Enzymatic activity on sediments and nematode assemblage responses during seagrass beds habitat recovery following the disturbance of the traditional digging activity of bivalve harvesting

O69

Jordana Branco[1], Sílvia Pedro[2], Patrick Materatski[1], Ricardo Pires[2], Carlos Ribeiro[3], Isabel Caçador[2], Helena Adão[1]

[1]MARE, Universidade de Évora, Évora, Portugal
[2]MARE, Faculdade de Ciências da Universidade de Lisboa, Lisboa, Portugal
[3]Geosciences Department, Universidade de Évora, Évora, Portugal

Sediment digging is an anthropogenic activity connected to the exploitation of living resources in estuarine and marine environments. Knowledge of the functional responses of the benthic assemblages to such physical disturbance is an important baseline for the understanding of the ecological processes of habitat recovery and restoration and for the development of tools for the management of harvesting activities. To investigate the effects of digging activity of the bivalves on *Zostera noltii* seagrass beds, a manipulative field experiment was conducted that included the enzymatic activity of sediments and the associated nematode assemblages. Four plots (two undisturbed serving as control and two dug to collect bivalves - treatment) with 18 subplots were randomly located at seagrass beds in the Mira estuary at the SW coast of Portugal. Samples were randomly and unrepeatably collected from three subplots of each plot on five different occasions, before sediment digging (T0) up to six months after disturbance (T5). Microbial activity in sediments was assessed by determining the extracellular enzymatic activity of six hydrolytic enzymes (sulfatase, phosphatase, b-N-acetilglucosaminidase, b-glucosidase, urease, protease) and two oxidoreductases (phenol oxidase and peroxidase). The microbial community status was also assessed through the measurement of dehydrogenase, which reflects microbial respiration. The nematode assemblages composition, biodiversity and trophic composition on different sampling occasions were also analyzed. The fluorometric and biochemical parameters of the *Z. noltii* plants analysed during the experimental period showed a recovery of the seagrass beds, and an increase of the enzymatic activity of the sediments after disturbance was detected. The nematodes assemblages were similar on all sampling occasions. The seagrass beds and the associated nematodes assemblages showed high resilience to the stress caused by the traditional bivalves digging activity. The obtained results allow the development of a management programme for the commercial fishing activity to maintain good environmental status and minimize the secondary environmental effects on marine and estuarine habitats through the establishment of a baseline for the regulation of the harvesting frequency.