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A STUDY OF ZOOPLANKTON DIVERSITY AND THEIR SEASONAL VARIATION IN KANDLAPALLY LAKE, JAGTIAL, TELANGANA.

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Abstract:-
In the present investigation the selected lake is Kandlapally Lake for the purpose of study. During the study period the total number of seventeen species are identified from the selected lake during the present study. The total zooplankton population was dominated by Rotifera, Cladocera, Copepoda and Ostracoda respectively. In the present study the total Eight number of Rotifera sps, three number of Copepoda sps excluding of Nauplius Larva, four number of Cladocera sps and Two number of Ostracoda sps in both the selected stations during the year 2012Febraury to 2013 January.

Keywords:- *Zooplankton, Rotifera, Copepoda, Cladocera and Ostracoda.*

INTRODUCTION:

Kandlapally Lake is located in the village Cherlapally and Kandlapally, Jagtial Mandal of Karimnagar district. It is situated at 18º.47′.42.44″ (N) latitude and 78º.54′.19.98″ (E) longitutde. It is one of the major irrigation lake of Jagtial Mandal. The fishermen society using this lake for the fish production. The catchment area of the lake is 4015 ha. Plankton is the most sensitive community which is being the first target of water pollution, thus any undesirable change in aquatic ecosystem affects diversity as well as biomass of this community. Plankton has been used recently as an indicator to observe and understand changes in the ecosystem because it seems to be strongly influenced by climatic features. The food chain in Lake Ecosystem is very simple comprising phytoplankton and aquatic vegetation as primary producers, zooplankton as primary consumers, small fishes are secondary consumers and large fishes are tertiary consumers.

Methodology:

In the present study, we carried out the quantitative analysis of zooplankton and their seasonal variation during the year 2012 February to 2013 January.

Zooplankton collections were made by employing a modified Haron-Trantor net with a square metallic frame of area 0.0625 m^2 area. The filtering cone was made up of nylon bolting silk plankton net (No. 25 mesh size 50µ) was used for collection of zooplankton. Collected samples were transferred to labeled vial bottles containing 4% formalin.

The qualitative estimation of zooplankton communities was carried out in the laboratory. Samples were kept for setting for a period of 48 hours. Three equal aliquots were drawn from the settled samples. Proportionate samples were drawn from above three aliquot and transferred on to Sedgwick-Rafter cell and planktonic organisms numerically counted and identified. The identification of zooplankton species was done by the Zoological Survey of India, Kolkata and the same was confirmed by Needham and Needham (1962), Michael (1973), Pennak (1978), Tonopi (1980), Patil and Gouder (1982) and Battish (1992).

Results and Discussion:

The zooplankton of the three lakes mainly consists of Rotifers, Cladocera, Copepoda and Ostracods, the total number of seventeen species are identified from the selected lake during the present study. The total zooplankton population was dominated by Rotifera, Cladocera, Copepoda and Ostracoda respectively.

Rotifera:

In the present study the Rotifera population varied between 12-89 indi./L at station A and 13-92 indi./L. at station B. The highest number found is *Brachionus falcatus* and lowest number is *Cephalodella sps.* at both stations. During the study period Rotifer species were highest recorded in the monsoon season and lowest recorded in summer season. This may be due favorable conditions such as phytoplankton growth in monsoon season and highest temperature in summer season why because temperature plays an important role in regulating rotifer population. Sharma (2001) dealt with the biomonitoring relations to different indices and highlighted the role of Rotifera as biomonitor in assessment of water quality of freshwater bodies Manickam *et al*. (2014). Similar results were observed by Majhi *et al.,* (2004), Balakrishna *et al.,* (2013).

Copepoda:

In the present investigation Copepod population varied between 18-82 indi./L at station A and 16-99 indi./L. at station B. The species found highest in number is *Mesocyclops leukarti* and lowest found species is *Tropocyclops parasinus* at both stations.During the study period highest Copepod population recorded in north east monsoon season and lowest values recorded in summer season. This may be due to inflow of runoff water from agriculture fields and surrounding catchment area of lakes. The species diversity and dominance among copepod have been reported by several investigators, Gouder and Joseph, (1961) and Ali and Khan, (1979). Similar type of results were observed by Chennaiah *et al*., (2011), Shivalingam *et al*., (2013).

Nauplius larva:

Copepod group represented by three main species and Nauplius larva also included under this group in the present study. During the present study total 139 indi/L of Nauplius larvae were found at station A and 131 indi/L of Nauplius larvae were found at station B. highest number of Nauplius larva found in North East Monsoon Season and Lowest number found in Summer Season at both the stations.

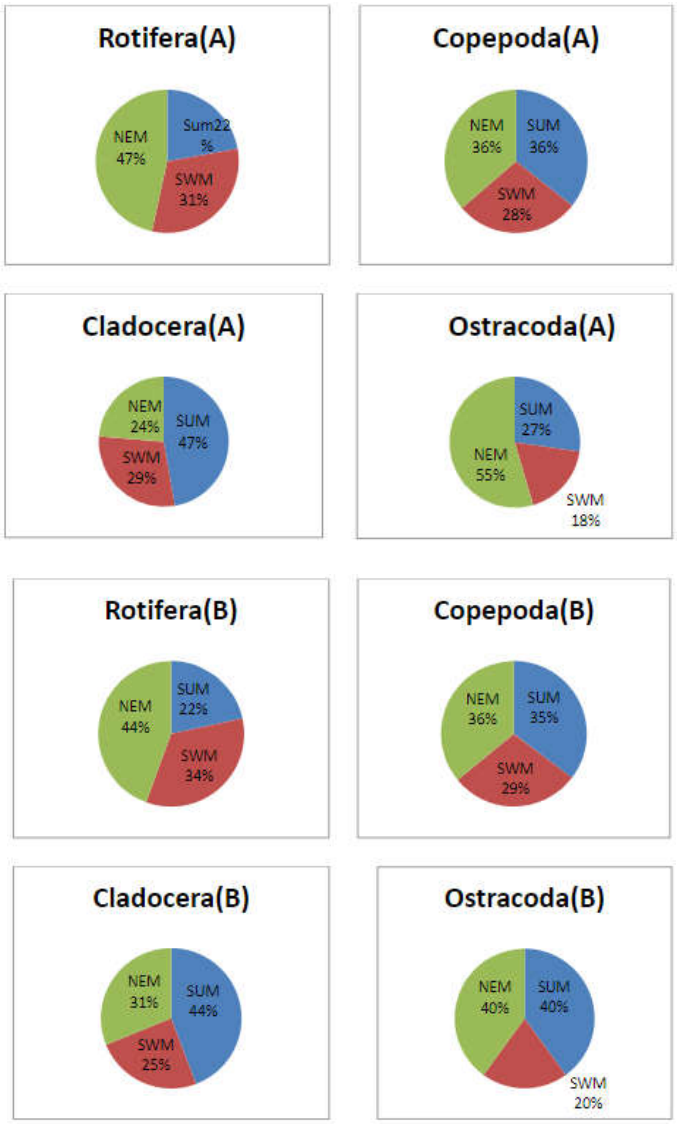
Cladocera:

During the study period Cladoceran population varied between 6-22 indi./L at station A and 8-25 indi./L. at station B. The highest number found is *Bosmina longirostris* at both stations. The organism found in lowest number is *Moina brachiata* in both stations. Abundance of cladocerans can be attributed to thick deposits of organic matter in the aquatic system. During the study period the highest copepod population observed in north east monsoon season and lowest in summer season. Similar findings are observed in the present investigation. Balakrishna *et al.,* (2013). Recorded most dominant caldocerons inhibiting in the wetlands were *Moina* and *Ceriodaphnia sps.*

Ostracoda:

In the present investigation the Ostracods population varied between 5-6 indi./L at station A and at station B 5-5 indi./L. at station B. The highest number found is *Hemicypris fossulata* and lowest number is *Cypris sps.* in both the stations. During the present study the highest Ostracods were observed in north east monsoon season and lowest in summer season. Kumar, (1993) studied on the species composition, total abundance periodicity of dominant ostracoda species in relation to certain physico-chemical factors in subtropical pond of Jammu and observed a direct correlation of ostracods with protozoa and rotifera. Similar results were observed by Gulati, (1978), Arjariya, (2003) and Hsieh *et al.,* (2011).

Seasonal variation of Zooplankton at both the stations during the year 2012-2013



Seasonal Variation of Zooplankton from February 2012 to January 2013 in Kandlapally Lake at Station A

Season	SUMMER					South West Monsoon					North East Monsoon					
	Feb	Mar	Apr	May	Average	Jun	Jul	Aug	Sep	Average	Oct	Nov	Dec	Jan	Average	Total
ROTIFERS																
Cephalodella sps	1	1	1	0	0.75	1	1	2	0	1	2	2	1	0	1.25	12
Cephalodella gibba	1	2	3	2	2	4	6	3	4	4.25	6	6	3	6	5.25	46
Keratella tropica	2	2	1	1	1.5	1	1	0	5	1.75	2	2	2	2	2	21
Keratella cochlearis	1	1	1	0	0.75	2	2	1	1	1.5	3	3	6	4	4	25
Brachionus falcatus	6	4	3	8	5.25	8	8	6	4	6.5	9	9	11	13	10.5	89
Brachionus diversiconis	1	1	2	2	1.5	3	3	2	1	2.25	3	3	3	2	2.75	26
Brachionus caudatus	1	1	2	2	1.5	3	3	2	1	2.25	3	3	3	2	2.75	26
Lecane luna	4	4	3	7	4.5	9	6	4	3	5.5	8	8	9	10	8.75	75
COPEPODA																
Tropocyclops prasinus	1	1	2	1	1.25	1	3	1	1	1.5	1	2	2	2	1.75	18
Mesocyclops hyalinus	5	5	6	5	5.25	1	3	3	3	2.5	2	4	5	4	3.75	46
Mesocyclops leukarti	8	5	8	5	6.5	9	9	4	3	6.25	9	8	5	9	7.75	82
CLODOCERA																
Bosmina longirostris	1	4	4	3	3	1	2	1	1	1.25	1	3	1	0	1.25	22
Ceriodaphnia cornuta	2	2	4	1	2.25	1	1	3	1	1.5	1	0	0	1	0.5	17
Moina brachiata	0	0	1	1	0.5	0	1	1	0	0.5	0	0	1	1	0.5	6
Moina macrocopa	0	1	1	1	0.75	1	1	1	0	0.75	1	1	1	1	1	10
OSTRACODA																
Hymicypris fossulata	0	0	1	1	0.5	0	1	0	0	0.25	0	1	1	1	0.75	6
Cypris sps.	0	0	0	1	0.25	0	0	1	0	0.25	0	1	1	1	0.75	5
Nauplius larva	9	8	11	10	9.5	11	14	9	9	10.75	14	16	12	16	14.5	139

Seasonal Variation of Zooplankton from February 2012 to January 2013 in Kandlapally Lake at Station B

Season	SUMMER					South West Monsoon					North East Monsoon					
	Feb	Mar	Apr	May	Average	Jun	Jul	Aug	Sep	Average	Oct	Nov	Dec	Jan	Average	Total
ROTIFERS																
Cephalodella sps	1	1	1	0	0.75	1	0	2	1	1	2	1	2	1	1.5	13
Cephalodella gibba	1	1	3	2	1.75	4	8	3	3	4.5	6	6	6	3	5.25	46
Keratella tropica	1	2	2	1	1.5	1	0	3	4	2	2	1	3	2	2	22
Keratella cochlearis	1	0	0	1	0.5	2	2	2	0	1.5	1	3	3	2	2.25	17
Brachionus falcatus	8	5	2	6	5.25	6	8	8	5	6.75	11	10	9	14	11	92
Brachionus diversiconis	1	2	1	1	1.25	3	3	3	1	2.5	2	4	5	4	3.75	30
Brachionus caudatus	1	0	2	2	1.25	3	3	1	2	2.25	3	3	3	1	2.5	24
Lecane luna	5	4	4	8	5.25	6	9	6	7	7	8	9	8	6	7.75	80
COPEPODA																
Tropocyclops prasinus	1	0	1	2	1	1	4	1	0	1.5	1	0	3	2	1.5	16
Mesocyclops hyalinus	6	6	6	4	5.5	3	2	2	3	2.5	2	6	6	3	4.25	49
Mesocyclops leukarti	9	8	9	6	8	8	9	8	6	7.75	11	10	6	9	9	99
CLODOCERA																
Bosmina longirostris	1	3	4	4	3	1	2	0	1	1	2	2	4	1	2.25	25
Ceriodaphnia cornuta	2	3	4	1	2.5	1	0	4	1	1.5	1	1	0	1	0.75	19
Moina brachiata	0	1	0	1	0.5	0	1	1	1	0.75	0	1	1	1	0.75	8
Moina macrocopa	1	0	1	1	0.75	1	0	1	0	0.5	1	1	1	1	1	9
OSTRACODA																
Hymicypris fossulata	0	1	0	1	0.5	1	0	0	0	0.25	1	0	0	1	0.5	5
Cypris sps.	0	0	1	1	0.5	0	0	1	0	0.25	1	0	0	1	0.5	5

Conclusion:

The present study reveals that rotiferan population is recorded high followed by Cladocera, Copepoda and Ostracoda respectively. This is indicating that the selected lake is not polluted and support rich diversity of planktons.

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