

Impact on the copepod community structure in a coastal region after a mining dam disaster in the Southwestern Atlantic Ocean.

THEME: BIODIVERSITY IN A CHANGING OCEAN

Session 3: Cumulative impacts of human activities on marine biodiversity

Abstract

Zooplankton plays an important role in marine ecosystems by controlling the phytoplankton population, regenerating nutrients and exporting biogenic matter. Their distribution is limited by the environmental characteristics of the pelagic realm, and potential changes in the environment may promote several levels of responses. Zooplankton was sampled in the Southwestern Atlantic Ocean in a coastal region near the Doce River after the worst mining dam disaster ever recorded in Brazilian waters. Samples were collected using a WP2 plankton net fitted with a 200-micron mesh and a mechanical flowmeter, and preserved in a 4% buffered formaldehyde. Results showed an increase in abundance right after the disaster with more than $222.959 \text{ ind.m}^{-3}$ at the river mouth, a two-hundred-fold increase over the past year, with two copepod species, *Parvocalanus scotti* and *Oithona nana*, making up to 80% of this total abundance. A decrease in species richness and diversity was also observed in the sampling area along the year as well as a shift in species composition. A significant impact on the zooplankton community was observed due to the mining residues that reached the coastal area of the Doce River in the Southwestern Atlantic Ocean, with negative consequences for the entire local food web.

Keywords: copepod; diversity; environmental impact; Southwestern Atlantic.

Short Description: In November 2015, the worst mining dam disaster ever recorded in Brazilian history reached the Atlantic Ocean impacting the coastal region and its biodiversity. Four oceanographic campaigns took place, right after the disaster and in other three moments, to verify the impacts of the contamination by this enormous charge of suspended matter with high concentrations of heavy metals. A shift in the local copepod community structure with species loss, species changes and atypical abundance behavior was observed right after the first campaign. With the distancing from the river mouth, the copepod community changed due to the river plume shifts due to the hydrodynamic features in the region. This is a contribution to the understanding of human impacts on the copepod biodiversity in the Southwestern Atlantic Ocean

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