

Benthos response to physical disturbance: “The case of deep-sea trawling at the Portuguese Margin off Sines”

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Paucity of data on the ecological significance of deep-sea bottom trawling still exists. An effort to contribute information on the response of benthic communities to bottom trawling disturbance at the SW Portuguese margin, Off Sines was made by conducting two ROV dives: dive 1 (trawled) and dive 2 (non/low-trawled) and through sampling at two stations: Trawled (st 7) and non/low-trawled (st 6) both occurring at depths range (290-356m). Megafaunal densities (ind.100m) and meiofaunal abundances (ind.10cm⁻²), their structural distribution and composition were determined between dives and stations respectively. Sediment characteristics (i.e. grain size, %TN and %TOC) from the studied areas were investigated and correlated to these benthic functional assemblages. Results of megafaunal abundances and taxa composition significantly differed ($P < 0.0001$) between the two dives, depicting the impact of bottom trawling gear. Meiofaunal community did not show any significant differences ($P < 0.4516$) in abundance (per group) and community composition ($P < 0.1077$) between stations, although their vertical profiles significantly differed ($P < 0.0001$) suggesting the influence of oxygen requirement, quality and quantity of food supply e.g. fresh phytoplankton and phytodetritus, bottom currents flow and higher concentration of Sulphide compounds that trigger sediment biogeochemistry. Top sediment layers (0-3cm) recorded higher abundance and diversity in relation to the deeper sediment depths (3-5cm). Sediment grain size in st 7 (T) had the highest percentage of coarse sand whilst st 6 (LT) showed high percentage of fine sand. Both stations recorded low %TN and %TOC contents in the sediments.

Findings of the current study indicates that the response of megafaunal communities to the impacts of bottom trawling are more pronounced whereas no effect of trawling was observed on meiofaunal communities, thus knowledge of their interaction with fisheries will promote deep-sea habitat conservation.

Keywords: trawling impacts; deep-sea; meiofauna; megafauna; grain size; conservation