CHARACTERIZATION OF BENTHIC FORAMINIFERA AND ENVIRONMENTAL MAGNETISM OF SOFT SEDIMENTS IN THE OUTER CHANNEL OF CHILIKA LAGOON

ABSTRACT: Environmental monitoring is now critical for coastal areas around the world as a result of continual geomorphologic changes caused by natural events or man-made activity. Benthic foraminiferal assemblages have been used as a proxy for evaluating the health of the coastal environment. Magnetic measurements also provide typical analytical approaches for soil contamination mapping and atmospheric pollution research. The current research aims to (i) characterize foraminiferal biofacies in the Chilika Lagoon's outer channel and central sector, (ii) identify magnetic minerals associated with environmental pollution using magnetic mineral measurements, and (iii) understand the relationship between foraminiferal assemblages and magnetic susceptibility of soft sediments. A micropaleontological study was carried out in the lagoon's outer channel and central sector during the pre- and post-monsoon months. To analyse these microorganisms, surface sediment samples were taken from 56 different places in the lagoon and stained with buffered Rose Bengal solution. During this study, soft-bottom sediments from 54 sites around the Chilika lagoon's outer channel were collected for magnetic mineral examination. For the collected sediments, standard micropaleontological methods were employed. Altogether, thirty-four species of benthic foraminifera are identified, among which *Ammonia* spp. are predominant. Other calcareous taxa include *Elphidium* spp., *Quinqueloculina* sp., *Haynesina* spp., *Pararotalia* sp., *Hanzawaia* sp., *Nonionella* sp. and agglutinated forms such as *Miliammina* sp., *Trochammina* sp. and *Textularina* sp. The current research suggests a reduction in the abundance of live foraminifera in comparison to earlier studies. Three separate biofacies zones have been identified based on total foraminiferal number. The main variables influencing this zonation of foraminifera include low salinity, shallow water depth, low oxygen conditions, and nutrient inflow. All magnetic measurements indicate that ferromagnetic minerals, such as magnetite, are the predominant magnetic carriers in all samples, with certain paramagnetic elements, such as haematite, also present. This study found that agglutinated species (*Miliammina fusca*, *Ammobaculites exiguus*, *Textularia earlandi*) dominate regions with low magnetic susceptibility (MS) ranges, while calcareous hyaline species (*Ammonia beccarii*, *Ammonia parkinsoniana*, *Pararotalia nipponica*) dominate regions with high MS ranges.

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