Impact of the changing ecology on intertidal polychaetes in an anthropogenically stressed tropical creek, India

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Abstract : Polychaete assemblages and associated environment c strategically selected intertidal stations along the extremely polluted T creek on the west coast of India were studied monthly for a year and com with past available data to investigate changes in the creek ecology d various anthropogenic activities like industrial, domestic, and solid disposal along with land reclamation. Shannon's index (H') varied spatially 0.4 to 1.5, Margalef richness index (d) from 0.4 to 1.1, and evenness in from 0.3 to 0.7 indicating poor polychaete diversity. Ceratonereis burm and Lycastis indica were the most abundant and omnipresent polychae the creek indicating their tolerance and adaptability to various degre pollution. Hydro-sedimentological investigations revealed enhancement o nitrogen (TN) and organic carbon (Corg) load and

hypoxic levels of dissolved oxygen (DO) over the years. Slit component of sediment was increasing, with proportionate decrease in clay due to various anthropogenic disturbances. Species richness was correlated positively with clay and negatively with silt. The BIO-ENV analyses indicated the strong influence of No3 - -N, clay and TN on the distribution patterns of polychaetes. Pollution-tolerant polychaetes like Lycastis ounaryensis and Polydora tentaculata were getting replaced by more pollution-resistant species like C. burmensis in the creek due to changing sediment texture, reduced oxygen levels, and increased Corg and TN.

Keywords Polychaetes - BIO-ENV - Coastal pollution - Creek

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References

Ajmal Khan S, Murugesan P (2005) Polychaete diversity in Indian estuaries. Indian J Mar Sci 34:114-119

Annie M, Govindan K (1995) Macrobenthos in the nearshore coastal system of Bombay. Proc. Nati Acad Sci India 65:411-429

Arasaki E, Muniz P, Pires AMS (2004) A functional analysis of the benthic macrofauna of the Sao Sebastiao Channel (south-eastern Brazil). Mar Ecol (Berl) 25 : 249-263. doi : 10.1111/j, 1439-0485, 2004. 00032x

Armstrong JW, Jhom RM, Chow KK (1981) Impact of a combined sewer overflow on the abundance, distribution and community structure of subtidal benthos. Mar Environ Res 4:3-23. doil:10.1016/0141-1136(80)90056-2

Athalye RP (1988) Status of macrobenthos in detritus food chain of Thane creek near Thane city. PhD Thesis, University of Bombay, 197 p

Athalye RP, Gokhale KS (1991) Heavy metals in the polychaete Lycastis ouanaryensis from Thane creek, India. Mar Pollut Bull 22:233-236.
doi :10.1016/0025-326 X(91) 90916-G

Belan TA (2003) Marine environmental quality assessment using polychaete taxocene characteristics in Vancouver harbour. Mar Environ Res 57:89-101.
doi:10.1016/S0141-1136(03) 00062-X

Buchanan JB (1984) Sediment analysis. In : Holme NA, McIntyre AD (eds) Methods of study of marine benthos, 2nd edn. Blackwell Scientific Publications, Oxford, pp 41-65.

Cardoso PG, Bankovic M, Raffaelli D, Pardal MA (2006) Polychaete assemblages as indicators of habitat recovery in a temperature estuary under