

Newsletter

(A basin-wide research program co-sponsored by IOC-UNESCO, SCOR and IOGOOS)

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To advance our understanding of interactions between geologic, oceanic and atmospheric processes that give rise to the complex physical dynamics of the Indian Ocean region, and to determine how those dynamics affect climate, extreme events, marine biogeochemical cycles, ecosystems and human populations.

A synthesis of phytoplankton diversity and their regulating factors in Indian coastal lagoons

Phytoplankton are microscopic algae on which all other higher trophic levels in the aquatic food chain depend. Being sensitive to water quality parameters such as nutrients, silt load, pollutants, etc. phytoplankton are also potent bioindicators in aquatic ecosystems. Against this backdrop, an extensive literature review was carried out to understand the phytoplankton ecology (composition, diversity, distribution and regulating factors) in the Indian coastal lagoons (eight on the east coast and nine on the west coast). Some of the notable lagoons investigated were Chilika, Pullicat, Muthukadu and Muthupet in the east, and Vembanad, Veli, and Ashtamudi on the west coast (see Figure below). Bacillariophyta (diatoms), Dinophyta (dinoflagellates), Cyanophyta (cyanobacteria), Chlorophyta (green algae), Euglenophyta, Chrysophyta (golden algae), Cryptophyta, and Xanthophyta (yellow-green algae) constituted the dominant phytoplankton groups in these coastal lagoons. Diatoms were the most abundant and ubiquitous group due to their high growth rates and positive correlation with regulating environmental factors. Phytoplankton biomass in lagoons is regulated by two opposing forces: biomass gain through nutrient availability and light penetration, and biomass loss through tidal flushing and zooplankton grazing. Intense light-limitation (turbid and turbulent water) during the Indian summer monsoon (July - September) does not promote phytoplankton biomass build-up despite the elevated levels of nutrients entraining the lagoons during this time.



Figure: Map showing the locations of coastal lagoons on the Indian







Instead, the blooming of phytoplankton happens a few months later, when the water column gets stabilized and clearer, indicating that shallow water ecosystems like lagoons are more light-limited than nutrient-limited. The finding also points out that except for a few lagoons like Chilika, Indian lagoons are not as intensively studied as other coastal ecosystems when it comes to phytoplankton ecology and community dynamics. Indian coastal lagoons, the drivers of Blue Economy (in terms of capture fishery and centre of tourist attraction), are under increased anthropogenic stress brought about by thermal pollution and organic and inorganic matter loading that can potentially affect phytoplankton and higher trophic level through cascading effect. Hence, rapid analysis of phytoplankton at large space and time scale is needed to decipher how anthropogenic factors can influence phytoplankton ecology on a long-term basis. For that, remote sensing observations, ecological modelling, size classes, and functional type analysis through pigment chemotaxonomy, can be considered as potential tools for future studies.



Figure: Relative abundance of phytoplankton groups in Indian lagoons [(a): Chilika Lagoon (b) Pullicat Lagoon (c) Muthukadu Lagoon (d) Muthupet Lagoon]

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DEEP-SEA RESEARCH PART II



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THE SUBMISSION PORTAL FOR VOL. 6 OF THE DEEP-SEA RESEARCH II SPECIAL ISSUE SERIES ON THE IIOE-2 IS NOW OPEN

Submission of manuscripts that describe the results of studies related to the physical, chemical, biological, and/or ecological variability and dynamics of the Indian Ocean (including higher trophic levels) is encouraged.

Submission of manuscripts from students and early career scientists is also encouraged.

If you are interested in submitting a manuscript, please contact Raleigh Hood (rhood@umces.edu).

E-2 Indian Ocean Expedition 2015-2025

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The endorsement of your scientific proposal or a scientific activity focusing on the Indian Ocean region is a recognition of the proposal's or activity's alignment with the mission and objectives of IIOE-2, of its potential for contributing to an increased multi-disciplinary understanding of the dynamics of the Indian Ocean, and of its contribution to the achievement of societal objectives within the Indian Ocean region. Over 48 international, multi-disciplinary scientific projects have already been endorsed to date by the IIOE-2. Yours could be the next one!

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CLIVAR May 2022 Bulletin is available online



The International CLIVAR Project Office distributes a monthly bulletin with announcements, funding opportunities, meeting notifications relevant to the ocean/climate science community.

The latest CLIVAR Bulletin May, 2022 is available at: https://mailchi.mp/clivar.org/clivar-may-2022-bulletin

Call for Contributions

Informal articles/short notes of general interest to the IIOE-2 community are invited for the next (June-end) issue of the IIOE-2 Newsletter. Contributions referring IIOE-2 endorsed projects, cruises, conferences, workshops, "plain language summary" of published papers focused on the Indian Ocean etc. are welcome. Articles may be up to 500 words in length (Word files) accompanied by suitable figures, photos.(separate.jpg files).

Deadline: 25 June, 2022



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