

**Assessment of current and future Invasive Alien Species in Cyprus  
Akrotiri Environmental Education and Information Centre (AEEIC)  
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# **The alien vascular flora of Greece**

## **Historical background - Current situation**

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A satellite map of the Balkan Peninsula and the Aegean Sea. Greece is highlighted in yellow, showing its mainland and numerous islands. The surrounding countries and the sea are in natural colors. The text is overlaid on the map in yellow.

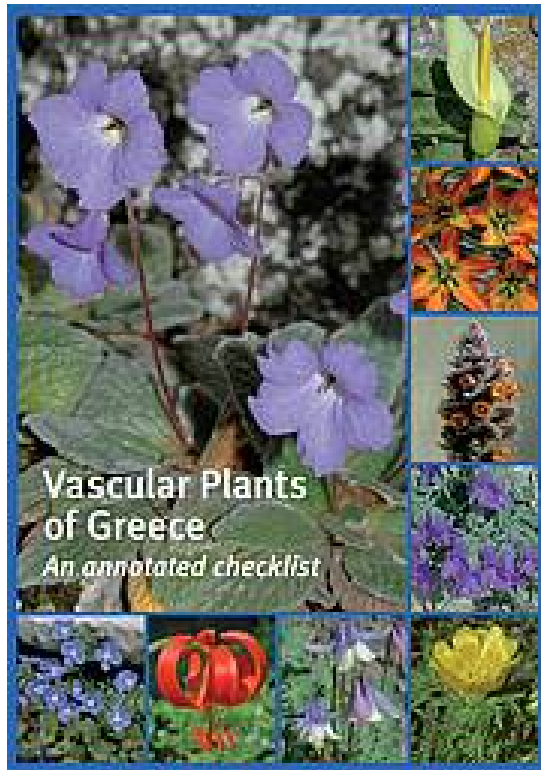
**Greece occupies the southernmost part of the Balkan Peninsula and covers an area of approximately 132.000 km<sup>2</sup>**

**It has the longest coastline among the Mediterranean countries (c 15.000 km) and thousands of islands (less than 100 are inhabited).**

**Eighty percent (80%) of Greece is mountainous. The highest peak (2917 m) is on Mt Olimbos (Olympus).**

# The vascular flora of Greece

The flora of Greece is among the richest in Europe.

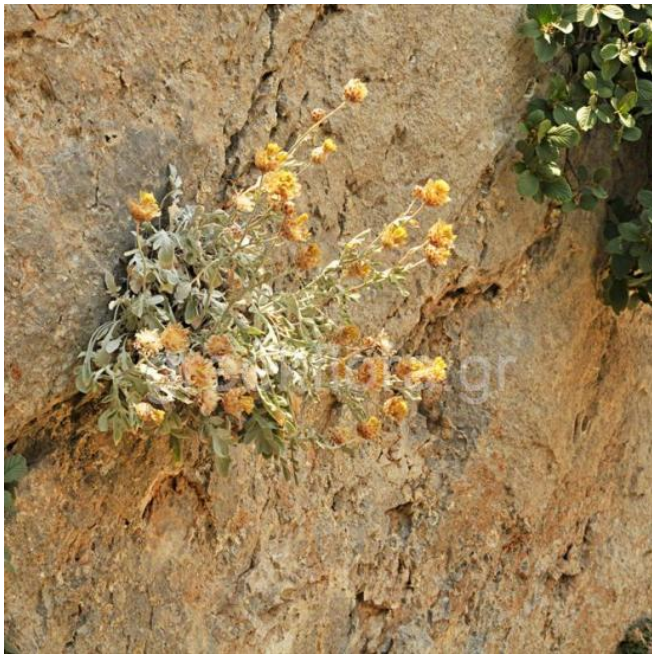


According to the most recent and up-to-date list compiled by Dimopoulos et al. (2013) the vascular flora of Greece consists of 5752 species and 1893 subspecies representing 6600 native and naturalised taxa, belonging to 1072 genera and 185 families.



# The vascular flora of Greece

*Asteraceae* is the most species-rich family with 749 species followed by *Poaceae* (439 species), *Fabaceae* (438 species), *Caryophyllaceae* (341 species) and *Brassicaceae* (278 species)



*Centaurea musarum* a rare  
Greek endemic

*Centaurea* is the most species-rich genus with 110 species followed by *Silene* (108 species), *Allium* (97 species), *Trifolium* (90 species) and *Limonium* (89 species).



**Floristic divisions of Greece as adopted for the *Flora Hellenica* project.**

# Endemism

There are 1462 Greek endemic taxa (22.2%) corresponding to 1278 endemic species and 452 endemic subspecies.

Eight (8) genera (*Hymenonema*, *Horstrissea*, *Jankaea*, *Leptoplax*, *Lutzia*, *Petromarula*, *Phitosia* and *Thamnosciadium*) are endemic to Greece.

The Cretan area has the highest rate (17,3%) of endemism among the floristic regions of Greece followed by the Peloponnese (14,5%).



*Jankaea heldreichii*  
a narrow Greek endemic.



# Alien vascular plants of Greece – Early studies

- As a result of the richness of the Greek native flora, the research on the non-native species was not systematic.
- Until 1970 there were very few scattered and not well documented information.
- The areas where alien plant taxa appeared were not among the scientific interests of botanists dealing with the study of the Greek flora.

The study of the Greek alien vascular flora started in the early 1970's (Yannitsaros 1982). It became more intense and systematic during the last 20-30 years.



# Alien vascular plants of Greece – Local floras

Some of the Greek mainland areas for which there is sufficient information are Attica (Yannitsaros 1982), the metropolitan areas of Thessaloniki (Krigas & Kokkini 2004) and Patras (Chronopoulos & Christodoulakis 2000) and the cities of Mesolongi (Tsiotsiou & Christodoulakis 2004) and Ioannina (Kantsa & al 2013).

Furthermore the island of Crete (Yannitsaros 1991; Turland et al. 1995), and some Aegean Islands, e.g. Chios (Snogerup et al. 2001), Lesvos (Bazos 2005), Kalymnos (Zervou and Yannitsaros 2009) and Rhodes (Galanos 2015) are considered sufficiently studied.



*Solanum elaeagnifolium*



# Alien vascular plants of Greece – DAISIE Project

As a result of the DAISIE project (DAISIE (ed.) 2009, <http://www.europe-aliens.org>) the database “Alien” was compiled.

The database includes tables with multiple records for the status, distribution, introduction and ecological traits of each plant.

The recorded data were based on the investigation of more than 300 sources [original articles, standard floras and checklists such as *Flora Hellenica* (Strid & Tan 1997, 2002), *Flora Europaea* (Tutin & al. 1968–1980, 1993), *Med-Checklist* (Greuter & al. 1984–1989; Greuter & von Raab-Straube 2008) and *Vascular Plants of Greece* (Dimopoulos & al. 2013)].



*Datura stramonium*

# **Alien vascular plants of Greece**

The dataset includes alien species recorded at terrestrial habitats of Greece published in the literature. Taxa native in some parts of Greece but alien in others as well as doubtfully native taxa are excluded.

The species entries are supplemented with data on taxonomy, chorology, life and growth form, life cycle, habitats, ecological characteristics (flowering period and duration, dispersal type and mode, dispersal agent and dispersal unit) and status.



Status is defined as naturalised or casual (after Richardson et al. 2000; Pysek et al. 2004) and as unknown if information is insufficient for the classification to one of the previous categories. These are either recent introductions or recently recorded in Greece.

# **Alien plants of Greece – First published checklist**

The first checklist of the alien vascular flora of Greece was published in 2010 (Arianoutsou & al.)

294 neophytes were in the list: 122 taxa (41%) were classified as naturalised, 77 taxa (26%) were classified as casual and 95 taxa (32%) were of unknown or uncertain status.

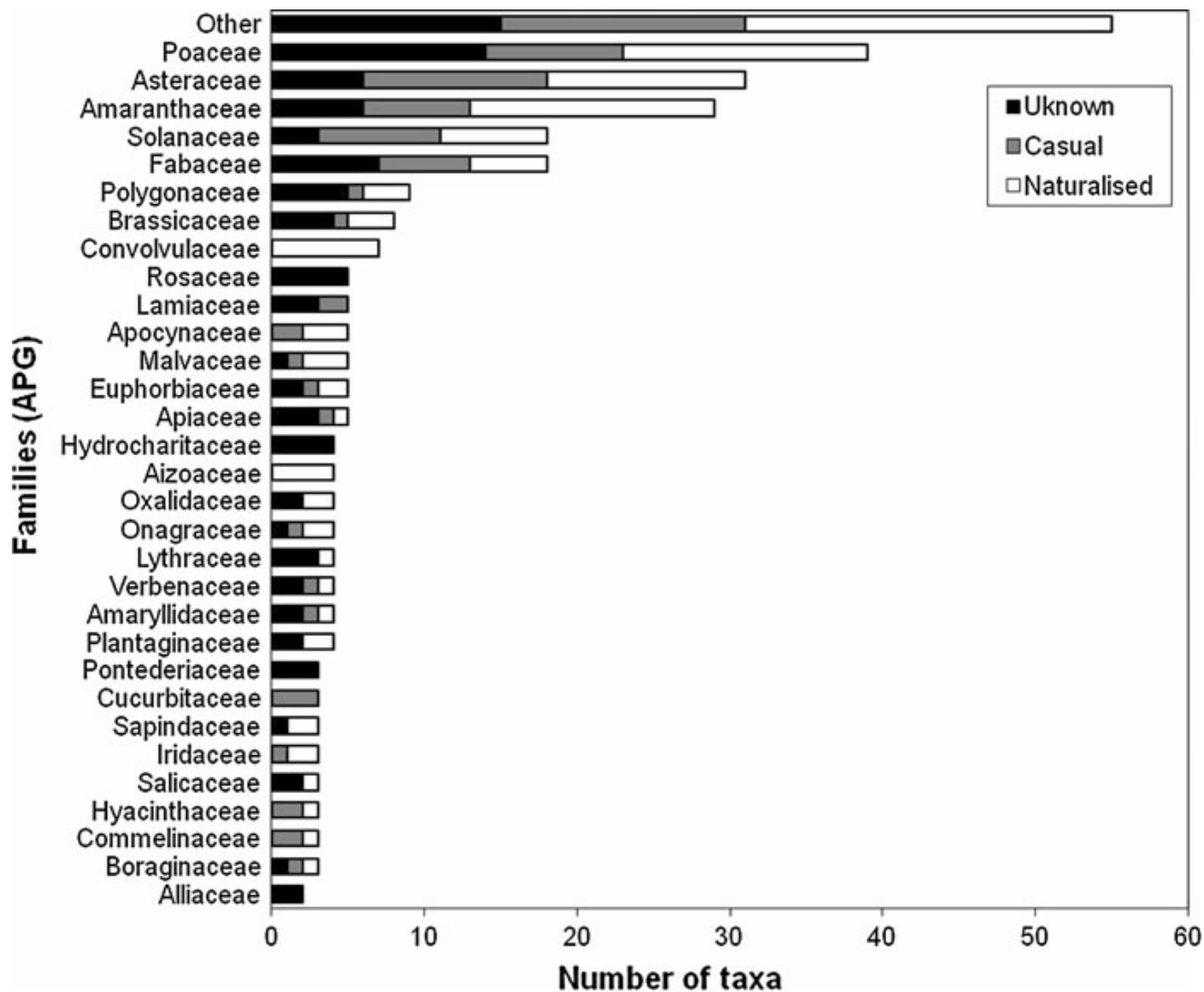
A total of 50 naturalised neophytes were characterised as invasive (after Richardson et al. 2000; Pysek et al. 2004), taking into account their distribution in Greece, the number of records, and number and types of habitats occupied.



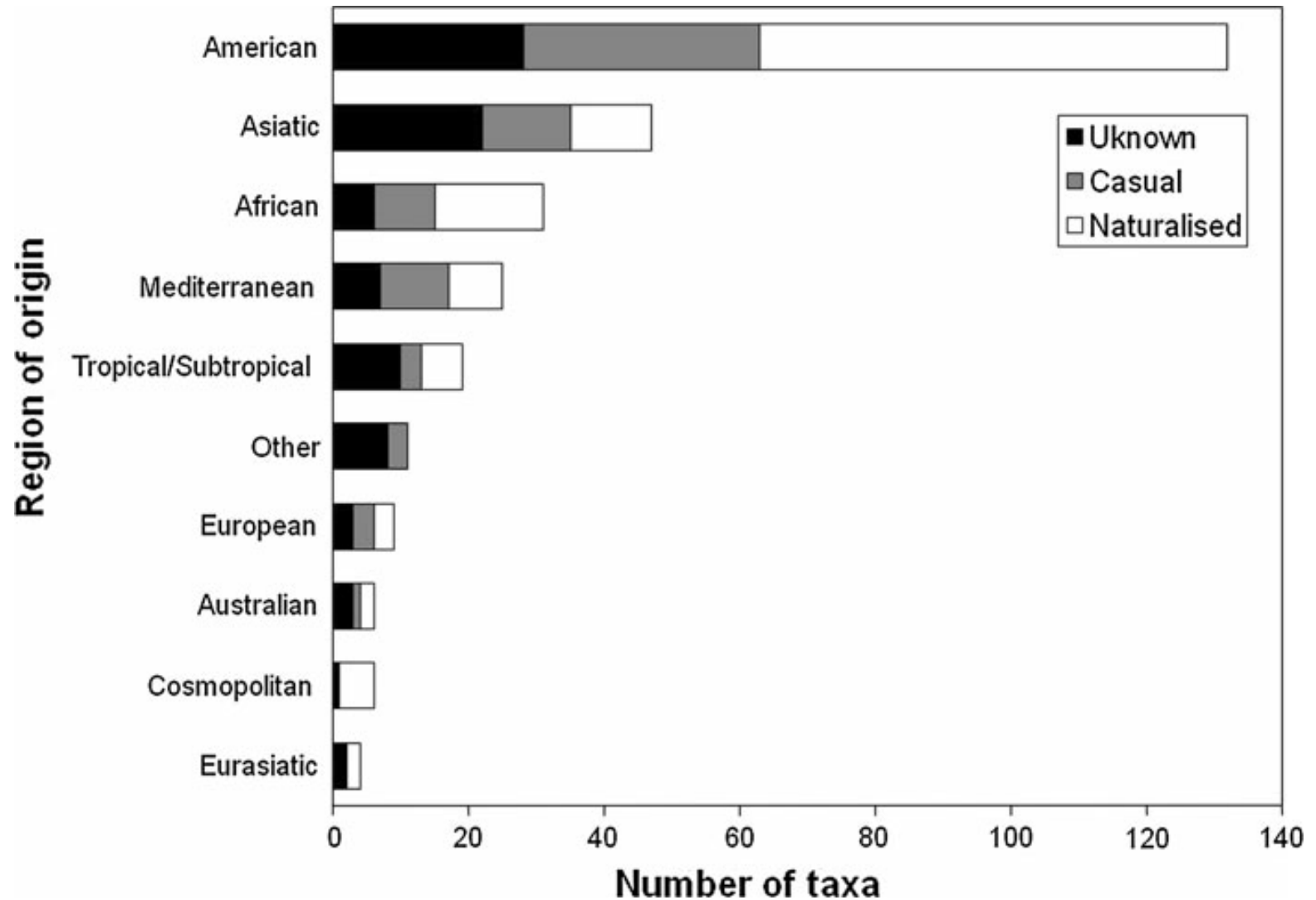
*Ailanthus altissima*



## The most species-rich families (after Arianoutsou & al. 2010)



## Origin of alien vascular plants of Greece (after Arianoutsou & al. 2010)



# Alien plants of Greece – Current situation

Seven years after the first checklist and according to the latest information there are 387 alien plant taxa recorded from Greece.



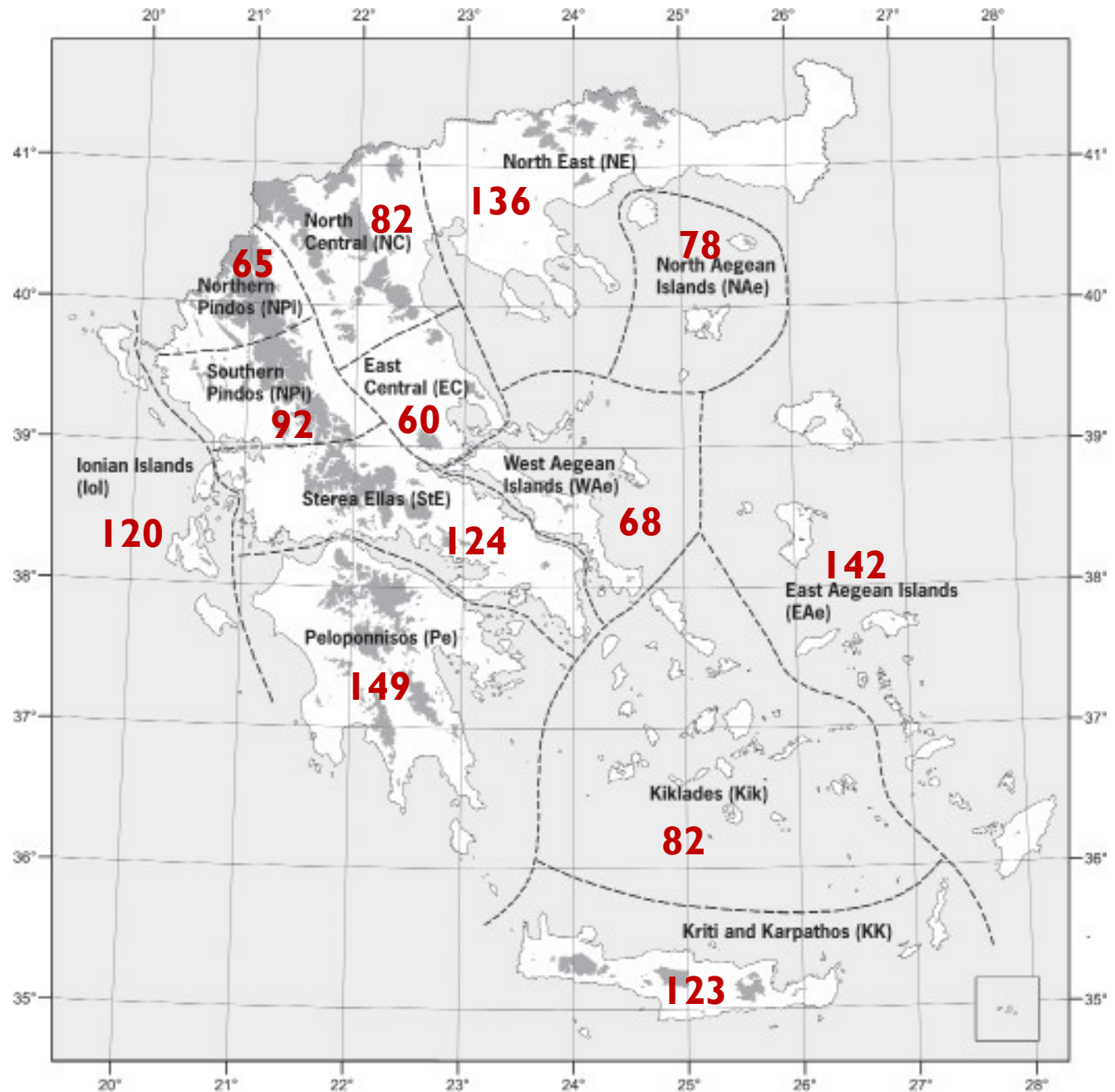
*Antirrhinum majus*

259 or 67% are naturalised, 122 or 31% are casual or not fully naturalised and only 6 are of unknown status.

The majority of the naturalised taxa (124 taxa or 48%) are of American origin followed by those of Asian, African and Tropical-Subtropical origin with 47, 25 and 24 taxa respectively.



## Number of naturalised alien plant taxa per floristic region



# Alien plants of Greece – Current situation

The majority of the taxa belong to the families of Poaceae (54 taxa), Asteraceae (40 taxa), Fabaceae (21 taxa), Solanaceae (20 taxa) and Amaranthaceae (18 taxa). Forty families are represented by a single taxon.

*Amaranthus* is by far the richest genus including 17 taxa, followed by *Oenothera*, *Euphorbia* and *Solanum* with 11, 7 and 6 taxa respectively.

The majority of the naturalised taxa are Therophytes (49%) followed by Hemicryptophytes (19%) and Phanerophytes (15%)



*Oenothera glazioviana*



## **Alien plants of Greece – Current situation**

Some of the most prominent among the invasive species are: *Ailanthus altissima*, *Amaranthus* spp., *Azola filiculoides*, *Datura stramonium*, *Eleusine indica*, *Erigeron* spp., *Nicotiana glauca*, *Oxalis pes-caprae*, *Paspalum distichum*, *Solanum elaeagnifolium* and *Symphytotrichum squamatum*



*Nicotiana glauca*



*Amaranthus retroflexus*



**Thank you for your attention**

