

Maria Fais

University of Vigo

Nationality: Italian

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Orientation: Sustainable Use of Marine Resources

Specialization Area: Management and Use of Resources

Research Area: 2.1 Research of resources based on ecosystems knowledge



PhD project: Development of metabarcoding approaches for investigating temporal and spatial dynamics of meiobenthic communities in estuarine ecosystems

Supervisors: Dr. Filipe O. Costa (University of Minho)

Dr. Carlos A. Canchaya (University of Vigo)

Summary: I explored the potential of sediment environmental DNA (eDNA) metabarcoding for investigating temporal and spatial dynamics of meiobenthic communities in three coastal ecosystems in the Northern Iberian Peninsula: Rio Lima and Ria de Aveiro (Portugal) and the South margin of the Ría de Vigo (Spain). To this end, I performed the optimizing of sampling, molecular and bioinformatic protocols, testing six different primer pairs from the mitochondrial cytochrome c oxidase gene (COI) and the nuclear ribosomal 18S rRNA gene (18S) to maximize meiofaunal OTU (Operational Taxonomic Unit) detection. Main results indicated a minimum of 3 samplings points between the middle and the upper intertidal zones; the use of at least one primer pair for each genetic marker and excellent bioinformatics processing in order to identify the spatial-temporal patterns of the meiofauna in these estuarine ecosystems. Furthermore, concomitant analyses of OTU co-occurrence networks revealed striking stability in the network structure in the sampling stations and between years for both genetic regions employed in the community analyses. The network analysis approach applied to this study has extremely highlighted the modularity and connectivity patterns of meiofaunal communities, which reflected the combined actions of environmental filtering and geographical aspects on spatial and temporal distribution.

