The alien flora of terrestrial and marine ecosystems of Rodos island (SE Aegean), Greece

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Abstract

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The alien flora of the Greek island of Rodos (SE Aegean) is presented. This study is based on fieldwork carried out by the author up to June 2015, as well as on the literature found to date. The present checklist consists of 101 alien taxa of vascular plants, of which 27 are recorded for the first time as new for the alien flora of Rodos. Of these, 14 are also new for the alien flora of Greece. Of these, seven are naturalized: *Austrocylindropuntia subulata*, *Erythrina lysistemon*, *Ficus microcarpa*, *Myoporum tenuifolium*, *Senecio angulatus*, *Washingtonia filifera* and *Yucca gloriosa*; and seven are casual: *Bauhinia variegata*, *Brachychiton populneus*, *Hibiscus rosa-sinensis*, *Jacaranda mimosifolia*, *Pittosporum tobira*, *Thevetia peruviana* and *Phymosia umbellata.* The last taxon is also recorded as a new for the alien flora of Europe. In addition, 13 alien taxa of marine algae are recorded. Each taxon is listed with its status (naturalized or casual, neophyte or archaeophyte), as well as its geographical origin. For each of the 27 taxa recorded as new for Rodos, localities and dates of field observations are provided, as well as a voucher specimen and at least one voucher photograph for each taxon. The modes of introduction of alien taxa to Rodos and their modes of dispersal within the island, as well as the invasion success and effects of invasive alien taxa, are discussed. The numbers of alien taxa in Rodos and other areas in the Mediterranean region are compared.

Additional key words: casual, checklist, Dodekanisos, invasive, marine algae, Mediterranean, naturalized, Rhodes, vascular plants

Introduction

Studies on the flora of an area, specifically the introduction and the process of naturalization of alien species, are of interest with regard to the dynamics and distributional structure of flora and vegetation on the one hand, and to the administration and conservation of nature and agriculture on the other (Georgiadis 1994).

Plants alien to Europe are considered to be those introduced (non-native) taxa whose presence in an area is due to intentional or unintentional human involvement. In the case where an alien taxon is able to occasionally reproduce outside of cultivation, but eventually dies out because it is unable to form a self-replacing population, it is considered as casual. This is in contrast to a naturalized alien taxon, which is capable of reproducing self-sustaining populations for a long period, by seeds or vegetatively, without or in spite of human intervention, enough to experience climate changes in the area where it exists (Lambdon & al. 2008).

According to the DAISIE Database (DAISIE), 6658 terrestrial plant species are at present classified as aliens in Europe, whereas more than six new alien taxa are arriving each year in the European continent and are considered capable of becoming established (Pyšek & al. 2009).

The alien flora of Greece amounts to 272 taxa, of which 250 are considered as permanently established in the country (Dimopoulos & al. 2013). Mediterranean islands, of which Rodos is one, are suitable as model systems for research on invasive aliens due to their species diversity, their long history of introduced species, as well as their having been subject to extensive floristic inves-

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tigations (Lloret & al. 2005). The present study, which was completed in June 2015, is based on the literature found to date, as well as field investigations carried out by the author and other researchers on the island. The online databases Encyclopedia of Life (http://www.eol.org), Euro+Med PlantBase (Euro+Med 2006+) and Med-Checklist (http://ww2.bgbm.org/mcl/home.asp) were consulted with respect to the distribution of taxa in Europe. Knowledge of the alien flora of Rodos before this study was based mainly on Carlström's (1987) research, which the author has taken into consideration, and in which 101 alien species, 1127 native species and 134 doubtful records, making a total of 1362 species, were included. Another study on the alien flora of Rodos is that of Chilton (2003), which is based to a very great extent on Carlström's checklist and includes 102 alien species, of which 84 were considered as accepted, ten as probably introduced and eight as uncertain records. Lastly, according to the recently published floristic catalogue of the island by Authier & Covillot (2011), the native flora of Rodos amounts to 1257 taxa and the alien flora amounts to 84 taxa. The aim of the present study is to present the first complete list of the alien flora of Rodos since Carlström's (1987) survey, taking into consideration the new findings that have been recorded since then and clarifying the naturalization status and distribution of each taxon.

Material and methods

Rodos (Rhodes) is the largest of the Dodekanisos islands located in the SE Aegean region (28°05'N, 36°24'E) NE of Saria and Karpathos and SE of Tilos and Simi islands (Fig. 1) at a crossroads between SE Europe, SW Asia and NE Africa. The island covers a total area of 1400.68 km^2, is 79.7 km long and 38 km wide and has a coastline of c. 220 km. Its principal town is Rodos located at the northern tip of the island, while its highest mountains are Ataviros (1215 m), Akramitis (821 m) and Profitis Ilias (798 m). The climate of the island is semi-arid Mediterranean, with a short, mild and wet winter, followed by a long, hot and dry summer, according to the climatic diagrams of the Hellenic National Meteorological Service (http://www.hnms.gr). The vegetation of the island consists mainly of woodlands with coniferous, deciduous and sclerophyllous forest species, scrublands with phrygana, macchie and thickets, dry and damp grasslands, sandy and rocky seashores, as well as a vegetation of limestone cliffs (Carlström 1987). The agriculture in Rodos is mainly based on oil, cereal, vegetable and fruit-tree crops, as well as on viticulture.

Concerning the determination of the naturalization-invasion status of the alien taxa of Rodos, this study took into account the definitions proposed by Pyšek & al. (2004). According to those authors, aliens that form self-replacing populations without human intervention for a period of at least ten years despite all possible negative effects such as climatic extremes, pathogens, etc. are *naturalized*. Taxa that form self-replacing populations for a long period but then disappear are regarded as *casual*. Taxa such as planted trees that persist in the areas where they were planted after cultivation has ceased are considered as either casual (when unable to form sustainable populations) or naturalized (when able to form sustainable populations in at least one site). Furthermore, a taxon is considered as naturalized when it has overcome the three main barriers, i.e. geographical, environmental, and reproductive, that control introduction, establishment and naturalization (Richardson & al. 2000; Krigas & Dardiotis 2008). Every taxon recorded in the present study fulfils the condition that it was found in at least one wild locality on the island. Taxonomy and nomenclature mostly follow Dimopoulos & al. (2013) or Tutin & al. (1964–1980), for the vascular plants, and AlgaeBase (Guiry & Guiry 2008) and Zenetos & al. (2009), for the marine algae.

Life-form categories, discussed under Results, are according to the system of Raunkiaer (1934), which includes phanerophytes, chamaephytes, hemicryptophytes, geophytes, therophytes and aquatics. Authors of plant names are not cited in the Results and Discussion if they appear in the Checklist. Voucher specimens for all 27 alien taxa, both naturalized and casual, recorded here for the first time from the island of Rodos, were collected by the author under license from the General Secretariat of the Ministry of Reconstruction, of Production, Environment and Energy, reference number 124400/2051, and are deposited in the author's personal herbarium. In addition, voucher photographs are provided in Fig. 2–6.

Results

The alien flora of Rodos comprises 114 taxa of vascular plants and marine algae belonging to 91 genera and 55 families. Of these, 99 taxa are angiosperms (of which 24 are monocots), two are gymnosperms and 13 are marine algae. Of the 101 vascular plant taxa, 78 are naturalized and 23 are casual; the majority are neophytes (85) but also there is a significant presence of archaeophytes (16). In relation to the Greek alien vascular plant flora as a whole (272 taxa; Dimopoulos & al. 2013), the 101 taxa on Rodos represent 37.1 %. The majority are herbaceous (59 taxa), followed by trees (26 taxa), shrubs (15 taxa) and one marine taxon (*Halophila stipulacea*). Phanerophytes are the most representative life form with 46 taxa, followed by 26 therophytes, 13 geophytes, nine hemicryptophytes, three chamaephytes, two aquatics, one hemicryptophyte/therophyte and one chamaephyte/hemicryptophyte. Of the 13 marine algae, seven are naturalized, six are casual and all are neophytes. The most common geographical origins are American with 24 taxa, Asian with 17 taxa, Mediterranean with 12 taxa and African with ten taxa. In total 27 vascular plants are recorded for the first time as new for the alien flora of Rodos, of

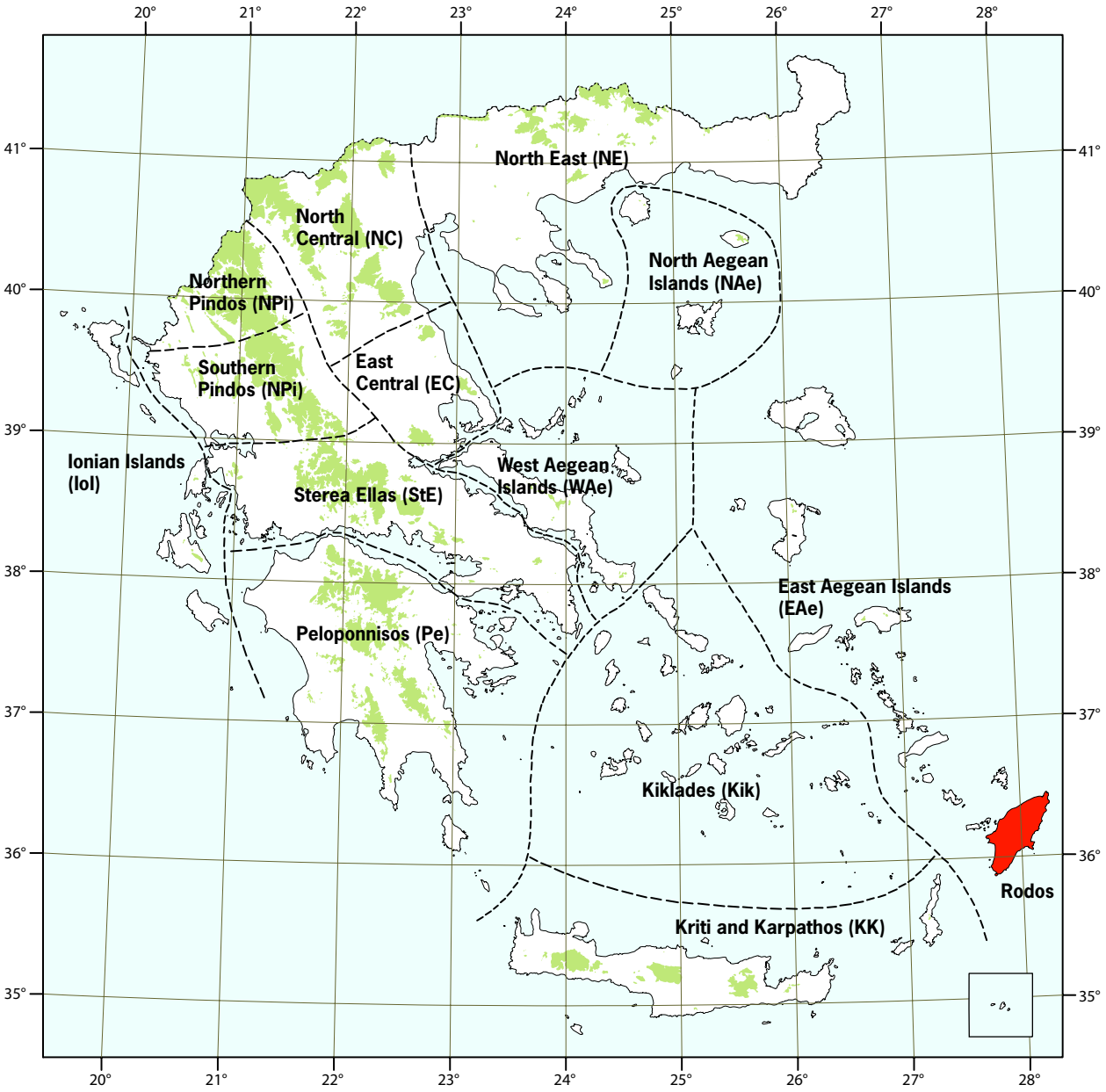

Fig. 1. The floristic regions of Greece (from Dimopoulos & al. 2013) showing the position of Rodos in the SE Aegean.

which 15 are considered as naturalized and 12 as casual, and 26 are neophytes and one is an archaeophyte. Of these 27 taxa, 14 (seven naturalized and seven casual) are new for the alien flora of Greece, of which one is also a new (casual) taxon for the alien flora of Europe.

The figure of 78 naturalized alien vascular plant taxa recorded by the present research shows in less than 30 years an increase of 95 % from the previous survey of Carlström (1987), in which 40 naturalized vascular plant taxa were mentioned. At the same time, nine taxa of the 29 most widespread naturalized alien taxa in Europe (Pyšek & al. 2009) occur on the island and are considered as naturalized.

Dimopoulos & al. (2013) listed 272 naturalized alien vascular plant taxa from Greece. Among the five floristic regions they recognized in the Aegean Sea (Fig. 1), the region East Aegean Islands, to which the island of Rodos belongs, is the richest, with 147 such taxa (54 % of the total in Greece), followed by Kriti and Karpathos with 128 taxa (47 %), Kiklades with 85 taxa (31.2 %), North Aegean Islands with 80 taxa (29.4 %) and West Aegean Islands with 70 taxa (25.7 %). The figure of 78 naturalized alien vascular plant taxa in Rodos corresponds to 53 % of those in the East Aegean Islands region.

Of the 53 invasive naturalized taxa of the alien flora of Greece (51 neophytes and two archaeophytes) recorded by Arianoutsou & al. (2010), 30 are present in Rodos; 28 of these are neophytes, of which 25 are naturalized and three are casual, and two are archaeophytes, which are naturalized and very common on the island.

The present checklist includes 14 marine alien taxa, of which eight (one vascular plant and seven algae) are naturalized and six (all algae) are casual (Tsiamis & Panayotidis 2007; Tsiamis & al. 2007, 2010, 2011; Zenetos & al. 2009, 2011; Pancucci-Papadopoulou & al. 2011; Tsiamis & Verlaque 2011; Tsiamis, pers. comm., 2015). The marine algae *Asparagopsis taxiformis* and *Caulerpa cylindracea* and the marine angiosperm *Halophila stipulacea* belong to the nine most invasive marine macrophytes listed for the Mediterranean Sea by Zenetos & al. (2009).

The mode of introduction cannot be assessed for the whole alien flora of Rodos. However, information provided by the Municipal Service of Environmental Protection (MSEP) of Rodos, heads of privately owned nurseries and elder inhabitants (pers. comm.) suggests that most aliens have been introduced intentionally to the island for ornamental and agricultural purposes, whereas others have been introduced accidentally by humans, as contaminants of crop seeds or as propagules mainly through the trade and use of agricultural products such as seeds, feeds, etc. The predominant dispersal mechanism of the alien taxa within the island is zoochory, via the digestive systems or hair of animals or by the hoarding of fruits or seeds. On Rodos, besides stray or farm goats, 27 mammal species have been recorded in the wild, of which 15 are non-flying terrestrial species and 12 are bats (Massetti 2002). In addition, Rodos presents a particular ornithological interest because of its geographical position in the middle of a significant bird-migration route from N Europe to Africa and vice versa. About 250 bird species are found on the island, of which more than 50 species are resident, while approximately 200 species are visitors during the migration (Massetti 2002). *Carpobrotus edulis*, *Ficus microcarpa*, *Lantana camara*, *Melia azedarach*, *Morus alba*, *Opuntia ficus-indica*, *Phoenix dactylifera*, *Ricinus communis* and *Washingtonia filifera* were observed either by the author or by other persons such as hunters and farmers (pers. comm.) to be dispersed through the consumption of fruits or seeds by birds, bats or rodents. *Dactyloctenium aegyptium*, *Ricinus communis* and *Xanthium orientale* subsp. *italicum* are mainly dispersed through the transportation of seeds by animals, e.g. goats (Georgiadis 1994). Another dispersal mechanism of seeds is anemochory, as occurs in *Agave americana*, *Antirrhinum majus*, *Arundo donax*, *Erigeron bonariensis*, *E. canadensis*, *Mirabilis jalapa*, *Nicotiana glauca*, *Pinus halepensis*, *P. pinea* and *Symphyotrichum squamatum* (Georgiadis 1994). Wind may cause fruits and seeds to fall nearby the parent plants in such species as *Agave americana*, *Bauhinia variegata*, *Erythrina lysistemon*, *Phytolacca americana*, *Pinus pinea* and *Robinia pseudoacacia* (Georgiadis 1994; pers. obs.). Hydrochory occurs in *Amaranthus* spp., *Cyperus involucratus* and *Ricinus communis* (Georgiadis 1994; pers. obs.). Anthropochory occurs in some species of *Poaceae*, which may be dispersed through the trade of cereal crops (Georgiadis 1994). For several of the taxa, more than one dispersal mode is functional, while it is of particular interest that zoochory and/or anemochory allows a taxon to have better access to more habitats, thus multiplying its chances of becoming established (Arianoutsou & al. 2010).

The majority of the aliens occur in artificial and ruderal habitats, such as agricultural and residential environments (fields, abandoned and disturbed sites, in ditches along roads, in crevices of roadsides, walls and sidewalks, parks), coastal habitats, as well as in water-related habitats, e.g. streams and rivers. In contrast, natural habitats, such as woodlands and higher sites on mountains, do not promote colonization by aliens.

Discussion

The introduction and establishment of alien plants in natural or semi-natural ecosystems constitutes one of the most important determinants of change, and to some extent even of threat, to the native biodiversity (Vitousek & al. 1997; Ruiz & Carlton 2003). Natural ecosystems of the Mediterranean islands are especially vulnerable to plant invasions, and such factors as intensity of human disturbance, climate change, breaking up of natural habitats and expansion of urban areas greatly increase the range size and invasiveness of alien species (Yannitsaros & Economidou 1974; Vilà & al. 2004; Krigas & Dardiotis 2008; Podda & al. 2012). Extensive agricultural activities, particularly methods of extension, management and protection of arable lands (in order to ensure and enhance production), e.g. large-scale monocultures, irrigation, and use of herbicides, pesticides and fertilizers, promote and facilitate the establishment of alien plants, whereas the trade and transport of agricultural or livestock products (e.g. cereals or forage) has been found to play an important role in the introduction of invasive weeds (Georgiadis 1994). Abandoned and disturbed habitats are considered as ideal for the gradual spread of the aliens, which through the lack of strong competition with other native plants species channel their energy into reproductive mechanisms (Georgiadis 1994).

Efforts have not yet been conducted to discriminate naturalized invasive and naturalized non-invasive taxa on Rodos. However, the natural ecosystem of Rodos seems not to be endangered by the invasion of alien species at present because most aliens are not currently showing invasiveness. In this context, it is interesting to consider the European invasion map by Chytrý & al. (2009), which presents the levels of invasion by alien neophytes in Europe and shows that the high levels of invasion in the Mediterranean region are observed on its coastline. Specifically for Rodos, this level ranged around 1 % for most parts of the island, while a higher rate, but under 5 %, was observed in the coastal areas of the island (Chytrý & al. 2009). Indeed, as confirmed by the author's own

field investigations, the area defined by the sites of Rodos town in the north to Kalavarda village in the west, as well as the eastern coastlines of the island, is regarded as an area of intense tourism development and of other human activity, and where the whole alien flora of Rodos can be found, and all the habitat categories, i.e. residential, agricultural and ruderal habitats, phrygana and grasslands, water-related habitats (both freshwater and marine), woodlands and scrublands.

As observed by the author, some species possess competitive abilities and can potentially cause loss of native biodiversity. For example, the presence of *Agave americana*, *Arundo donax*, *Carpobrotus edulis*, *Ipomoea indica*, *Lantana camara* and *Oxalis pes-caprae* is often associated with a decrease in the abundance of the native flora. In this context it is essential to note that *Arundo donax* and *Lantana camara* are rated as two of the 100 of the world's worst invasive alien species (Lowe & al. 2004). Some other species, e.g. *Acacia saligna* and *Ailanthus altissima*, induce changes in soil chemistry, increasing total nitrogen and organic carbon content, as well as soil pH (Hadjichambis & Della 2007; Scalera & al. 2012). *Agave americana* and *Carpobrotus edulis* compete aggressively with native plant species for nutrients, water, light and space, forming impenetrable and monodominant mats on coastal cliffs and dunes, sometimes covering large areas and reducing local biodiversity (Scalera & al. 2012). Likewise, *Oxalis pes-caprae* adversely affects the growth of rare native species, such as orchids and other geophytes, as it forms monodominant mats in all types of habitats (Arianoutsou & al. 2010). Some of the most abundant alien taxa on Rodos are *Agave americana*, *Amaranthus* spp., *Arundo donax*, *Erigeron bonariensis*, *Eucalyptus camaldulensis*, *Ipomoea indica*, *Melia azedarach*, *Nicotiana glauca*, *Opuntia ficus-indica*, *Oxalis pes-caprae*, *Ricinus communis* and *Xanthium orientale* subsp. *italicum* (Carlström 1987; author's field investigations).

Bauhinia variegata, *Erythrina lysistemon*, *Eucalyptus camaldulensis*, *Ficus microcarpa*, *Melia azedarach*, *Morus* spp., *Phytolacca dioica*, *Pinus pinea* and *Washingtonia filifera* were introduced in the early 20th century during the Italian occupation of the island (1912–1947) as ornamentals in urban and suburban places, where the parent plants currently still exist. *Justicia adhatoda* and *Phymosia umbellata* are considered to be casual, rather than naturalized, because of the uncertain degree of their forming self-replacing populations, even though the parent plants have persisted for more than 35–40 years in the urban areas where they were planted (Chimarras Str., Ethnikis Antistasis Str., Papagou Str., Rodini) and have already fulfilled several life cycles. Carlström (1987) considered plants of *Lilium candidum* L. on Rodos to be probably only escapes from cultivation. Indeed, cultivated plants have been found occasionally in Kritinia village by the author. However, after extensive fieldwork and taking into account personal testimonies of local people, native populations were found also on barely accessible calcareous slopes near the village of Archipoli. Therefore this species considered as native to Rodos and is accordingly excluded from this checklist. Studies carried out in other Mediterranean islands with climates, habitats and alien taxa similar to those of Rodos confirm that reproductive and vegetative attributes are related to alien taxon abundance. Specifically, as argued by Lloret & al. (2005), vegetative traits such as longevity, vegetative propagation, leaf size, growth form, height and succulence, as well as reproductive traits such as flowering span, reproduction and pollination types, fruit type, seed size and dispersal modes, affect and determine significantly the invasion success of alien species. In this context, some species on Rodos were found to bloom earlier or for more months of the year, a fact that potentially affects the extending of the reproductive period of these species, e.g. *Nothoscordum gracile* was observed to flower in December in the area of Mandraki near the marina; *Ipomoea indica* and *Nicotiana glauca* were found to flower for 12 months of the year; *Myoporum tenuifolium*, *Thevetia peruviana* and *Yucca gloriosa* were found to flower for 8–10 months of the year; *Oxalis pes-caprae* and *Zantedeschia aethiopica* were found to flower from December. Some other species form impenetrable barriers of thorns or spines to discourage herbivores, thereby contributing to their reproduction: *Agave americana*, *Austrocylindropuntia subulata*, *Erythrina lysistemon*, *Opuntia ficus-indica*, *Pyracantha coccinea*, *Robinia pseudoacacia* and *Yucca gloriosa*. Others species are toxic to humans or livestock: *Erythrina lysistemon*, *Lantana camara*, *Nicotiana glauca*, *Phalaris canariensis*, *Prunus dulcis*, *Ricinus communis*, *Thevetia peruviana*, as well as species of *Euphorbia*, *Narcissus*, *Phytolacca*, *Robinia*, *Xanthium* and *Zantedeschia* (Wink 2009).

All taxa listed here, whether naturalized or casual, as well as the cultivated taxa, are recommended for monitoring so as to ascertain their invasiveness, as a future spread is possible, mainly in urban, abandoned and coastal areas of the island.

The alien floras of Rodos and other areas of the Mediterranean basin are compared in Table 1 in order to demonstrate the abundance and naturalization success of alien taxa in each area. Specifically, the total number of naturalized alien taxa and the land area in km^2 are shown for the Greek island of Kriti (Crete), the other Mediterranean islands of Corsica, Cyprus, Mallorca, Malta and Sardinia, as well as Egypt.

Checklist

Each taxon is given with details concerning its family, name, authorship, naturalization status: naturalized (N) or casual (C), residence status: archaeophyte (arch) if a taxon was introduced to the region up to 1500 C.E. or neophyte (neo) if it was introduced to the region after 1500

C.E. (Arianoutsou & al. 2010), as well as its geographical origin. First records for Rodos made in the present study by the author are indicated with an asterisk (*); in these cases, localities and dates of field observations are cited, with references to voucher photographs (Fig. 2–6) and herbarium specimens deposited in the author's personal herbarium ("herb. Galanos"). All cited field observations are by the author. New records by other researchers that were reconfirmed by the author are indicated with "A&C 2011" (Authier & Covillot 2011) or "H&S 2014" (Hassler & Schmitt 2014).

Table 1. Comparative analysis of Rodos and other regions in the Mediterranean: area and number of naturalized alien vascular plant taxa.

Region	Area [km^2]	Naturalized alien vascular plant taxa	Source of data
Rodos	1401	78	present study
Kriti	8700	91	Dal Cin D'Agata & al. (2009)
Cyprus	9251	125	Hand & al. (2015+)
Egypt	1 001 450	86	Vitousek & al. (1997)
Malta	246	83	Lloret & al. (2005)
Corsica	8748	166	Jeanmonod & al. (2011)
Sardinia	24 090	218	Podda & al. (2012)
Mallorca	3656	119	Lloret & al. (2005)

Vascular plants

Acanthaceae

**Justicia adhatoda* L., C, neo, S Asia. – According to the DAISIE Database, *J. adhatoda* is not established in Europe. – Rodini, 36°25'37"N, 28°13'14"E, 40 m, shady place along stream banks, 20 May 2012; Rodini, 36°25'38"N, 28°13'15"E, 45 m, 20 May 2012 (Fig. 6D); Rodos town, along Papagou Str., 36°26'50"N, 28°13'22"E, 20 m, grassland, 16 Apr 2014; Rodos town, Filikis Eterias Square and Chimarras Str., 36°26'33"N, 28°13'13"E, 35 m, grassland, 6 Sep 2012, *Ch. Galanos 023* (herb. Galanos) (Fig. 6C).

Agavaceae

Agave americana L., N, neo, C Amer.

**Yucca gloriosa* L., N, neo, Amer. – Not previously recorded from Greece regardless of status (established or not). According to the DAISIE Database, *Y. gloriosa* is established in Great Britain. Spontaneous plants were observed to be established very well, mainly in streams, coastal habitats, along forest roads and abandoned sites. – Ilioupoli area, 36°24'48"N, 28°12'20"E, 80 m, stream margins, 7 Jun 2011, 22 Oct 2014 (Fig. 4I); near Pastida village, 36°23'35"N, 28°08'52"E, 85 m, *Pinus* forest clearing, 28 Dec 2014; Kallithies to Pastida road, 36°22'48"N, 28°08'29"E, 60 m, dry grassland along roadside, 2 Jun 2015, *Ch. Galanos 014* (herb. Galanos) (Fig. 4J).

Aizoaceae

Carpobrotus edulis (L.) N. E. Br. var. *edulis*, N, neo, S Africa.

Carpobrotus edulis var. *rubescens* Druce, N, neo, S Africa, H&S 2014.

Alliaceae

**Nothoscordum gracile* (Aiton) Stearn, N, neo, Neosubtrop., Neotrop. – Extended populations of *N. gracile* were found to be very well established in several urban sites of Rodos town, usually around the roots of trees, such as *Ficus microcarpa* and *Platanus orientalis* L., as well as on roadsides and in open grasslands. – Mandraki, 36°26'57"N, 28°13'30"E, 5 m, near roots of *Ficus microcarpa*, 6 Dec 2014 (Fig. 3J); Mandraki, 36°26'49"N, 28°13'31"E, 14 Dec 2014; Rodini, 36°25'35"N, 28°13'14"E, 40 m, under trees, 20 May 2012 (Fig. 3L); Rodos town, along Canada Str., 36°26'17"N, 28°14'01"E, 10 m, under trees on sidewalks, 5 May 2013 (Fig. 3K); Kremasti, 36°24'41"N, 28°07'11"E, 10 m, grassland, 12 May 2015, *Ch. Galanos 010* (herb. Galanos).

Amaranthaceae

Amaranthus albus L., N, neo, N Amer.

Amaranthus blitoides S. Watson, N, neo, N Amer.

**Amaranthus cruentus* L., N, neo, Neotrop. – Spontaneous plants of *A. cruentus* were found along roadsides, in dry grasslands and next to streams in the Ixia, Lindos, Psinthos, Rodos town and Stegna areas. – Ixia area, 36°25'06"N, 28°10'42"E, 5 m, in crevices of roadside, 17 Nov 2014, *Ch. Galanos 001* (herb. Galanos) (Fig. 2A); Lindos, 36°05'24"N, 28°05'02"E, 65 m, dry grassland, 11 Jun 2015; Rodos town, Damaskinou Str., 36°26'07"N, 28°13'46"E, 15 m, in roadside crevices under *Melia azedarach* roots, 10 Jan 2015; Stegna, 36°12'38"N, 28°08'28"E, 5 m, next to river bank, 17 Nov 2014 (Fig. 2B); Psinthos, 36°18'45"N, 28°05'47"E, 260 m, in streams and grasslands, 30 Dec 2014.

Amaranthus retroflexus L., N, neo, N Amer.

Amaranthus viridis L., N, neo, S Amer.

Chenopodium giganteum D. Don, N, neo, Pantrop., H&S 2014.

Dysphania ambrosioides (L.) Mosyakin & Clemants, N, neo, Neotrop., H&S 2014.

Amaryllidaceae

**Narcissus papyraceus* Ker Gawl., N, neo, Medit. – Established populations of *N. papyraceus* were observed in forest clearings with phrygana and grasslands in the Maritsa and Pefkakia areas. This species

Fig. 2. Naturalized taxa. See Checklist for localities and dates. – A, B: *Amaranthus cruentus* (*Amaranthaceae*); C, D: *Austrocylindropuntia subulata* (*Cactaceae*); E, F: *Bidens pilosa* (*Asteraceae*); G, H: *Erythrina lysistemon* (*Fabaceae*); I–K: *Ficus microcarpa* (*Moraceae*); L: *Freesia leichtlinii* subsp. *alba* (*Iridaceae*). – All photographs by Ch. J. Galanos.

Fig. 3. Naturalized taxa. See Checklist for localities and dates. – A: *Freesia leichtlinii* subsp. *alba* (*Iridaceae*); B, C: *Lantana camara* (*Verbenaceae*); D–G: *Myoporum tenuifolium* (*Scrophulariaceae*); H, I: *Narcissus papyraceus* (*Amaryllidaceae*); J–L: *Nothoscordum gracile* (*Alliaceae*). – All photographs by Ch. J. Galanos.

Fig. 4. Naturalized taxa. See Checklist for localities and dates. – A–C: *Senecio angulatus* (*Asteraceae*); D–E: *Tropaeolum majus* (*Tropaeolaceae*); F–H: *Washingtonia filifera* (*Arecaceae*); I, J: *Yucca gloriosa* (*Agavaceae*); K, L: *Zantedeschia aethiopica* (*Araceae*). – All photographs by Ch. J. Galanos.

is here recorded for the first time from the Aegean region; A. Strid (pers. comm. 2015) remarked that so far in Greece there are a few records of *N. papyraceus* from the Ionian Islands and from the Asprovalta area (Thessaloniki, N Greece), which presumably all concern naturalized plants. – Pefkakia area, 36°25'16"N, 28°12'53"E, 70 m, in forest clearing with phrygana, orchids and other bulbous plants, 16 Jan 2015, *Ch. Galanos 009* (herb. Galanos) (Fig. 3H, I); near Maritsa village, 36°22'19"N, 28°06'58"E, 70 m, open field with *Arundo donax* and *Olea europaea*, 12 Jan 2015.

Narcissus tazetta subsp. *aureus* (Loisel.) Baker, N, neo, N & E Medit.

Apiaceae

Anethum graveolens L., C, arch, SW Asia.

Apocynaceae

Asclepias fruticosa L., C, neo, S Africa.

**Thevetia peruviana* (Pers.) K. Schum., C, neo, C Amer., Mexico. – Not previously recorded from Greece regardless of status (established or not). According to the DAISIE Database, *T. peruviana* is not established in Europe. – Ixia area, 36°25'07"N, 28°10'55"E, 8 m, along roadside, 20 Sep 2014 (Fig. 6K, L); Rodos town, Zefiros area along Charalambou Mouscou Str., 36°25'56"N, 28°14'02"E, 7 m, along roadside, 10 May 2014; Pastida square, 36°23'18"N, 28°08'06"E, 45 m, 12 Oct 2014, *Ch. Galanos 027* (herb. Galanos).

Araceae

**Zantedeschia aethiopica* (L.) Spreng., N, neo, S Africa. – Spontaneous populations of *Z. aethiopica* were found to be established as well as to have developed an invasive behaviour mainly in *Pinus* forest clearings, abandoned sites such as old houses and along roadsides. – Megavli, 36°24'35"N, 28°11'19"E, 120 m, *Pinus* forest clearing, 14 Feb 2015, *Ch. Galanos 015* (herb. Galanos) (Fig. 4K); Rodos town, Papalouka Str., 36°26'49"N, 28°13'05"E, 40 m, abandoned site in association with *Ailanthus altissima* and *Ricinus communis*, 8 May 2013; Rodos town, Delmouzou Str., 36°25'03"N, 28°12'54"E, 90 m, open field, 10 Apr 2015 (Fig. 4L); Kallithea, 36°23'21"N, 28°14'05"E, 50 m, *Pinus* forest clearing in association with populations of *Arum dioscoridis* Sm., 28 Dec 2014.

Arecaceae

Phoenix dactylifera L., C, neo, Paleosubtrop.

**Washingtonia filifera* (Linden ex André) H. Wendl. ex S. Watson, N, neo, N Amer. – Not previously recorded from Greece regardless of status (established or not). According to the DAISIE Database, *W. filifera* is established in Cyprus, Italy, Madeira, Sicily and Spain. Recorded also from Kriti by Ardenghi & Cauzzi (in Raab-Straube & Raus 2015). Spontaneous plants were found next to parent plants in residential and agricultural sites, but also young individuals were found in ruderal habitats, road crevices, ditches, seashores and streams. The birds *Corvus corone* L. and *Passer domesticus* L. were observed to visit the pendulous infructescences of the trees and consume and carry seeds, contributing to the dispersal of the species. – Faliraki, 36°20'51"N, 28°12'19"E, 5 m, along coastline, 16 Jun 2015 (Fig. 4G); Rodos town, K. Paleologou Str., 36°26'10"N, 28°13'22"E, 35 m, road crevices, 12 Jun 2015; Ialisos, Mikinon Str., 36°25'14"N, 28°09'19"E, 5 m, road crevices, 8 Jun 2015 (Fig. 4H); Afandou area, 36°17'22"N, 28°10'01"E, 20 m, dry grassland near parent plant along roadside, 22 Oct 2014, *Ch. Galanos 013* (herb. Galanos) (Fig. 4F).

Asteraceae

**Bidens pilosa* L., N, neo, Cosmop. – Spontaneous populations of *B. pilosa* were observed to be very well established on roadsides and ditches in the areas of Paradissi and Kritika. This species is here recorded for the first time from the Aegean region; A. Strid (pers. comm. 2015) remarked that *Bidens pilosa* has so far been found in Greece as an established alien only around Patra (Peloponnisos), but is maybe spreading in the Aegean area. – Paradissi area, 36°23'29"N, 28°03'24"E, near sea level, along roadside, 29 Dec 2014, *Ch. Galanos 003* (herb. Galanos) (Fig. 2E, F); Paradissi area, 36°23'29"N, 28°03'19"E, 8 m, 29 Dec 2014; Paradissi area, 36°23'30"N, 28°03'22"E, 8 m, in crevices of asphalt along roadside, 29 Dec 2014; Kritika area, 36°26'24"N, 28°12'23"E, 8 m, crevices of roadside, 13 Nov 2013.

Eclipta prostrata (L.) L., N, neo, Neotrop.

Erigeron bonariensis L., N, neo, Neotrop.

Erigeron canadensis L., N, neo, N Amer.

**Senecio angulatus* L. f., N, neo, S Africa. – Not previously recorded from Greece regardless of status (established or not). According to the DAISIE Database, *S. angulatus* is established in the Balearic islands, Corsica, France, Italy, Sicily and Spain. Spontaneous plants of *S. angulatus* were found to be established and to have developed an invasive behaviour in abandoned sites, dry grasslands, next to streams and along roadsides in Acropolis of Rodos, Kato Rodini and Profitis Ilias. – Apollona village, 36°15'40"N, 27°58'24"E, 300 m, on rocky slopes of Profitis Ilias mountain, 16 Jan 2015 (Fig. 4B, C); near Acropolis of Rodos, 36°26'34"N, 28°12'44"E, 70 m, dry grasslands, 24 Nov 2014 (Fig. 4A); Kato Rodini, Kallipatiras Str., 36°25'08"N, 28°13'37"E, 20 m, stream margins, 27 Jan 2015, *Ch. Galanos 011* (herb. Galanos).

Symphyotrichum squamatum (Spreng.) G. L. Nesom, N, neo, Neotrop.

Xanthium orientale subsp. *italicum* (Moretti) Greuter, N, neo, S Europe.

Xanthium spinosum L., C, neo, S Amer.

Bignoniaceae

**Jacaranda mimosifolia* D. Don, C, neo, S Amer. – Not previously recorded from Greece regardless of status (established or not). According to the DAISIE Database, *J. mimosifolia* is established in Madeira and Spain. – Kato Rodini, Vrixellon Str. 36°25'16"N, 28°13'04"E, 73 m; Rodos town, Zefiros area along Charalambou Mouscou Str., 36°25'56"N, 28°14'01"E, 8 m, along roadsides, 10 May 2014, *Ch. Galanos 022* (herb. Galanos) (Fig. 6B); as well as either planted or casual on roadsides in other urban and suburban areas of the island.

Brassicaceae

Lobularia maritima (L.) Desv., N, neo, Medit.

Matthiola incana (L.) R. Br., N, arch, Europe, Medit.

Cactaceae

**Austrocylindropuntia subulata* (Mühlenpf.) Backeb., N, neo, S Amer. – Not previously recorded from Greece regardless of status (established or not). According to the DAISIE Database, *A. subulata* is established in Italy, Sardinia, Sicily and Spain. Spontaneous plants of *A. subulata* were found near parent plants in dry grasslands and open fields in the areas of Acropolis of Rodos, Maritsa and Trianta. – Acropolis of Rodos, near Nympheon area, 36°26'34"N, 28°12'44"E, 70 m, dry rocky habitat along roadside, 19 Nov 2014, *Ch. Galanos 002* (herb. Galanos) (Fig. 2C, D); near Maritsa village, 36°21'50"N, 28°07'02"E, 90 m, dry grassland near the settlement, 12 Jan 2015; Trianta area, 36°25'08"N, 28°09'30"E, 5 m, open field along roadside, 4 Dec 2014.

Opuntia ficus-indica (L.) Mill., N, neo, Neotrop.

Caesalpiniaceae

**Bauhinia variegata* L., C, neo, SE Asia. – Not previously recorded from Greece regardless of status (established or not). According to the DAISIE Database, *B. variegata* is established in Madeira. – Rodos town, Simis Square near port, 36°26'45"N, 28°13'38"E, 8 m, along roadside, 25 Feb 2013 (Fig. 5C); near bridge of Afandou, 36°17'21"N, 28°10'01"E, 20 m, along roadsides, 12 Apr 2014, *Ch. Galanos 017* (herb. Galanos) (Fig. 5D, E); Rodos town, Diagoridon Str., 36°26'27"N, 28°13'09"E, 45 m, roadside, 20 Mar 2014.

**Caesalpinia gilliesii* (Wall. ex Hook.) D. Dietr., C, neo, S Amer. – Ialisos area, 36°24'39"N, 28°09'11"E, near sea level, roadside, 13 Aug 2014, *Ch. Galanos 019* (herb. Galanos) (Fig. 5I); Ialisos area, 36°24'57"N, 28°09'51"E, abandoned open field, 9 Aug 2014.

Cannabaceae

Cannabis sativa L., C, arch, S & W Asia.

Convolvulaceae

Cuscuta campestris Yunck., N, neo, N Amer.

Ipomoea indica (Burm.) Merr., N, neo, Pantrop.

Cyperaceae

Cyperus involucratus Rottb., N, neo, Africa, H&S 2014.

Elaeagnaceae

Elaeagnus angustifolia L., C, neo, Asia.

Euphorbiaceae

Euphorbia hypericifolia L., N, neo, Amer., Oceania.

Euphorbia maculata L., N, neo, N Amer., H&S 2014.

Euphorbia nutans Lag., N, neo, N Amer., H&S 2014.

Euphorbia prostrata Aiton, N, neo, N Amer., A&C 2011.

Euphorbia serpens Kunth, N, neo, N Amer., A&C 2011.

Ricinus communis L., N, arch, Paleotrop.

Fabaceae

**Erythrina lysistemon* Hutch., N, neo, Africa. – Not previously recorded from Greece regardless of status (established or not). According to the DAISIE Database, *E. lysistemon* is established in Madeira. Established plants were found in several places on the banks of the Kremastinos river in Kremasti village. – Kremasti area, 36°24'28"N, 28°06'41"E, 5 m, roadside along Kremastinos river, 3 Apr 2015; Kremasti area, 36°24'33"N, 28°06'39"E, near sea level, along banks of Kremastinos river, 19 Apr 2014, *Ch. Galanos 004* (herb. Galanos) (Fig. 2G, H); Rodos town, along Ethnikis Antistaseos Str. near Gorgopotamou Square, 36°26'01"N, 28°13'24"E, 25 m, grassland, 14 Feb 2015.

Hedysarum coronarium L., N, neo, W Medit., H & S 2014.

Robinia pseudoacacia L., N, neo, N Amer.

Fagaceae

Quercus ilex L., N, neo, Medit.

Hyacinthaceae

Melomphis arabica (L.) Raf. (*Ornithogalum arabicum* L.), N, neo, S Medit.

Hydrocharitaceae

Halophila stipulacea (Forssk.) Asch., N, neo, Ind. Ocean, Red Sea.

Iridaceae

**Freesia leichtlinii* subsp. *alba* (G. L. Mey.) J. C. Manning & Goldblatt, N, neo, S Africa. – Established populations of *F. leichtlinii* subsp. *alba* were found in *Pinus* forest clearings in Filerimos Hill and Kalathos area. – Filerimos Hill, 36°24'09"N, 28°08'51"E, 100 m, *Pinus* forest clearing, 22 Mar 2012, 14 Feb 2015, *Ch. Galanos 006* (herb. Galanos) (Fig. 2L, 3A); Kalathos, 36°07'47"N, 28°04'03"E, 0 m, in *Pinus* forest, 6 Apr 2012.

Iris albicans Lange, N, neo, S Arabia, Yemen.

Iris germanica L., N, arch, Europe, Asia.

Fig. 5. Casual taxa. See Checklist for localities and dates. – A, B: *Albizia julibrissin* (*Mimosaceae*); C–E: *Bauhinia variegata* (*Caesalpiniaceae*); F–H: *Brachychiton populneus* (*Malvaceae*); I: *Caesalpinia gilliesii* (*Caesalpiniaceae*); J–L: *Cortaderia selloana* (*Poaceae*). – All photographs by Ch. J. Galanos.

Juglandaceae
Juglans regia L., N, arch, Asia.

Malvaceae
Alcea rosea L., C, neo, SW Asia, H&S 2014.
**Brachychiton populneus* (Schott & Endl.) R. Br., C, neo, Australia. – Not previously recorded from Greece regardless of status (established or not). According to the DAISIE Database, *B. populneus* is not established in Europe. – Asgourou, 36°23'41"N, 28°11'08"E, 110 m, open field, 15 Jun 2015; Kato Rodini, Marathonos Str., 36°25'26"N, 28°13'28"E, 40 m, along road, 9 May 2014; Kato Rodini, Verginas Str., 36°25'23"N, 28°13'34"E, 30 m, 9 May 2014, *Ch. Galanos 018* (herb. Galanos) (Fig. 5H); Rodos town, Iliadon Str., 36°25'31"N, 28°12'06"E, 40–80 m, scrubland along roadside, 27 May 2012, (Fig. 5F, G).
**Hibiscus rosa-sinensis* L., C, neo, E Asia. – Not previously recorded from Greece regardless of status (established or not). According to the DAISIE Database, *H. rosa-sinensis* is established in the Azores and Madeira. – Rodini, 36°25'37"N, 28°13'17"E, 40 m, in crevices of walls, 16 Feb 2015, *Ch. Galanos 021* (herb. Galanos) (Fig. 6A); as well as in other urban and suburban residential areas of the island.
Malva arborea (L.) Webb. & Berthel., N, neo, Medit.
**Phymosia umbellata* (Cav.) Kearney, C, neo, C Amer. – First record of this species as an alien in Europe. – Rodini, 36°25'37"N, 28°13'14"E, 40 m, shady place along stream banks, 20 May 2012; Rodini, 36°25'38"N, 28°13'11"E, 45 m, shady place along stream banks, 10 Jan 2015 (Fig. 6F); Rodos town, along Ethnikis Antistaseos Str. near Gorgopotamou Square, 36°26'01"N, 28°13'24"E, 25 m, grassland, 14 Feb 2015 (Fig. 6E); Rodos town, Zefiros area along Charalambou Mouscou Str., 36°25'56"N, 28°14'02"E, 7 m, along roadside, 10 May 2014, *Ch. Galanos 024* (herb. Galanos).

Meliaceae
Melia azedarach L., C, neo, C & E Asia.

Mimosaceae
Acacia saligna (Labill.) Wendl., N, neo, Australia.
**Albizia julibrissin* Durazz., C, neo, Paleotrop. – Road between Kremasti and Paradissi villages before airport, 36°24'30"N, 28°06'22"E, 10 m, dry grasslands along roadsides, 2 Jun 2014, *Ch. Galanos 016* (herb. Galanos), 29 May 2015 (Fig. 5A, B); W of Kremasti village, 36°24'21"N, 28°06'38"E, 2 Jun 2014.

Moraceae
**Ficus microcarpa* L., N, neo, SE Asia, Australia. – Not previously recorded from Greece regardless of status (established or not). According to the DAISIE Database, *F. microcarpa* is established in Sicily. Spontaneous plants were observed to be very well established near parent plants in urban areas of Rodos town, mainly many young individuals were observed in crevices of the walls of old buildings and to a great extent within and outside the walls of the medieval town; the bird *Passer domesticus* was observed to consume and carry fruits into the wall crevices, contributing to the dispersal of the species. – Rodos town, 36°26'23"N, 28°13'25"E, 5 m, on old walls of medieval town around port, 11 Jan 2015 (Fig. 2I); Rodos town, 36°26'46"N, 28°13'41"E, near sea level, on old walls of medieval town around port, 18 Jan 2015 (Fig. 2J), 8 Nov 2014 (Fig. 2K); Rodos town, around the building of Rodiaki Epavli, 36°26'53"N, 28°13'10"E, 25 m, in crevices of walls, 21 Nov 2014, *Ch. Galanos 005* (herb. Galanos); Rodos town, 36°26'57"N, 28°13'06"E, 20 m, in crevices of walls, 21 Nov 2014.
Morus alba L., N, arch, E Asia.
Morus nigra L., N, arch, SW Asia.

Myrtaceae
Eucalyptus camaldulensis Dehnh., N, neo, Australia.
Eucalyptus globulus Labill., N, neo, Australia.

Najadaceae
Najas marina L., N, neo, Cosmop., H&S 2014.

Nyctaginaceae
Mirabilis jalapa L., N, neo, S Amer., H&S 2014.

Oxalidaceae
Oxalis pes-caprae L., N, neo, S Africa.

Phytolaccaceae
Phytolacca americana L., N, neo, N Amer.
Phytolacca dioica L., N, neo, S Amer.

Pinaceae
Pinus halepensis Mill., N, arch, Medit.
Pinus pinea L., N, arch, Medit.

Pittosporaceae
**Pittosporum tobira* (Thunb.) W. T. Aiton, C, neo, Asia. – Not previously recorded from Greece regardless of status (established or not). According to the DAISIE Database, *P. tobira* is established in Great Britain. – Kritika area, 36°25'47"N, 28°12'00"E, 5 m, along sea shore with *Myoporum tenuifolium*, 21 Nov 2014 (Fig. 6G, H); Rodini area, 36°25'37"N, 28°13'16"E, 35 m, stream banks, 23 Aug 2014, *Ch. Galanos 025* (herb. Galanos).

Plantaginaceae
Antirrhinum majus L. subsp. *majus*, N, arch, W Medit.

Poaceae
Arundo donax L., N, arch, Asia.

Fig. 6. Casual taxa. See Checklist for localities and dates. – A: *Hibiscus rosa-sinensis* (*Malvaceae*); B: *Jacaranda mimosifolia* (*Bignoniaceae*); C, D: *Justicia adhatoda* (*Acanthaceae*); E, F: *Phymosia umbellata* (*Malvaceae*); G: *Pittosporum tobira* (*Pittosporaceae*) with *Myoporum tenuifolium* (*Scrophulariaceae*); H: *Pittosporum tobira*; I, J: *Pyracantha coccinea* (*Rosaceae*); K, L: *Thevetia peruviana* (*Apocynaceae*). – All photographs by Ch. J. Galanos.

Cenchrus clandestinus (Hochst. ex Chiov.) Morrone (*Pennisetum clandestinum* Hochst. ex Chiov.), N, neo, E Africa.

**Cortaderia selloana* (Schult. & Schult. f.) Asch. & Graebn., C, neo, S Amer. – Medieval moat of Rodos town, 36°26'22"N, 28°13'43"E, 15 m, grasslands, 30 Oct 2014 (Fig. 5J, K, L); medieval moat of Rodos town, 36°26'28"N, 28°13'22"E, 10 m, grasslands, 15 Oct 2014, *Ch. Galanos 020* (herb. Galanos).

Dactyloctenium aegyptium (L.) P. Beauv., N, neo, Paleotrop., Subtrop.

Echinochloa colonum (L.) Link, N, arch, Paleotrop., Subtrop.

Paspalum distichum L., N, neo, Neotrop.

Phalaris canariensis L., N, neo, Macaronesian.

Setaria adhaerens (Forssk.) Chiov., N, neo, Circumtemp.

Sorghum halepense (L.) Pers., N, neo, Medit.

Polygonaceae

Persicaria senegalensis (Meisn.) Soják, N, neo, Paleotrop., H&S 2014.

Rosaceae

Prunus dulcis (Mill.) D. A. Webb, N, arch, S Medit.

**Pyracantha coccinea* M. Roem., C, arch, Europe, Medit. – Ialisos, 36°25'20"N, 28°09'31"E, 5 m, along roadside next to stream banks, 25 Oct 2014 (Fig. 6I); medieval moat of Rodos town, 36°26'38"N, 28°13'17"E, 15 m, grassland, 5 Oct 2014, *Ch. Galanos 026* (herb. Galanos) (Fig. 6J).

Pyrus communis L., C, neo, Europe, SW Asia.

Salicaceae

Populus alba L., N, neo, Europe, SW Asia.

Populus nigra L., C, neo, Europe, SW Asia.

Scrophulariaceae

**Myoporum tenuifolium* G. Forst., N, neo, SE Asia, Australia. – Not previously recorded from Greece regardless of status (established or not). According to the DAISIE Database, *M. tenuifolium* is established in the Azores, Balearic islands, Corsica, Italy, Madeira and Sicily. – Spontaneous plants were found in forest clearings and coastal habitats near the parent plants in the areas of Ixia, Kritika, Rodini and Rodos town. – Rodos town, Kato Petres area, 36°26'35"N, 28°12'30"E, 5 m, coastal scrubland, 21 Nov 2014 & 5 Feb 2015; Kritika area, 36°25'47"N, 28°12'00"E, 5 m, along sea shore, 21 Nov 2014 (Fig. 6G); Rodini, Pefkakia area, 36°25'24"N, 28°12'59"E, 60 m, coniferous forest clearing, 22 Nov 2014 (Fig. 3E); Ixia area, 36°25'51"N, 28°12'02"E, 5 m, along sea shore, 29 Apr 2014 (Fig. 3G); Ixia area, 36°25'49"N, 28°12'01"E, 0 m, along sea shore, 5 Dec 2014 (Fig. 3D), 7 Feb 2015, *Ch. Galanos 008* (herb. Galanos) (Fig. 3F); Ixia area, 36°25'47"N, 28°12'00"E, 5 m, along sea shore, 9 Sep 2013.

Simaroubaceae

Ailanthus altissima (Mill.) Swingle, N, neo, E Asia.

Solanaceae

Nicotiana glauca Graham, N, neo, S Amer.

Tropaeolaceae

**Tropaeolum majus* L., N, neo, S Amer. – Established populations of *T. majus* were found near residential and agricultural habitats in association with *Arundo donax* and *Phragmites australis* (Cav.) Trin. ex Steud. along the banks of the Kremastinos river, as well as in open fields near Paradissi village. – Kremasti area, 36°24'50"N, 28°06'39"E, 10 m, in reedbeds along banks of Kremastinos river, 19 Apr 2014, *Ch. Galanos 012* (herb. Galanos) (Fig. 4D, E); near Paradissi village, 36°23'56"N, 28°04'34"E, 8 m, dry grassland along the road, 5 Mar 2015.

Valerianaceae

Centranthus ruber (L.) DC., C, arch, Medit.

Verbenaceae

**Lantana camara* L., N, neo, Neotrop. – Established populations of *L. camara* were found to have developed an invasive behaviour in abandoned and disturbed sites, along roadsides and in open grasslands in the Filerimos, Koskinou, Soroni and Trianta areas. – Filerimos area, 36°24'17"N, 28°09'43"E, 30 m, grassland, 27 Oct 2014, *Ch. Galanos 007* (herb. Galanos) (Fig. 3C); Trianta, 36°25'09"N, 28°09'55"E, 8 m, along road, 16 Apr 2012; Koskinou area, 36°23'55"N, 28°13'36"E, 15 m, ravine, 6 Apr 2012; Soroni village, 36°22'42"N, 28°01'36"E, 5 m, along roadside, 28 Dec 2014, (Fig. 3B).

Veronicaceae

Veronica persica Poir., N, neo, W Asia.

Marine algae

Bonnemaisoniaceae

Asparagopsis taxiformis (Delile) Trevis., N, neo, Circumtrop.

Caulerpaceae

Caulerpa cylindracea Sond., N, neo, Pacific

Caulerpa racemosa [var. *lamourouxii*] f. *requenii* (Mont.) Weber Bosse, N, neo, Cosmop.

Caulerpa taxifolia var. *distichophylla* (Sond.) M. Verlaque & al., N, neo, Australia (in Aplikioti & al. in press).

Cystocloniaceae

Hypnea anastomosans Papenf. & al., C, neo, Red Sea.

Hypnea cornuta (Kütz.) J. Agardh, C, neo, Red Sea.

Hypnea spinella (C. Agardh) Kütz., N, neo, Circumtrop.

Hypnea valentiae (Turner) Mont., C, neo, Japan.

Dictyotaceae
Stypopodium schimperi (Kütz.) M. Verlaque & Boudour., N, neo, Red Sea.

Rhodomelaceae
Laurencia caduciramulosa Masuda & Kawag., C, neo, SE Asia.
Lophocladia lallemandii (Mont.) F. Schmitz, N, neo, Indopacific.
Womersleyella setacea (Hollenb.) R. E. Norris, C, neo, Circumtrop.

Scytosiphonaceae
Colpomenia peregrina Sauv., C, neo, Indopacific.

Cultivated taxa

The following cultivated taxa have been excluded from the main part of the checklist because they were observed by the author only as cultivated ornamentals or as vegetable crops in flower beds, gardens or fields, i.e. their status was observed to be neither naturalized nor casual.

Aizoaceae
Aptenia cordifolia (L. f.) Schwantes
Alliaceae
Allium cepa L.
Amaranthaceae
Achyranthes sicula (L.) All.
Anacardiaceae
Pistacia vera L.
Schinus molle L.
Apiaceae
Chaerophyllum bulbosum L.
Araceae
Colocasia esculenta (L.) Schott
Araucariaceae
Araucaria heterophylla (Salisb.) Franco
Asphodelaceae
Aloe arborescens Mill.
Asteraceae
Cynara scolymus L.
Scolymus grandiflorus Desf.
Boraginaceae
Borago officinalis L.
Cordia myxa L.
Brassicaceae
Lepidium sativum L. subsp. *sativum*
Raphanus sativus L.
Caprifoliaceae
Sambucus nigra L. subsp. *nigra*
Viburnum tinus L.
Caryophyllaceae
Saponaria officinalis L.
Convolvulaceae
Convolvulus tricolor L.
Cucurbitaceae
Citrullus colocynthis (L.) Schrad.
Citrullus lanatus (Thunb.) Mansf.
Dipsacaceae
Dipsacus fullonum L.
Fabaceae
Cicer arietinum L.
Lathyrus ochrus (L.) DC.
Lathyrus odoratus L.
Lathyrus sativus L.
Lens culinaris Medik.
Medicago sativa L. subsp. *sativa*
Pisum sativum L. subsp. *sativum*
Hydrophyllaceae
Phacelia tanacetifolia Benth.
Iridaceae
Crocosmia ×*crocosmiiflora* (Lemoine ex anonymous) N. E. Br.
Lamiaceae
Ocimum basilicum L.
Rosmarinus officinalis L.
Malvaceae
Brachychiton discolor F. Muell.
Hibiscus trionum L.
Mimosaceae
Acacia farnesiana (L.) Willd.
Acacia karroo Hayne
Nymphaeaceae
Nymphaea alba L.
Oleaceae
Olea europaea L. subsp. *europaea* – In Greece occur var. *europaea*, which is only cultivated or a remnant of abandoned cultivation, and var. *sylvestris* (Mill.) Lehr, which is autochthonous but often difficult to distinguish between native and feral occurrences (Dimopoulos & al. 2013: 286).
Poaceae
Avena byzantina K. Koch
Hordeum vulgare subsp. *distichon* (L.) Körn.
Sorghum bicolor (L.) Moench
Triticum aestivum L.
Rosaceae
Eriobotrya japonica (Thunb.) Lindl.
Sorbus umbellata (Desf.) Fritsch
Rutaceae
Citrus ×*aurantium* L.
Solanaceae
Atropa belladonna L.
Datura innoxia Mill.
Datura stramonium L.
Lycopersicon esculentum Mill.
Withania somnifera (L.) Dunal
Ulmaceae
Celtis australis L.
Verbenaceae
Duranta erecta L.
Phyla canescens (Kunth) Greene

Vitaceae

Vitis vinifera L. subsp. *vinifera* – Locally persisting from abandoned cultivation, but naturalized status in Greece still uncertain (Dimopoulos & al. 2013: 304).

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