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Seasonal variation in methane and nitrous oxide flux in the Cochin coastal micro tidal estuarine system

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The Cochin estuary is a micro tidal positive estuary situated on the southwest coast of India, in its banks where the country's major shipment ports and industrial sectors are located. It is the second largest estuarine system in India, fed by six rivers discharging about $2 \times 10^{10} \text{ m}^3\text{-y}^{-1}$ of fresh water. The seasonal distribution of dissolved methane and nitrous oxide in micro tidal Cochin estuarine hydrological system was investigated during the pre-monsoon, monsoon and post-monsoon seasons from August 2013 to July 2014. The surface and bottom samples were investigated extensively from representative estuarine provinces extending from organic loaded riverine discharge to the bar mouth of the Arabian Sea. Dissolved methane in the subsurface water was supersaturated in the entire study area in all the seasons, ranging from a lowest value of $2.9 \mu\text{moles-l}^{-1}$ in the post monsoon to highest value of $64.8 \mu\text{moles-l}^{-1}$ in the pre monsoon season. The near- bottom waters showed relatively reduced concentrations of methane ranging from $0.3 \mu\text{moles/L}$ in the monsoon to $15.5 \mu\text{moles/L}$ in pre monsoon. The methane concentration in the Cochin estuarine system is largely determined by in-situ production, inputs from the coastal wetlands and air-water exchange. Low super- saturation of nitrous oxide was observed in the subsurface waters in all the seasons during the study period. The average surface water nitrous oxide concentration ranged from 9.08 nml-l in the post-monsoon to 20.88 nml-l in the pre-monsoon. Increased concentrations of dissolved nitrous oxide were observed in the near bottom waters ranging from 10.60 nm.l-l in the postmonsoon to 53.85 nml-l in the monsoon. Coastal estuarine environments of the Cochin seem to be an important source of methane rather than a sink.

Biography

Akhilesh Vijay is a Senior Research Fellow pursuing his PhD in Dept. of Marine Biology, Microbiology and Biochemistry, CUSAT under the supervision of Dr. S Bijoy Nandan in the topic "Carbon Sequestration Potential of Coastal Wetlands a Comparative Model".

Abundance of mesozooplankton in Cochin estuary with reference to calanoid copepods

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India is blessed with many extensive estuarine systems. The South – West Coast is a tropical environment with diverse waterways and hydrological habitats. Cochin estuary extending from Munambam ($10^{\circ} 10' \text{N}$, $76^{\circ} 15' \text{E}$) in the north to Thanneermukkam ($09^{\circ} 30' \text{N}$, $76^{\circ} 25' \text{E}$), is one among the most productive estuarine environments. Diversity of the copepods from nine stations in the Cochin estuary was explored by carrying out a pre monsoon sampling. Fifteen species of calanoid copepods belonging to five families namely Acartidae, Centropagidae, Pontellidae, Paracalanidae and Pseudodiaptomidae were identified from these stations. Physico chemical parameters such as water temperature, pH, salinity, dissolved oxygen and nutrients like nitrate, nitrite, phosphate, silicate were analyzed. Mean abundance of mesozooplankton in the Cochin estuary was found to be 31467 No/m^3 and the copepods dominated 48% of the mesozooplankton, out of which, calanoid copepods dominated and their abundance was about 45% and the cyclopoid copepods constituted 2% of the total mesozooplankton abundance. Shannon Weiner diversity index - H' was recorded highest at Fort- Kochi (2.45) followed by Eloor (2.34). The Bray- Curtis MDS plot based on the average abundance of mesozooplankton indicated the highest similarity in abundance of 80% in Stations Eloor, Mulavukadu, Bolghatty and Thoppumpadi in Cochin estuary.

Biography

Santu K S is Research Scholar, in the Department of Marine Biology, Microbiology & Biochemistry, Cochin University of Science & Technology and is working in the University Grants Commission funded project.