

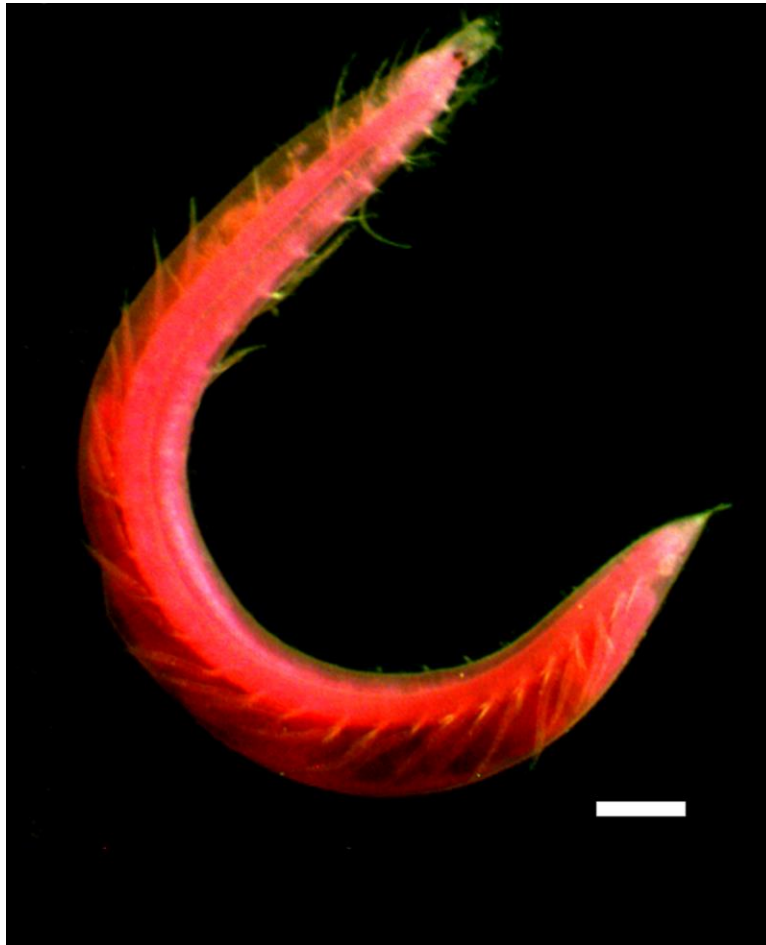
## CMLRE study to help devise conservation strategy for Andaman and Nicobar Island ecosystems

New Delhi, Tuesday, Oct 20 (India Science Wire): The oceans covering two-third of the surface area of Earth play a vital role in sustaining life on Earth. Three billion people all over the world depend on marine and coastal resources for their livelihoods. Despite their ecological and economic importance and the existence of the policy and regulatory frameworks, the Andaman and Nicobar Islands are under serious threat to its coral reefs, associated habitat, and the beauty of the area. In this context, a recent study conducted by the Centre for Marine Living Resources and Ecology (CMLRE), Kochi is providing the first detailed information on the distribution of bottom-dwelling marine organisms in the benthic zone which would help to develop a healthy ecosystem management strategy in the Andaman and Nicobar Islands area.

The functioning of the marine ecosystem is dependent on a wide range of organisms living at different depths of the ocean. The ecosystem of the seafloor is referred to as the 'benthic zone', of which about 70% is covered with muddy or sandy sediments. The seafloor sediments harbor a vast diversity of marine life, which are sustained by the organic matter settling from the water column above. These organisms which live within or above the sediments of the seafloor are collectively termed as 'benthos'. The 'benthic zone' which extends from the seashore to the deepest ocean trenches, is inhabited by different species and communities depending on the depth, and the prevailing environmental conditions. Benthic organisms include microorganisms (e.g. bacteria and fungi) as well as larger invertebrates, such as crustaceans and polychaetes. Macrozoobenthos are benthic animals that are big enough to be seen with the naked eye.

The study of the distribution of macrofauna in areas surrounding the insular margin of Andaman and Nicobar archipelago in the tropical Indian Ocean at different depths (50m, 100m and 200m) was carried out by CMLRE, Kochi to ascertain the distribution of these marine invertebrates known as benthic assemblage that include macrozoobenthos (benthic fauna of the size  $\geq 300 \mu\text{m}$ ) such as polychaetes, molluscs and crustaceans.

The study found that among the macrozoobenthos, polychaetes constitute the most dominant group constituting about 80% of the total macro benthic community and their diet includes interstitial organisms and organic matter. Macrofauna perform essential functions in the ocean carbon cycle influencing the productivity of the habitat, and thereby helps in the recycling of nutrients and promotes primary productivity. This macrozoobenthos help in nutrient cycling by breaking the organic molecules derived from biological sources to simplest inorganic forms which are reused as nutrients by other marine organisms and thereby maintaining a biogeochemical dynamics for a healthy ocean ecosystem. The CMLRE study provided a unique opportunity to examine the community shift of macrozoobenthos in well-oxygenated mesophotic reef areas as well as Oxygen Minimum Zone (OMZ) conditions occurring in close proximity zones of the Andaman and Nicobar Islands.



*A new species of polychaetes described from Andaman Islands, named in the honour of the research vessel 'Sagar Sampada'*

The study found that the population of macrozoobenthos decreased from the mesophotic reef areas (50 m) to higher depths (200 m), particularly in the case of the dominant groups- the polychaetes and crustaceans. Smaller-sized interstitial polychaetes and crustaceans were found to be abundant in the coarser sandy sediments of the shallower sites of the area. A mesophotic (meso meaning 'middle' and photic meaning 'light') coral reef is characterized by the presence of both light dependent coral and algae, and also organisms that can be found in water with low light penetration. The study found that the polychaetes in the area were represented by 606 species from 279 genera of which 50% rare species were recorded. Several new taxonomic discoveries were also made during the CMLRE study. The water around Andaman and Nicobar Islands were found to be an important biodiversity hotspot with highest polychaete species ever recorded in the northern Indian Ocean.

The polychaete diversity in oxygen minimum condition in Andaman Island (at depths of 200 m) is higher than other OMZ (Oxygen Minimum Zone)-influenced margins around the world. The study on the distribution of polychaetes is also important as they are the most veritable marine organisms for the detection of anthropogenic disturbances. Their distribution and diversity can help to analyze different type of anthropogenic disturbances as some species of Polychaetes thrives well even in such areas.

Based on polychaete species composition, the CMLRE study delineated three regions in the study area-the Nicobar margin, the western margin of the Andaman Islands and eastern margin of Andaman Islands. The scientists noted that the goals of sustainable development is to create a framework to manage and protect Andaman and Nicobar ecosystems from pollution as well as to address the impacts of ocean acidification. CMLRE suggested that conservation of sea-based resources can be achieved through sustainable use of these resources by acceding to international laws and thus mitigate some of the challenges.

Led by Aiswarya Gopal, the research team comprised of Usha V. Parameswaran, V.N. Sanjeevan, Anilkumar Vijayan, N. Saravanane, G.V.M. Gupta and M. Sudhakar of CMLRE, Kochi, Ministry of Earth Sciences, K. U. Abdul Jaleel of National Institute of Oceanography Regional Centre, Kochi and A.V. Saramma of Department of Marine Biology, Microbiology and Biochemistry, School of Marine Sciences, Cochin University of Science and Technology, Kochi. The research paper is published in the Journal of Frontiers in Marine Science. (India Science Wire)

Keywords: Macrozoobenthos, polychaetes, Andaman and Nicobar, mesophotic reefs, biodiversity, islands, benthic ecology

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