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**SOUVENIR AND  
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**THEME: EDUCATING  
FOR CLIMATE ACTION  
AND SUSTAINABILITY**



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Climate change is one of the most significant issues of our times. It affects the sustainable and equitable development of all countries and their citizens. Solutions to the climate crisis require that the population is aware of the issues. As climate impacts are not the same across the world, measures to mitigate climate change will involve solutions that are locally rooted but based on global science. The integration of sustainability education, specifically climate change education into the formal education system can equip current and future generations across the world with key skills to determine locally relevant solutions for building a climate resilient, just, equitable and sustainable society.

Project TROP ICSU (Transdisciplinary Research Oriented Pedagogy for Improving Climate Studies and Understanding) (<https://climated.org> ; <https://tropicsu.org>) is an open access, free to use education platform that integrates climate change education into the mainstream education system across the world. We have developed, collated, curated, and validated a repository of over 800 teaching resources (including lesson plans with detailed, step-by-step guides) from across the world that can be used by all teachers to integrate climate education with their everyday teaching. This platform contains teaching resources that are locally rooted but globally relevant for their science, and are designed to promote interdisciplinary thinking. They have been developed by experts and undergo a multi-stage review. The resources have been mapped to topics in the syllabi of 10 disciplines, grade levels, climate topics, type of tools, locations, languages, and internet and computer accessibility.

Project TROP ICSU has trained over 1000 teachers in 11 countries and demonstrates how to effectively address the climate crisis through innovative pedagogical approaches and methods. We have curated teaching tools and developed detailed lesson plans as teaching aids for teachers to teach topics in the existing curriculum with the help of an example, case study, or activity related to climate change. The use of these interactive and engaging educational resources will help students enhance their conceptual understanding of topics in their disciplines, stimulate critical thinking, and simultaneously, increase the knowledge and awareness of the science of climate change. In addition to addressing this critical issue through interdisciplinary teaching and learning, the project also demonstrates how to effectively engage with today's learners through the use of digital teaching tools such as visualizations, models, video micro-lectures, hands-on classroom/laboratory activities, games, and readings. Learning is most effective when it is localized and in the learner's language. Our teaching resources include local climate stories, lesson plans on climate impacts in every country, and some resources in different languages. Our resources developed by global experts undergo a strict review process and help in making scientifically accurate

quality climate change education accessible to all.

The project is led by the International Union of Biological Sciences and the Centre for Sustainability, Environment and Climate Change at FLAME University, India and has more than 20 global partners that include science unions, national academies of countries, research centers, and UN agencies (<https://climated.org/people-partners/>).

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## HOURLY VARIATION OF MESOZOOPANKTON AND ENVIRONMENT OF THAKURAN ESTUARY, INDIAN SUNDARBANS

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Hourly variation of mesozooplankton and environment of Thakuran estuary, Indian Sundarbans, was studied. Mesozooplankton were sampled from stations S1 (22°07.992' N 88°48.989' E) and S2 (21°47.480' N 88°27.409' E) located near the head and mouth of the estuary, respectively, in December 2022, for 12 hours (from 20:00 to 09:00 next day) using a zooplankton net (mesh size 200µ, diameter 60cms) mounted with a mechanical flowmeter. Nitrate-nitrogen, phosphate, silicate and chlorophyll-a concentrations, temperature, salinity, pH, total dissolved solids and depth were measured on hourly basis. Copepods dominated the mesozooplankton community constituting 85.70–100%. Calanoid copepods shared the bulk of biomass representing 17 (S1) and 25 (S2) species of 13 genera, followed by cyclopoids comprising 5 species of 3 genera and lastly 2 harpacticoids at S1 and 1 monogeneric harpacticoid at S2. Apart from copepods, chaetognaths, decapod larvae and Lucifer contributed significantly to the total mesozooplankton count. At S2, water temperature ( $t=-4.73$ ,  $df=11$ ,  $p < 0.001$ ), salinity ( $t=-2.78$ ,  $df=11$ ,  $p=0.02$ ), pH ( $t=-6.33$ ,  $df=11$ ,  $p < 0.001$ ), TDS ( $t=-3.54$ ,  $df=11$ ,  $p=0.005$ ), depth ( $t=-5.29$ ,  $df=11$ ,  $p=0.003$ ) significantly declined but chlorophyll-a ( $t=4.40$ ,  $df=11$ ,  $p=0.001$ ) concentrations rose during the study. Acartiidae and Pseudodiaptomidae maintained a negative relationship with other families. At S2, Acartiella tortaniformis, Oithona brevicornis, Paracalanus parvus and Bestiolina similis formed a separate cluster at 70% level of similarity, being the most dominant throughout the study. At S1, the most dominant Paracalanus parvus formed a cluster at 80% level. Shannon-Wiener Diversity Index was found to be high at S2 ( $3.07 \pm 0.06$ ). Omnivorous copepods dominated the herbivores and carnivores. Canonical Correspondence Analyses reveal salinity, depth, chlorophyll-a and nitrate concentrations to be the major regulating factors of mesozooplankton distribution at S1; while temperature, chlorophyll-a and phosphate at S2. The results reveal minute variations in mesozooplankton community structure despite contrasting environment of different microhabitats of an estuary. Being interconnected with fishes via trophic relationship, behaviour, ecology and their susceptibility to the impacts of climate change, the monitoring of hourly variation of plankton community is recommended.

Keywords: Copepod community, diversity and distribution,