Assessing Vertical and Horizontal Distribution of Meiobenthos Diversity as Indicators of Ecological Change along Salinity Gradient in the Estuaries of Rivers Sabaki and Tana, Kenya

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ABSTRACT
Vertical and horizontal distribution of meiofauna densities and community structure of two major river estuaries (Sabaki and Tana) in north coast of Kenya, a part of the Western Indian Ocean were investigated. The aim of the study was to develop an initial baseline inventory of meiobenthic assemblages in the two estuaries and to examine how salinity gradient, environmental characteristics and seasons influence their community structure, densities and diversity. Replicate samples were collected from three sampling stations along the salinity gradient of each estuary. A total of 3,556 individuals belonging to 26 taxa were identified. Meiobenthic structural densities in upper surface (0-5 cm) in estuarine sediments were generally higher ($\bar{x} = 50 \pm 23 \text{ind.10cm}^{-2}$) and ranged from 10 to 90 ind.10 cm$^{-2}$. The highest densities were recorded during the wet southeast monsoon (SEM) ($\bar{x} = 160 \pm 22 \text{ind.10 cm}^{-2}$) than northeast monsoon (NEM) season ($\bar{x} = 22 \pm 12 \text{ind.10cm}^{-2}$) for both estuaries. Results of non-Metric Multidimensional Scaling (nMDS) analyses revealed seasonal difference in meiobenthic composition whereas 1-way ANOSIM indicated meiobenthic densities were not significantly different between the estuaries (p = 0.712) but significantly differed between the seasons (p = 0.001). Nematoda was the most abundant taxon ($\bar{x} = 117 \pm 68 \text{ind.10 cm}^{-2}$) in all the sampling sites of both estuaries. The taxa diversity per site was relatively low (Taxa Richness ($S$)$\bar{x} = 9$; with a range of between 5 and 13 taxa; Shannon-Wiener diversity index $H'\bar{x} = 0.54$; ranging between 0.21 to 1.1). Four taxa out of a total of 26 were present in both estuaries. Habitat type, season and sediment grain size largely influenced the meiobenthic densities and community composition.

Key words: Meiobenthos, Vertical and horizontal distribution, Salinity gradient, Estuary, River Sabaki; River Tana; Kenya.