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Seasonal variations in the production and distribution of Zooplankton in Coringa back waters of Kakinada Bay.

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Abstract: *Climatological changes in the coming decades most likely will alter compositions and abundances of zooplankton. What we need to rapidly and comprehensively assess polar, boreal, subtropical and tropical regions and communities is automated instrumentation with which longer time-series and frequent coverage are possible. Such long-time series could be obtained from an Ocean Observatory (Wiebe et.al. 1987). These field studies need to cover processes over scales from seconds to decades, especially to distinguish between natural variance and that created by climatological changes.*
***Key words**: Zooplankton,Coringa,Mangroves,Biomass,Numerical abundance*

I. Introduction:

Characterization of small-scale individual behavior,the vast majority of process studies on marine zooplankton in the ocean or in the laboratory have been on populations in assemblages and communities. No individual zooplankton organism has been studied over any extended period of time in the ocean or in a community like Coringa Estuary. Thus, the distribution and behavior of zooplankton at the level of the individual organism, and their importance to biological and chemical processes in the ocean or in actual study i.e Coringa are largely unknown.

II. Materials and Methods :

Monthly surface zooplankton samples were made out at the selected two stations in the Coringa river.Surface zooplankton samples were collected by employing a 120 μ m mesh sized net of 40 cm diameter. As soon as the net was hauled the contents in the cod end collector of the net were gently transferred in to a clean polyethylene container and fixed with 5% formaldehyde solution. In the laboratory biomass was measured by the displacement method **(**WICKSTEAD, 1965) and expressed as ml-m^{-3}. For the enumeration of Zooplankton aliquot method was employed (Wickstead, 1965), where the total sampled was sub sampled and 10 ml. aliquot, was taken in to a petridish provided with a grid, and the major groups of zooplankton were enumerated according to the illustrations given by Wickstead (1965). Prior to the sub sampling larger forms like Hydromedusae, Siphonophores were separated from the sample and counted separately. Zooplankton numerical abundance was expressed as no / m^3

III. Results :

Monthly Variations In Zooplankton Composition At Station – I

	Jan'10	Feb	Mar	April	May	June	Mean	Min	Max
Biomass (ml/ m^{-3})	0.22	2.04	0.30	0.51	2.14	0.8	1.001	0.30	2.14
Numerical Abundance (no/ m^3)	11543	56430	20213	28322	41367	25578	30513	1154 3	56430
Copepods	9899 (85.75)	37002 (65.67)	10527 (37.15)	10527 (37.15)	25190 (50.89)	15388 (58.150	18,827	9899	37002
Decapod Larvae	852 (7.38)	2880 (5.11)	1995 (9.86)	799 (2.82)	2470 (7.38)	2133 (9.89)	1854	799	2880
Chactognaths	--	--	--	959 (3.38)	812 (1.160	186 (0.82)	652	186	959
Luicifers	16 (0.B)	29 (0.65)	--	194	1610 (3.89)	283 (1.25)	426	16	1610
Gastropod Veligers	252 (218)	10350 (18.37)	1332 (6.58)	12558 (44.33)	5560 (13.44)	2686 (11.89)	5456	252	12588
Polychaete larvae	--	833 (1.47)	240 (1.18)	--	167 (0.40)	121 (0.54)	340	121	833
Bivalve Veligers	330 (2.85)	4897 (8.69)	1280 (8.69)	2649 (9.35)	5322 (12.86)	1601 (7.09)	2679	330	5322

Appendicularians	67 (0.58)	--	--	--	--	59 (0.14)	63	59	67
Ostracods	--	219 (0.38)	128 (0.63)	43 (0.15)	178 (0.43)	80 (0.35)	129.	43	178
Cladocerens	95 (082)	131 (0.23)	165 (0.820	47 (0.16)	--	--	109	47	165
Miscellaneous groups	(0.03)	(0.050	(0.04)	(0.040	(0.02)	(0.02)			

Number in the Parentheses indicate percentage in total Zooplankton.

Station I:
Biomass: The zooplankton biomass at the station I varied between 0.30 ml.m^{-3} to a maximum of 2.14 ml.m^{-3} with a mean of 1.0 ml.m$^{-3.}$
Numerical abundance: Zooplankton numerical abundance at the station I varied between 11543 no.m^{-3} to a maximum of 56430 no.m^{-3} with a mean of 30513 no.m$^{-3.}$
Copepods: Copepods constitute the bulk of the plankton at the present station the abundance of the copepods ranged from aminimum of 9899 no.m^{-3} to a maximum of 37002 no.m^{-3} with a mean of 18827 no.m^{-3}.
Decapod Larvae: The decapod larval abundance varied between 799 no.m^{-3} and 2880 no.m^{-3} with a mean of 1854 no.m^{-3}.
Chaetognaths: The abundance of the chaetognaths varied between 186 no.m^{-3} and 959 no.m^{-3} with a mean of 652 no.m^{-3}.
Lucifers: The abundance of the lucifers varied between 16 no.m^{-3} and 1610 no.m^{-3} with a mean of 426 no.m^{-3}.
Gastropod Veligers: The abundance of the gastropod veligers ranged from a minimum of 252 no.m^{-3} to a maximum of 12588 no.m^{-3} with a mean of 5456 no.m^{-3}.
Polychaete larvae: The polychaete larval abundance varied between 121 no.m^{-3} and 12588 no.m^{-3} with a mean of 340 no.m^{-3}.
Bivalve veligers: The bivalve veligers abundance varied between 330 no.m^{-3} and 5322 no.m^{-3} with a mean of 2679 no.m^{-3}.
Appendicularians: Abundance of the appendicularians varied between 59 no.m^{-3} and 67 no.m^{-3} with a mean of 63 no.m^{-3}.
Ostracods: The abundance of Ostracods ranged between 43 no.m^{-3} and 178 no.m^{-3} with a mean of 129 no.m^{-3}.
Cladocerns: Cladocern abundance varied between 47 no.m^{-3} and 165 no.m^{-3} with a mean of 109 no.m^{-3}.
The miscellaneous groups includes hydromedusae, ctenophores, siphonophores and other larger planktonic groups.

IV. Discussion and Summary

The numerical abundance and biomass of Zooplankton in the area during the study period showed two peaks of abundance one in January – February and another in May. Even though the hydrographical conditions were highly fluctuating, the numerical abundance and biomass of Zooplankton was considerably high and it showed seasonal climatic effects.

The results revealed that the mangrove areas support high zooplankton populations. The zooplankton population was mostly dominated by copepods ranging between 53% - 83% of total populations. Estuarine environments exhibited wide range of fluctuations in physical and chemical factors in both time and space demanding considerable physiological and behavioral plasticity in the Organisms which colonize them. Estuaries are among the most productive ecosystems, largely as a result of allochthonous organic matter inputs from surrounding marshes, swamps and inflowing of rivers, as well as urban generated organic matter (Lay bourn – Parry et all, 1992).

Large scale conversion of mangrove areas for brackish water fish and shrimp ponds in the area ,and heavy petrochemical industries including fertilizer factories has not only rapidly depleted the valuable mangrove resources but also impaired the ecological balance in the estuarine ecosystem where mangroves are generally located. The present study is a baseline study, further studies throws light on the significance of Coringa river and the Coringa wild life sanctuary in the Kakinada Bay and Godavari estuarine environment complex.

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