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SPECIES COMPOSITION AND DISTRIBUTION OF ZOOPLANKTON IN MATLAPALEM AREA, KAKINADA DEISTIC, ANDHRA PRADESH

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Abstract

This study was aimed to current composition and distribution status of zooplankton of Matlapalem Canal area Kakinada Deistic, Andhra Pradesh. The present study area 10 groups of zooplankton species was recorded in the Matlapalem Canal area during the period of July 2023 to June 2024. The zooplankton percentage composition of each group in Matlapalem Canal area water was record in decreasing order Copepods 40%, Miscellaneous groups 13%, Coelenterates 9%, Decapods larva 8%, Mysidacea 7%, Chaetoghatha 6%, Rhizostomids 6%, Ostracods 4%, Bivalve veligers 4% and Rotifer 3%. The zooplankton composition was very high in the pre-monsoon and monsoon. The lowest zooplankton concentration was recorded during the post-Monsoon and winter. The zooplankton percentage composition exhibited very high in mangrove water because of the high productivity due to mangrove litter fall that supports host of dexterous feeding of aquatic animals.

Keywords: Matlapalem Canal area Kakinada Deistic, Composition and distribution of zooplankton

Introduction

Zooplankton productivity is widely used as an indicator for assessing fishery potential and ecosystem output in coastal and estuarine environments, since these organisms mediate energy transfer between phytoplankton and higher trophic levels (Nair, 1981; Chandramohan et al., 1999).

Mangrove-affected coastal waters typically exhibit enhanced biological productivity owing to the influx of nutrients and organic matter from decaying mangrove leaves and estuarine runoff, which enrich suspended particles and support greater planktonic growth (Alam et al., 2022).

Key environmental parameters-such as temperature, salinity, dissolved oxygen, and nutrient supply-govern seasonal variations in zooplankton abundance, composition, and diversity (Jakher et al., 1981). In tropical coastal systems, copepods generally represent the predominant zooplankton group and serve as useful ecological indicators due to their sensitivity to environmental fluctuations (Nair, 1981; Chandramohan et al., 1999).

The present investigation, covering July 2023 to June 2024 in the Matlapalem Canal area of Kakinada District, revealed a dominance of copepods and peak abundances during the pre-monsoon and monsoon seasons. These findings correspond with earlier studies from Kakinada Bay and other eastern Indian estuaries (Chandramohan et al., 1999), consistent with regional patterns in which copepods constitute the bulk of zooplankton biomass.

Material and Methods

Zooplankton samples were collected at monthly intervals from the surface waters of the study area by using conical plankton net (80 µ bolting nylon). The entire study period were classified into four seasons representing pre-monsoon (mar-may) monsoon (jun-agu) post monsoon (sept-nov) and winter (dec-feb) plankton.

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Result &Discussion

Tab 1: Number of zooplankton groups in Matlapalem Area

S. No	Name of Zooplankton	Number of Species
1	Coelenterates	8
2	Copepodes	30
3	Mysidasea	5
4	Chaetoghatha	4
5	Decapodes larva	6
6	Bivalue Valgares	2
7	Rotifer	1
8	Rhizostomids	4
9	Ostracods	2
10	Miscellaneous groups	15

A total number of 77 species of zooplankton were encountered in the Matlapalem Canal area and copepod group was found to be highest species with Copepods 30 (38%), Miscellaneous groups 15 (16%), Coelenterates 8 (10%), Decapods larva 6 (7%), Mysidacea 5 (6%), Chaetoghatha 4 (5%), Rhizostomids 4 (5%), Ostracods 2 (2%), Bivalve veligers 2 (2%) and Rotifer 1 (3%). The dominant group of zooplankton was copepods 38% followed by miscellaneous groups 16%, Coelenterates 10%, Mysidacea 6%, Decapods larva 7%, Chaetoghatha 5%, Rhizostomids 5%, Rotifer 3%, Ostracods and Bivalve veligers 2%.

Tab 2: Percentage composition of zooplankton groups in Matlapalem Area

S. No	Name of Zooplankton	Percentage
1	Coelenterates	10%
2	Copepodes	38%
3	Mysidasea	6%
4	Chaetoghatha	5%
5	Decapodes larva	7%
6	Bivalue Valgares	2%
7	Rotifer	1%
8	Rhizostomids	5%
9	Ostracods	2%
10	Miscellaneous groups	16%

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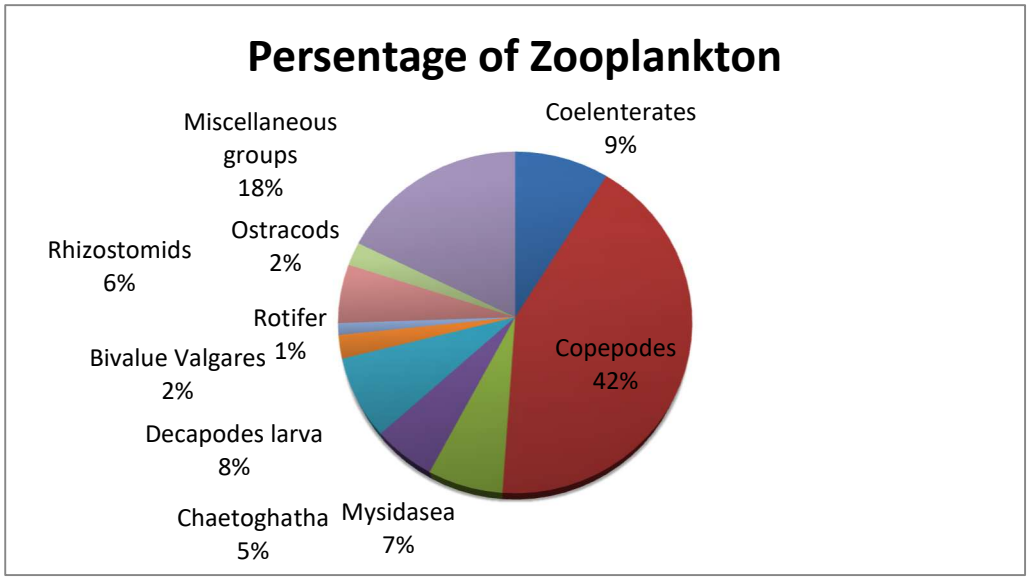

Fig 1: Percentage composition of zooplankton groups in Matlapalem Area

A total of 77 zooplankton species representing ten major taxonomic groups were documented in the Matlapalem Canal. Among these, copepods accounted for the largest proportion (about 38%), followed by diverse miscellaneous taxa and coelenterates. This prevalence of copepods corresponds with earlier findings from Kakinada Bay and nearby estuarine zones, where members of this group typically dominate the zooplankton community and play key roles in nutrient cycling and energy transfer within food webs (Nair, 1981; Chandramohan et al., 1999).

Pronounced increases in zooplankton density were observed during the pre-monsoon and monsoon periods, with lower values in post-monsoon and winter months. These seasonal patterns are likely controlled by variations in temperature, nutrient input, and freshwater inflow, which influence salinity, primary productivity, and particulate matter availability (Jakher et al., 1981). In many Indian estuaries, nutrient enrichment during the monsoon encourages phytoplankton blooms that sustain higher zooplankton populations, while the pre-monsoon phase often benefits from warmer waters and enhanced grazing activity.

Elevated zooplankton concentrations in mangrove-associated sectors of the canal can be attributed to organic matter supplied by decomposing mangrove litter, which increases detrital carbon and supports a variety of detritivorous and meroplanktonic organisms (Alam et al., 2022). The microbial processing of this material further enhances food availability for small crustaceans such as copepods and mysids.

Anthropogenic influences may also contribute to spatial and temporal differences in zooplankton distribution. Evidence from the Bay of Bengal suggests that copepods can bioaccumulate trace metals, reflecting local contamination patterns and potential shifts in community composition (Parthasarathi et al., 2023). Thus, differences in species richness or abundance in the Matlapalem system may result from pollution, sedimentation, or nutrient enrichment associated with human activities. Further analysis of heavy metal and nutrient concentrations would help clarify these effects.

Comparisons with past studies (Chandramohan et al., 1999) indicate that copepods remain the predominant taxa and that seasonal cycles remain consistent, implying that major ecological controls in Kakinada waters have persisted over

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time. However, regional assessments also reveal gradual community shifts linked to climatic variability, modified freshwater inflows, and anthropogenic stressors. Periodic monitoring-combining classical taxonomy with molecular approaches such as e-DNA-would be valuable for detecting long-term compositional changes and hidden biodiversity.

Implications and recommendations. The Matlapalem Canal's zooplankton assemblage -dominated by copepods with seasonal peaks during pre-monsoon/monsoon-indicates a productive estuarine zone that likely supports local fish recruitment. To strengthen ecological interpretation and resource management, we recommend: (1) coupling plankton surveys with nutrient and contaminant analyses, (2) adding quantitative biomass estimates (e.g., mg C m^{-3} or ml/100 m^3) to complement species counts, and (3) periodic monitoring (including e-DNA) to track long-term shifts linked to climate and anthropogenic change. The data presented here form a useful baseline for such efforts.

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