ABUNDANCE OF CLADOCERANS RELATED TO WATER QUALITY OF YELDARI DAM PARBHANI (M.S.) INDIA

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Abstract
Yeldari Dam is the major dam in Parbhani District, providing water for agricultural activities as well as household use. As we know the Dam is constructed on the basis of the flow of rivers due to that it brings about changes in abiotic and biotic factors compare to Free-flowing rivers show different responses to dam construction. To study the abundance of Cladocerans related with water quality, the physico-chemical parameters of Yeldari dam were analyzed seasonally from January 2024 to December 2024 Water temperature, transparency, PH, Oxygen dissolved in water, free carbon dioxide, alkalinity, total hardness, chloride content, nitrates, phosphates, biochemical oxygen demand (BOD), and chemical oxygen demand (COD). During the study period total eight species of Cladocerans were collected from Yeldari dam. They were abundant during the winter season and minimum was found in the monsoon season. Conservation of this water body is essential, as this habitat may reveal interesting Cladocerans fauna Present there.
Keywords: *Yeldari Dam Cladocerans abundance, Water quality*

Introduction

Cladocerans represent one of the key groups of freshwater zooplankton and are among the most abundant animal groups on Earth, inhabiting nearly all types of environments. Aquatic habitats like lakes, ponds, reservoirs, and similar water bodies. The Cladocerans are an order of small crustaceans commonly called water fleas. These utilize varieties of food items ranging from the detritus, bacteria to a wide range of unicellular and multicellular phytoplankton and themselves serve as an excellent food for fish. They are also widely used in aquaculture, and large filter-feeding planktonic species. These animals as intermediate hosts of some parasites may potentially pose a threat to human health. These play vital role in energy transfer from primary producer to secondary consumer in aquatic ecosystem. A high diversity of cladocerans can be found in the littoral zone of stagnant waters, as well as in temporary water bodies. These habitats are often negatively influenced by human activities, and especially the loss of temporary waters may lead to a decrease of diversity or even local extinction of some species. Cladocerans are extremely sensitive to variations in water quality and serve as important indicators of aquatic pollution.

Material and Methods

Yeldari Dam is situated in Yeldari village, a rural area about 15 km from Jintur city, at the geographical coordinates of N 19°43′12.4″ latitude.43’ 12.4” Longitude E 760 43’ 55”. Yeldari Dam is a freshwater reservoir constructed on the Purna River, which forms a sub-basin of the Godavari River. This dam has spread on large agricultural area there are so many villages were came under the this dam during construction i.e. The villages of Kinhi, Kawatha, Amberwadi, Bamni, Wazar, Sawangi, Sonsawangi, and Belkhi are situated around the area. For the first time, the present study on Yeldari Dam has been undertaken to assess climatic variations in relation to different sites and species diversity. A limnological survey of Yeldari Dam has been proposed with the aim of studying its ecological conditions. To achieve the objectives of this research, plankton samples will be collected from four distinct sites:

Sampling Site 1: Located on the eastern side of the dam.
Sampling Site 2: Located on the western side of the dam.
Sampling Site 3: Located on the northern side of the dam.
Sampling Site 4: Located on the southern side of the dam.

Plankton sample will be collected from four different sampling sites, with the Help of Nylon Planktonic Net 25u Concentrated Zooplankton in the filtrate collected in bottle attach to plankton net collected plankton sample are Preservative 4% Formalin Solution analyzed in to the laboratory of P. G. and Research Department of Zoology R. A. College Washim. All collected sample will be analyzed by following the methods suggested in APHA (1998) and Dhanpathi (2000).

Water Sampling of Yeldari Dam

Result:

Cladocera

Quantitative analysis of Cladocerans during the January 2024 - December 2025 it was 3.25±o.5 to 6.25 ±1.2583 Cladocerans were found more in summer than monsoon and winter. Calculating't' value ranges from zero to 2.81. Total 8 species of Cladocerans was found in five genera. Comparison by calculating 'f' value is 0.692667. The population of Cladocerans was higher in January, with the lowest count recorded in September 2024, while the peak abundance was observed in August and the minimum in May 2024. Similarly, **Gadekar *et al.*, (2014)** reported that Cladocerans were least abundant during the monsoon season but reached their maximum population in winter. Bacteria and nanoplakton the abundance of Cladocerans increases. **Raut *et. al.*, (2012)** reported similar findings, noting that Cladocerans were more dominant than other zooplankton during the summer season. During the monsoon, physico-chemical parameters such as dissolved oxygen, temperature, turbidity, and transparency play a significant role in regulating the density and diversity of Cladocerans. **Edmonson, (1965), Baker (1979).** Cladocerans act as primary consumers, feeding on algae and fine particles, thereby influencing the energy flow of the food chain and contributing to nutrient cycling within detritus. **Sitare, (2013)** Among cladocera *Alona sp.* and *Moina* were most abundant. The PH ranged between7.8 to 8.6. Minimum PH was observed in the month of July while the maximum in April, 2019 Cladocerans exhibited slight positive correlation with PH Cladocerans exhibited positive correlation with PH in Varuna lake **Deepthi and Sadanand, (2014).** Total dissolved solids ranged between 228 to 375mg/l. The Cladocera exhibited positive correlation with T.D.S. Dissolved oxygen ranged between 4.45 to 7.70 mg/l. The Cladocera showed negative correlation with DO similar observation was noticed in Lake Vela **Antunes *et al.*, (2003)**

Biological oxygen demand ranged between 24.3 to 42.4 mg/l. The Cladocerans showed Positive correlation with B.O.D. Chlorides ranged between 73.23 to 140.73.mg/l. The Cladocerans exhibited positive correlation similar findings were observed in Pandu lake**, Bodhan Solanki *et al.*, (2016).**Total alkalinity ranged between 139 to 183 mg/l. Cladocerans showed a positive correlation with total alkalinity, a similar observation reported by Deepthi and Sadanand (2014) in Madappa Lake. Total hardness ranged between 193 to 300 mg/l. Cladocera showed negative correlation with total hardness our results are in conformity with the findings of **Tidame and Shinde (2012).**Nitrates ranged between 2.16 to 8.32mgandl. Cladoceran abundance increased with higher nitrate levels, and they are recognized as indicators of the eutrophic condition of water bodies. **Sharma (2001), Tapas Kumar and Bidhan (2013).** Phosphates ranged between 0.17 to 211 mg/l. The Cladocerans showed positive correlation with phosphates. **Rao (1987)** stated that Cladocerans are rich in eutrophic waters. **Shah and Pandit (2013)** found an increase in Cladoceran density with the increase in the nutrient content of the water in Wular Lake, Kashmir.

Quadri and Yousuf (1980) investigated the influence of some physico-chemical factors on the seasonal abundance of Cladocera. The maximum population of Cladocera in winter may be attributed

to favorable temperature and availability of abundant food in the form of bacteria, nanoplankton and suspended detritus. Similar findings were also reported by **Jayabhaye *et. al.*, (2006). Patil *et. al.*, (2008)** has reported minimum Cladocerans during monsoon months and attributed to the low water temperature, dissolved oxygen, and transparency play an important role in controlling the diversity and density of Cladocera. **Siva Kumar (2001)** has reported maximum number of Cladocerans species during winter than summer season. The less number of these species during summer might be attributed to the higher temperature, evaporation of water or might be due to the depletion of the important factors such as Dissolved oxygen. The reduction in the number of species may also be due to predation. **Welch (1952)**.

Table 1: Seasonal fluctuations in physico-chemical parameters of water in Yeldari Dam water during the study period Jan to Dec 2024.

Parameter	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Tem	24.75	25.5	25.50	25.63	29.5	29.75	26.25	26.75	24.5	22.5	20.5	19.25
pH	7.58	7.7	7.9	8.05	7.9	8.10	7.9	7.68	7.53	8.03	7.45	7.60
Do	7.70	6.83	4.45	5.3	5.25	6.35	7.45	6.48	4.75	3.9	5.25	7.4
Co2	7.7	6.83	4.45	5.3	5.25	6.35	7.45	6.48	4.75	3.9	5.25	7.4
Alkality	144.00	123.54	162.88	229.14	254.05	186.23	201.64	168.95	142.07	170.04	158.94	132.21
Total Hardness	266	301.5	254.25	289.5	230	268.5	200.5	192	186.25	177.5	200.25	142.5
Chloride	79.76	68.43	90.22	127.48	140.73	103.16	93.56	93.03	78.7	94.15	87.48	73.23
Nitrate	2.13	2.40	3.11	5.50	7.65	7.34	5.85	8.42	4.87	4.08	4.15	3.40
Phosphate	0.15	0.26	0.29	0.43	0.52	0.63	1.17	2.17	1.04	0.92	0.67	0.36
BOD	2.06	2.11	1.33	1.05	0.53	0.35	1.96	0.77	0.66	0.7	0.46	0.52
COD	9.35	11.81	12.25	13.35	14.39	13.51	14.88	12.17	13.73	14.98	14.78	15.48

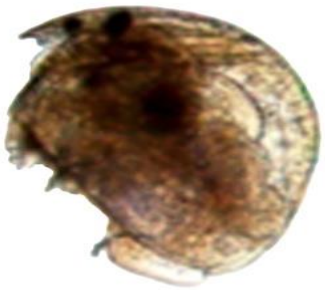
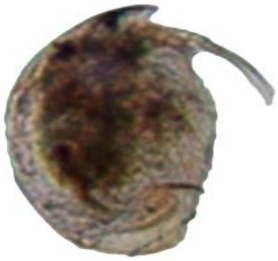
Zooplankton	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**July**	**Aug**	**Set**	**Oct**	**Nov**	**Dec**
Cladocera/ml	**6.26**	**4**	**3.78**	**4.75**	**3.70**	**4.72**	**5**	**5.26**	**3.23**	**5.4**	**6.25**	**5**

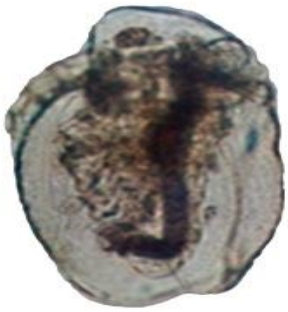
PHYLUM CLADOCERA
FAMILY I: CHYDORIDAE
1.Dunhevedia crassa
2.Chydorus ovalis
3. Chydrous cf.hermanni

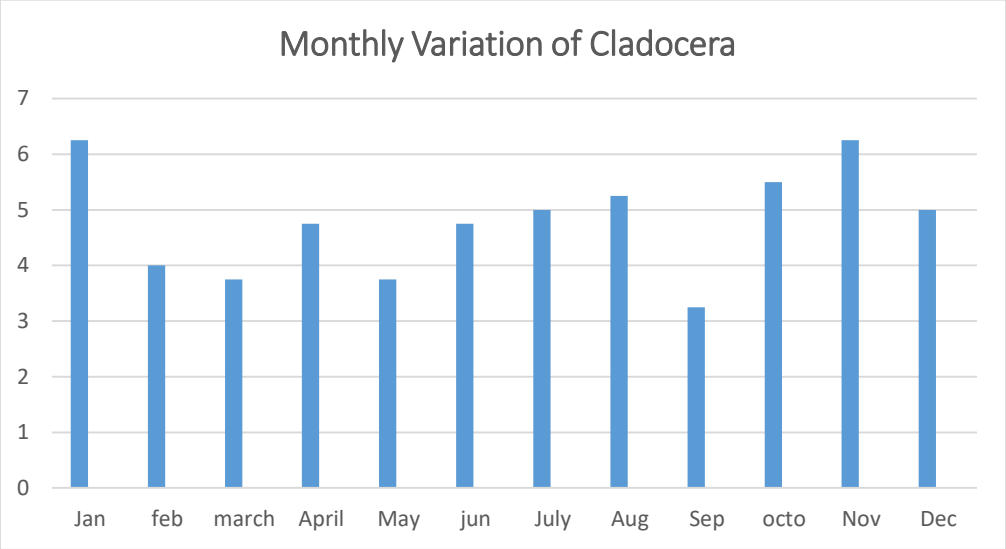
FAMILY II: Aloniae
4. Alona affinis
5.Allonella sp

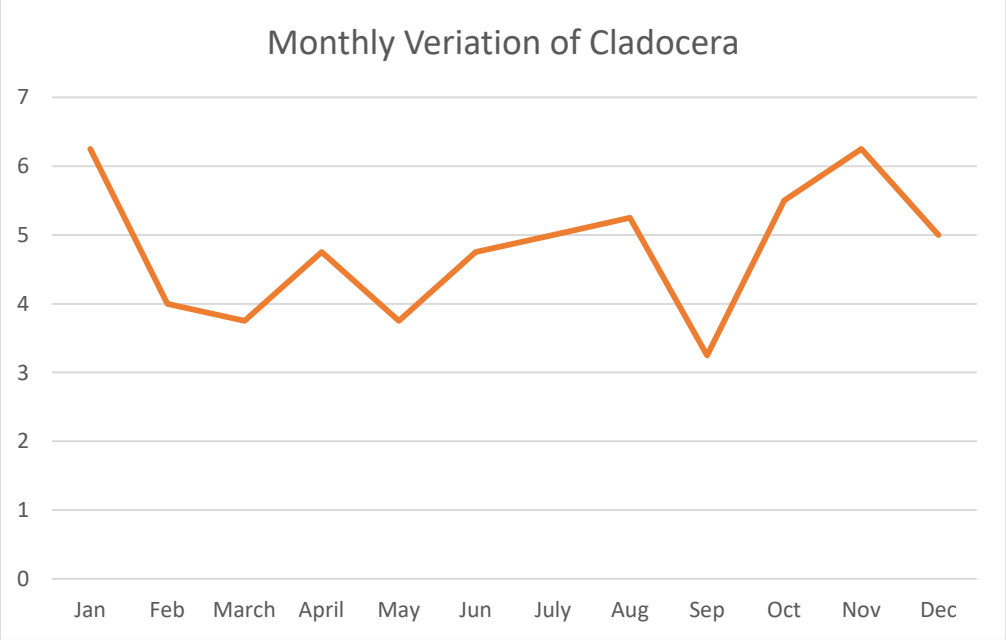
FAMILY III:DAPHNIIDAE
6. Daphnia schodleri

FAMILY IV: MOINIDEA
7.Moina sp.(macrothris goeldil)
8. Moina micrura

		
Allona sp (Dunhevedia crassa)	Allonella sp A	Allonella sp

		
Alona affinis	Chydrous cf hermanni	Daphnia schodleri
		
Moina micrura	*Moina sp. (macrothris goeldil)*	





Conclusion:

The Given Studies abundance of Cladocerans among zooplankton shows increases in Winter season due to maximum population of Cladocerans in winter may be attributed to favorable temperature and availability of abundant food in the form of bacteria, nanoplankton and suspended detritus and minimum in monsoon low water temperature, dissolved oxygen, and transparency play an important role in controlling the diversity and density of Cladocerans and Some amount increased in Summer. Among Cladocerans, *Alona sp. Daphnia sp*. *Moina* species were the most abundant recorded in this study, highlighting their importance in understanding food chain dynamics within zooplankton communities.

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