Heavy Metal Pollution Levels in Water and Oysters, *Saccostrea Cucullata*, from Mzinga Creek and Ras Dege Mangrove Ecosystems, Tanzania

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Abstract

Heavy metal (cadmium, chromium, copper, mercury, lead and zinc) concentrations in mangrove forests were investigated in water,
suspended particulate matter (SPM) and oyster samples from the Mzinga Creek and Ras Dege mangrove stands, Tanzania, using
Inductively Coupled Plasma–Atomic Emission Spectroscopy. With the exception of Zn, the concentrations of dissolved metals were generally less than 1μg l–1 in all samples. Higher concentrations of metals were recorded in SPM in samples from the Mzinga
Creek mangrove forest, on ebb tides during the rainy season. Concentrations of Cd in SPM ranged from 33.9–85.5μg g–1 dw and, for Cr, from 23.9–138.1μg g–1 dw. The concentration of Pb ranged from 56.5–114.0μg g–1 dw and the concentration of Zn in SPM
from Mzinga Creek was 35 times higher than that of Ras Dege, with concentration ranges between 229.8 and 1 427.3μg g–1 dw. In Ras Dege, concentrations of Cd, Cr, Cu and Pb in SPM were generally lower than those of Mzinga Creek. Metal concentrations in oysters were of an order of magnitude higher in Mzinga Creek than in Ras Dege. These results are indicative of the contributions of heavy metal pollution from several anthropogenic sources, such as industrial and agricultural activities, in the Mtoni Creek catchment. Dar es Salaam seaport is a potential source of heavy metals to the Mzinga Creek mangrove stand. In comparison with the less-impacted Ras Dege mangrove stand, Mzinga Creek's environmental condition calls for urgent management intervention.

Keywords:

Dissolved metals, heavy metals, mangroves, suspended particulate matter, tidal cycles