian	T		S
Arenaria serpyllifolia L.	*Caryophyllaceae*	Widespread	T		S
Artemisia absinthium L.	*Asteraceae*	Eurasian	Ch		S, D, M
Artemisia annua L.	*Asteraceae*	Eurasian	T	Asia	S, M
Artemisia arborescens L.	*Asteraceae*	Circum-Mediterranean	Ch		M
Artemisia vulgaris L.	*Asteraceae*	Widespread	H		S, D
Arum italicum Mill.	*Araceae*	Circum-Mediterranean	G		D, M
Asparagus acutifolius L.	*Liliaceae*	Circum-Mediterranean	G		S
Asphodelus fistulosus L.	*Liliaceae*	Circum-Mediterranean	H		D
Asplenium ruta-muraria L.	*Aspleniaceae*	Circum-Holarctic	H		S
Asplenium trichomanes L.	*Aspleniaceae*	Widespread	H		S, D
Aster squamatus (Spreng.) Hieron.	*Asteraceae*	Cultivated and adventitious	T	Central and South America	S, D
Aster tripolium L.	*Asteraceae*	Widespread	H		D
Atriplex hastata L.	*Chenopodiaceae*	Widespread	T		D
Aurinia sinuata (L.) Griseb	*Brassicaceae*	Illyrian-Apennine	Ch		S
Avena sativa L.	*Poaceae*	Cultivated and adventitious	T		S
Avena sterilis L.	*Poaceae*	Southern European-Pontian	T		S, D
Ballota nigra L.	*Lamiaceae*	South European-Mediterranean	H		D, M
Ballota nigra L. ssp. *foetida* Hayek	*Lamiaceae*	South European-Mediterranean	H		S
Ballota nigra L. ssp. *uncinata* (Fiori & Bég.) Patzak	*Lamiaceae*	Circum-Mediterranean	H		S
Barbarea vulgaris R.Br.	*Brassicaceae*	Widespread	H		S
Bellis perennis L.	*Asteraceae*	Centraleuropean	H		S

Bertoroa incana (L.) DC.	*Brassicaceae*	Eurasian	H		S, D
Bidens subalternans DC.	*Asteraceae*	Cultivated and adventitious	T	South America	S, D, M
Brachypodium retusum (Pers.) P. Beauv.	*Poaceae*	Circum-Mediterranean	H		D
Brassica oleracea L.	*Brassicaceae*	Cultivated and adventitious	Ch	West Europa	S
Briza maxima L.	*Poaceae*	Circum-Mediterranean	T		D
Bromus madritensis L.	*Poaceae*	Mediterranean-Atlantic	T		S, D
Bromus rigidus Roth.	*Poaceae*	Eastern European-Pontian	T		S
Bromus sterilis L.	*Poaceae*	Widespread	T		S
Broussonetia papyrifera (L.) Vent.	*Moraceae*	Cultivated and adventitious	P	East Asia	S, D
Bunias erucago L.	*Brassicaceae*	South European-Mediterranean	T		S
Calaminitha nepetoides Jord.	*Lamiaceae*	Southern European-Pontian	H		S, D, M
Calaminitha sylvatica Bromf.	*Lamiaceae*	Eurasian	H		M
Calendula arvensis L.	*Asteraceae*	South European-Mediterranean	T		S
Calendula officinalis L.	*Asteraceae*	Cultivated and adventitious	T		S, D
Calepina irregularis (Asso) Thell.	*Brassicaceae*	European	T		S
Calystegia sepium (L.) R. Br.	*Convolvulaceae*	Widespread	H		S
Campanula pyramidalis L.	*Campanulaceae*	Illyrian-Adriatic endemic	H		S, D
Canna indica L.	*Cannaceae*	Cultivated and adventitious	G	Subtropical	S, D
Cannabis sativa L.	*Cannabaceae*	Cultivated and adventitious	T	South and West Asia	S
Capparis spinosa L.	*Capparaceae*	Circum-Mediterranean	P		S, D
Capsella rubella Reut.	*Brassicaceae*	Circum-Mediterranean	T		S, M
Cardamine hirsuta L.	*Brassicaceae*	Widespread	T		S
Cardaria draba (L.) Desv.	*Brassicaceae*	Widespread	H		S, D
Carduus pycnocephalus L.	*Asteraceae*	Circum-Mediterranean	H		S, D
Carlina corymbosa L.	*Asteraceae*	Circum-Mediterranean	H		S, D
Carthamus lanatus L.	*Asteraceae*	Circum-Mediterranean	T		S, D
Celtis australis L.	*Ulmaceae*	South European-Mediterranean	P		S, D
Centaurea alba L. subsp.*deusta* (Ten.) Nyman	*Asteraceae*	Kvarner-Liburnian endemic	H		M
Centaurea calcitrapa L.	*Asteraceae*	Mediterranean-Atlantic	H		S
Centaurea solstitialis L.	*Asteraceae*	South European-Pontic	H		S

Centaurea spinosocilata Seenus subsp.*cristata* (Bertol.) Dostál	*Asteraceae*	Illyrian-Adriatic endemic	H		M
Centaurea spinosociliata Seenus susp. *spinosociliata*	*Asteraceae*	Illyrian-Adriatic endemic	H		S, D
Centranthus ruber (L.) DC.	*Valerianaceae*	Mediter.-Atlantic	Ch		S, D
Cephalaria leucantha (L.) Roem. & Schult.	*Dipsacaceae*	Circum-Mediterranean	H		S, D
Cerastium brachypetalum Pers.	*Caryophyllaceae*	South European-Mediterranean	T		S
Ceratonia siliqua L.	*Fabaceae*	Cultivated and adventitious	P		S
Cercis siliquastrum L.	*Fabaceae*	Cultivated and adventitious	P		D, M
Asplenium ceterach L.	*Aspleniaceae*	South European-Mediterranean	H		D
Chamaerops humilis L.	*Arecaceae*	Cultivated and adventitious	P		S
Chamomilla recutita (L.) Rauschert	*Asteraceae*	Cultivated and adventitious	T		S
Cheilanthes acrostica (Balbis) Tod.	*Adiantaceae*	South European-Mediterranean	H		S, D
Chelidonium majus L.	*Papaveraceae*	Eurasian	H		M
Chenopodium album L.	*Chenopodiaceae*	Widespread	T		S, D, M
Chenopodium ambrosioides L.	*Chenopodiaceae*	Cultivated and adventitious	T	Tropical America	S, D, M
Chenopodium hibridum L.	*Chenopodiaceae*	Widespread	T		S
Chenopodium murale L.	*Chenopodiaceae*	Widespread	T		S, D
Chenopodium vulvaria L.	*Chenopodiaceae*	South European-Mediterranean	T		S, D
Chondrilla juncea L.	*Cichoriaceae*	Eurasian	H		S, D, M
Chrysanthemum coronarium L.	*Asteraceae*	Circum-Mediterranean	T		S
Cichorium intybus L.	*Cichoriaceae*	Widespread	H		S, D, M
Cirsium arvense (L.) Scop.	*Asteraceae*	Eurasian	T		S, M
Cirsium vulgare (Savi) Scop.	*Asteraceae*	Eurasian	H		S, D
Clematis vitalba L.	*Ranunculaceae*	Eurasian	P		S, D, M
Colutea arborescens L.	*Fabaceae*	Circum-Mediterranean	P		D
Commelina virginica L.	*Commelinaceae*	Cultivated and adventitious	G	North America	S, D
Consolida ajacis (L.) Schur	*Ranunculaceae*	Circum-Mediterranean	T		D
Convolvulus althaeoides L. ssp. *tennuissimus* (Sibith. & Sm.) Stace	*Convolvulaceae*	Eastern Mediterranean	H		S, D
Convolvulus arvensis L.	*Convolvulaceae*	Widespread	G		S, D, M
Conyza bonariensis (L.) Cronquist	*Asteraceae*	Cultivated and adventitious	T		S, D, M
Conyza canadensis(L.) Cronquist	*Asteraceae*	Cultivated and adventitious	T		S, D, M

Coronilla emerus L. ssp.*emeroides* Boiss.& Spruner	*Fabaceae*	Eastern Mediterranean	P		D
Coronilla varia L.	*Fabaceae*	European	H		S
Coronopus squamatus (Forskal) Ascherson	*Brassicaceae*	South European-Mediterranean	T		S
Crepis foetida L. ssp. *foetida*	*Cichoriaceae*	South European-Mediterranean	T		S
Crepis neglecta L.	*Cichoriaceae*	European-Mediterranean	T		S, D
Crepis rubra L.	*Cichoriaceae*	Eastern Mediterranean	T		S
Crepis vesicaria L.	*Cichoriaceae*	Circum-Mediterranean	T		S
Crithmum maritimum L.	*Apiaceae*	Mediterranean-Atlantic	Ch		S, D
Chrozophora tinctoria (L.) A. Juss.	*Euphorbiaceae*	Mediterranean-Pontic	T		S
Cupressus sempervirens L.	*Cupressaceae*	Eastern Mediterranean	P		S
Cuscuta australis R. Br.	*Cuscutaceae*	South European-Mediterranean	T		M
Cyclamen europaeum Sibth. & Sm.	*Primulaceae*	European-Mediterranean	G		D
Cymbalaria muralis P. Gaertn.	*Scrophulariaceae*	South European-Mediterranean	H		S, D
Cynodon dactylon (L.) Pers.	*Poaceae*	Widespread	G		S, D, M
Cyperus papyrus	*Cyperaceae*	Cultivated and adventitious	G	Tropical Africa	D
Cyperus rotundus L.	*Cyperaceae*	South European-Mediterranean	G		S, D
Dactylis glomerata L. ssp. *hispanica* (Roth) Nyman	*Poaceae*	Circum-Mediterranean	H		S, D
Datura inoxia Mill.	*Solanaceae*	Cultivated and adventitious	T	Central America	S
Datura stramonium L.	*Solanaceae*	Widespread	T	Tropical America	S, D, M
Daucus carota L. ssp. *carota*	*Apiaceae*	Illyrian-Adriatic endemic	H		S, D, M
Delphinium staphisagria L.	*Ranunculaceae*	Circum-Mediterranean	T		D
Desmazeria rigida (L.) Tutin	*Poaceae*	Mediterranean-Atlantic	T		S, D
Dianthus sylvestris Wulfen in Jacq. ssp. *tergestinus* (Reichenb.) Hayek	*Caryophyllaceae*	Illyrian-Adriatic endemic	H		D
Dichanthium ischaemum (L.) Roberty	*Poaceae*	South European-Mediterranean	H		D
Dichondra micrantha Urb.	*Convolvulaceae*	Cultivated and adventitious	G	East Asia	S, D
Digitaria ciliaris (Retz.) Koeler	*Poaceae*	Widespread	T	Tropical and subtropical	S, D, M
Digitaria sanguinalis (L.) Scop.	*Poaceae*	Widespread	T		S, D
Diplotaxis erucoides (L.) DC.	*Brassicaceae*	Western Mediterranean	T	Western Mediterranean	S, D
Diplotaxis muralis (L.) DC.	*Brassicaceae*	Widespread	T		S, D, M

Diplotaxis tenuifolia (L.) DC.	*Brassicaceae*	Widespread	H		S, D
Ditrichia graveolens (L.) Greuter	*Asteraceae*	South European-Mediterranean	T		S, M
Ditrichia viscosa (L.) Greuter	*Asteraceae*	South European-Mediterranean	H		S, D, M
Ecbalium elaterium (L.) A. Rich.	*Cucurbitaceae*	Widespread	Ch		S, D
Echinochloa crus-galli (L.) P. Beauv.	*Poaceae*	Widespread	T		S, D
Echium italicum L.	*Boraginaceae*	Widespread	H		S, D
Echium vulgare L.	*Boraginaceae*	European	H		S
Eleusine indica (L.) Gaertn.	*Poaceae*	Cultivated and adventitious	T	Southwest Asia	S, D, M
Elymus pungens (Pers.) Melderis	*Poaceae*	Circum-Mediterranean	G		D
Elymus pycnanthus (Godr.) Melderis	*Poaceae*	Circum-Mediterranean	G		S, D
Elymus repens (L.) Gould	*Poaceae*	Widespread	G		D
Epilobium hirsutum L.	*Onagraceae*	Eurasian	H		S
Epilobium tetragonum L. ssp. *tetragonum*	*Onagraceae*	European	H		S
Eragrostis cilianensis (All.) F.T. Hubb.	*Poaceae*	Widespread	T		S
Eragrostis minor Host	*Poaceae*	Circum-Mediterranean	T		S, D
Erigeron annuus (L.) Pers. ssp. *septentrionalis* (Fernald &Wiegand) Wagenitz	*Asteraceae*	Cultivated and adventitious	T	North America	S, M
Erodium ciconium (L.) L' Hér.	*Geraniaceae*	Mediterranean-Pontic	T		S
Erodium cicutarium (L.) L' Hér.	*Geraniaceae*	Widespread	T		S
Erodium malacoides (L.) L' Hér.	*Geraniaceae*	Circum-Mediterranean	T		S, D
Erophila verna (L.) Chevall. ssp. *praecox* (Steven) Walters	*Brassicaceae*	Circum-Mediterranean	T		S
Eryngium campestre L.	*Apiaceae*	South European-Mediterranean	H		S
Erysimum cheiri (L.) Crantz.	*Brassicaceae*	Cultivated and adventitious	Ch		S, D
Eupatorium canabinum L.	*Asteraceae*	Eurasian	H		D
Euphorbia chamaesyce L.	*Euphorbiaceae*	South European-Mediterranean	T		S, M
Euphorbia characias L. ssp. *wulfenii* (Hoppe ex Koch) A.M.Sm.	*Euphorbiaceae*	Illyrian-Adriatic endemic	Ch		D
Euphorbia helioscopia L.	*Euphorbiaceae*	Widespread	T		S, D
*Euphorbia maculata*L.	*Euphorbiaceae*	Cultivated and adventitious	T	North America	S, D
Euphorbia peplus L.	*Euphorbiaceae*	Widespread	T	Europa, Asia	S
Euphorbia pinea L.	*Euphorbiaceae*	Circum-Mediterranean	T		D

Euphorbia prostrata Aiton	*Euphorbiaceae*	Cultivated and adventitious	T	North America	S, D
Fallopia baldschuanica (Regel) Holub	*Polygonaceae*	Cultivated and adventitious	P	Asia, China	M
Fallopia convolvulus (L.) Á. Löve	*Polygonaceae*	Circum-Holarctic	T		S
Ferula communis L.	*Apiaceae*	South European-Mediterranean	H		D
Ficus carica L.	*Moraceae*	Circum-Mediterranean	P		S, D
Foeniculum vulgare Mill.	*Apiaceae*	Circum-Mediterranean	H		S, D, M
Fumaria parviflora Lam.	*Fumariaceae*	South European-Mediterranean	T		S
Fumaria vaillantii Loisel in Desv.	*Fumariaceae*	Eurasian	T		S
Galinsoga ciliata (Raf.) S. F. Blake	*Asteraceae*	Cultivated and adventitious	T	South America	S
Galinsoga parviflora Cav.	*Asteraceae*	Cultivated and adventitious	T	South America	S, M
Galium aparine L.	*Rubiaceae*	Widespread	T		S, D
Galium lucidum All.	*Rubiaceae*	South European-Mediterranean	H		S, D
Geranium molle L.	*Geraniaceae*	Widespread	T		S
Geranium purpureum Vill.	*Geraniaceae*	South European-Mediterranean	T		S
Geranium rotundifolium L.	*Geraniaceae*	South European-Mediterranean	T		S, D
Hedera helix L.	*Araliceae*	European	P		S, D, M
Helianthus tuberosus L.	*Asteraceae*	Cultivated and adventitious	G		S, D
Helichrysum italicum (Roth.) G.Don ssp. *italicum*	*Asteraceae*	South European-Mediterranean	Ch		S
Heliotropium europaeum L.	*Boraginaceae*	Mediterranean-Pontic	T		S, D, M
Herniaria hirsuta L.	*caryophyllaceae*	European	T		S
Herniaria incana Lam.	*Caryophyllaceae*	South European-Mediterranean	H		S
Hordeum bulbosum L.	*Poceae*	South European-Mediterranean	H		S
Hordeum murinum L. ssp. *leporinum* (Link) Arcang.	*Poaceae*	South European-Mediterranean	T		S, D
Hyoscyamus albus L.	*Solanacea*	Circum-Mediterranean	T		S, D
Hyparrhenia hirta (L.) Stapf.	*Poaceae*	Circum-Mediterranean	H		D
Hypericum perforatum L.	*Clusiaceae*	South European-Mediterranean	H		S, D
Iberis sempervirens L.	*Brassicaceae*	Cultivated and adventitious	Ch		S
Inula conyza DC.	*Asteraceae*	South European-Pontic	H		D, M
Inula crithmoides L.	*Asteraceae*	Mediterranean-Atlantic	Ch		D
Inula verbascifolia (Willd.) Hausskn.	*Asteraceae*	Illyrian-South European	H		S, D

Ipomoea purpurea Roth.	*Convolvulaceae*	Cultivated and adventitious	T	South America	S, D, M
Iris pseudopallida Trinajsti}	*Iridaceae*	Illyrian-Adriatic endemic	G		D
Kickxia commutata (Bernh. Ex Rchb.) Fritsch.	*Scrophulariaceae*	Eurasian	H		S
Knautia integrifolia (L.) Bertol.	*Dipsacaceae*	Circum-Mediterranean	T		S, D
Knautia purpurea (Vill.) Borbas	*Dipsacaceae*	Western Mediterranean	H		M
Koelreuteria paniculata Laxm.	*Sapindaceae*	Cultivated and adventitious	P		S
Lactuca quercina L.	*Cichoriaceae*	Cultivated and adventitious	H		M
Lactuca serriola L.	*Cichoriaceae*	Widespread	H		S, D
Lactuca viminea (L.) J.& C.Presl	*Cichoriaceae*	South European-Pontic	H		S, D
Lamium amplexicaule L.	*Lamiaceae*	Eurasian	T		S
Laurus nobilis L.	*Lauraceae*	Cultivated and adventitious	P		S, D
Lavatera arborea L.	*Malvaceae*	Euro-Mediterranean	H		S, D
Leontodon tuberosus L.	*Cichoriaceae*	Circum-Mediterranean	H		S
Lepidium graminifolium L.	*Brassicaceae*	South European-Pontic	H		S, D
Lepidium virginicum L.	*Brassicaceae*	Cultivated and adventitious	T		S, M
Linaria dalmatica (L.) Mill.	*Scrophulariaceae*	Circum-Mediterranean	H	North America	D
Linaria vulgaris Mill.	*Scrophulariaceae*	Eurasian floral	H		S, D, M
Linum strictum L.	*Linaceae*	Mediterranean-Pontic	T		S
Lolium perenne L.	*Poaceae*	European	H		S, D
Lotus corniculatus L.	*Fabaceae*	Widespread	H		S
Malva sylvestris L.	*Malvaceae*	Widespread	H		S, D, M
Marrubium vulgare L.	*Lamiaceae*	Illyrian-Apennine	H		M
Matricaria perforata Mérat	*Asteraceae*	Eurasian	T		S, D
Medicago arabica (L.) Hudson	*Fabaceae*	Widespread	T		S
Medicago lupulina L.	*Fabaceae*	Widespread	T		S
Medicago orbicularis (L.) Bartal	*Fabaceae*	Circum-Mediterranean	T		S, D
Medicago sativa L. ssp. *sativa*	*Fabaceae*	Widespread	T		S, D, M
Medicago sativa L. subsp. *falcata* (L.) Arcangeli	*Fabaceae*	European	T		M
Melia azedarach L.	*Meliaceae*	Cultivated and adventitious	P	East Asia	S, D, M
Melica ciliata L.	*Poaceae*	Eurasian	H		S, D, M

Melilotus albus Medik.	*Fabaceae*	Eurasian	T		S
Melilotus italicus (L.) Lam.	*Fabaceae*	South European-Mediterranean	T		S
Melissa officinalis L.	*Lamiaceae*	South European-Mediterranean	H		D, M
Mentha arvensis L.	*Lamiaceae*	Circum-Holarctic	H		M
Mentha longifolia (L.) Hudson	*Lamiaceae*	Widespread	H		S, D
Mercurialis annua L.	*Euphorbiaceae*	Widespread	T		S, D, M
Micromeria juliana (L.) Benth. ex Rchb.	*Lamiaceae*	Circum-Mediterranean	Ch		D
Mirabilis jalapa L.	*Nyctaginaceae*	Cultivated and adventitious	G	Tropical America	S, D
Misopates orontium (L.) Raf.	*Scrophulariaceae*	Eurasian floral elements	T		S, D
Morus alba L.	*Moraceae*	Cultivated and adventitious	P		S, D
Muscari comosum (L.) Mill.	*Liliaceae*	South European-Mediterranean	G		S
Nerium oleander L.	*Apocynaceae*	Cultivated and adventitious	P		S, D
Nicotiana glauca Graham	*Solanaceae*	Cultivated and adventitious	P	South America	S, D
Ononis spinosa L.	*Fabaceae*	Circum-Mediterranean	Ch		M
Onopordum illyricum L.	*Asteraceae*	Circum-Mediterranean	H		S
Opuntia vulgaris Miller	*Cactaceae*	Cultivated and adventitious	P	Tropical America	S, D
Origanum heracleoticum L.	*Lamiaceae*	Eastern Mediterranean	H		M
Origanum vulgare L.	*Lamiaceae*	Eurasian floral elements	H		M
Oxalis acetosella L.	*Oxalidaceae*	Plant Circum Holarctic distribution	H		M
Oxalis corniculata L.	*Oxalidaceae*	Cultivated and adventitious	G	South America	S, D
Oxalis urticulata Savigny	*Oxalidaceae*	Cultivated and adventitious	G	South America	S
Oxalis pes-caprae L.	*Oxalidaceae*	Cultivated and adventitious	G	South Africa	S
Oxalis stricta L.	*Oxalidaceae*	Cultivated and adventitious	H	North America	S, D, M
Pallenis spinosa (L.) Cass.	*Asteraceae*	Circum-Mediterranean	T		S, D
Panicum capillare L.	*Poaceae*	Cultivated and adventitious	T	North America	S
Panicum miliaceum L.	*Poaceae*	Cultivated and adventitious	T	Central and East Asia	S
Papaver rhoeas L.	*Papaveraceae*	Widespread	T		S
Parietaria judaica L.	*Urticaceae*	South European-Mediterranean	H		S, D
Parthenocissus tricuspidata(Siebold & Zucc.) Planchon		Cultivated and adventitious	P	North America	S, M

Paspalum dilatatum Poiret	*Poaceae*	Cultivated and adventitious	H	South America	S, D
Paspalum paspalodes (Michx) Scribner	*Poaceae*	Cultivated and adventitious	G	Tropical America	S, D, M
Passiflora coerulea L.	*Passifloraceae*	Cultivated and adventitious	P	South America	S, D
Paulownia tomentosa (Thunb.) Steud.	*Scrophulariaceae*	Cultivated and adventitious	P	East Asia	S, D
Petrorhagia prolifera (L.) P.W.Ball ex Heywood	*caryophyllaceae*	Eurasian floral elements	T		D
Petrorhagia saxifraga (L.) Link	*caryophyllaceae*	South European-Mediterranean	H		S, D, M
Peucedanum cerviaria (L.) Lapeyr.	*Apiaceae*	South European-Mediterranean	H		M
Phagnalon rupestre (L.) DC.	*Asteraceae*	Eastern Mediterranean	Ch		D
Phalaris canariensis L.	*Poceae*	Cultivated and adventitious	T	Western Mediterranean	S
Phaseolus vulgaris L.	*Fabaceae*	Cultivated and adventitious	T		M
Phlomis fruticosa L.	*Lamiaceae*	Circum-Mediterranean	H		D
Phoenix canariensis hort. ex Chabaud	*Arecaceae*	Cultivated and adventitious	P	Canary	S
Phragmites australis (Cav.) Trin. *ex* Steud.	*Poaceae*	Widespread	G		D, M
Phytolacca americana L.	*Phytolaccaceae*	Cultivated and adventitious	G	North America	S, D
Picris echioides L.	*Cichoriaceae*	Circum-Mediterranean	T		S, D, M
Picris hieracioides L.	*Cichoriaceae*	Eurasian	H		S, D, M
Pimpinella peregrina L.	*Apiaceae*	South European-Mediterranean	H		D
Pinus halepensis Miller	*Pinaceae*	Circum-Mediterranean	P		S
Pinus nigra Arnold	*Pinaceae*	South European-Mediterranean	P		S, D
Piptatherum miliaceum (L.) Cosson	*Poaceae*	Circum-Mediterranean	H		S, D, M
Pistacia terebinthus L.	*Anacardiaceae*	Circum-Mediterranean	P		D
Plantago lanceolata L.	*Plantaginaceae*	Widespread	H		S, D, M
Plantago major L.	*Plantaginaceae*	Widespread	H		S, D
Plantago media L.	*Plantaginaceae*	European	H		M
Platanus occidentalis L.	*Platanaceae*	Cultivated and adventitious	P		M
Plumbago europaea L.	*Plumbaginaceae*	Circum-Mediterranean	Ch		S, D
Poa annua L.	*Poaceae*	Widespread	T		S
Polycarpon tetraphyllum (L.) L.	*caryophyllaceae*	South European-Mediterranean	T		S
Polygonum aviculare L.	*Polygonaceae*	Widespread	T		S, D, M
Polygonum lapathifolium L.	*Polygonaceae*	Widespread	T		S, D

Polygonum persicaria L.	*Polygonaceae*	Widespread	T		S
Polypodium cambricum L.	*Polypodiaceae*	Eastern Mediterranean	H		S
Polypodium vulgare L.	*Polypodiaceae*	Circum-Holarctic	H		D
Polypogon monspeliensis (L.) Desf.	*Poaceae*	Widespread	T		S, D
Portulaca oleracea L.	*Portulacaceae*	Widespread	T		S, D
Potentilla reptans L.	*Rosaceae*	Widespread	H		S, D
Prunus cerasifera Ehrh.	*Rosaceae*	Cultivated and adventitious	P		S, M
Bituminaria bituminosa (L.) Stirton	*Fabaceae*	Circum-Mediterranean	H		S, D
Pulicaria dysenterica (L.) Bernh.	*Asteraceae*	South European-Mediterranean	H		S, D
Ranunculus muricatus L.	*Ranunculaceae*	Circum-Mediterranean	T		S
Raphanus raphanistrum L.	*Brassicaceae*	Cultivated and adventitious	T		S
Raphanus sativus L.	*Brassicaceae*	Cultivated and adventitious	T		S, D
Reichardia picroides (L.) Roth.	*Cichoriaceae*	Circum-Mediterranean	H		S, D, M
Reseda alba L.	*Resedaceae*	Circum-Mediterranean	H		S, D
Reseda lutea L.	*Resedaceae*	Widespread	H		S, D
Reseda phyteuma L.	*Resedaceae*	South European-Mediterranean	T		S, M
Rhagadiolus stellatus (L.) Gaertn.	*Cichoriaceae*	Circum-Mediterranean	T		S
Ricinus communis L.	*Euphorbiaceae*	Cultivated and adventitious	T	Paleotropical	S
Robinia pseudoacacia L.	*Fabaceae*	Cultivated and adventitious	P	North America	S, D
Rorippa sylvestris (L.) Besser	*Brassicaceae*	European	H		S
Rosa canina L.	*Rosaceae*	Widespread	P		D
Rubus caesius L.	*Rosaceae*	Eurasian	P		D
Rubus dalmaticus Tratt. *ex* Focke	*Rosaceae*	Illyrian-Apennine	P		S, D, M
Rubus ulmifolius Schott.	*Rosaceae*	Mediterranean-Atlantic	P		M
Rumex crispus L.	*Polygonaceae*	Widespread	H		D
Rumex pulcher L. subsp. *woodsii* (De Not.) Arcangeli	*Polygonaceae*	South European-Pontic	H		S, D, M
Salvia bertolonii Vis.	*Lamiaceae*	Illyrian-Adriatic endemic	H		S, D
Salvia officinalis L.	*Lamiaceae*	Euro-Mediterranean	Ch		D
Salvia pratensis L.	*Lamiaceae*	European floral elements	H		M
Sambucus nigra L.	*Caprifoliaceae*	Cultivated and adventitious	P		S, D

Sanguisorba minor Scop. ssp. *muricata* Briq.	*Rosaceae*	South European-Mediterranean	H		S
Saponaria officinalis L.	*Caryophyllaceae*	Cultivated and adventitious	H		S
Satureja montana L.	*Lamiaceae*	Mediterranean-Pontic	Ch		D
Saxifraga tridactylites L.	*Saxifragaceae*	Widespread	T		S, D
Scabiosa triandra L.	*Dipsacaceae*	South European-Mediterranean	H		S, D
Scandix pecten-veneris L.	*Apiaceae*	Widespread	T		S
Scila autumnalis L.	*Liliaceae*	Mediterranean-Pontic	G		D
Scolymus hispanicus L.	*Cichoriaceae*	Circum-Mediterranean	H		S, D
Scrophularia canina L. ssp. *bicolor* (Sibth. & Sm.) Greuter	*Scrophulariaceae*	South European-Mediterranean	H		S, D, M
Securigera securidaca (l.) Degen & Dörfl.	*Fabaceae*	Circum-Mediterranean	T		S
Sedum acre L.	*Crassulaceae*	Widespread	Ch		S
Sedum dasyphyllum L.	*Crassulaceae*	South European-Mediterranean	Ch		S, D
Sedum ochroleucum Chaix in Vill.	*Crassulaceae*	South European-Mediterranean	H		S, D
Sedum telephium L.	*Crassulaceae*	European floral elements	H		S
Sempervivum tectorum L.	*Crassulaceae*	Central European	Ch		S
Senecio bicolor (Villd) ssp. *cineraria* (DC.) Chater	*Asteraceae*	Cultivated and adventitious	Ch		S, D
Solidago canadensis L.	*Asteraceae*	Cultivated and adventitious	H		D
Senecio vulgaris L.	*Asteraceae*	Widespread	T		S, M
Seseli globiferum Vis.	*Apiaceae*	Circum-Mediterranean	H		D
Seseli montanum L.	*Apiaceae*	Illyrian-South European	H		D
Seseli tomentosum Vis.	*Apiaceae*	Illyrian-Adriatic endemic	H		D
Setaria italica (L.) P. Beauv.	*Poaceae*	Cultivated and adventitious	T	Central Asia	S
Setaria pumila (Poir.) Schult.	*Poaceae*	Widespread	T		S, D, M
Setaria verticilata (L.) P. Beauv.	*Poaceae*	Widespread	T		S, D
Setaria verticilliformis Dumort.	*Poaceae*	Widespread	T		S, D
Setaria viridis (L.) P. Beauv.	*Poaceae*	Eurasian	T		S, D
Sideritis romana L.	*Lamiaceae*	Circum-Mediterranean	T		D
Silene latifolia Poiret ssp. *alba* (Miller) Greuter & Burdet		South European-Mediterranean	H		S, D
Silene gallica L.	*Caryophyllaceae*	Widespread	T		S
Silene vulgaris (Moench) Garcke	*Caryophyllaceae*	South European-Mediterranean	H		S, D, M

Sinapis arvensis L.	*Brassicaceae*	Widespread	T		S, D
Sisymbrium officinale (L.) Scop.	*Brassicaceae*	Widespread	T		S
Sisymbrium polyceratium L.	*Brassicaceae*	Circum-Mediterranean	T		S
Smyrnium olustratum L.	*Apiaceae*	Mediterranean-Atlantic	H		D
Smyrnium perfoliatim L.	*Apiaceae*	Circum-Mediterranean	H		D
Solanum nigrum L. ssp. *nigrum*	*Solanaceae*	Widespread plant	T		S, D, M
Solanum tuberosum L.	*Solanaceae*	Cultivated and adventitious	T	North America	S, D
Solanum villosum Mill. ssp. *alatum* (Moench) Dostál	*Solanaceae*	Eurasian	T		S, D
Solidago gigantea Ait.	*Asteraceae*	Cultivated and adventitious	H	North America	S
Sonchus arvensis L.	*Cichoriaceae*	Eurasian	T		M
Sonchus asper (L.) Hil	*Cichoriaceae*	Circum-Mediterranean	T		M
Sonchus asper (L.) Hill. ssp. *glaucescens* (Jord.) Ball.	*Cichoriaceae*	Circum-Mediterranean	T		S, D
Sonchus oleraceus L.	*Cichoriaceae*	Widespread	T		S, D, M
Sorghum halepense (L.) Pers.	*Poaceae*	Widespread	G	North Africa, Southwest Asia	S, D, M
Spartium junceum L.	*Fabaceae*	Circum-Mediterranean	P		S, D
Spergularia media (L.) C.Presl.	*Caryophyllaceae*	Widespread	T		S, D
Stellaria media (L.) Vill.	*Caryophyllaceae*	Widespread	T		S, M
Tagetes minuta L.	*Asteraceae*	Cultivated and adventitious	T	South America	S, M
Tagetes patula L.	*Asteraceae*	Cultivated and adventitious	T	South America	S
Tanacetum vulgare L.	*Asteraceae*	European	H		S, D
Taraxacum laevigatum (Willd.) DC. agg.	*Cichoriaceae*	South European-Mediterranean	H		S
Taraxacum officinale Webber	*Cichoriaceae*	Widespread	H		S, D, M
Campsis radicans (L.) Seen.	*Bignoniaceae*	Cultivated and adventitious	P	North America/Pantropical	S, D
Teucrium flavum L.	*Lamiaceae*	Circum-Mediterranean	Ch		D
Thelygonum cynocrambe L.	*Theligonaceae*	South European-Mediterranean	T		D
Torilis nodosa (L.) Gaertn.	*Apiaceae*	Mediterranean-Atlantic	T		S
Tribulus terrestris L.	*Zygophyllaceae*	South European-Mediterranean	T		S, D
Trifolium campestre Schreber	*Fabaceae*	Widespread	T		S

Trifolium dalmaticum Vis.	*Fabaceae*	Illyrian-South European	T		S
Trifolium pratense L.	*Fabaceae*	Eurasian floral elements	H		M
Trifolium repens L.	*Fabaceae*	Circum-Mediterranean	H		S, D
Trigonella corniculata (L.) L.	*Fabaceae*	Circum-Mediterranean	T		S
Tussilago farfara L.	*Asteraceae*	European	G		S, D
Ulmus minor Miller	*Ulmaceae*	Widespread	P		D
Ulmus pinnato-ramosa Dieck	*Ulmaceae*	Cultivated and adventitious	P	Asia	S
Umbilicus horizontalis (Guss.) DC.	*Crassulaceae*	Circum-Mediterranean	Ch		S, D
Urospermum picroides (L.) Scop. *ex* F.W.Scmidt	*Cichoriaceae*	Circum-Mediterranean	T		S, D
Urtica membranacea Poiret	*Urticaceae*	South European-Mediterranean	H		S, D
Urtica urens L.	*Urticaceae*	Widespread	H		S
Valantia muralis L.	*Rubiaceae*	Circum-Mediterranean	T		D
Verbascum sinuatum L.	*Scrophulariaceae*	Circum-Mediterranean	H		S, D
Verbena officinalis L.	*Verbenaceae*	Widespread	H		S, D, M
Veronica arvensis L.	*Scrophulariaceae*	Eurasian	T		S
Veronica cymbalaria Bodard	*Scrophulariaceae*	South European-Mediterranean	T		S, D, M
Veronica persica Poir.	*Scrophulariaceae*	Widespread	T		S, D
Viburnum tinus L.	*Caprifoliaceae*	Circum-Mediterranean	P		M
Vicia cracca L.	*Fabaceae*	European	H		D
Vicia hibrida L.	*Fabaceae*	Circum-Mediterranean	T		S
Vicia sativa L.	*Fabaceae*	Widespread	T		S
Vinca major L.	*Apocynaceae*	Cultivated and adventitious	Ch		S, M
Viola odorata L.	*Violaceae*	Widespread	T		M
Vitis vinifera ssp. *sylvestris*	*Vitaceae*	Widespread	P		D
Xanthium spinosum L.	*Asteraceae*	Widespread	T		S, M
Xanthium strumarium L. ssp. *italicum* (Moretti) D.Löve	*Asteraceae*	Widespread	T		S, D