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“CLIMATE CHANGE IS HERE”

IES EL TABLERO
CÓRDOBA

Agrupamento de Escolas À Beira Douro
Medas, Gondomar

WHAT TO DO FOR World

Nature CONSERVATION

Climate change threats: flora and fauna at risk.

2o ΓΥΜΝΑΣΙΟ ΤΕΡΑΚΑ

SREDNJA ŠKOLA METKOVIĆ

FAUNA

ITALY

MUSSELS

Scientific findings confirmed higher concentrations of Dioxins and PCBs in Mar Piccolo . So the famous tiny black mussels from Taranto that are grown in the Ionian Sea resulted contaminated . Thus, the Department of Prevention of the Local Health Authority of Taranto proposed to Puglia Region the adoption of the Regional Ordinance n. 188/2016 to block the removal and handling of commercial mussels in Mar Piccolo.

As a matter of fact, mussels can represent a food at risk of contamination, because they are filter-feeding organisms with high bioaccumulation and low biotransformation potential for both organic and inorganic contaminants .

CARETTA CARETTA TURTLES:WWF action

Turtles are seriously threatened by human activities, as they are sensitive to the disturbance of tourism in breeding areas, pollution, especially plastic, and suffer from accidental fishing (bycatch).

Jonian Dolphin conservation: their scientific research in the Gulf of Taranto

They study the change of behavior and group size of **Stenella coureleoalba** dolphins

FLORA

ITALY

The olive trees

However, a fast-spreading bacteria risked causing an olive-oil apocalypse in 2021 in Apulia.The cause of the blight was Xylella fastidiosa, a bacteria that researchers believe arrived around 2010 from Latin America, possibly from Costa Rica on an imported ornamental plant. Xylella infected at least one-third of the 60 million olive trees in Puglia, which produces 12 percent of the world's olive oil. The bacteria left no chance of

The olive tree is the symbol of the flora of the entire region. The territory has been characterized by endless stretches of olive trees for thousands of years. With their beauty and charm, transmitted by centuries-old curved trunks, they represent the history of Puglia. Apulian olive groves are the oldest group of plants, with the greatest presence in the world of millennial specimens.

The Mediterranean scrub or Maquis

Prickly pear cactus

A Phenician juniper shrub

A wild Caper shrub

Characteristic for the territory is the presence of the Mediterranean scrub or maquis, a, evergreen spontaneous vegetation consisting mainly of shrubs such as Lentisk,Phenician juniper, Thorny oak, Caper.
The Mediterranean basin has long been a special surveillance of climatologists. If you look at the trend of rising temperatures in the last two centuries and particularly at the turn of the 20th century, compared to the average temperatures of the rest of the globe, about 0.9 ºF, this area registers an average of 1.3 ºF. C concentrated in recent decades, inevitably has a heavy effect on the environment and the entire ecosystem, at various levels.
Protecting such a vast and complex hotspot is a challenge that requires concerted efforts.Variation in salinity, decreased rainfall, lower river water intake and a general increase in drought, are among the effects reported by one of the latest ENEA report. chance of survival.

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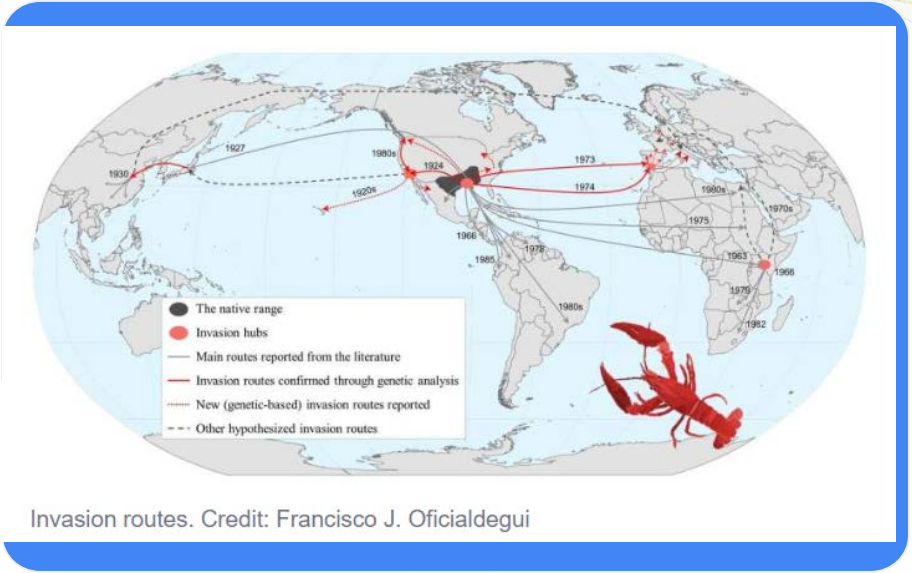
FAUNA

SPAIN

THE RED SWAMP CRAYFISH



Invasion routes. Credit: Francisco J. Oficialdegui

The zebra mussel (*Dreissena polymorpha*)

THE

ZEBRA

MUSSEL

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IMPORTANT CHARACTERISTICS

Origin: Ponto-Caspian region (basins around Caspian, Aral and Black seas).

Environmental factor	Requirements	
Water speed	<1.5 m/s	
Water temperature	Survival	0-32 ^{0}C
	Growth	10-30 ^{0}C
	Reproduction	>12 ^{0}C
Depth	2-14 m	
Dissolved O_2 saturation	>25 % (several days anoxia)	
Dissolved Ca concentration	>12 mg/L	
pH	7.3-9.0 (optimal 8.4)	
Survival outside the water	8-10 days	
Salinity	< 5 psu	

That is a relatively wide range of tolerance

IMPACTS:

ECOLOGICAL

- Phyto and microzooplancton decrease.
- Macrophyta increase.
- Accumulation of organic and inorganic residues in the bed of the reservoir.
- Relocation of most energy and matter movements from the water column to the bottom. Alteration of nutrient cycles.
- Increases transparency of water.
- Severe drecrese of authoctonous bivalves.
- Reduction of fishes biomass.
- Bioaccumulation and biomagnification of toxics (heavy metals, organic pollutants), and transference of them to higher throphic strata.
- Source of food for birds. Migratory habits perturbance and, therefore, it causes impacts thousands of kilometres away.

Invasive Alien Species

Hey, one moment! Not that fast!

What's an "alien, exotic or allochthonous" species?

"It is any species that is not native or indigenous to a particular area". So, the adjective "alien" is always referred to a particular place (to a biogeographical sector/province/region/reign...). E.g., "lions are alien to the Eurosiberian region".

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ALIEN SPECIES IN THE WATERSHED

SCIENTIFIC NAME	COMMON NAME
PLANTS AND ALGAE	
Arundo donax	Giant reed, giant cane or Spanish cane
Azolla spp.	mosquito fern, duckweed fern, fairy moss or water fern
Egeria densa	Large-flowered waterweed or Brazilian waterweed
NON ARTHROPOD INVERTEBRATES	
Dreissena polymorpha	Zebra mussel
Corbicula fluminea	Asian clam, golden freshwater clam or prosperity clam (in SE Asia)
Mytilopsis leucophaeta	Conrad's false mussel, dark false mussel or false zebra mussel
Paludicella articulata, Urnatella gracilis and Plumatella spp.	Bryozoans or moss animals
CRUSTACEANS	
Procambarus clarkii	Red swamp crayfish, American crayfish or Louisiana crawfish
Pacifastacus leniusculus	Signal crayfish
Eriocheir sinensis	Chinese mitten crab or Shanghai hairy crab
FISHES	
Alburnus alburnus	Common bleak
Ameiurus melas	Black bullhead or black bullhead catfish
Esox lucius	Pike or Northern pike
Gambusia holbrooki	Eastern mosquitofish
Lepomis gibbosus	Pumpkinseed, sunfish or pond perch
Micropterus salmoides	Largemouth bass or black bass
Silurus glanis	Wels catfish or sheatfish

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The giant cane (*Arundo donax*)

Origin: Central Asia.

Situation in Spain: in most provinces, but specially in the South, in the East and in Canary and and Balearic Islands.

It is considered by IUCN **one of the 100 most harmful species**, in respect of its invasiveness and capacity to disturb colonised habitats.




- **Changes in the riverbed**.
  - In small rivers and creeks, the constriction of the riverbed is big. So, it increases de risk of overflows and floods.
  - In big rivers where de loss of hydraulic section is not significant, it can be positive for flood abatement.
- **Increases risk of fire.**
- Autochthonous vegetation is displaced. Giant cane tends to form monospecific masses. So, although it provides some habitat an food for animals, **the ecosystem suffers a general impoverishment and biodiversity loss**, when compared with the native community.

FLORA

Portugal

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Invasive plant species in Portugal: an overview

Portuguese native flora is threatened by invasions of exotic plants.

The species listed as invasive by this law are: *Acacia dealbata, Acacia karroo, Acacia melanoxylon, Acacia mearnsii, Acacia longifolia, Acacia pycnantha, Acacia retinodes, Acacia saligna, Ailanthus altissima* (EPPO List of Invasive Alien plants), *Arctotheca calendula, Azolla filiculoides* (EPPO List of Invasive Alien plants), *Carpobrotus edulis, Cortaderia selloana, Eichhornia crassipes, Elodea canadensis, Hakea sericea, Hakea salicifolia, Ipomoea indica, Myriophyllum aquaticum* (EPPO List of Invasive Alien plants),, *Oxalis pes-caprae, Pittosporum undulatum, Robinia pseudoacacia, Spartina*

Figure 8. *Acacia dealbata* flowers.

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EGERIA DENSA

- **Appearance:** Aquatic herb
- **Status in Portugal:** Invasive species (listed in Decree-Law no. 92/ 2019, 10th July).
- **Risk Assessment Score**: 20 | Value obtained according to a protocol adapted from the Australian Weed Risk Assessment (Pheloung et al. 1999), by Morais et al. (2017), according to which values above 13 mean that the species has risk of having invasive behavior in the Portuguese territory | Updated on 30/ 09/ 2017.
- **Synonymy:** *Anacharis densa* (Planch.) Vict.; *Elodea densa* (Planch.) Casp.; *Philotria densa* (Planch.) Small; *Elodea canadensis* var. *gigantea* L.H.Bailey; *Elodea densa* var. *longifolia* Bonstedt; *Udora densa* (Planch.) M.R.Almeida
- **Last update**: 01/06/2020

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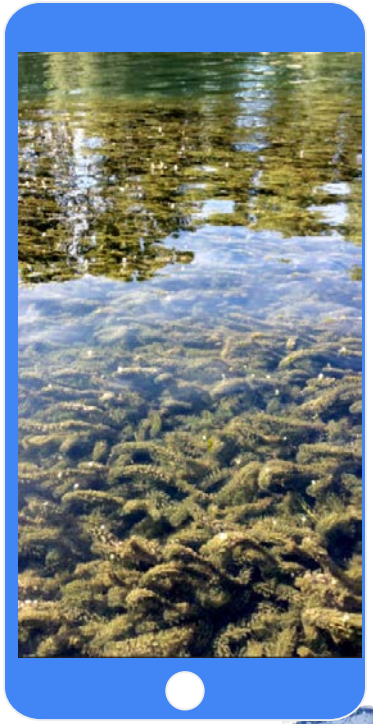
EGERIA DENSA

- **Dark green submerged aquatic plant, scarcely branched, with 4 or 5 leaves per node. It forms “tufts” at the water body bottom, and can grow up to 6 meters, forming floating “carpets” close to the surface.**
- **Scientific name:** *Egeria densa* Planch.
- **Common name:** leafy elodea, Brazilian elodea, Brazilian waterweed, common waterweed, dense waterweed, egeria
- **Family:** *Hydrocharitaceae*



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"CLIMATE CHANGE IS HERE"

INVASIVE FLORA AND FAUNA

PAPADAKI MARILENA

ERRIKAITI STAVRAKA

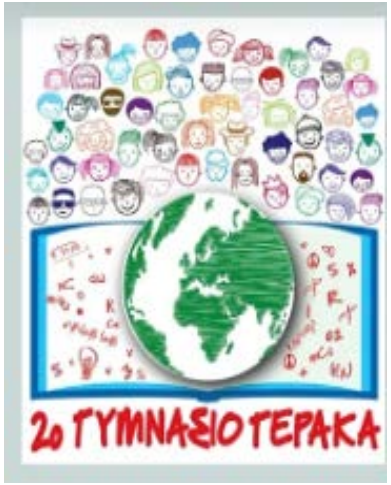
2o GYMNASIO GERAKA

FAUNA

GREECE

The Dusky Spinefoot

This expansive fish took its greek name (Germans) from the Nazis, as it appeared here at the time of WW2. It has since expanded all over South Greece, causing huge problems for coastal fishermen. The daily migration of flocks from deep to shallow, traps thousands in the nets. Fishermen often dump their nets because the first dorsal ray of the Dusky Spinefoot contains a toxin that causes swelling and pain and so it is almost impossible to dislodge thousands of them from a net.

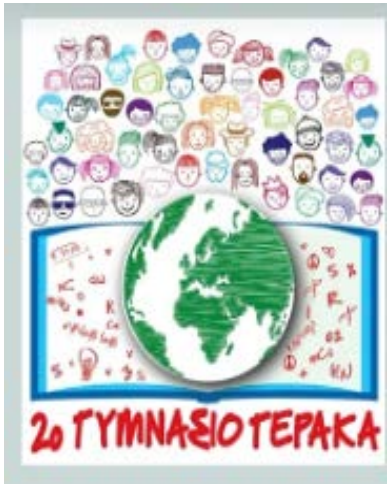


MAMMALS

The American mink (Neovison vison). A very successful semiaquatic hunter who poses a huge threat to the wildest ecosystems in Greece. It has already displaced the European mink in Europe, while among its prey are small mammals, birds, reptiles and actually everything that can be eaten. It is established in lakes Prespa and Orestiada and seems to be an old runaway from the fur industries of the area. The catastrophic mass release of hundreds of American minks from fur industries by eco activists has magnified the problem, as it is a highly adaptable animal, able, in a few years, to change the habitats of the region.

The American Bullfrog

The American Bullfrog (Lithobates catesbeianus). Or the swamp monster. Originally from North America this giant frog (up to 18 cm long), feeds on any animal that fits in its mouth. Snakes, fish, frogs, rodents, chicks, insects, bats, etc. It has been introduced to Agia lake, near Chania, Crete, where it has already displaced the rare, endemic Cretan frog (Pelophylax cretensis).



FLORA

Greece

The Silverleaf Nightshade

Descend from America the silverleaf nightshade has spread all over maquis habitats. A particularly adaptive plant -one centimeter of root can give a whole plant- threatens the characteristic type of Mediterranean ecosystems, growing where there should be thyme, oregano and other native shrubs. It is already found in most parts of southern Greece, especially in islands, without any systematic attempt to eradicate it.

The Tree of Heaven

Coming from China, this particularly adaptive tree has been used extensively as an ornamental on the sides of streets and in cities. It can withstand frost as well as drought and so it is no coincidence to see it appearing in many of our forests next to firs, plane trees, lindens, ashes, willows, etc., occupying their space.

FAUNA

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CROATIA

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Proterebia afra dalmata - Dalmatia

Proterebia afra dalmata is an endemic subspecies of the butterfly. It lives in the areas around **Zadar and Sibenik**, as well as in the hinterland around Knin and at the spring of the Cetina river.

After the females lay their eggs on plants and the caterpillars survive the winter, in spring we can see the adult butterflies flying through the green fields of the **Dalmatian hinterland**.

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Underground leech - Velebit

The underground leech is the deepest found animal in the world. It was found in four deep pits on Velebit, first time **in 1994 in Luke´s trench**. Not much is known about this interesting animal, and its endangerment cannot yet be estimated.

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FLORA

Croatia

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Degenia velebitica -
Velebit Mountain Range

The Degenia velebitica is a protected endemic plant with yellow flowers and is the only species of its kind. It grows on **mountain ridges or crevices of Velebit**. So far they have been found **only in three places**: two places on southern Velebit and one in the central part of the mountains. Today, the Degenia velebitica is the **rarest plant in Croatia**. The uniqueness of this plant can be seen on the 50-lipa coin of the national currency.

Sibiraea Croatica - Many endemic species tell the history of a certain terrain and the Sibiraea croatica, a deciduous shrub of the rose family that only occurs on the rocky ground of Mount Velebit, is one of the best-known memorials of the Ice Age.

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The Aquilegia kitaibelii (Kitajbelov Pakujac), a plant endemic to the western Balkans with deep purple flowers on long stems, is named after Pál Kitaibel, a botanist, chemist and one of the first researchers of the Velebit flora.

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Thanks!