Assessment of heavy metals and subtidal macrofauna associated to the sediments at Nacala Bay, Mozambique

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Assessment of heavy metals contend on sediments and macrofauna abundance and species composition associated to sediment were performed at the new coal port at Nacala-a-Velha and surrounding subtidal areas from November 2015 to March 2017 in Nacala Bay, North of Mozambique. Sampling was carried out twice a year from November 2015 to March 2017. Heavy metal levels reported where compared between locations and seasons based on Canadian and South African Guidelines. The levels of 09 of the 11 heavy metals assessed at the all locations and sampling campaigns were significantly different among locations than among seasons (except for the As and Co which presented differences between the 1st and 2nd campaigns). Only three elements (AS, Cr and Ni) were above the threshold effect level (TEL) for the Canadian guidelines and none of the metals studied have exceeded the South Africa guidelines whose environmental conditions are more similar to Mozambique compared to Canada. The highest levels of heavy metal were associated to high levels of organic content and percentage of clay in the sediment. The benthic communities demonstrated evidence of structuring due to differences in spatial and temporal variations between the sampling campaigns. Malacostraca was the most abundant class recorded in all areas and seasons. The differences in granulometry and organic matter indicate that these parameters may be relevant both in the distribution of the macrofauna and the association with heavy metals. The results obtained so far do not show any evidence of relationship between the content of heavy metals in the sediment and the structuring of the studied communities. However, the risk of benthic organism contamination and bioaccumulation due to exposure to these pollutants is high. The potential sources of the metals in Nacala Bay as well as the degree of contamination and effects on macrobenthic fauna need to be assessed in future studies.