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Levels of heavy metal and the effect of salinity on nutrients uptake and productivity of mangroves along the coast of Dar es salaam, Tanzania

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Mangroves are extremely productive ecosystems and host substantial amounts of biodiversity. Mangroves located in urban areas are exposed to more chemical pollution than those in rural areas due to industrial activity. In the present study levels of Ni, Cu and Zn in the mangrove plants tissues (*Avicennia marina* and *Rhizophora mucronata*) and sediments from the city based mangrove forest of Mtoni Kijichi and suburb Mbweni along the coast of Dar es Salaam, Tanzania were determined. Sediment samples from Mtoni Kijichi exhibited significantly higher levels of Ni, Cu and Zn (40.47 ± 3.81 , 16.33 ± 3.82 and 56.51 ± 15.95 , $\mu\text{gg}^{-1}\text{dw}$) respectively than those from Mbweni (12.02 ± 3.01 , 3.5 ± 1.56 and 12.94 ± 2.41 $\mu\text{gg}^{-1}\text{dw}$) respectively. Plant tissues of both species from Mtoni Kijichi accumulated significantly higher amounts of Ni, Cu and Zn than the same species from Mbweni. Concentrations of the studied metals have increased in both sites when compared to previous studies. *Ex situ* experiment was conducted and *in situ* measurements taken to establish the influence of salinity on nutrient (N and P) uptake, productivity and growth of *A. marina* and *R. mucronata*. Over eight months *A. marina* and *R. mucronata* seedlings were grown under salinity levels of 0, 10, 20, 30, 35, 40 and 50 psu. Nutrient uptake, stomatal conductance, plant height, number of leaves and dry matter accumulation were significantly higher at 19 ± 0.6 - 20 and 10 - 11 ± 1.3 psu in *A. marina* and *R. mucronata* respectively and decreased significantly as salinity increased. Therefore increase of heavy metal concentrations due to anthropogenic activities and the projected salinity increase due to climate change may result in changes in mangrove ecosystem along the coast of Dar es Salaam as they influence nutrients uptake, productivity and growth of the studied species.