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Polychaete Diversity In A Tropical Estuarine Ecosystem

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Polychaetes are the important constituent of the estuarine benthic macro
faunal community and they exhibit a wide range of sediment choice.
Present study was carried out to determine spatial distribution, diversity
and species composition of the polychaetes in the Negombo estuary (7°6'
– 7°12'N, 79°49' – 79°53'E) and investigate the relationships between their
distributions with the physico-chemical parameters. Three replicate 0.025
m^2 Van Veen grab samples were taken during September, 2005, at each of
37 stations to represent the entire estuary. Water depth, pH, Temperature,
Salinity, Dissolved Oxygen content, Nitrate Nitrite and Phosphate contents,
Sea grass biomass, abundance of mangroves and sediment texture were
determined at each station. A total of 862 polychaetous annelids
representing 16 families and 36 species (Errantia 22 spp.; Sedentaria 14
spp.) were identified. The polychaetes constituted 40% of the total
macrofauna. Families with highest species richness were Nereididae (7
spp.), Pilargidae (3 spp.), and Spionidae (3 spp.). Pilargids and
Heterospionids were dominated in most of the sampling sites. The ranges
of the values calculated for Species richness, Shannon Weiner (diversity)
index (H'), Simpson index (J') and Pielou's index of the sampling sites were
0-18, 0-2.73, 0-1.02 and 0-0.95 respectively. Low or zero diversity
recorded from the mouth region and deeper areas of middle region of the
estuary. High abundance and diversity were noted at the marginal and
inner regions. The ordinations of Non-parametric Multidimensional Scaling
(MDS) indicated the clustering of sites which were located in the northern
region of the estuary. Results of the Spearman rank correlation coefficients
for permutations of environmental variables indicated that the combination
of salinity, depth and nutrient contents of water mostly affected the
abundance and diversity of polychaetes in the estuary. Polychaete
abundance decreased with increasing depth and their diversity changed
with the salinity.