

# Large scale patterns of trematode parasites communities infecting *Cerastoderma edule* from Portugal to Morocco

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Trematodes are common coastal macroparasites with complex life cycle using generally three hosts. The exploited cockle, *Cerastoderma edule*, is a dominant bivalve, distributed along North eastern Atlantic coasts that hosts several trematode species. We performed an extensive spatial sampling of cockles from Portugal to South Morocco (2500 km) in order to 1) analyze cockle parasites south of 31°N. and 2) identify drivers of parasite community structure.

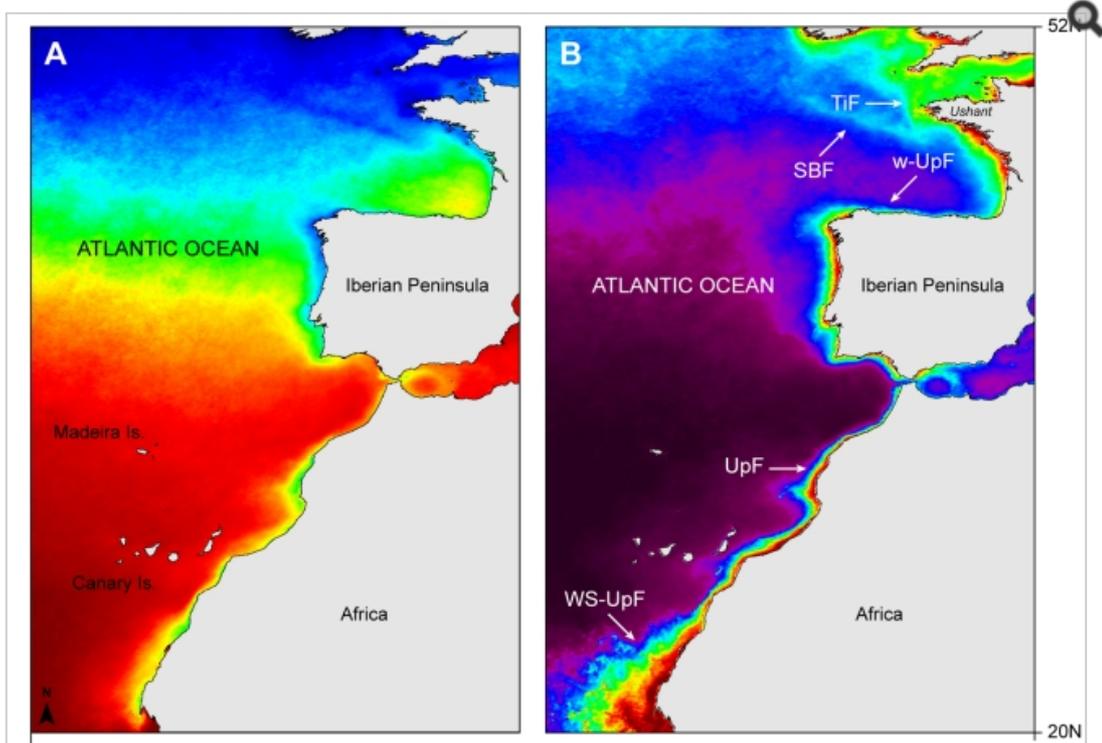
Most of the 12 trematode species were observed along the whole latitudinal gradient, demonstrating the high dispersal ability of these parasites. However, one species was absent in the southern stations, in relation with host distribution area. Multivariate analysis related to trematode communities in cockles clustered: 1) a series of poorly connected sites with low infection, corresponding to northern Portuguese stations under the influence of cold water (upwelling proximity) and coarse sediments; 2) sites characterized by the dominance of the trematode *Parvatrema minutum* in habitat suitable for intermediate host, *Scrobicularia plana*; 3) lagoons (or bays) with high oceanic influence and characterized by high trematode diversity.

This study highlighted that the most important limiting factor was the presence of the other hosts. The results also suggest that temperature is an important trigger to predict parasite infection, with coastal upwelling system operating for Portugal as a shield against trematode infection. These vertical currents provide cool surface temperature and mask latitudinal gradients of temperature (and

trematode infection). This study figures out what could be the consequence of thermal modification mediated by oceanographic global circulation changes on cockle populations.

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**Figure 2**



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