

Benthic Nematode assemblages response to seagrass beds spatial heterogeneity in natural recovery process of *Zostera Noltii* after major collapse

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Abstract

After a seagrass beds (*Zostera noltii*) collapse in 2008 of the Mira estuary (SW coast of Portugal) symptoms of early recovery were observed. The principal goal of this study is to assess the evolution and resilience of the benthic nematodes assemblages during the natural recovery of the seagrass beds through analysis of the spatial and temporal differences in structural and functional characteristics of the communities. The horizontal macroscale (km) and small scale (m) variability was evaluated. We hypothesize that the new environmental conditions of the early recovery, with sparsely distributed and small-sized seagrass patches, will increase the spatial heterogeneity of nematode communities and significantly affect community diversity, both taxonomic and functional. The sampling design was as follows: Samples were collected in five “occasions”, (February, June, September, December 2010 and February 2011), at randomly “stations” located over a distance 50 m, at two “sites”, 2km distance. To test the hypothesis that the composition of nematodes assemblages changes spatially and seasonally a two-way PERMANOVA analysis was performed. Mean nematode densities varied between 1416 ± 107 ind. 10 cm^{-2} (Site A) and 2611 ± 230 ind. 10 cm^{-2} (Site B), and a total of 89 species were identified. The PCO ordination based on abundance and composition of nematode genera do not show the discrimination of the two sampling sites. However densities and trophic groups showed significant differences across macroscale (sites A and B), the increase of

spatial heterogeneity was clear identified in small scale. No significant differences was observed between the temporal variation. The response of the nematode assemblages after the collapse, both in terms of density and diversity, showed a substantial potential of resilience and recovery.