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The alien vascular flora of Linosa (Pelagie Islands, Strait of Sicily): update and management proposals

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Table 1. Overview of the alien plant species on Linosa. **Year:** shows the year of first reported naturalization event with source in superscript as follows: 1 = literature until 1996; 2 = Hammer & al. (1997); 3 = Danin & al. (2008); 4 = Domina & Mazzola (2008); 5 = La Mantia & al. (2009); 6 = G. Parolo & coll. (2009–2011); 7 = Pasta & al. (2012); 8 = Domina & al. (2013); 9 = S. Pasta & coll. (May 2013); 10 = E. Badalamenti, T. La Mantia & coll. (2014–2017). **Residence time:** ARC = archaeophyte; NEO = neophyte; CRY = cryptogenic; LOC = locally alien. **Status:** CAS = casual, NAT = naturalized, INV = invasive. **Impact:** H = high; M = medium; L = low; N = negligible. **Frequency:** C = common; F = frequent; S = sporadic; R = rare; RR = very rare. **Habitat code** (according to Dir. 92/43 EEC): 1240 “Vegetated sea cliffs of the Mediterranean coasts with endemic *Limonium* spp.”; 5320 “Low formations of *Euphorbia* close to cliffs”; 5330 “Thermo-Mediterranean and pre-desert scrub”; 6220 “Pseudo-steppe with grasses and annuals of the *Thero-Brachypodietea*” (priority); 8220 “siliceous rocky slopes with chasmophytic vegetation”; 8320 “fields of lava and natural excavations”. **Corine Biotopes code:** 34.81 “sub-nitrophilous dry meadows and post-crop vegetation” (uncultivated lands); 82.3 “extensive herbaceous crops” (arable crops in dry and irrigated fields); 83.2 “shrubby orchards” (prickly pear and mixed orchards); 83.31 “artificial coniferous afforestation”; 86 “cities, villages and industrial sites” (e.g. piers, ports, roads); 86.2 “villages” (the town of Linosa); 86.3 “active industrial sites” (desalinator, lighthouse); 86.4 “industrial sites decommissioned” (the former quarries of inert landfill, etc.). **Main purpose:** ornam = ornamental; alim = alimentary; agr-cra = agricultural and/or craft; for-hydr = forestry or hydrology; no = species not intentionally introduced. Taxa are sorted first by status (INV, NAT, CAS), then by frequency (C, F, S, R, RR).

Year	Taxon	Family	Residence time	Status	Impact	Frequency	Habitat code				Corine Biotopes code				Main purpose									
							1240	5320	5330	6220*	8220	8320	34.81	82.3	83.2	83.31	86	86.2	86.3	86.4	ornam	alim	agr-cra	for-hydr
until 1996 ¹	<i>Amaranthus graecizans</i> L. s.l.	<i>Amaranthaceae</i>	LOC	NAT	N	F							x								x			
until 1996 ¹	<i>Erigeron bonariensis</i> L.	<i>Asteraceae</i>	NEO	NAT	L	F							x	x			x	x	x			x		
until 1996 ¹	<i>Mesembryanthemum crystallinum</i> L.	<i>Aizoaceae</i>	LOC	NAT	M	F	x										x			x	x		x	
until 1996 ¹	<i>Papaver hybridum</i> L.	<i>Papaveraceae</i>	CRY	NAT	L	F							x				x						x	
until 1996 ¹	<i>Papaver rhoeas</i> L.	<i>Papaveraceae</i>	CRY	NAT	L	F							x	x									x	
2013 ⁸	<i>Setaria verticillata</i> (L.) P. Beauv.	<i>Poaceae</i>	LOC	NAT	N	F							x										x	
until 1996 ¹	<i>Solanum linnaeanum</i> Hepper and P.-M. L. Jaeger	<i>Solanaceae</i>	NEO	NAT	L	F							x				x	x	x			x		
until 1996 ¹	<i>Symphytrichum squatum</i> (Spreng.) G. L. Nesom	<i>Asteraceae</i>	NEO	NAT	H	F							x				x	x	x			x		
2009 ⁵	<i>Tamarix canariensis</i> Willd.	<i>Tamaricaceae</i>	LOC	NAT	H	F		x								x							x	
until 1996 ¹	<i>Vicia sativa</i> L.	<i>Fabaceae</i>	LOC	NAT	L	F							x	x								x		
2012 ⁷	<i>Acacia cyclops</i> A. Cunn. ex G. Don	<i>Fabaceae</i>	NEO	NAT	M	S									x								x	
until 1996 ¹	<i>Agave americana</i> L. (incl. <i>Agave americana</i> var. <i>marginata</i> Trel.)	<i>Asparagaceae</i>	NEO	NAT	L	S				x						x		x	x	x		x		
2015 ¹⁰	<i>Agave sisalana</i> Perrine ex Engelm.	<i>Asparagaceae</i>	NEO	NAT	L	S				x						x		x	x	x		x		
2008 ⁴	<i>Amaranthus cruentus</i> L.	<i>Amaranthaceae</i>	NEO	NAT	N	S							x										x	
until 1996 ¹	<i>Arundo donax</i> L.	<i>Poaceae</i>	ARC	NAT	M	S							x				x					x		
2008 ⁴	<i>Catharanthus roseus</i> (L.) G. Don	<i>Apocynaceae</i>	NEO	NAT	N	S										x		x	x	x				
until 1996 ¹	<i>Ceratonia siliqua</i> L.	<i>Fabaceae</i>	LOC	NAT	L	S			x						x						x			
until 1996 ¹	<i>Erigeron sumatrensis</i> Retz.	<i>Asteraceae</i>	NEO	NAT	L	S							x	x			x	x	x	x	x		x	
2013 ⁸	<i>Euphorbia maculata</i> L.	<i>Euphorbiaceae</i>	NEO	NAT	N	S						x			x		x	x	x			x		
2013 ⁸	<i>Euphorbia nutans</i> Lag.	<i>Euphorbiaceae</i>	NEO	NAT	N	S						x			x		x	x	x			x		
until 1996 ¹	<i>Ficus carica</i> L.	<i>Moraceae</i>	LOC	NAT	M	S				x	x			x		x		x	x	x	x	x		
2008 ⁴	<i>Kalanchoë daigremontiana</i> Raym.-Hamet & H. Perrier	<i>Crassulaceae</i>	NEO	NAT	N	S										x		x	x	x	x	x		

Year	Taxon	Family	Residence time	Status	Impact	Frequency	Habitat code				Corine Biotopes code				Main purpose								
							1240	5320	5330	6220*	8220	8320	34.81	82.3	83.2	83.31	86	86.2	86.3	86.4	ornam	alim	agr-cra
2010 ⁶	<i>Lantana camara</i> L.	Verbenaceae	NEO	NAT	H	S		x	x	x			x				x		x	x			
2010 ⁶	<i>Mesembryanthemum cordifolium</i> L. f.	Aizoaceae	NEO	NAT	L	S	x				x						x	x	x	x			
2008 ⁴	<i>Mirabilis jalapa</i> L.	Nyctaginaceae	NEO	NAT	L	S							x				x		x	x			
2013 ⁸	<i>Myoporum insulare</i> R. Br.	Myoporaceae	NEO	NAT	L	S									x	x					x		
2008 ⁴	<i>Opuntia amyacaea</i> Ten.	Cactaceae	NEO	NAT	L	S					x	x	x								x		
2013 ⁸	<i>Oxalis corniculata</i> L.	Oxalidaceae	LOC	NAT	N	S											x					x	
2013 ⁸	<i>Portulaca granulato-stellulata</i> (Poelln.) Ricceri & Arrigoni	Portulacaceae	LOC	NAT	N	S							x								x		
2008 ³	<i>Portulaca rausii</i> Danin	Portulacaceae	LOC	NAT	N	S						x			x							x	
2008 ⁴	<i>Antirrhinum majus</i> L. subsp. <i>majus</i>	Plantaginaceae	ARC	NAT	N	R				x						x		x	x				
until 1996 ¹	<i>Artemisia arborescens</i> (Vaill.) L.	Asteraceae	LOC	NAT	M	R		x	x				x					x				x	
until 1996 ¹	<i>Gladiolus italicus</i> Mill.	Iridaceae	ARC	NAT	L	R							x	x									x
2013 ⁸	<i>Malephora crocea</i> (Jacq.) Schwantes	Aizoaceae	NEO	NAT	M	R	x						x			x		x		x			
2013 ⁹	<i>Opuntia stricta</i> (Haw.) Haw.	Cactaceae	NEO	NAT	H	R	x	x	x	x			x						x				
2010 ⁶	<i>Portulaca grandiflora</i> Hook.	Portulacaceae	NEO	NAT	L	R										x	x		x		x		
2009 ⁵	<i>Ricinus communis</i> L.	Euphorbiaceae	ARC	NAT	L	R							x			x		x	x	x	x		
1997 ²	<i>Sorghum bicolor</i> (L.) Moench	Poaceae	ARC	NAT	L	R						x										x	
until 1996 ¹	<i>Sorghum halepense</i> (L.) Pers.	Poaceae	ARC	NAT	N	R						x	x									x	
2009 ⁵	<i>Spartium junceum</i> L.	Fabaceae	LOC	NAT	M	R			x					x							x		
2010 ⁶	<i>Aloe arborescens</i> Mill.	Asphodelaceae	NEO	NAT	N	RR				x						x		x	x	x			
until 1996 ¹	<i>Datura inoxia</i> Mill.	Solanaceae	NEO	NAT	M	RR							x			x		x	x	x		x	
2015 ¹⁰	<i>Datura stramonium</i> L.	Solanaceae	NEO	NAT	M	RR									x							x	
2010 ⁶	<i>Erysimum cheiri</i> (L.) Crantz	Brassicaceae	ARC	NAT	L	RR				x						x		x	x	x	x		
until 1996 ¹	<i>Heliotropium curassavicum</i> L.	Boraginaceae	NEO	NAT	M	RR						x			x		x	x	x	x	x	x	
2010 ⁶	<i>Ipomoea indica</i> (Burm.) Merr.	Convolvulaceae	NEO	NAT	H	RR					x		x			x		x	x	x			
2013 ⁹	<i>Vachellia karroo</i> (Hayne) Banfi & Galasso (= <i>Acacia karroo</i> Hayne)	Fabaceae	NEO	NAT	L	RR				x		x								x		x	

Year	Taxon	Family	Residence time	Status	Impact	Frequency	Habitat code				Corine Biotopes code				Main purpose							
							1240	5320	5330	6220*	8220	8320	34.81	82.3	83.2	83.31	86	86.2	86.3	86.4	ornam	alim
2009 ⁵	<i>Pinus halepensis</i> Mill.	<i>Pinaceae</i>	LOC	CAS	H	F		x					x								x	
until 1996 ¹	<i>Raphanus sativus</i> L.	<i>Brassicaceae</i>	ARC	CAS	N	F					x	x									x	
2008 ⁴	<i>Acacia saligna</i> (Labill.) H. L. Wendl.	<i>Fabaceae</i>	NEO	CAS	M	S							x	x	x						x	
2010 ⁶	<i>Agave attenuata</i> Salm-Dyck	<i>Asparagaceae</i>	NEO	CAS	L	S								x		x				x		
2015 ¹⁰	<i>Erythrostemon gilliesii</i> (Wall. ex Hook.) Klotzsch [= <i>Caesalpinia gilliesii</i> (Hook.) D. Dietr.]	<i>Fabaceae</i>	NEO	CAS	L	S					x			x	x			x				
2015 ¹⁰	<i>Hylocereus undatus</i> (Haw.) Britton & Rose	<i>Cactaceae</i>	NEO	CAS	N	S		x							x	x		x		x		
2015 ¹⁰	<i>Melia azedarach</i> L.	<i>Meliaceae</i>	NEO	CAS	M	S									x	x		x		x		
2013 ⁹	<i>Solanum lycopersicum</i> L.	<i>Solanaceae</i>	NEO	CAS	L	S					x	x								x		
2010 ⁶	<i>Amaranthus caudatus</i> L.	<i>Amaranthaceae</i>	NEO	CAS	N	R					x			x							x	
2010 ⁶	<i>Campsis radicans</i> (L.) Bureau	<i>Bignoniaceae</i>	NEO	CAS	N	R									x			x		x		
2015 ¹⁰	<i>Kleinia anteuphorbia</i> (L.) Haw.	<i>Asteraceae</i>	NEO	CAS	L	R					x				x			x		x		
2015 ¹⁰	<i>Leucaena leucocephala</i> subsp. <i>glabrata</i> (Rose) Zárate	<i>Fabaceae</i>	NEO	CAS	M	R					x		x		x	x		x		x		
until 1996 ¹	<i>Lupinus albus</i> L. subsp. <i>albus</i>	<i>Fabaceae</i>	ARC	CAS	N	R					x									x		
1997 ²	<i>Medicago sativa</i> L.	<i>Fabaceae</i>	CRY	CAS	L	R					x	x									x	
2010 ⁶	<i>Parthenocissus</i> cf. <i>quinquefolia</i> (L.) Planch.	<i>Vitaceae</i>	NEO	CAS	L	R								x			x			x		
2013 ⁸	<i>Petunia hybrida</i> (Hook.) Vilm.	<i>Solanaceae</i>	NEO	CAS	N	R								x			x		x			
2010 ⁶	<i>Phoenix canariensis</i> Chabaud	<i>Arecaceae</i>	NEO	CAS	N	R								x			x		x			
2010 ⁶	<i>Pittosporum tobira</i> (Thunb.) W. T. Aiton	<i>Pittosporaceae</i>	NEO	CAS	L	R								x			x		x			
2010 ⁶	<i>Aeonium arboreum</i> (L.) Webb & Berthel. (incl. <i>A. arboreum</i> var. <i>atropurpureum</i> (Nich.) Bgr.)	<i>Crassulaceae</i>	ARC	CAS	N	RR			x					x			x		x			
2008 ⁴	<i>Ailanthus altissima</i> (Mill.) Swingle	<i>Simaroubaceae</i>	NEO	CAS	M	RR					x				x	x	x	x	x			
2013 ⁹	<i>Anredera cordifolia</i> (Ten.) Steenis	<i>Basellaceae</i>	NEO	CAS	M	RR		x			x			x		x		x		x		
2015 ¹⁰	<i>Cucumis melo</i> L.	<i>Cucurbitaceae</i>	ARC	CAS	N	RR								x						x		
2015 ¹⁰	<i>Plumbago auriculata</i> Lam.	<i>Plumbaginaceae</i>	NEO	CAS	L	RR								x	x		x	x		x		
2015 ¹⁰	<i>Portulaca afra</i> Jacq.	<i>Portulacaceae</i>	NEO	CAS	L	RR				x									x			

Year	Taxon	Family	Residence time	Status	Impact	Frequency	Habitat code						Corine Biotopes code						Main purpose						
							1240	5320	5330	6220*	8220	8320	34.81	82.3	83.2	83.31	86	86.2	86.3	86.4	ornam	alim	agr-cra	for-hydr	no
2015 ¹⁰	<i>Tagetes erecta</i> L. (= <i>T. patula</i> L.)	<i>Asteraceae</i>	NEO	CAS	N	RR									x	x			x						
2015 ¹⁰	<i>Trichocereus spachianus</i> (Lem.) Riccob. [= <i>Echinopsis spachiana</i> (Lem.) Friedrich & G. D. Rowley]	<i>Cactaceae</i>	NEO	CAS	L	RR									x			x	x						
2015 ¹⁰	<i>Tropaeolum majus</i> L.	<i>Tropaeolaceae</i>	NEO	CAS	L	RR									x			x		x					
2017 ¹⁰	<i>Nerium oleander</i> L.	<i>Apocynaceae</i>	LOC	CAS	L	RR		x											x						
Total							6	6	8	5	12	6	37	20	4	6	17	49	5	16	37	6	7	6	27

Table 2. Overview of the alien plant species found only in cultivation in Linosa. **Year** of first reported cultivation and source in superscript as follows: 1 = literature source until 1996; 2 = Hammer & al. (1997); 3 = Mantisi (2001); 4 = Domina & Mazzola (2008); 5 = La Mantia & al. (2009); 6 = G. Parolo & coll. (2009–2011); 7 = S. Pasta & coll. (May 2013); 8 = E. Badalamenti & T. La Mantia (2014–2017). **Impact:** H = high; M = medium; L = low; N = negligible. **Main purpose:** ornam = ornamental; alim = alimentary; agr-cra = agricultural and/or craft; for-hydr = forestry or hydrology.

Year	Taxon	Family	Impact	Main purpose			
				ornam	alim	agr-cra	for-hydr
2010 ⁶	<i>Acacia melanoxylon</i> R. Br.	<i>Fabaceae</i>	L				x
2008 ⁴	<i>Acca sellowiana</i> (O. Berg.) Burret	<i>Myrtaceae</i>	N	x			
2008 ⁴	<i>Agave salmiana</i> var. <i>ferox</i> (K. Koch) Gentry	<i>Asparagaceae</i>	N	x			
1997 ²	<i>Allium cepa</i> L.	<i>Amaryllidaceae</i>	N		x		
1997 ²	<i>Allium sativum</i> L.	<i>Amaryllidaceae</i>	N		x		
2008 ⁴	<i>Aloe brachystachys</i> Baker (= <i>Aloe lastii</i> Baker)	<i>Asphodelaceae</i>	N	x			
2008 ⁴	<i>Aloe ciliaris</i> Haw.	<i>Asphodelaceae</i>	N	x			
2008 ⁴	<i>Aloe marlothii</i> A. Berger	<i>Asphodelaceae</i>	N	x			
2008 ⁴	<i>Aloe perfoliata</i> L. (= <i>Aloe distans</i> Haw.)	<i>Asphodelaceae</i>	N	x			
2008 ⁴	<i>Araucaria heterophylla</i> (Salisb.) Franco	<i>Araucariaceae</i>	N	x			
2008 ⁴	<i>Arbutus unedo</i> L.	<i>Ericaceae</i>	M				x
2008 ⁴	<i>Austrocylindropuntia subulata</i> (Muehlenpf.) Backeb.	<i>Cactaceae</i>	L	x			
2008 ⁴	<i>Begonia cucullata</i> Willd. (= <i>Begonia semperflorens</i> Link & Otto)	<i>Begoniaceae</i>	N	x			
1997 ²	<i>Beta vulgaris</i> L. subsp. <i>vulgaris</i>	<i>Chenopodiaceae</i>	L		x		
2008 ⁴	<i>Bougainvillea glabra</i> Choisy	<i>Nyctaginaceae</i>	N	x			
2008 ⁴	<i>Bougainvillea spectabilis</i> Willd.	<i>Nyctaginaceae</i>	N	x			
1997 ²	<i>Brassica oleracea</i> L.	<i>Brassicaceae</i>	L		x		
2008 ⁴	<i>Brugmansia arborea</i> (L.) Steud.	<i>Solanaceae</i>	N	x			
2008 ⁴	<i>Buddleja davidii</i> Franch.	<i>Scrophulariaceae</i>	N	x			
2008 ⁴	<i>Callistemon citrinus</i> (Curtis) Skeels	<i>Myrtaceae</i>	N	x			
2008 ⁴	<i>Campsis grandiflora</i> (Thunb.) K. Schum.	<i>Bignoniaceae</i>	N	x			
2008 ⁴	<i>Canna indica</i> L.	<i>Cannaceae</i>	N	x			
1997 ²	<i>Capsicum annuum</i> L.	<i>Solanaceae</i>	N		x		
2015 ⁸	<i>Carissa macrocarpa</i> (Eckl.) A. DC.	<i>Apocynaceae</i>	N	x			
2015 ⁸	<i>Cascabela thevetia</i> (L.) Lippold [= <i>Thevetia peruviana</i> (Pers.) K. Schum.]	<i>Apocynaceae</i>	N	x			
2009 ⁵	<i>Castanea sativa</i> Mill.	<i>Fagaceae</i>	N	x			
2008 ⁴	<i>Chamaerops humilis</i> L.	<i>Arecaceae</i>	H				x
2008 ⁴	<i>Chlorophytum comosum</i> (Thunb.) Jacques	<i>Asparagaceae</i>	N	x			
1997 ²	<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai	<i>Cucurbitaceae</i>	L		x		

Year	Taxon	Family	Impact	Main purpose			
				ornam	alim	agr-era	for-hydr
1997 ²	<i>Citrus ×aurantium</i> L.	Rutaceae	N		x		
1997 ²	<i>Citrus ×limon</i> (L.) Osbeck	Rutaceae	N		x		
1997 ²	<i>Citrus ×sinensis</i> (L.) Osbeck	Rutaceae	N		x		
2008 ⁴	<i>Cleistocactus straussii</i> (Heese) Backeb.	Cactaceae	N	x			
2008 ⁴	<i>Cortaderia selloana</i> (Schult. & Schult. f.) Asch. & Graebn.	Poaceae	M	x			
2008 ⁴	<i>Cotyledon orbiculata</i> L.	Crassulaceae	N	x			
2008 ⁴	<i>Crassula ovata</i> (Mill.) Druce (= <i>Crassula argentea</i> Thunb.)	Crassulaceae	N	x			
1997 ²	<i>Cucumis sativus</i> L.	Cucurbitaceae	N		x		
1997 ²	<i>Cucurbita maxima</i> Duchesne	Cucurbitaceae	N		x		
1997 ²	<i>Cucurbita pepo</i> L.	Cucurbitaceae	N		x		
2008 ⁴	<i>Cupressus sempervirens</i> L.	Cupressaceae	L	x			
2008 ⁴	<i>Cycas revoluta</i> Thunb.	Cycadaceae	N	x			
2008 ⁴	<i>Cyclamen persicum</i> Mill.	Primulaceae	N	x			
1997 ²	<i>Cylindropuntia imbricata</i> (Haw.) F. M. Knuth	Cactaceae	N	x			
1997 ²	<i>Cynara cardunculus</i> L. subsp. <i>cardunculus</i>	Asteraceae	N		x		
1997 ²	<i>Cynara cardunculus</i> subsp. <i>scolymus</i> (L.) Hayek	Asteraceae	N		x		
2008 ⁴	<i>Cyperus alternifolius</i> subsp. <i>flabelliformis</i> Kük. (= <i>Cyperus involucratus</i> Rottb.)	Cyperaceae	N	x			
2008 ⁴	<i>Dendranthema indicum</i> (L.) Des Moul.	Asteraceae	N	x			
2008 ⁴	<i>Dianthus caryophyllus</i> L.	Caryophyllaceae	N	x			
2015 ⁸	<i>Dyckia brevifolia</i> Baker	Bromeliaceae	N	x			
2008 ⁴	<i>Echium candicans</i> L. f.	Boraginaceae	N	x			
2008 ⁴	<i>Elaeagnus angustifolia</i> L.	Eleagnaceae	N	x			
2008 ⁴	<i>Eriobotrya japonica</i> (Thunb.) Lindl.	Rosaceae	N		x		
2008 ⁴	<i>Eucalyptus camaldulensis</i> Dehnh.	Myrtaceae	M	x			
2008 ⁴	<i>Euphorbia ingens</i> E. Mey. ex Boiss.	Euphorbiaceae	N	x			
2015 ⁸	<i>Euphorbia mili</i> Des Moul.	Euphorbiaceae	N	x			
2015 ⁸	<i>Euphorbia pulcherrima</i> Willd.	Euphorbiaceae	N	x			
2008 ⁴	<i>Euphorbia tirucalli</i> L.	Euphorbiaceae	N	x			
2008 ⁴	<i>Fallopia baldschuanica</i> (Regel) Holub	Polygonaceae	L	x			
2008 ⁴	<i>Ficus benjamina</i> L.	Moraceae	N	x			
2008 ⁴	<i>Ficus elastica</i> Roxb.	Moraceae	N	x			
2008 ⁴	<i>Ficus lyrata</i> Warb.	Moraceae	N	x			

Year	Taxon	Family	Impact	Main purpose			
				ornam	alim	agr-era	for-hydr
2015 ⁸	<i>Ficus microcarpa</i> L. f.	<i>Moraceae</i>	L	x			
2008 ⁴	<i>Ficus rubiginosa</i> Desf. ex Vent.	<i>Moraceae</i>	N	x			
1997 ²	<i>Foeniculum vulgare</i> Mill.	<i>Apiaceae</i>	H		x		
1997 ²	<i>Fragaria ananassa</i> (Duchesne) Rozier	<i>Rosaceae</i>	N		x		
2008 ⁴	<i>Gazania rigens</i> (L.) Gaertn.	<i>Asteraceae</i>	L	x			
2015 ⁸	<i>Gloriosa superba</i> L.	<i>Colchicaceae</i>	N	x			
2008 ⁴	<i>Gomphrena globosa</i> L.	<i>Amaranthaceae</i>	N	x			
2008 ⁴	<i>Graptopetalum paraguayense</i> (N. E. Br.) Walther subsp. <i>paraguayense</i>	<i>Crassulaceae</i>	L	x			
2008 ⁴	<i>Hedera helix</i> L.	<i>Araliaceae</i>	L	x			
2008 ⁴	<i>Helianthus annuus</i> L.	<i>Asteraceae</i>	N		x		
2008 ⁴	<i>Helianthus tuberosus</i> L.	<i>Asteraceae</i>	N	x			
2008 ⁴	<i>Hibiscus rosa-sinensis</i> L.	<i>Malvaceae</i>	N	x			
1997 ²	<i>Hordeum vulgare</i> L.	<i>Poaceae</i>	L		x		
2008 ⁴	<i>Hydrangea macrophylla</i> (Thunb.) Ser.	<i>Hydrangeaceae</i>	N	x			
1997 ²	<i>Ipomoea purpurea</i> (L.) Roth	<i>Convolvulaceae</i>	L	x			
2008 ⁴	<i>Iris ×germanica</i> L. (pro sp.)	<i>Iridaceae</i>	L	x			
2015 ⁸	<i>Kalanchoë beharensis</i> Drake	<i>Crassulaceae</i>	N	x			
1997 ²	<i>Kalanchoë blossfeldiana</i> Poelln.	<i>Crassulaceae</i>	N	x			
2008 ⁴	<i>Kalanchoë marmorata</i> Baker	<i>Crassulaceae</i>	N	x			
2008 ⁴	<i>Kleinia stapeliiformis</i> (E. Phillips) Stapf	<i>Asteraceae</i>	N	x			
1997 ²	<i>Lactuca sativa</i> L.	<i>Asteraceae</i>	L		x		
1997 ²	<i>Lagenaria siceraria</i> (Molina) Standl.	<i>Cucurbitaceae</i>	N			x	
2008 ⁴	<i>Lampranthus spectabilis</i> (Haw.) N. E. Br.	<i>Aizoaceae</i>	N	x			
2008 ⁴	<i>Lantana montevidensis</i> (Spreng.) Briq.	<i>Verbenaceae</i>	N	x			
1997 ²	<i>Lathyrus oleraceus</i> Lam. subsp. <i>oleraceus</i> (= <i>Pisum sativum</i> L.)	<i>Fabaceae</i>	L		x		
2008 ⁴	<i>Laurus nobilis</i> L.	<i>Lauraceae</i>	L		x		
2008 ⁴	<i>Lobivia silvestrii</i> (Speg.) G. D. Rowley [= <i>Chamaecereus silvestrii</i> (Speg.) Britton & Rose]	<i>Cactaceae</i>	N	x			
1997 ²	<i>Malus pumila</i> Mill. (= <i>M. domestica</i> Borkh.)	<i>Rosaceae</i>	N		x		
until 1996 ¹	<i>Matthiola incana</i> (L.) R. Br. subsp. <i>incana</i>	<i>Brassicaceae</i>	L	x			
1997 ²	<i>Mentha spicata</i> L.	<i>Lamiaceae</i>	N		x		
2015 ⁸	<i>Metrosideros excelsa</i> Sol. ex Gaertn	<i>Myrtaceae</i>	N	x			

Year	Taxon	Family	Impact	Main purpose			
				ornam	alim	agr-era	for-hydr
2008 ⁴	<i>Morus alba</i> L.	<i>Moraceae</i>	N		x		
2008 ⁴	<i>Morus nigra</i> L.	<i>Moraceae</i>	L		x		
2008 ⁴	<i>Musa ×paradisiaca</i> L. (pro sp.)	<i>Musaceae</i>	N	x			
1997 ²	<i>Myrtus communis</i> L.	<i>Myrtaceae</i>	M				x
2008 ⁴	<i>Nephrolepis cordifolia</i> C. Presl	<i>Lomariopsidaceae</i>	N	x			
1997 ²	<i>Ocimum basilicum</i> L.	<i>Lamiaceae</i>	N		x		
until 1996 ¹	<i>Olea europaea</i> L. subsp. <i>europaea</i>	<i>Oleaceae</i>	L		x		
2008 ⁴	<i>Opuntia microdasys</i> (Lehm.) Pfeiff. subsp. <i>microdasys</i>	<i>Cactaceae</i>	N	x			
2008 ⁴	<i>Opuntia monacantha</i> (Willd.) Haw.	<i>Cactaceae</i>	L	x			
2008 ⁴	<i>Opuntia robusta</i> J. C. Wendl.	<i>Cactaceae</i>	L			x	
2008 ⁴	<i>Osteospermum fruticosum</i> (L.) Norl.	<i>Asteraceae</i>	N	x			
2015 ⁸	<i>Parkinsonia aculeata</i> L.	<i>Fabaceae</i>	M	x			
2015 ⁸	<i>Parthenocissus tricuspidata</i> (Siebold & Zucc.) Planch.	<i>Vitaceae</i>	L	x			
2015 ⁸	<i>Passiflora caerulea</i> L.	<i>Passifloraceae</i>	N	x			
2008 ⁴	<i>Pelargonium capitatum</i> (L.) L'Hér.	<i>Geraniaceae</i>	N	x			
2008 ⁴	<i>Pelargonium peltatum</i> (L.) L'Hér.	<i>Geraniaceae</i>	N	x			
2008 ⁴	<i>Pelargonium zonale</i> (L.) L'Hér.	<i>Geraniaceae</i>	N	x			
1997 ²	<i>Petroselinum crispum</i> (Mill.) Fuss	<i>Apiaceae</i>	L		x		
1997 ²	<i>Phaseolus vulgaris</i> L.	<i>Fabaceae</i>	N		x		
2008 ⁴	<i>Phillyrea latifolia</i> L.	<i>Oleaceae</i>	H				x
1997 ²	<i>Phoenix dactylifera</i> L.	<i>Arecaceae</i>	N	x			
2008 ⁴	<i>Phytolacca dioica</i> L.	<i>Phytolaccaceae</i>	N	x			
2008 ⁴	<i>Pinus pinaster</i> Aiton	<i>Pinaceae</i>	L				x
1997 ²	<i>Pistacia vera</i> L.	<i>Anacardiaceae</i>	N		x		
2008 ⁴	<i>Platycladus orientalis</i> (L.) Franco	<i>Cupressaceae</i>	N	x			
2008 ⁴	<i>Plectranthus scutellarioides</i> (L.) R. Br. (= <i>Coleus blumei</i> Benth.)	<i>Lamiaceae</i>	N	x			
2015 ⁸	<i>Plumeria rubra</i> L.	<i>Apocynaceae</i>	N	x			
2008 ⁴	<i>Polygala myrtifolia</i> L.	<i>Polygalaceae</i>	L	x			
2008 ⁴	<i>Prunus armeniaca</i> L.	<i>Rosaceae</i>	N		x		
1997 ²	<i>Prunus avium</i> (L.) L.	<i>Rosaceae</i>	L		x		
2008 ⁴	<i>Prunus dulcis</i> (Mill.) D. A. Webb	<i>Rosaceae</i>	L		x		
1997 ²	<i>Prunus persica</i> (L.) Batsch	<i>Rosaceae</i>	N		x		

Year	Taxon	Family	Impact	Main purpose			
				ornam	alim	agr-era	for-hydr
2009 ⁵	<i>Punica granatum</i> L.	<i>Lythraceae</i>	L		x		
1997 ²	<i>Pyrostegia venusta</i> (Ker Gawl.) Miers	<i>Bignoniaceae</i>	N	x			
2001 ³	<i>Quercus ilex</i> L.	<i>Fagaceae</i>	M				x
2015 ⁸	<i>Quercus pubescens</i> Willd. s.l.	<i>Fagaceae</i>	N	x			
2009 ⁵	<i>Retama raetam</i> (Forssk.) Webb & Berthel. subsp. <i>raetam</i>	<i>Fabaceae</i>	M				x
2017 ¹⁰	<i>Robinia pseudoacacia</i> L.	<i>Fabaceae</i>	N	x			
2008 ⁴	<i>Rhaphiolepis umbellata</i> (Thunb.) Makino	<i>Rosaceae</i>	N	x			
1997 ²	<i>Rosa gallica</i> L.	<i>Rosaceae</i>	L	x			
1997 ²	<i>Rosmarinus officinalis</i> L.	<i>Lamiaceae</i>	M		x		
2015 ⁸	<i>Ruellia simplex</i> C. Wright	<i>Acanthaceae</i>	N	x			
2008 ⁴	<i>Sansevieria trifasciata</i> Prain	<i>Asparagaceae</i>	N	x			
2008 ⁴	<i>Schefflera arboricola</i> (Hayata) Merr.	<i>Araliaceae</i>	N	x			
2015 ⁸	<i>Selenicereus anthonyanus</i> (Alexander) D. R. Hunt	<i>Cactaceae</i>	N	x			
2015 ⁸	<i>Senecio angulatus</i> L. f.	<i>Asteraceae</i>	M	x			
2015 ⁸	<i>Senegalvia visco</i> (Lorentz ex Griseb.) Seigler & Ebinger	<i>Fabaceae</i>	L	x			
2015 ⁸	<i>Solandra maxima</i> (Sessé & Moc.) P. S. Green	<i>Solanaceae</i>	N	x			
1997 ²	<i>Solanum melongena</i> L.	<i>Solanaceae</i>	L		x		
1997 ²	<i>Solanum tuberosum</i> L.	<i>Solanaceae</i>	N		x		
2008 ⁴	<i>Stapelia grandiflora</i> Masson	<i>Apocynaceae</i>	N	x			
2008 ⁴	<i>Strelitzia reginae</i> Banks	<i>Strelitziaceae</i>	N	x			
until 1996 ¹	<i>Tamarix africana</i> Poir.	<i>Tamaricaceae</i>	H	x			
2010 ⁶	<i>Tecomaria capensis</i> (Thunb.) Spach	<i>Bignoniaceae</i>	L	x			
2015 ⁸	<i>Tradescantia pallida</i> (Rose) D. R. Hunt	<i>Commelinaceae</i>	L	x			
2008 ⁴	<i>Thuja occidentalis</i> L.	<i>Cupressaceae</i>	N	x			
1997 ²	<i>Vicia faba</i> L.	<i>Fabaceae</i>	N		x		
2008 ⁴	<i>Vicia lens</i> (L.) Coss. & Germ. (= <i>Lens culinaris</i> Medik.)	<i>Fabaceae</i>	N		x		
1997 ²	<i>Vigna unguiculata</i> (L.) Walp.	<i>Fabaceae</i>	N		x		
2013 ⁷	<i>Vitis</i> sp.	<i>Vitaceae</i>	L		x		
until 1996 ¹	<i>Vitis vinifera</i> L.	<i>Vitaceae</i>	N		x		
2008 ⁴	<i>Washingtonia filifera</i> (Linden ex André) H. Wendl. ex de Bary	<i>Arecaceae</i>	N	x			
2008 ⁴	<i>Washingtonia robusta</i> H. Wendl.	<i>Arecaceae</i>	N	x			

Year	Taxon	Family	Impact	Main purpose			
				ornam	alim	agr-era	for-hydr
2008 ⁴	<i>Yucca guatemalensis</i> Baker (= <i>Y. elephantipes</i> Regel ex Trel., nom. illeg.)	<i>Asparagaceae</i>	N	x			
2008 ⁴	<i>Yucca gloriosa</i> L.	<i>Asparagaceae</i>	N	x			
1997 ²	<i>Zea mays</i> L. subsp. <i>mays</i>	<i>Poaceae</i>	N		x		
1997 ²	<i>Zinnia elegans</i> Jacq.	<i>Asteraceae</i>	N	x			
Total				104	45	2	8

Table 3. Invasive status, potential impacts and ecological requirements of alien and native species of particular biogeographical and/or conservation interest (from La Mantia & al. 2009). **Status:** CAS = casual, NAT = naturalized, INV = invasive. **Impact:** H = high; M = medium; L = low; N = negligible. **Natural habitats** (habitat code according to Dir. 92/43 EEC): 1240 “Vegetated sea cliffs of the Mediterranean coasts with endemic *Limonium* spp.”; 5320 “Low formations of *Euphorbia* close to cliffs”; 5330 “Thermo-Mediterranean and pre-desert scrub”; 6220 “Pseudo-steppe with grasses and annuals of the *Thero-Brachypodietea*” (priority); 8220 “siliceous rocky slopes with chasmophytic vegetation”; 8320 “fields of lava and natural excavations”. **Land use subject to a ± pronounced form of anthropogenic disturbance** (Corine Biotopes code): 34.81 “sub-nitrophilous dry meadows and post-crop vegetation” (uncultivated lands); 82.3 “extensive herbaceous crops” (arable crops in dry and irrigated fields); 83.2 “shrubby orchards” (prickly pear and mixed orchards); 83.31 “artificial coniferous afforestation”; 86 “cities, villages and industrial sites” (e.g. piers, ports, roads); 86.2 “villages” (the town of Linosa); 86.3 “active industrial sites” (desalinator, lighthouse); 86.4 “industrial sites decommissioned” (the former quarries of inert landfill, etc.). **Main purpose:** ornam = ornamental; alim = alimentary; agr-cra = agricultural and/or craft; for-hydr = forestry or hydrology; no = species not intentionally introduced.

Parameter		Natural habitats						Land use subject to a ± pronounced form of anthropogenic disturbance						Main purpose						
		1240	5320	5330	6220*	8220	8320	34.81	82.3	83.2	83.31	86	86.2	86.3	86.4	ornam	alim	agr-cra	for-hydr	no
Status	No. CAS	0	1	3	0	1	1	8	5	0	2	9	18	0	1	20	4	1	2	1
	No. NAT	4	4	5	3	8	2	24	13	2	4	5	27	4	12	15	2	5	4	23
	No. INV	2	1	0	2	3	3	6	2	2	0	3	4	1	3	2	0	1	0	3
	Total	6	6	8	5	12	6	38	20	4	6	17	49	5	16	37	6	7	6	27
Impact	No. H	3	4	3	3	3	3	6	1	2	2	2	5	2	3	4	0	1	2	2
	No. M	2	1	3	1	1	1	7	9	1	3	5	11	2	7	5	1	2	3	6
	No. L	1	1	1	1	5	2	16	7	1	1	4	19	1	6	17	2	3	2	7
	No. N	0	0	1	0	3	0	6	10	0	0	5	14	1	0	11	3	0	0	12
No. of native taxa of conservation and biogeographic interest		8	25	28	40	10	14	22	13	10	0	2	2	2	8					

Willdenowia

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