Vascular flora in public spaces of Santiago, Chile

Flora vascular en el espacio público de Santiago, Chile

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ABSTRACT

After an extensive two-year long research effort, the results document the diversity of vascular plants that grow in the public spaces of Santiago, Chile. We analyze the taxonomic composition, life-forms and phytogeographic origin of the vascular flora of Santiago and, finally, we compare the results with those of urban areas in the Northern Hemisphere. We identified 508 species, 100 families, and 338 genera. The families that showed the greatest richness were Asteraceae and Poaceae. We found that at least 85.1% of the species are exotic. The life-forms are similarly represented, although chamaephytes and geophytes are poorly represented. We conclude that the composition of the urban flora of Santiago differs from that of most Northern Hemisphere cities, due to the increased presence of exotic species, which is likely a consequence of the historical and cultural patterns of ornamentation. Therefore it is likely that this urban area would be an adverse environment for the establishment and development of native species.

Keywords: Central Chile, exotic plants, native plants, plant diversity, urban flora.

RESUMEN

Los resultados documentan la diversidad de plantas vasculares que se desarrollan en el espacio público de Santiago en una investigación que se prolongó por dos años. Nosotros analizamos la composición taxonómica, la forma de vida y el origen fitogeográfico de la flora vascular y, finalmente, comparamos los resultados con aquellos de áreas urbanas del Hemisferio Norte. Se reconocen 508 especies, 100 familias y 338 géneros. Las familias que tienen mayor riqueza fueron Asteraceae y Poaceae. El 85,1% de las especies son exóticas. Las formas de vida están similarmente representadas, aunque las caméfitas y las geófitas están muy poco representadas. Concluimos que la composición de la flora urbana de Santiago se distingue de la mayoría de las ciudades del Hemisferio Norte por el mayor número de especies exóticas, que es probablemente una consecuencia de los patrones históricos y culturales de ornamentación, al tiempo que los espacios urbanos parecen representar un ambiente adverso para el establecimiento y desarrollo de especies nativas.

Palabras clave: Chile central, plantas exóticas, plantas nativas, biodiversidad de plantas, flora urbana.

INTRODUCTION

Cities are biodiversity centers that contain native and exotic plants in variable proportions (Kowarik *et al*. 2013, Pyšek 1998). Due to the multiple ecosystem services provided by urban biodiversity, and particularly, plants (i.e. decontamination, aesthetic, recreational, native biotic, and soil conservation), there has been a recent increase in studies on urban flora (Kowarik 2011, Gong *et al*. 2013, Kowarik *et al*. 2013).

Most studies analyzing the diversity of urban flora have been carried out in cities in the Northern Hemisphere, particularly in Europe and the United States (Burton 1983, Klotz 1990, Godefroid 2001, McKinney 2002, 2006, Chocholoušková & Pysek 2003, Celesti-Grapow *et al*. 2006, Ricotta *et al*. 2009, Kowarik *et al*. 2013). These studies

indicate that most of the flora in these cities are native species, representing approximately 60 to 40% of species present (Ricotta *et al*. 2009). Native richness within these cities has favored comprehensive conservation strategies (Sukopp & Werner 1983, Pyšek 1998, Kühn *et al*. 2004, Celesti-Grapow *et al*. 2006, La Sorte & McKinney 2006).

Studies on the flora and vegetation of urban areas in South America and, particularly in Chile, have been rather scarce (Cursach *et al*. 2012). However, there have been a few studies undertake in Chilean cities on such topics as: vegetational cover studies (Reyes-Paecke & Meza 2011, De la Barrera *et al*. 2011), conservation of native flora and fauna species (Díaz & Armesto 2003, Romero *et al*. 2001, Pauchard *et al*. 2006), the importance of social and economic factors in determining the value of vegetational cover (Romero *et al*. 2007, Hernández *et al*. 2007, Escobedo *et al*. 2008), the effects of pollen on human health (Rojas *et al*. 1999, Ibañez *et al*. 2001), and on the role of vegetational patterns in territorial planning (Romero *et al*. 2007). However, as far as we know, there are only two studies on the diversity of urban plants: Hoffmann (1998) and Alvarado *et al*. (2013). Thus, a central question remains: which vascular plant species grow in the capital city of Chile, and what is the proportion of native flora compared to the total number of species?

Based on evidence available in the published literature, this study hypothesized that exotic species are dominant in vascular flora in the public spaces of Santiago, Chile. After an extensive two-year long research effort, the results document the diversity of vascular plants that grow in Santiago's public spaces. Specifically, we analyzed the taxonomic composition, Raunkiaer's life-form, and the phytogeographic origin of the plant species and, finally, we compare the results with those of urban areas in the Northern Hemisphere.

MATERIALS AND METHODS

Study site

The city of Santiago, the capital of Chile (33°27′00″ S 70°40′00″ W; 500 masl), has a mediterranean-type climate. It was founded by the Spaniards in 1541. Today it covers an area of approximately 15,400 km^2 and concentrates more than 6 million inhabitants (approximate density: 393 inhabitants/km^2)[1]. Thus, it is one of the most densely concentrated urban areas in Latin America.

Sampling

To evaluate the floristic composition we established 200 random sites in public spaces of 35 communes within the city of Santiago (Fig. 1). These sites were georeferenced and visited between August and December in 2012 and again in 2013. At each site we placed a transect (100 m in length by 1 - 3 m in width). For each species recognized we assigned the taxonomic category and phytogeographic origin according to Marticorena & Quezada (1985), Matthei (1995), and Zuloaga *et al.* (2009). Several specimens were only determined at the genus level, thus they were not included in the analisys.

Species origins were classified as either native flora present in Chile prior to Spanish colonization or exotic flora that arrived afterwards. The categories presented by Raunkiaer (1934), as modified by Govaerts *et al.* (2000), were used to assign the life-form of each plant species: phanerophytes (have stems that are woody and persistent, and buds that are normally exposed 3 m or more above ground level), Nanophanerophytes (have stems that are woody and persistent, and buds typically located between 0.5 m and 3 m above ground level), chamaephytes (have stems that are herbaceous or woody and persistent, and have buds that are located above soil level, but never by more than 0.5 m), hemicryptophytes (have herbaceous stems that often die-back during unfavourable seasons, and surviving buds placed on (or just below) soil level), terophytes (complete their entire life-cycle during the favourable season, and survive the unfavourable season as a seed), and geophytes (have stems that die back during unfavourable seasons, with the plant surviving as a bulb, rhizome, tuber or root bud).

The original distribution of the exotic flora collected in urban public space in Santiago, was determined consulting several sources (Tutin 1964-1983, Hoffmann 1998, Matthei 1995, Kuhn 2004). Thus, Euroasian origin includes Europa, near East and Mediterranean coast of Africa. American, African and Oceanian include original distribution from the respective continent. Asian origin includes species with distributional area on eastern Asia.

The collected specimens were deposited in the Laboratorio de Ecología y Biodiversidad Vegetal at the Universidad de Santiago de Chile.

RESULTS

At the 200 sites, we recognized 508 species, 100 families and 338 genera (Table I). Plants were determined at species level, and assigned to a taxonomic category as follows: Division Magnoliophyta (96.5% of the species) and Pinophyta (3.5% of the species). The four most diverse families within the urban flora of Santiago were as follows: Poaceae (54 species), Asteraceae (50 species), Fabaceae (36 species), and Rosaceae (31 species).

With respect to phytogeographic origin, 76 plant species were native to Chile (14.9% of the identified origins), whereas that 432 were exotic (85.1% of the identified origins). Within the exotic taxa the most common original distribution was Euroasian, representing 28.5% of the total (Table II), American (17.8%), Asian (16.0%), and African

[1]URL: http://www.ine.cl/canales/chile_estadistico/familias/demograficas_vitales.php Viewed: May 4, 2015.

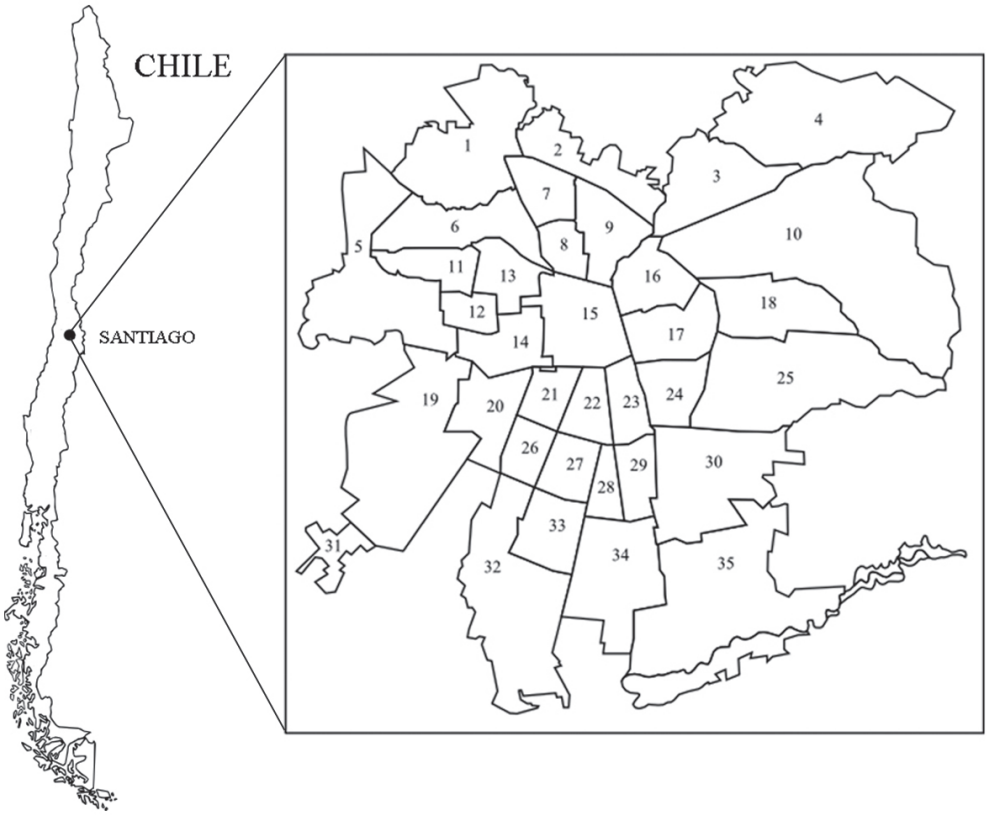

Figure 1. Location of the communes containing 200 study sites at Santiago, Chile. The communes of Santiago are showed. 1= Quilicura (4), 2= Huechuraba (3), 3= Vitacura (4), 4= Lo Barnechea (3), 5= Pudahuel (6), 6= Renca (6), 7= Conchalí (7), 8= Independencia (3), 9= Recoleta (7), 10= Las Condes (11), 11= Cerro Navia (4), 12= Lo Prado (4), 13= Quinta Normal (8), 14= Estación Central (7), 15= Santiago (9), 16= Providencia (8), 17= Ñuñoa (9), 18= La Reina (7), 19= Maipú (15), 20= Cerrillos (6), 21= Pedro Aguirre Cerda (5), 22= San Miguel (2), 23= San Joaquín (6), 24= Macul (4), 25= Peñalolén (8), 26= Lo Espejo (5), 27= La Cisterna (4), 28= San Ramón (3), 29= La Granja (5), 30= La Florida (7), 31= Padre Hurtado (1), 32= San Bernardo (4), 33= El Bosque (4), 34= La Pintana (5), 35= Puente Alto (6). Number of study sites sampled per commune are shown in parentheses.

Figura 1. Ubicación de las comunas que contienes los 200 sitios de estudio en Santiago de Chile. Las comunas de Santiago son señaladas. 1= Quilicura (4), 2= Huechuraba (3), 3= Vitacura (4), 4= Lo Barnechea (3), 5= Pudahuel (6), 6= Renca (6), 7= Conchalí (7), 8= Independencia (3), 9= Recoleta (7), 10= Las Condes (11), 11= Cerro Navia (4), 12= Lo Prado (4), 13= Quinta Normal (8), 14= Estación Central (7), 15= Santiago (9), 16= Providencia (8), 17= Ñuñoa (9), 18= La Reina (7), 19= Maipú (15), 20= Cerrillos (6), 21= Pedro Aguirre Cerda (5), 22= San Miguel (2), 23= San Joaquín (6), 24= Macul (4), 25= Peñalolén (8), 26= Lo Espejo (5), 27= La Cisterna (4), 28= San Ramón (3), 29= La Granja (5), 30= La Florida (7), 31= Padre Hurtado (1), 32= San Bernardo (4), 33= El Bosque (4), 34= La Pintana (5), 35= Puente Alto (6). En paréntesis se señala el número de sitios de estudio muestreados por comuna.

Table I. Number of families, genera, and species identified (N and %) by taxonomic division of the urban flora in public space of Santiago, Chile.

Tabla I. Número de familias, géneros y especies identificadas (N y %) por división taxonómica de la flora urbana en el espacio público de Santiago, Chile.

Division	Family	Genus	Species	%
Magnoliophyta	95	327	490	96.5
Pinophyta	5	11	18	3.5
TOTAL	100	338	508	100

(10.9%). Other distributional origins had representation < 10% (Table II); 11 exotic species were hybrids and considered with undetermined origin (Table II).

The most common life-forms was phanerophytes (137 species, Table III). Among these, 115 (83.9%) were exotic and 22 (16.1%) were native. Of particularly importance was the presence of endemic species such as: *Aextoxicon punctatum* Ruiz et Pav., *Beilschmiedia berteroana* (Gay) Kosterm., and *B. miersii* (Gay) Kosterm. The abundance of the following native phaneropytes was noteworthy: *Quillaja saponaria* Molina and *Senna candolleana* (Vogel) H.S. Irw. & Barneby. We identified 131 terophytes, 87.0% of which were exotic species (Table III). It is interesting that among the 17 native terophytes, the most common were the following:

Table II. Original distribution of the exotic flora collected in public space in Santiago, Chile.

Tabla II. Distribución de origen de la flora exótica colectada en espacios públicos de Santiago, Chile.

Original distribution	N	%
Eurasian	123	28.5
American	77	17.8
Asian	69	16.0
African	47	10.9
Mediterranean	42	9.7
European	32	7.4
Oceanian	18	4.2
African and Asian	8	1.9
North American	2	0.5
American and African	1	0.2
Eurasian and North American	1	0.2
Oceanian and Asian	1	0.2
Undetermined origin (hybrids)	11	2.5
TOTAL	432	100

Table III. Life form and origin of the exotic flora collected in public space in Santiago, Chile. Frequency (N) and percentage (%) for each life form are indicaded.

Tabla III. Forma de vida y origen de toda la flora urbana colectada en espacios públicos de Santiago, Chile. Se señala la frecuencia (N) y el porcentaje (%) para cada forma de vida.

Life form	Origin	N	%
Phanerophytes	Native	22	16.1
	Exotic	115	83.9
Nanophanerophytes	Native	15	14.9
	Exotic	86	85.1
Hemicryptophytes	Native	17	15.9
	Exotic	90	84.1
Terophytes	Native	17	13.0
	Exotic	114	87.0
Chamaephytes	Native	4	16.0
	Exotic	21	84.0
Geophytes	Native	1	14.3
	Exotic	6	85.7

Aristolochia chilensis Bridges ex Lindl., *Loasa triloba* Dombey ex Juss, and *Oxalis rosea* Jacq. Nanophanerophytes were represented by a sizable group of 101 species (Table III). Among these 86 species were exotic, and 15 native (e.g. *Colliguaja odorifera* Molina, *Escallonia illinita* C. Presl, *Fuchsia magellanica* Lam., and *Luma chequen* (Molina) A. Gray). Another important group consists of hemicryptophytes, among which 107 were exotic (84.1%) and 17 were native, including *Dysphania ambrosioides* (L.) Mosyakin & Clemants, *Festuca acanthophylla* E. Desv., and *Pasithea caerulea* (Ruiz. et Pav.) D. Don. We identified 21 exotic chamaephytes and 4 native chamaephytes, including *Carpobrotus chilensis* (Molina) N. E. Br.*, Fragaria chiloensis* (L.) Mill.*,* and *Sphaeralcea obtusiloba* G. Don. Finally, we identified 7 geophytes, of which 1 were native (Table III): *Oxalis arenaria* Bertero.

DISCUSSION

According to our results, the composition of the urban flora of Santiago differs from that of most Northern Hemisphere cities in terms of the greater representation of exotic species (Burton 1983, Klotz 1990, Godefroid 2001, McKinney 2002, 2006, Chocholouskova & Pyšek 2003, Celesti-Grapow *et al*. 2006, Ricotta *et al*. 2009, Kowarik *et al*. 2013). The scarce representation of native species in Santiago suggests that this urban area may be an adverse environment for the establishment and development of their individuals. It is noteworthy that some native plants, such as *Aextoxicon punctatum* Ruiz. et Pav., *Beilschmiedia* spp. and *Fuchsia magellanica* Lam., were planted for ornamental or urbanistic purposes and there is no evidence that they grow spontaneously. In fact, during the colonial period of Chilean history and the 19th century, Santiago was ornamented using exotic trees, following the model of European parks and gardens, and native species were scarcely used during 20th and 21st century (Serra *et al.* 2002, Hoffmann 1998, Alvarado *et al.* 2013).

This study shows that in Santiago's public spaces exotic plant species are more common than native species. In contrast, in diverse patches of vegetation in central Chile, the richness of exotic species is rarely greater than native ones (Teillier *et al*. 2010). The origins of the urban flora in Santiago are similar to that of plants found on the agricultural lands of central Chile, where exotic weeds represent about 80% of species (Figueroa *et al*. 2013). It is known that the successful establishment of exotic species is much more frequent in artificial habitats, and that they likely benefit from the high rate of anthropogenic disturbance and a large-scale removal of the natural habitat (Sukopp 2004, Figueroa *et al*. 2013, Gong *et al*. 2013).

Given these results, and due to the present social and cultural conditions, the idea of considering Santiago as a spot for the conservation of native species should be undertaken soon. In many cities there are organizations willing to allocate resources to conservation and education efforts (Figueroa *et al.* 2011). Thus, the role of both private and public agencies needs to be coordinated in order to empower organizations within civil society.

Green spaces can be opportunities for *ex-situ* conservation and environmental education, while at the same time collaborating for efficient use of water and reducing the atmospheric pollen load (Rojas *et al*. 1999).

On the other hand, the predominance of Eurasian species seen in Santiago is consistent with the flora present in rural areas as well as with the overall flora of central Chile (Teillier *et al*. 2010). This is most likely a consequence of the high historical availability of Eurasian plants in the country (Figueroa *et al*. 2004). It is worth noting that African and Oceanic species represented the 15.1% of the species pool in Santiago, far higher that the 3% of species they represent in natural habitats of central Chile (Teillier *et al*. 2010). Clearly, African and Oceanic species require to be monitored, since various weeds and invasive plants currently commons in central Chile were initially introduced in Santiago during 19th century and later they spread spontaneously to rest of the country (Matthei 1995). Although our study constitutes a random sampling of diversity only in public spaces, studies that include private spaces are required because these form an important contribution to urban diversity that is usually neglected (Smith *et al.* 2006).

This is the first floristic study that we knowing the literature that considers the non-woody species in public space of Santiago. Although in Santiago the non-woody (mainly hemicryptophytes and therophytes) cover is lower than woody cover, this study demonstrates that species richness is similar in both. While a large proportion of therophytes have spontaneously established themselves in the diverse artificial habitats available in the city, phanerophytes, on the other hand were cultivated in the city and they need to be managed by municipal agencies. Nevertheless, the source of therophytes is diverse although we were not able to accurately determine, and their impact on urban activities within Santiago has not yet been evaluated.

Nowadays there is an agreement that cities are not internally homogeneous structures, they are typically characterized by a wide ranging spatial and temporal heterogeneity caused by cultural, socio – economic and environmental patterns particular to each town (Gilbert 1989, Kowarik 1995, Kinzig & Grove 2001, Pickett *et al*. 2001, Barbosa *et al*. 2007, Sánchez & Bonilla 2007, Marco *et al*. 2010). There is a growing need of more research in order to determine the causes that are responsible for the current patterns of diversity in species composition and abundance of the urban flora of Santiago.

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Annex 1. Urban flora collected in the public space of Santiago, Chile[1].

Anexo 1. Flora urbana recolectada en los espacios públicos de Santiago, Chile[1].

Species	Family	Life form	Native distribution	Origin status
Acanthus mollis L.	Acanthaceae	Hemicryptophyte	Mediterranean	Exotic
Sambucus nigra L.	Adoxaceae	Nanophanerophyte	Eurasian	Exotic
Viburnum rotundifolium Raf.	Adoxaceae	Nanophanerophyte	Asian	Exotic
Viburnum tinus L.	Adoxaceae	Nanophanerophyte	Mediterranean	Exotic
Viburnum lucidum Mill.	Adoxaceae	Nanophanerophyte	Mediterranean	Exotic
Aextoxicon punctatum Ruiz & Pav.	Aextoxicaceae	Phanerophyte	South American	Native
Mesembryanthemum cordifolium L.f.	Aizoaceae	Hemicryptophyte	African	Exotic
Carpobrotus chilensis (Molina) N.E. Br.	Aizoaceae	Chamaephyte	South American	Native
Drosanthemum hispidum (L.) Schwantes	Aizoaceae	Chamaephyte	African	Exotic
Liquidambar styraciflua L.	Altingiaceae	Phanerophyte	American	Exotic
Amaranthus deflexus L.	Amaranthaceae	Chamaephyte	American	Exotic
Beta vulgaris L.	Amaranthaceae	Terophyte	Mediterranean	Exotic
Chenopodium album L.	Amaranthaceae	Terophyte	Eurasian	Exotic

Species	Family	Life form	Native distribution	Origin status
Chenopodium hircinum Schrad.	Amaranthaceae	Terophyte	American	Exotic
Chenopodium murale L.	Amaranthaceae	Terophyte	Eurasian	Exotic
Chenopodium vulvaria L.	Amaranthaceae	Terophyte	Eurasian	Exotic
Dysphania ambrosioides (L.) Mosyakin & Clemants	Amaranthaceae	Hemicryptophyte	South American	Native
Agapanthus africanus (L.) Hoffmanns.	Amaryllidaceae	Geophyte	African	Exotic
Allium neapolitanum Cirillo	Amaryllidaceae	Geophyte	Eurasian	Exotic
Nothoscordum bivalve (Sims) P. Beauv.	Amaryllidaceae	Geophyte	American	Exotic
Nothoscordum gracile (Aiton) Stearn	Amaryllidaceae	Geophyte	African	Exotic
Lithrea caustica (Molina) Hook. & Arn.	Anacardiaceae	Phanerophyte	South American	Native
Rhus crenata Thunb.	Anacardiaceae	Nanophanerophyte	African	Exotic
Schinus latifolius (Gillies ex Lindl.) Engl.	Anacardiaceae	Phanerophyte	South American	Native
Schinus molle L.	Anacardiaceae	Phanerophyte	South American	Native
Schinus polygama (Cav.) Cabrera	Anacardiaceae	Phanerophyte	South American	Native
Ammi visnaga (L.) Lam.	Apiaceae	Terophyte	Mediterranean	Exotic
Anthriscus caucalis M.Bieb.	Apiaceae	Terophyte	Mediterranean	Exotic
Bowlesia incana Ruiz & Pav.	Apiaceae	Terophyte	South American	Native
Conium maculatum L.	Apiaceae	Terophyte	Eurasian	Exotic
Coriandrum sativum L.	Apiaceae	Terophyte	Eurasian	Exotic
Cyclospermum leptophyllum (Pers.) Sprague	Apiaceae	Terophyte	South American	Native
Daucus carota L.	Apiaceae	Terophyte	Asian	Exotic
Eryngium paniculatum Cav. & Dombey ex. F.Delaroche	Apiaceae	Chamaephyte	South American	Native
Foeniculum vulgare Mill.	Apiaceae	Hemicryptophyte	Eurasian	Exotic
Nerium oleander L.	Apocynaceae	Nanophanerophyte	Eurasian	Exotic
Thrachelospermum jasminoides (Lindl.) Lem.	Apocynaceae	Nanophanerophyte	Asian	Exotic
Vinca major L.	Apocynaceae	Hemicryptophyte	Mediterranean	Exotic
Vinca minor L.	Apocynaceae	Hemicryptophyte	European	Exotic
Monstera deliciosa Liebm.	Araceae	Hemicryptophyte	American	Exotic
Philodendron bipinnatifidum Schott ex Endl.	Araceae	Nanophanerophyte	American	Exotic
Syngonium podophyllum Schott	Araceae	Chamaephyte	American	Exotic
Zantedeschia aethiopica (L.) Spreng.	Araceae	Hemicryptophyte	African	Exotic
× *Fatshedera lizei* (Cochet) Guillaumin	Araliaceae	Nanophanerophyte	Artificial hybrid	Exotic
Fatsia japonica (Thunb.) Decne. & Planch.	Araliaceae	Nanophanerophyte	Asian	Exotic
Hedera canariensis Willd.	Araliaceae	Nanophanerophyte	African	Exotic
Hedera colchica (K.Koch) K.Koch	Araliaceae	Nanophanerophyte	Eurasian	Exotic
Hedera helix L.	Araliaceae	Nanophanerophyte	Eurasian	Exotic
Schefflera arboricola (Hayata) Merr.	Araliaceae	Nanophanerophyte	Asian	Exotic
*Araucaria angustifolia (*Bertol.) Kuntze	Araucariaceae	Phanerophyte	American	Exotic
Araucaria araucana (Molina) K. Koch	Araucariaceae	Phanerophyte	South American	Native
Araucaria bidwillii Hook.	Araucariaceae	Phanerophyte	Oceanian	Exotic
Araucaria heterophylla (Salisb.) Franco	Araucariaceae	Phanerophyte	Oceanian	Exotic

Species	Family	Life form	Native distribution	Origin status
Phoenix canariensis Chabaud	Arecaceae	Phanerophyte	African	Exotic
Syagrus romanzoffiana (Cham.) Glassman	Arecaceae	Phanerophyte	American	Exotic
Trachycarpus fortunei (Hook.) H.Wendl.	Arecaceae	Phanerophyte	Asian	Exotic
Washingtonia filifera (Linden ex André) H.Wendl. ex de Bary	Arecaceae	Phanerophyte	American	Exotic
Aristolochia chilensis Bridges ex Lindl.	Aristolochiaceae	Terophyte	South American	Native
Agave americana L.	Asparagaceae	Hemicryptophyte	American	Exotic
Asparagus densiflorus (Kunth) Jessop	Asparagaceae	Hemicryptophyte	African	Exotic
Asparagus setaceus (Kunth) Jessop	Asparagaceae	Hemicryptophyte	African	Exotic
Chlorophytum comosum (Thunb.) Jacques	Asparagaceae	Chamaephyte	African	Exotic
Cordyline australis (G.Forst.) Endl.	Asparagaceae	Phanerophyte	Oceanian	Exotic
Ruscus aculeatus L.	Asparagaceae	Hemicryptophyte	Mediterranean	Exotic
Ruscus hypoglossum L.	Asparagaceae	Hemicryptophyte	Eurasian	Exotic
Achillea millefolium L.	Asteraceae	Hemicryptophyte	European	Exotic
Anthemis cotula L.	Asteraceae	Terophyte	Mediterranean	Exotic
Arctotheca calendula (L.) Levyns	Asteraceae	Hemicryptophyte	African	Exotic
Argyranthemum frutescens (L.) Sch. Bip.	Asteraceae	Nanophanerophyte	African	Exotic
Baccharis linearis (Ruiz & Pav.) Pers.	Asteraceae	Nanophanerophyte	South American	Native
Bellis perennis L.	Asteraceae	Hemicryptophyte	Eurasian	Exotic
Bidens aurea (Aiton) Sherff	Asteraceae	Hemicryptophyte	American	Exotic
Calendula officinalis L.	Asteraceae	Terophyte	Mediterranean	Exotic
Callistephus × *sinensis* Bergmans	Asteraceae	Hemicryptophyte	Asian	Exotic
Carduus pycnocephalus L.	Asteraceae	Terophyte	Eurasian	Exotic
Centaurea melitensis L.	Asteraceae	Terophyte	Mediterranean	Exotic
Centaurea solstitialis L.	Asteraceae	Terophyte	Eurasian	Exotic
Cichorium intybus L.	Asteraceae	Hemicryptophyte	Eurasian	Exotic
Cirsium vulgare (Savi) Ten.	Asteraceae	Hemicryptophyte	Eurasian	Exotic
Cotula australis (Sieber ex Spreng.) Hook. f.	Asteraceae	Terophyte	African	Exotic
Cotula coronopifolia L.	Asteraceae	Terophyte	African	Exotic
Cynara cardunculus L.	Asteraceae	Hemicryptophyte	Mediterranean	Exotic
Erigeron bonariensis L.	Asteraceae	Hemicryptophyte	American	Exotic
Erigeron karwinskianus DC.	Asteraceae	Hemicryptophyte	American	Exotic
Erigeron floribundus (Kunth) Sch. Bip.	Asteraceae	Terophyte	South American	Native
Euryops chrysanthemoides (DC.) B. Nord.	Asteraceae	Nanophanerophyte	African	Exotic
Euryops pectinatus (L.) Cass.	Asteraceae	Nanophanerophyte	African	Exotic
Felicia amelloides (L.) Voss	Asteraceae	Chamaephyte	African	Exotic
Galinsoga parviflora Cav.	Asteraceae	Terophyte	American	Exotic
Gazania rigens (L.) Gaertn.	Asteraceae	Hemicryptophyte	African	Exotic
Glebionis coronaria (L.) Cass. ex Spach	Asteraceae	Terophyte	Eurasian	Exotic
Helianthus annuus L.	Asteraceae	Terophyte	American	Exotic
Helianthus tuberosus L.	Asteraceae	Hemicryptophyte	American	Exotic
Helminthotheca echioides (L.) Holub	Asteraceae	Terophyte	Eurasian	Exotic

Species	Family	Life form	Native distribution	Origin status
Hypochaeris radicata L.	Asteraceae	Hemicryptophyte	Eurasian	Exotic
Jacobaea maritima (L.) Pelser & Meijden	Asteraceae	Nanophanerophyte	African	Exotic
Lactuca serriola L.	Asteraceae	Terophyte	Eurasian	Exotic
Lactuca sativa L.	Asteraceae	Terophyte	Eurasian	Exotic
Lactuca virosa L.	Asteraceae	Terophyte	Mediterranean	Exotic
Matricaria chamomilla L.	Asteraceae	Terophyte	Eurasian	Exotic
Matricaria matricarioides (Less.) Porter ex Britton	Asteraceae	Terophyte	Eurasian and North American	Exotic
Osteospermum ecklonis (DC.) Norl.	Asteraceae	Hemicryptophyte	African	Exotic
Osteospermum fruticosum (L.) Norl.	Asteraceae	Hemicryptophyte	African	Exotic
Petasites fragans (Vill) C. Presl	Asteraceae	Hemicryptophyte	Eurasian	Exotic
Santolina chamaecyparissus L.	Asteraceae	Nanophanerophyte	European	Exotic
Senecio angulatus L.*f.*	Asteraceae	Nanophanerophyte	African	Exotic
Senecio vulgaris L.	Asteraceae	Terophyte	Eurasian	Exotic
Silybum marianum (L.) Gaertn.	Asteraceae	Terophyte	Eurasian	Exotic
Soliva sessilis Ruiz & Pav.	Asteraceae	Terophyte	South American	Native
Sonchus asper (L.) Hill	Asteraceae	Terophyte	Eurasian	Exotic
Sonchus oleraceus (L.) L.	Asteraceae	Terophyte	Eurasian	Exotic
Sonchus tenerrimus L.	Asteraceae	Terophyte	Eurasian	Exotic
Tanacetum parthenium (L.) Sch. Bip.	Asteraceae	Hemicryptophyte	Eurasian	Exotic
Taraxacum campylodes G. E. Haglund	Asteraceae	Hemicryptophyte	Eurasian	Exotic
Tessaria absinthioides (Hook. & Arn.) DC.	Asteraceae	Nanophanerophyte	South American	Native
Berberis aquifolium Pursh	Berberidaceae	Nanophanerophyte	American	Exotic
Berberis darwinii Hook.	Berberidaceae	Nanophanerophyte	South American	Native
Berberis thunbergii DC.	Berberidaceae	Nanophanerophyte	Asian	Exotic
Nandina domestica Thunb.	Berberidaceae	Nanophanerophyte	Asian	Exotic
Betula pendula Roth	Betulaceae	Phanerophyte	Eurasian	Exotic
Catalpa bignonioides Walter	Bignoniaceae	Phanerophyte	American	Exotic
Jacaranda mimosifolia D. Don	Bignoniaceae	Phanerophyte	American	Exotic
Amsinckia calycina (Moris) Chater	Boraginaceae	Terophyte	South American	Native
Brassica napus L.	Brassicaceae	Terophyte	European	Exotic
Brassica nigra (L.) K.Koch	Brassicaceae	Terophyte	Eurasian	Exotic
Brassica rapa L.	Brassicaceae	Terophyte	Mediterranean	Exotic
Capsella bursa-pastoris (L.) Medik.	Brassicaceae	Terophyte	Mediterranean	Exotic
Cardamine hirsuta L.	Brassicaceae	Terophyte	European	Exotic
Hirschfeldia incana (L.) Lagr.-Fossat	Brassicaceae	Terophyte	Eurasian	Exotic
Lepidium didymum L.	Brassicaceae	Terophyte	American	Exotic
Lepidium draba L.	Brassicaceae	Terophyte	African	Exotic
Lepidium strictum (S. Watson) Rattan	Brassicaceae	Terophyte	American	Exotic
Lobularia maritima (L.) Desv.	Brassicaceae	Hemicryptophyte	Mediterranean	Exotic
Raphanus raphanistrum L	Brassicaceae	Terophyte	Mediterranean	Exotic
Rapistrum rugosum (L.) All.	Brassicaceae	Terophyte	Eurasian	Exotic
Sisymbrium irio L.	Brassicaceae	Terophyte	Eurasian	Exotic
Sisymbrium officinale (L.) Scop.	Brassicaceae	Terophyte	Eurasian	Exotic

Species	Family	Life form	Native distribution	Origin status
Sisymbrium orientale L.	Brassicaceae	Terophyte	Eurasian	Exotic
Buxus sempervirens L.	Buxaceae	Chamaephyte	Eurasian	Exotic
Austrocylindropuntia subulata (Muehlenpf.) Backeb.	Cactaceae	Chamaephyte	American	Exotic
Echinopsis pachanoi (Britton & Rose) Friedrich & G.D. Rowley	Cactaceae	Nanophanerophyte	American	Exotic
Opuntia ficus-indica (L.) Mill.	Cactaceae	Nanophanerophyte	American	Exotic
Cannabis sativa L.	Cannabaceae	Terophyte	Asian	Exotic
Celtis australis L.	Cannabaceae	Phanerophyte	Mediterranean	Exotic
Canna indica L.	Cannaceae	Hemicryptophyte	American	Exotic
Abelia floribunda (M. Martens & Galeotti) Decne.	Caprifoliaceae	Phanerophyte	American	Exotic
Abelia triflora R.Br. ex Wall.	Caprifoliaceae	Nanophanerophyte	Asian	Exotic
Centranthus ruber (L.) DC.	Caprifoliaceae	Hemicryptophyte	Eurasian	Exotic
Cerastium glomeratum Thuill.	Caryophyllaceae	Terophyte	Eurasian	Exotic
Dianthus caryophyllus L.	Caryophyllaceae	Hemicryptophyte	Mediterranean	Exotic
Polycarpon tetraphyllum (L.) L.	Caryophyllaceae	Terophyte	Eurasian	Exotic
Sagina apetala Ard.	Caryophyllaceae	Terophyte	Eurasian	Exotic
Spergularia media (L.) C.Presl	Caryophyllaceae	Terophyte	Eurasian	Exotic
Spergularia rubra (L.) J. Presl & C. Presl	Caryophyllaceae	Terophyte	Eurasian	Exotic
Stellaria media (L.) Vill.	Caryophyllaceae	Terophyte	Eurasian	Exotic
Casuarina cunninghamiana Miq.	Casuarinaceae	Phanerophyte	Oceanian and Asian	Exotic
Euonymus japonicus Thunb.	Celastraceae	Nanophanerophyte	Asian	Exotic
Maytenus boaria Molina	Celastraceae	Phanerophyte	South American	Native
Tradescantia × *andersoniana* W. Ludw. & Rohweder	Commelinaceae	Chamaephyte	Artificial hybrid	Exotic
Convolvulus arvensis L.	Convolvulaceae	Hemicryptophyte	Eurasian	Exotic
Dichondra sericea Sw.	Convolvulaceae	Hemicryptophyte	South American	Native
Crassula arborescens (Mill.) Willd.	Crassulaceae	Nanophanerophyte	African	Exotic
Crassula ovata (Mill.) Druce	Crassulaceae	Nanophanerophyte	African	Exotic
Cedrus deodara (Roxb. ex D. Don) G. Don	Cupressaceae	Phanerophyte	Asian	Exotic
Cedrus libanii A.Rich.	Cupressaceae	Phanerophyte	Asian	Exotic
Cupressus funebris Endl.	Cupressaceae	Phanerophyte	Asian	Exotic
Cupressus macrocarpa Hartw.	Cupressaceae	Phanerophyte	American	Exotic
Cupressus sempervirens L.	Cupressaceae	Phanerophyte	Mediterranean	Exotic
Platycladus orientalis (L.) Franco	Cupressaceae	Phanerophyte	Asian	Exotic
Sequoia sempervirens (D.Don) Endl.	Cupressaceae	Phanerophyte	American	Exotic
Taxodium distichum (L.) Rich.	Cupressaceae	Phanerophyte	American	Exotic
Cyperus alternifolius L.	Cyperaceae	Hemicryptophyte	African	Exotic
Cyperus eragrostis Lam.	Cyperaceae	Hemicryptophyte	South American	Native
Cyperus papyrus L.	Cyperaceae	Hemicryptophyte	African	Exotic
Elaeagnus angustifolia L.	Elaeagnaceae	Phanerophyte	Asian	Exotic
Aristotelia chilensis (Molina) Stuntz	Elaeocarpaceae	Phanerophyte	South American	Native
Crinodendron patagua Molina	Elaeocarpaceae	Phanerophyte	South American	Native
Arbutus unedo L.	Ericaceae	Phanerophyte	Mediterranean	Exotic

Species	Family	Life form	Native distribution	Origin status
Escallonia rubra (Ruiz & Pav.) Pers.	Escalloniaceae	Nanophanerophyte	South American	Native
Colliguaja odorifera Molina	Euphorbiaceae	Nanophanerophyte	South American	Native
Euphorbia helioscopia L.	Euphorbiaceae	Terophyte	Eurasian	Exotic
Euphorbia lathyris L.	Euphorbiaceae	Terophyte	Asian	Exotic
Euphorbia peplus L.	Euphorbiaceae	Terophyte	Eurasian	Exotic
Euphorbia pulcherrima Willd. ex Klotzsch	Euphorbiaceae	Nanophanerophyte	American	Exotic
Euphorbia serpens Kunth	Euphorbiaceae	Terophyte	South American	Native
Ricinus communis L.	Euphorbiaceae	Nanophanerophyte	African	Exotic
Acacia caven (Molina) Molina	Fabaceae	Phanerophyte	South American	Native
Acacia dealbata Link	Fabaceae	Phanerophyte	Oceanian	Exotic
Acacia karroo Hayne	Fabaceae	Phanerophyte	African	Exotic
Acacia melanoxylon R. Br.	Fabaceae	Phanerophyte	Oceanian	Exotic
Acacia saligna (Labill.) Wendl.	Fabaceae	Phanerophyte	Oceanian	Exotic
Acacia visco Griseb.	Fabaceae	Phanerophyte	American	Exotic
Albizia julibrissin Durazz.	Fabaceae	Phanerophyte	Asian	Exotic
Bauhinia forficata Link	Fabaceae	Phanerophyte	American	Exotic
Caesalpinia gilliesii (Wall. ex Hook.) D. Dietr.	Fabaceae	Nanophanerophyte	American	Exotic
Caesalpinia spinosa (Molina) Kuntze	Fabaceae	Phanerophyte	South American	Native
Cercis siliquastrum L.	Fabaceae	Phanerophyte	Eurasian	Exotic
Erythrina crista-galli L.	Fabaceae	Phanerophyte	American	Exotic
Erythrina falcata Benth.	Fabaceae	Phanerophyte	American	Exotic
Galega officinalis L.	Fabaceae	Hemicryptophyte	Eurasian	Exotic
Genista monspessulana (L.) L.A.S. Johnson	Fabaceae	Nanophanerophyte	Mediterranean	Exotic
Gleditsia triacanthos L.	Fabaceae	Phanerophyte	American	Exotic
Lotus tenuis Waldst. & Kit.	Fabaceae	Terophyte	American	Exotic
Lupinus polyphyllus Lindl.	Fabaceae	Hemicryptophyte	American	Exotic
Medicago lupulina L.	Fabaceae	Terophyte	Eurasian	Exotic
Medicago polymorpha L.	Fabaceae	Terophyte	Eurasian	Exotic
Medicago sativa L.	Fabaceae	Chamaephyte	Eurasian	Exotic
Melilotus albus Medik.	Fabaceae	Terophyte	European	Exotic
Melilotus indicus (L.) All.	Fabaceae	Terophyte	Eurasian	Exotic
Parkinsonia aculeata L.	Fabaceae	Phanerophyte	American	Exotic
Prosopis chilensis (Molina) Stuntz	Fabaceae	Phanerophyte	South American	Native
Robinia hispida L.	Fabaceae	Phanerophyte	American	Exotic
Robinia pseudoacacia L.	Fabaceae	Phanerophyte	American	Exotic
Senna candolleana (Vogel) H.S.Irwin & Barneby	Fabaceae	Phanerophyte	South American	Native
Sophora cassioides (Phil.) Sparre	Fabaceae	Phanerophyte	South American	Native
Sophora macrocarpa Sm.	Fabaceae	Nanophanerophyte	South American	Native
Spartium junceum L.	Fabaceae	Nanophanerophyte	Mediterranean	Exotic
Styphnolobium japonicum (L.) Schott	Fabaceae	Phanerophyte	Asian	Exotic
Trifolium fragiferum L.	Fabaceae	Hemicryptophyte	Eurasian	Exotic
Trifolium repens L.	Fabaceae	Hemicryptophyte	Eurasian	Exotic

Species	Family	Life form	Native distribution	Origin status
Vicia sativa L.	Fabaceae	Terophyte	Eurasian	Exotic
Wisteria sinensis (Sims) Sweet	Fabaceae	Nanophanerophyte	Asian	Exotic
Castanea sativa Mill.	Fagaceae	Phanerophyte	European	Exotic
Quercus ilex L.	Fagaceae	Phanerophyte	Eurasian	Exotic
Quercus nigra L.	Fagaceae	Phanerophyte	American	Exotic
Quercus robur L.	Fagaceae	Phanerophyte	Eurasian	Exotic
Quercus suber L.	Fagaceae	Phanerophyte	Mediterranean	Exotic
Erodium botrys (Cav.) Bertol.	Geraniaceae	Terophyte	European	Exotic
Erodium cicutarium (L.) L'Hér.	Geraniaceae	Terophyte	Eurasian	Exotic
Erodium malacoides (L.) L'Hér.	Geraniaceae	Terophyte	Eurasian	Exotic
Erodium moschatum (L.) L'Hér.	Geraniaceae	Terophyte	Eurasian	Exotic
Geranium dissectum L.	Geraniaceae	Terophyte	European	Exotic
Geranium robertianum L.	Geraniaceae	Terophyte	Eurasian	Exotic
Pelargonium graveolens L'Hér.	Geraniaceae	Nanophanerophyte	African	Exotic
Pelargonium × *hortorum* L.H. Bailey	Geraniaceae	Chamaephyte	Artificial hybrid	Exotic
Pelargonium zonale (L.) L'Hér. ex Aiton	Geraniaceae	Chamaephyte	African	Exotic
Ginkgo biloba L.	Ginkgoaceae	Phanerophyte	Asian	Exotic
Hydrangea macrophylla (Thunb.) Ser.	Hydrangeaceae	Chamaephyte	Asian	Exotic
Philadelphus coronarius L.	Hydrangeaceae	Nanophanerophyte	European	Exotic
Hypericum calycinum L.	Hypericaceae	Chamaephyte	Eurasian	Exotic
Hypericum perforatum L.	Hypericaceae	Chamaephyte	Eurasian	Exotic
Chasmanthe aethiopica (L.) N.E.Br.	Iridaceae	Hemicryptophyte	African	Exotic
Crocosmia × *crocosmiiflora* (Lemoine) N.E. Br.	Iridaceae	Hemicryptophyte	Artificial hybrid	Exotic
Iris orientalis Mill.	Iridaceae	Hemicryptophyte	Mediterranean	Exotic
Iris × *germanica* L.	Iridaceae	Hemicryptophyte	Artificial hybrid	Exotic
Sisyrinchium striatum Dm.	Iridaceae	Hemicryptophyte	South American	Native
Juglans regia L.	Juglandaceae	Phanerophyte	Eurasian	Exotic
Ajuga reptans L.	Lamiaceae	Hemicryptophyte	European	Exotic
Lamium amplexicaule L.	Lamiaceae	Terophyte	Eurasian	Exotic
Lamium galeobdolon (L.) L.	Lamiaceae	Terophyte	Eurasian	Exotic
Lavandula angustifolia Mill.	Lamiaceae	Nanophanerophyte	European	Exotic
Marrubium vulgare L.	Lamiaceae	Hemicryptophyte	Eurasian	Exotic
Mentha × *piperita* L.	Lamiaceae	Hemicryptophyte	European	Exotic
Mentha pulegium L.	Lamiaceae	Hemicryptophyte	Eurasian	Exotic
Origanum majorana L.	Lamiaceae	Hemicryptophyte	Asian	Exotic
Rosmarinus officinalis L.	Lamiaceae	Nanophanerophyte	Mediterranean	Exotic
Salvia leucantha Cav.	Lamiaceae	Nanophanerophyte	American	Exotic
Salvia microphylla Kunth	Lamiaceae	Nanophanerophyte	African	Exotic
Salvia officinalis L.	Lamiaceae	Nanophanerophyte	Mediterranean	Exotic
Stachys palaestina L.	Lamiaceae	Chamaephyte	African and Asian	Exotic
Teucrium fruticans L.	Lamiaceae	Nanophanerophyte	African and Asian	Exotic
Beilschmiedia berteroana (Gay) Kosterm.	Lauraceae	Phanerophyte	South American	Native
Beilschmiedia miersii (Gay) Kosterm.	Lauraceae	Phanerophyte	South American	Native
Cryptocarya alba (Molina) Looser	Lauraceae	Phanerophyte	South American	Native

Species	Family	Life form	Native distribution	Origin status
Laurus nobilis L.	Lauraceae	Phanerophyte	Mediterranean	Exotic
Persea americana Mill.	Lauraceae	Phanerophyte	American	Exotic
Loasa triloba Dombey ex Juss.	Loasaceae	Terophyte	South American	Native
Tristerix corymbosus (L.) Kuijt	Loranthaceae	Phanerophyte	South American	Native
Lagerstroemia indica L.	Lythraceae	Phanerophyte	Asian	Exotic
Punica granatum L.	Lythraceae	Nanophanerophyte	Mediterranean	Exotic
Liriodendron tulipifera L.	Magnoliaceae	Phanerophyte	North American	Exotic
Magnolia grandiflora L.	Magnoliaceae	Phanerophyte	American	Exotic
Magnolia × *soulangeana* Soul.-Bod.	Magnoliaceae	Nanophanerophyte	Artificial hybrid	Exotic
Abutilon × *hybridum* Voss	Malvaceae	Nanophanerophyte	Artificial hybrid	Exotic
Alcea rosea L.	Malvaceae	Terophyte	Mediterranean	Exotic
Brachychiton acerifolius (A.Cunn. ex G.Don) F.Muell.	Malvaceae	Phanerophyte	Oceanian	Exotic
Brachychiton discolor F. Muell.	Malvaceae	Phanerophyte	Oceanian	Exotic
Brachychiton populneus (Schott & Endl.) R.Br.	Malvaceae	Phanerophyte	Oceanian	Exotic
Hibiscus rosa-sinensis L.	Malvaceae	Nanophanerophyte	Asian	Exotic
Lagunaria patersonia (Andrews) G. Don	Malvaceae	Phanerophyte	Oceanian	Exotic
Malva neglecta Wallr.	Malvaceae	Terophyte	Eurasian	Exotic
Malva nicaensis All.	Malvaceae	Terophyte	Eurasian	Exotic
Malva parviflora L.	Malvaceae	Terophyte	Eurasian	Exotic
Malva sylvestris L.	Malvaceae	Terophyte	Eurasian	Exotic
Malvella leprosa (Ortega) Krapov.	Malvaceae	Terophyte	South American	Native
Modiola caroliniana (L.) G.Don	Malvaceae	Hemicryptophyte	South American	Native
Sphaeralcea obtusiloba G. Don	Malvaceae	Chamaephyte	South American	Native
Tilia americana L.	Malvaceae	Phanerophyte	American	Exotic
Melia azedarach L.	Meliaceae	Phanerophyte	Asian	Exotic
Peumus boldus Molina	Monimiaceae	Phanerophyte	South American	Native
Ficus carica L.	Moraceae	Phanerophyte	Eurasian	Exotic
Ficus elastica Roxb. ex Hornem.	Moraceae	Phanerophyte	Asian	Exotic
Ficus repens Roxb. ex Sm.	Moraceae	Phanerophyte	Asian	Exotic
Morus alba L.	Moraceae	Phanerophyte	Asian	Exotic
Morus nigra L.	Moraceae	Phanerophyte	Asian	Exotic
Eucalyptus globulus Labill.	Myrtaceae	Phanerophyte	Oceanian	Exotic
Luma apiculata (DC.) Burret	Myrtaceae	Phanerophyte	South American	Native
Luma chequen (Molina) A.Gray	Myrtaceae	Nanophanerophyte	South American	Native
Myrceugenia lanceolata (Juss. ex J. St.-Hil.) Kausel	Myrtaceae	Nanophanerophyte	South American	Native
Myrtus communis L.	Myrtaceae	Nanophanerophyte	Mediterranean	Exotic
Mirabilis jalapa L.	Nyctaginaceae	Hemicryptophyte	American	Exotic
Fraxinus excelsior L.	Oleaceae	Phanerophyte	Asian	Exotic
Fraxinus ornus L.	Oleaceae	Phanerophyte	Eurasian	Exotic
Fraxinus pennsylvanica Marshall	Oleaceae	Phanerophyte	American	Exotic
Jasminum mesnyi Hance	Oleaceae	Nanophanerophyte	Asian	Exotic
Jasminum nudiflorum Lindl.	Oleaceae	Nanophanerophyte	Asian	Exotic

Species	Family	Life form	Native distribution	Origin status
Jasminum officinale L.	Oleaceae	Nanophanerophyte	Asian	Exotic
Jasminum polyanthum Franch.	Oleaceae	Nanophanerophyte	Asian	Exotic
Ligustrum japonicum Thunb.	Oleaceae	Nanophanerophyte	Asian	Exotic
Ligustrum lucidum W.T. *Aiton*	Oleaceae	Phanerophyte	Asian	Exotic
Ligustrum ovalifolium Hassk.	Oleaceae	Nanophanerophyte	Asian	Exotic
Ligustrum sinense Lour.	Oleaceae	Nanophanerophyte	Asian	Exotic
Olea europaea L.	Oleaceae	Phanerophyte	Mediterranean	Exotic
Syringa vulgaris L.	Oleaceae	Nanophanerophyte	Mediterranean	Exotic
Camissonia dentata (Cav.) Reiche	Onagraceae	Terophyte	South American	Native
Clarkia tenella (Cav.) H.F.Lewis & M.R.Lewis	Onagraceae	Terophyte	South American	Native
Epilobium ciliatum Raf.	Onagraceae	Hemicryptophyte	South American	Native
Fuchsia × *hybrida* hort. ex Siebert & Voss	Onagraceae	Nanophanerophyte	Artificial hybrid	Exotic
Fuchsia magellanica Lam.	Onagraceae	Nanophanerophyte	South American	Native
Oxalis arenaria Bertero	Oxalidaceae	Geophyte	South American	Native
Oxalis articulata Savigny	Oxalidaceae	Hemicryptophyte	American	Exotic
Oxalis corniculata L.	Oxalidaceae	Chamaephyte	African	Exotic
Oxalis incarnata L.	Oxalidaceae	Hemicryptophyte	African	Exotic
Oxalis pes-caprae L.	Oxalidaceae	Hemicryptophyte	African	Exotic
Oxalis rosea Jacq.	Oxalidaceae	Terophyte	South American	Native
Oxalis triangularis A. St.-Hil.	Oxalidaceae	Hemicryptophyte	American	Exotic
Eschscholzia californica Cham.	Papaveraceae	Hemicryptophyte	American	Exotic
Fumaria agraria Lag.	Papaveraceae	Terophyte	Eurasian	Exotic
Fumaria capreolata L.	Papaveraceae	Terophyte	Eurasian	Exotic
Fumaria officinalis L.	Papaveraceae	Terophyte	European	Exotic
Papaver somniferum L.	Papaveraceae	Terophyte	African and Asian	Exotic
Passiflora caerulea L.	Passifloraceae	Geophyte	American	Exotic
Paulownia tomentosa Steud.	Paulowniaceae	Phanerophyte	Asian	Exotic
Phytolacca dioica L.	Phytolaccaceae	Phanerophyte	American	Exotic
Abies procera Rehder	Pinaceae	Phanerophyte	American	Exotic
Pinus canariensis C.Sm.	Pinaceae	Phanerophyte	African	Exotic
Pinus radiata D. Don	Pinaceae	Phanerophyte	American	Exotic
Pseudotsuga menziesii (Mirb.) Franco	Pinaceae	Phanerophyte	American	Exotic
Pittosporum tenuifolium Banks & Sol. ex Gaertn	Pittosporaceae	Phanerophyte	Oceanian	Exotic
Pittosporum tobira (Thunb.) W.T. Aiton	Pittosporaceae	Nanophanerophyte	Asian	Exotic
Pittosporum undulatum Vent.	Pittosporaceae	Phanerophyte	Oceanian	Exotic
Antirrhinum majus L.	Plantaginaceae	Terophyte	American	Exotic
Cymbalaria muralis P.Gaertn., B.Mey. & Scherb.	Plantaginaceae	Chamaephyte	European	Exotic
Hebe buxifolia Cockayne & Allan	Plantaginaceae	Nanophanerophyte	Oceanian	Exotic
Hebe franciscana (Eastw.) Souster	Plantaginaceae	Nanophanerophyte	Artificial hybrid	Exotic
Plantago lanceolata L.	Plantaginaceae	Hemicryptophyte	Eurasian	Exotic
Plantago major L.	Plantaginaceae	Hemicryptophyte	Eurasian	Exotic
Veronica arvensis L.	Plantaginaceae	Terophyte	European	Exotic

Species	Family	Life form	Native distribution	Origin status
Veronica persica Poir.	Plantaginaceae	Terophyte	Eurasian	Exotic
Platanus acerifolia (Aiton) Willd.	Platanaceae	Phanerophyte	Eurasian	Exotic
Plumbago auriculata Lam.	Plumbaginaceae	Nanophanerophyte	African	Exotic
Amelichloa caudata (Trin.) Arriaga & Barkworth	Poaceae	Hemicryptophyte	South American	Native
Anthoxanthum odoratum L.	Poaceae	Terophyte	Eurasian	Exotic
Avena barbata Pott ex Link	Poaceae	Terophyte	African and Asian	Exotic
Avena fatua L.	Poaceae	Terophyte	Eurasian	Exotic
Avena sativa L.	Poaceae	Terophyte	Eurasian	Exotic
Avena sterilis L.	Poaceae	Terophyte	Eurasian	Exotic
Briza minor L.	Poaceae	Terophyte	Mediterranean	Exotic
Bromus berteroanus Colla	Poaceae	Terophyte	South American	Native
Bromus catharticus Vahl	Poaceae	Hemicryptophyte	South American	Native
Bromus cebadilla Steudel	Poaceae	Hemicryptophyte	Oceanian	Exotic
Bromus diandrus Roth	Poaceae	Terophyte	European	Exotic
Bromus hordeaceus L.	Poaceae	Terophyte	Eurasian	Exotic
Bromus madritensis L.	Poaceae	Terophyte	Eurasian	Exotic
Bromus racemosus L.	Poaceae	Terophyte	Eurasian	Exotic
Bromus scoparius L.	Poaceae	Terophyte	Mediterranean	Exotic
*Chaetotropis elongata (*Kunth) Björkman	Poaceae	Hemicryptophyte	South American	Native
Cortaderia selloana (Schult. & Schult. f.) Asch. & Graebn.	Poaceae	Hemicryptophyte	American	Exotic
Cynodon dactylon (L.) Pers.	Poaceae	Hemicryptophyte	Eurasian	Exotic
Dactylis glomerata L.	Poaceae	Hemicryptophyte	Eurasian	Exotic
Echinochloa crus-galli (L.) P. Beauv.	Poaceae	Terophyte	Eurasian	Exotic
Eleusine tristachya (Lam.) Lam.	Poaceae	Terophyte	American and African	Exotic
Eragrostis virescens J.Presl	Poaceae	Terophyte	South American	Native
Festuca acanthophylla É.Desv.	Poaceae	Hemicryptophyte	South American	Native
Festuca arundinacea Schreb.	Poaceae	Hemicryptophyte	Eurasian	Exotic
Festuca ovina Fr.	Poaceae	Hemicryptophyte	European	Exotic
Festuca rubra L.	Poaceae	Hemicryptophyte	Eurasian	Exotic
Holcus lanatus L.	Poaceae	Hemicryptophyte	Eurasian	Exotic
Hordeum murinum L.	Poaceae	Terophyte	Eurasian	Exotic
Lolium multiflorum Lam.	Poaceae	Terophyte	African and Asian	Exotic
Lolium perenne L.	Poaceae	Hemicryptophyte	Eurasian	Exotic
Nassella laevissima (Phil.) Barkworth	Poaceae	Hemicryptophyte	South American	Native
Nassella tenuissima (Trin.) Barkworth	Poaceae	Hemicryptophyte	South American	Native
Piptatherum miliaceum (L.) Coss.	Poaceae	Hemicryptophyte	Eurasian	Exotic
Pennisetum clandestinum Hochst. ex Chiov.	Poaceae	Hemicryptophyte	African	Exotic
Pennisetum purpureum Schumach.	Poaceae	Hemicryptophyte	African	Exotic
Pennisetum setaceum (Forssk.) Chiov.	Poaceae	Hemicryptophyte	African	Exotic
Pennisetum villosum Fresen.	Poaceae	Hemicryptophyte	African and Asian	Exotic
Phalaris canariensis L.	Poaceae	Hemicryptophyte	Mediterranean	Exotic

Species	Family	Life form	Native distribution	Origin status
Phyllostachys aurea Rivière & C. Rivière	Poaceae	Hemicryptophyte	Asian	Exotic
Piptochaetium stipoides (Trin. & Rupr.) Hack. & Arechav.	Poaceae	Hemicryptophyte	South American	Native
Poa annua L.	Poaceae	Terophyte	European	Exotic
Poa pratensis L.	Poaceae	Hemicryptophyte	Eurasian	Exotic
Polypogon australis Brongn.	Poaceae	Hemicryptophyte	South American	Native
Polypogon linearis Trin.	Poaceae	Hemicryptophyte	South American	Native
Polypogon viridis (Gouan) Breistr.	Poaceae	Terophyte	Eurasian	Exotic
Pseudosasa japonica (Steud.) Makino	Poaceae	Hemicryptophyte	Asian	Exotic
Rostraria cristata (L.) Tzvelev	Poaceae	Terophyte	Eurasian	Exotic
Setaria parviflora (Poir.) M.Kerguelen	Poaceae	Terophyte	South American	Native
Sorghum halepense (L.) Pers.	Poaceae	Hemicryptophyte	African and Asian	Exotic
Sporobolus indicus (L.) R.Br.	Poaceae	Terophyte	South American	Native
Sporobolus virginicus (L.) Kunth	Poaceae	Hemicryptophyte	South American	Native
Triticum aestivum L.	Poaceae	Terophyte	Asian	Exotic
Vulpia myuros (L.) C.C.Gmel.	Poaceae	Terophyte	Eurasian	Exotic
Zea mays L.	Poaceae	Terophyte	American	Exotic
Cantua buxifolia Juss. ex Lam.	Polemoniaceae	Nanophanerophyte	American	Exotic
Muehlenbeckia hastulata (Sm.) I.M. Johnst.	Polygonaceae	Nanophanerophyte	South American	Native
Polygonum aviculare L.	Polygonaceae	Terophyte	European	Exotic
Rumex acetosella L.	Polygonaceae	Hemicryptophyte	European	Exotic
Rumex pulcher L.	Polygonaceae	Hemicryptophyte	Mediterranean	Exotic
Portulaca oleracea L.	Portulacaceae	Terophyte	Asian	Exotic
Anagallis arvensis L.	Primulaceae	Terophyte	Eurasian	Exotic
Primula vulgaris Huds.	Primulaceae	Hemicryptophyte	European	Exotic
Grevillea robusta A. Cunn. ex R. Br.	Proteaceae	Phanerophyte	Eurasian	Exotic
Quillaja saponaria Molina	Quillajaceae	Phanerophyte	South American	Native
Consolida ajacis (L.) Schur	Ranunculaceae	Terophyte	European	Exotic
Ranunculus muricatus L.	Ranunculaceae	Hemicryptophyte	Eurasian	Exotic
Ceanothus caeruleus Lag.	Rhamnaceae	Nanophanerophyte	American	Exotic
Retanilla trinervia (Gillies & Hook.) Hook. & Arn.	Rhamnaceae	Nanophanerophyte	South American	Native
Rhamnus alaternus L.	Rhamnaceae	Nanophanerophyte	Mediterranean	Exotic
Chaenomeles japonica (Thunb.) Lindl. ex Spach	Rosaceae	Nanophanerophyte	Asian	Exotic
Cotoneaster lacteus W. W. Sm.	Rosaceae	Nanophanerophyte	Asian	Exotic
Cotoneaster horizontalis Decne.	Rosaceae	Nanophanerophyte	Eurasian	Exotic
Cotoneaster pannosus Franch.	Rosaceae	Nanophanerophyte	Asian	Exotic
Crataegus crus-galli L.	Rosaceae	Nanophanerophyte	North American	Exotic
Crataegus monogyna Jacq.	Rosaceae	Phanerophyte	Eurasian	Exotic
Cydonia oblonga Mill.	Rosaceae	Phanerophyte	Asian	Exotic
Eriobotrya japonica (Thunb.) Lindl.	Rosaceae	Phanerophyte	Asian	Exotic
Fragaria chiloensis (L.) Mill.	Rosaceae	Chamaephyte	South American	Native
Malus communis Desf.	Rosaceae	Phanerophyte	Eurasian	Exotic

Species	Family	Life form	Native distribution	Origin status
Malus pumila Mill.	Rosaceae	Phanerophyte	European	Exotic
Malus × *purpurea* (E.Barbier) Rehder	Rosaceae	Phanerophyte	Artificial hybrid	Exotic
Photinia serrulata Lindl.	Rosaceae	Phanerophyte	Asian	Exotic
Prunus armeniaca L.	Rosaceae	Phanerophyte	Asian	Exotic
Prunus avium (L.) L.	Rosaceae	Phanerophyte	Mediterranean	Exotic
Prunus cerasifera Ehrh.	Rosaceae	Phanerophyte	Eurasian	Exotic
Prunus cerasus L.	Rosaceae	Phanerophyte	Eurasian	Exotic
Prunus domestica L.	Rosaceae	Phanerophyte	Asian	Exotic
Prunus dulcis (Mill.) D.A.Webb	Rosaceae	Phanerophyte	Mediterranean	Exotic
Prunus ilicifolia (Nutt. ex Hook. & Arn.) D. Dietr.	Rosaceae	Phanerophyte	American	Exotic
Prunus laurocerasus L.	Rosaceae	Phanerophyte	Eurasian	Exotic
Prunus persica (L.) Batsch	Rosaceae	Phanerophyte	Asian	Exotic
Pyracantha coccinea M. Roem.	Rosaceae	Nanophanerophyte	Eurasian	Exotic
Pyrus communis L.	Rosaceae	Phanerophyte	Eurasian	Exotic
Rosa helenae Rehder & E.H. Wilson	Rosaceae	Nanophanerophyte	Asian	Exotic
Rosa × *hybrida* Schleich.	Rosaceae	Nanophanerophyte	Artificial hybrid	Exotic
Rubus ulmifolius Schott	Rosaceae	Nanophanerophyte	European	Exotic
Spiraea cantoniensis Lour.	Rosaceae	Nanophanerophyte	Asian	Exotic
Spiraea japonica L.f.	Rosaceae	Nanophanerophyte	Asian	Exotic
Spiraea thunbergii Siebold ex Blume	Rosaceae	Nanophanerophyte	Asian	Exotic
Coprosma baueri Endl.	Rosaceae	Nanophanerophyte	Oceanian	Exotic
Galium aparine L.	Rubiaceae	Terophyte	Eurasian	Exotic
Galium parisiense L.	Rubiaceae	Terophyte	Eurasian	Exotic
Citrus × *aurantium* L.	Rutaceae	Phanerophyte	Asian	Exotic
Citrus limon (L.) Osbeck	Rutaceae	Phanerophyte	Asian	Exotic
Citrus reticulata Blanco	Rutaceae	Phanerophyte	Asian	Exotic
Citrus sinensis (L.) Osbeck	Rutaceae	Phanerophyte	Asian	Exotic
Ruta graveolens L.	Rutaceae	Chamaephyte	European	Exotic
Populus alba L.	Salicaceae	Phanerophyte	Eurasian	Exotic
Populus deltoides Marshall	Salicaceae	Phanerophyte	American	Exotic
Populus nigra L.	Salicaceae	Phanerophyte	Eurasian	Exotic
Salix babylonica L.	Salicaceae	Phanerophyte	Asian	Exotic
Acer negundo L.	Sapindaceae	Phanerophyte	American	Exotic
Acer palmatum Thunb.	Sapindaceae	Phanerophyte	Asian	Exotic
Acer pseudoplatanus L.	Sapindaceae	Phanerophyte	Eurasian	Exotic
Aesculus hippocastanum L.	Sapindaceae	Phanerophyte	European	Exotic
Aesculus × *carnea* Zeyh.	Sapindaceae	Phanerophyte	European	Exotic
Koelreuteria paniculata Laxm.	Sapindaceae	Nanophanerophyte	Asian	Exotic
Buddleja globosa Hope	Scrophulariaceae	Nanophanerophyte	South American	Native
Myoporum laetum G. Forst.	Scrophulariaceae	Phanerophyte	Oceanian	Exotic
Verbascum virgatum Stokes	Scrophulariaceae	Terophyte	European	Exotic
Ailanthus altissima (Mill.) Swingle	Simaroubaceae	Phanerophyte	Asian	Exotic
Brugmansia arborea (L.) Steud.	Solanaceae	Nanophanerophyte	American	Exotic
Cestrum parqui (Lam.) L'Hér.	Solanaceae	Nanophanerophyte	South American	Native

Species	Family	Life form	Native distribution	Origin status
Datura ferox L.	Solanaceae	Terophyte	Asian	Exotic
Nicotiana glauca Graham	Solanaceae	Nanophanerophyte	American	Exotic
Nicotiana tabacum L.	Solanaceae	Hemicryptophyte	American	Exotic
Solanum crispum Ruiz & Pav.	Solanaceae	Nanophanerophyte	South American	Native
Solanum jasminoides J. Paxton	Solanaceae	Nanophanerophyte	American	Exotic
Solanum lycopersicum L.	Solanaceae	Terophyte	American	Exotic
Solanum tuberosum L.	Solanaceae	Geophyte	American	Exotic
Strelitzia reginae Banks	Strelitziaceae	Hemicryptophyte	African	Exotic
Tamarix ramosissima Ledeb.	Tamaricaceae	Nanophanerophyte	Eurasian	Exotic
Taxus baccata L.	Taxaceae	Phanerophyte	Eurasian	Exotic
Tropaeolum majus L.	Tropaeolaceae	Chamaephyte	American	Exotic
Ulmus americana L.	Ulmaceae	Phanerophyte	American	Exotic
Zelkova carpinifolia (Pall.) K. Koch	Ulmaceae	Phanerophyte	Asian	Exotic
Parietaria judaica L.	Urticaceae	Chamaephyte	Eurasian	Exotic
Soleirolia soleirolii (Req.) Dandy	Urticaceae	Chamaephyte	Mediterranean	Exotic
Urtica urens L.	Urticaceae	Terophyte	Mediterranean	Exotic
Aloysia citriodora Palau	Verbenaceae	Nanophanerophyte	South American	Native
Aloysia gratissima (Gillies & Hook.) Tronc.	Verbenaceae	Nanophanerophyte	American	Exotic
Duranta erecta L.	Verbenaceae	Nanophanerophyte	American	Exotic
Lantana camara L.	Verbenaceae	Nanophanerophyte	American	Exotic
Verbena litoralis Kunth	Verbenaceae	Terophyte	South American	Native
Viola cornuta L.	Violaceae	Hemicryptophyte	European	Exotic
Viola odorata L.	Violaceae	Terophyte	European	Exotic
Viola wittrockiana Gams ex Nauenb. & Buttler	Violaceae	Terophyte	European	Exotic
Parthenocissus quinquefolia (L.) Planch.	Vitaceae	Phanerophyte	American	Exotic
Vitis vinifera L.	Vitaceae	Nanophanerophyte	Eurasian	Exotic
Drimys winteri J.R.Forst. & G.Forst.	Winteraceae	Phanerophyte	South American	Native
Aloe arborescens Mill.	Xanthorrhoeaceae	Hemicryptophyte	African	Exotic
Aloe aristata Haw.	Xanthorrhoeaceae	Hemicryptophyte	African	Exotic
Aloe brevifolia Mill.	Xanthorrhoeaceae	Hemicryptophyte	African	Exotic
Aloe perfoliata L.	Xanthorrhoeaceae	Hemicryptophyte	African	Exotic
Aloe vera (L.) Burm. f.	Xanthorrhoeaceae	Hemicryptophyte	African and Asian	Exotic
Pasithea caerulea (Ruiz & Pav.) D.Don	Xanthorrhoeaceae	Hemicryptophyte	South American	Native
Phormium tenax J.R.Forst. & G.Forst.	Xanthorrhoeaceae	Hemicryptophyte	Oceanian	Exotic

[1]Nomenclature according to The Plant List (URL: http://www.theplantlist.org/ Viewed: May 4, 2015). / Nomenclatura de acuerdo a The Plant List (URL: http://www.theplantlist.org/ Viewed: May 4, 2015).

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