

Benthic macrofaunal populations of the Galician coasts (NW Spain)



Exposed area:
Outer part of Ria de Ortigueira.

Faunistic and ecological works on the macrobenthic communities of the Galician coasts have been carried out since 1886, year in which Hidalgo published the listing of marine species of the Spanish north-western coasts. But it is in recent years when a profusion of scientific studies analyses patterns of benthic distribution, trophic behaviour and population structures, necessary to manage these areas correctly. Ecological works have been mostly carried out in soft bottoms, since their species have been considered as good indicators of the marine conditions.

The particular kind of Galician estuarine systems called 'rías' have been especially studied due to their great economic and social importance. They are submitted to strong currents of bottom cold waters enriched in nutrients. Due to these upwellings they are linked to fisheries, culture of mussels on rafts and shellfish resources.

In the rías and associated inlets appear different variations of benthic communities. However, these communities follow similar distributions along different rías, since the composition of species depends on interaction between biotic factors, as food availability, predation or competition, and abiotic, such as sediment grain size, depth, current velocities, bottom relief or salinity. It is often that large freshwater inputs occur in the innermost part of the rías, which results in salinity fluctuations on a tidal (range about 3 m) and seasonal basis. From outer parts of the rías towards inner and



ABOVE: Sampling the sediment. A van Veen drag is a common technique used to get the samples.

RIGHT: *Zostera noltii* meadow during low tide.





FIGURE 1. The polychaete *Melinna palmata* appears in muddy bottoms.
FIGURE 2. The bivalve *Abra alba*.
FIGURE 3. The gastropod *Hydrobia ulvae* can reach really high densities in intertidal bottoms (> 40000 individuals per m²).
FIGURE 4. The decapod crustacean *Pisidia longicornis* is a dominant species of the raft epifauna.
FIGURE 5. The crustacean *Melita palmata*, characteristic of boreal shallow muds.
FIGURE 6. The family Magelonidae appears in fine and muddy sands where the boreal community of *Tellina* is distributed.

shallower areas, and according to the grain size distribution, we can be found the following communities:

Variations of the community of *Venus fasciatum*-*Spisula elliptica*-*Branchiostoma* appear in the outer part of the rías, in the coarse sediments until 50 m depth highly influenced by oceanic conditions. *Branchiostoma lanceolatum*, different species of genus *Glycera*, *Goodallia triangularis*, *Caecum imperforatum* or *Pisione parapari* are some of the more representative species.

Venus gallina community and the boreal community of *Tellina* appear in fine and muddy sands. The polychaetes *Nephtys cirrosa*, *N. caeca* or *Magelona filiformis* and the molluscs *Fabulina fabula*, *Angulus tenuis* are characteristic species of these communities. In general, number of species decrease towards areas with higher hydrodynamic.

Abra alba community appears in muddy bottoms, situated in harbours and protected areas. The bivalves *Thyasira flexuosa*, *Abra alba* and *A. nitida* and the annelids *Chaetozone gibber*, *Melinna palmata* and Oligochaeta are characteristics of these bottoms. Some of these sediments present high organic matter content due to anthropogenic influence (mussel culture, industrial discharges...). Typical communities in these cases are the *Spiochaetopterus costarum*, *Sternaspis scutata*, *Amphiura filiformis* or *A. chiajei* ones.

In the boreal shallow mud association appear the molluscs *Cerastoderma edule*, *Hydrobia ulvae*, *Loripes lacteus* and the crustacean *Melita palmata*. These intertidal and subtidal muddy sands are usually colonized by the seagrasses *Zostera noltii* Hornem. 1832 and *Zostera marina* L. The seagrass beds are some of the most heterogeneous landscape structures of shallow waters ecosystems in the world, and the most productive coastal ecosystem. These meadows are associated to

high biodiversities since organisms find here different habitats available, protection against predators, stabilization of the sediment or increased nutrient loads.

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The hermit crab *Diogenes pugilator* is an inhabitant of fine sand and shallow depth.

