EFFECTS OF CLIMATE CHANGE ON THE METACOMMUNITY STRUCTURE OF A MEDITERRANEAN BASIN

Eurofins Cavendish
Centre and southwest of the Iberian Peninsula

Mediterranean river basin with numerous temporary rivers

Highly vulnerability to climate change due to its geographic location and its marked seasonality
GUADIANA BASIN

- Spatially and temporally heterogeneous
  - Marked seasonality
    - Long periods of drought
- High presence of transversal barriers

Isolation between communities
GUADIANA BASIN METACOMMUNITY

Local communities / Sampling points according to the WFD
STUDIED METACOMMUNITY

Cladophora
Nitzschia desertorum
10 μm
Squalius pyrenaicus
Ephemerrillidae
METACOMMUNITY STRUCTURE

- Analysis of the elements of metacommunity structure
METACOMMUNITY STRUCTURE

Cladophora
Nitzschia desertorum
Squalius pyrenaicus
Ephemeroptera
RESULTS

MACROINVERTEBRATES
DIATOMS
MACROPHYTES
FISH
THE WHOLE METACOMMUNITY

WHAT DOES THIS MEAN?

Physical-chemical heterogeneity acts as an environmental filter but it is competition that structures the different communities

CLEMENTSIAN

- Independent local communities
- Functionally similar species that cannot coexist with each other
WHAT INFORMATION DOES THIS GIVE US IN THE FACE OF CLIMATE CHANGE?

**PRECIPITATION**
Reduced precipitation and increased temperatures are resulting in an increase in the frequency, intensity and severity of droughts.

**FRAGMENTATION**
Increased isolation between communities due to the increase in distance between communities.

**MIGRATION**
Gene flow between populations will be reduced making them increasingly vulnerable to extinction.

**SURVIVABILITY**
worsening in the factors that determine the composition of the metacommunity, a reduction in resources and greater competition is expected.
PRONOUNCED CLEMENTSIAN STRUCTURE
Greater isolation between communities

SHRINKING HABITATS, FEWER RESOURCES AND GREATER COMPETITION, VULNERABILITY TO EXTINCTION
Changes in the diversity, composition and stability of the metacommunity are expected

POTENTIAL EXTINCTION OF ENDEMIC SPECIES
Global biodiversity loss
how can we improve the situation?

- Ecological restoration of degraded rivers
- Cessation of the construction of barriers in water bodies
- Control of water abstraction and outflow of livestock and urban effluents

This will reduce the modification of the hydroperiod and, with it, the impacts on water bodies and the organisms that inhabit them