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is high in the system coastal part followed by the variation of phosphate and silicate found much in the river and estuary part of the Mahanadi estuarine system respectively.

SPATIAL VARIABILITY OF MICROZOOPLANKTON AND ABIOTIC ENVIRONMENT OF INDIAN SUNDARBANS

Puja Mishra[1] and Jhimli Mondal[1,2]*

[1]Estuarine and Coastal Studies Foundation, Howrah – 711101, West Bengal

[2]Zoological Survey of India, Prani Vigyan Bhawan, M – Block, New Alipore – 700053,

Kolkata, West Bengal

Microzooplankton play a significant role in ecosystem functioning of mangrove estuaries by transferring energy from microbial level to higher trophic level. Ciliates are the key component of any microzooplankton community. Ciliates community of the mangrove estuaries of Indian Sundarbans is rarely studied. This study asset the spatial diversity and distribution of the ciliate community of Indian Sundarbans. The sampling was conducted on 24th and 25th of March 2023 from the multiple sites of core and buffer regions of the Indian Sundarbans. In the buffer zone, salinity (20.45±0.25 (SE)), pH (7.96 ± 0.16 (SE)), water temperature (27.45 ±0.13□C (SE)), and Dissolve Oxygen (DO) (4.3±0.68 mg/L (SE) were measured. In core zone, salinity (20.88±0.19 (SE)) pH (7.89±0.022(SE)), water temperature (27.30±0.061□C (SE)), DO (6.33±0.16 mg/L (SE)) were measured. In the buffer zone microzooplankton abundance (55000±8539 individual/m³ (SE)) was lower than the abundance of microzooplankton in the core zone (60000±22867 individual/ m³ (SE)). Out of 27 species of ciliates 9 species exclusively were found in the buffer zone and 11 species were exclusively found in the core zone. Tintinnopsis parvula, Leprotintinnus simplex was the most dominant species in the buffer zone and in the core zone Stenosemella ventricosa, Stenosemella nevalis, Tintinidium primitivum, Tintinnopsis ovalis, Tintinnopsis lata were co-dominants. The study suggests that there is a considerable variability of ciliate community in Indian Sundarbans depending on the conditions of microhabitats. That may have consequences for higher trophic levels which use microzooplankton as their food resources. Abiotic conditions of Indian Sundarbans are

changing due to lack of freshwater and ongoing climate change; therefore, further studies on microzooplankton are recommended for betterunderstanding of the ecosystem functioning.

Keywords – Ciliates, Abundance, Diversity, Distribution

DYNAMICS OF MANGROVES IN SUNDARBAN IN THE LIGHT OF CLIMATE CHANGE

Kanailal Das[1], Karabi Das[2]

[1]Estuarine and Coastal Studies Foundation

[2]Assistant Professor, Dr. Kanailal Bhattacharyya College

Abstract: Climate Change is the word of the hour at present and Sundarban is also facing the brunt of it. The mean sea level shows a longpterm rising trend of about 1 mm/yr on an annual average in the Indian coast (Unnikrishnan et al., 2006). Recent observations suggest a rising trend of 2.5 mm/yr. A relative sea level rise of 10-20 mm/yr due to the coupled effects of eustatic sea level and land subsidence is seen in the seaward part of the Bengal delta (Allison, 1998; Coleman, 1969). The surface water temperature showed a rising trend in both western (6.14%) and central sectors of the delta (6.12%). The global average land and sea surface temperature increased by 0.6 +/- 0.2 °C over the 20th century (Raha et al., 2013). A trend of increasing recurrence interval is observed both for depressions and severe cyclonic storms in Bay of Bengal. Warming up of the Bay of Bengal alongwith it's orientation leads to higher incidences of tropical cyclones. The central sector of Indian Sundarban is deprived of freshwater due to siltation of Bidyadhari river. This has led to disappearance of sweet water loving mangroves like *Heritiera fomes* (Sundari) and *Nypa fruticans* (Golpata). Increasing salinity has brought about top dying disease in mangroves. Also recent cyclones Amphan and Yaas have led to charring of mangroves in Gopalganj of Kultali. About 9 stenohaline phytoplankton species were documented since 1994 in the upper estuarine stretch of Central Indian Sundarban and this change shall influence the aquatic food chain too (Raha et al, 2013). Mangroves act as efficient carbon sink and sequester huge amounts of carbon in their biomass pool (stems, leaves, branches, wood, roots) and sediments. Mangrove species globally can