

Copepods Diversity in Gorja Lake of Bhadrawati, District Chandrapur (M.S.), India.

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ABSTRACT: The Gorja Lake is principal fresh water body located in Gorja village of Bhadrawati tahsil in Chandrapur district of Maharashtra state. Bhadrawati is a tahsil place and it is 25 km north side of Chandrapur and 125 km south east side from Nagpur. It is situated at about 211 m above the mean sea level. The Copepod was studied from June 2014 to May 2016 during this period total 5 species of Copepods were found in sample three sites of Gorja Lake.

Key Words Gorja Lake, Copepods, Diversity.

INTRODUCTION

Copepods are one of the major zooplankton and occur in all types of water bodies. They are often called as “waterflea”. Cyclops constitute as major food items for many freshwater Indian major carps. Copepods are also known as significant for primary and secondary consumer in the aquatic food web.

In present investigation Gorja lake is 10 km south side from Bhadrawati tahsil at about 198 m above mean sea level and is at 79°05'48''E longitude and 20°05'59'' N latitude. Gorja lake receives the water from the surrounding catchment areas during the monsoon period. The area of Gorja Lake is spread over 300 acres. The depth of water is 35 feet during the monsoon and 12 feet during the summer season. The water of this lake is primarily used for washing, bathing fishing activities, agriculture and other domestic purpose but now it is at a transitional state with respect to degradation.

MATERIAL AND METHODS

Sample for planktonic study were collected monthly from three site of lake. The samples were collected in the morning hours between 8.30 a.m. to 10.30 a.m. 50 Lt. of water sample was filtrated through the plankton net made of bolting silk number 25 with mesh size 64 lime the collected samples were allowed to settle down by adding Lugol's Iodine. Normally sedimentation requires 24 hrs. after which supernatant was removed and concentrate was made up to 50 ml. depending the number of plankton and preserved in 5% formalin for further studies.

For the quantitative study the concentrated sample was shaken and immediately one drop of sample was taken on a clear micro slide with the help of standard dropper the whole drop was then carefully covered with the cover glass and

observed. Plankton identification up to genera and whenever possible upto species level was classified according to keys given by Prescott (1954), Edmonson(1959), Sehgal (1983), Adoni (1985), and APHA (1985) and standard analysis was undertaken as per Zar (2005).

Quantitative study of plankton was done by Sedgwick – Rafter cell method.

Sedgwick – Rafter Cell Method

The Sedgwick – Rafter Cell is a special kind of slide similar to the Haemocytometer. The cell has a 50 mm x 20 mm x 10 mm rectangular cavity that holds 1 ml. sample. The cell is moved in horizontal direction on the stage of an inverted microscope and plankton species encountered in the field are enumerated. A number of replicate samples are enumerated to calculate plankton/lit.

Plankton (units/lit) = $n \times C/V$

Where, n = number of plankton in 1ml

C = Volume of Concentrate

V = Volume of sample in lit.

RESULT AND DISCUSSION

In the present investigation a total 5 species of Copepods were recorded from the Gorjalake under study. In site A, Copepods were represented by 5 species in 2014-15 and 4 species in 2015-16, in site B, Copepods were represented by 5 species in 2014-15 and 4 species in 2015-16 and in site C, Copepods were represented by 5 species in 2014-15 and 5 species in 2015-16.

Kedar (2002) recorded 10 species belong Copepods in Rishi lake of Karanja (Lad) of Maharashtra. Pawar and Pulle observed 16 species of Copepods in Pethwadas dam of Nanded District, Maharashtra. Ugale, *et.al.*, (2005) founded 3 species belong to copepoda in Jagatunga samudra

reservoir of Kandhar. Jayabhaye and Madalpure (2006) represented 5 species of copepods in Parola dam of Hingoli, Maharashtra. Rajan, *et al.*, (2007) reported 7 species of copepods from 3 polluted water bodies of Virudhunagar District, Tamilnadu. Sakhre and Joshi (2006) noted 7 species of copepod in Yeldari reservoir. Akhter, *et al.*, (2007) recorded 5 species of copepods from Sarkoot pond, Jammu and Kashmir. Sharma, *et al.*, (2007) founded 12 species of copepods in different water bodies at Udaipur, Rajasthan. Balakrishna, D. *et al.*, (2013) observed 4 species of copepods in Dharmasagar lake is located in village and mandal of Dharmasagar of Warangal District, Andhra Pradesh. Shashikant R. Sitre and Mahendra G. Thakare (2013) reported Copepoda by 2 species in Balaji temple tank of Chimur city of Chandrapur District (M.S.), A.T. Kamble and L.M. Mudkhede (2013) observed 4 copepod genera in Ambadi reservoir of taluka Kinwat, Maharashtra. Jaiswal, D.P. *et al.*, (2014) reported 4 species of Copepod in a Freshwater of Rangavali Dam in Navapur, District Nandurbar (M.S.), Gunwant P. Gajanan Sontakke and Satish Mokashe (2014) founded 6 species of Copepoda in Dekhu reservoir from Aurangabad, Maharashtra.

In present investigation in site A, during 2014-15 In Copepoda five species recorded were *Copepod nauplius* (44 no./lit), *Cyclops sp.* (44 no./lit), are Dominant by *Diaptomus forbesi* (28 no./lit), *Mesocyclops leucarti* (27 no./lit) and *Nauplius larva* (19 no./lit). In site A, during 2015-16 four species were recorded *Cyclops sp.* (36 no./lit) was dominant followed by *Copepod nauplius* (33 no./lit), *Diaptomus forbesi* (31 no./lit) and *Mesocyclops leucarti* (23 no./lit).

In site B, during 2014-15, 5 species were recorded among which *Cyclops sp.* (35 no./lit) is dominant followed by *Copepod nauplius* (32 no./lit), *Diaptomus forbesi* (28 no./lit), *Halicyclops sp.* (17 no./lit) and *Mesocyclops leucarti* (17 no./lit). In site B, during 2015-16, 4 species were recorded among which *Cyclops sp.* (30 no./lit) is dominant followed by *Diaptomus forbesi* (23 no./lit), *Copepod nauplius* (20 no./lit) and *Mesocyclops leucarti* (11 no./lit).

In site C, 2014-15, 5 species were recorded among which copepod *nauplius* (27 no./lit), *Cyclops sp.* (27 no./lit) are dominant followed by *Diaptomus forbesi* (21 no./lit), *Mesocyclops leucarti* (13 no./lit) and *Halicyclops sp.* (11 no./lit). In site C, 2015-16, 5 species were recorded among which *Cyclops sp.* (23 no./lit) is dominant followed by *Copepod nauplius* (18 no./lit), *Diaptomus forbesi* (14 no./lit), *Mesocyclops leucarti* (13 no./lit) and *Halicyclops sp.* (8 no./lit).

Among the different species in site A, *Cyclops sp.* was dominant followed by Copepod nauplius, *Diaptomus forbesi*, *Mesocyclops leucarti* and *Nauplius larva*. In site B, *Cyclops sp.*, was dominant followed by *Copepod nauplius*, *Diaptomus forbesi*, *Halicyclops sp.* and *Mesocyclops leucarti*. In site C, *Copepod nauplius* was dominant followed by *Cyclops sp.*, *Diaptomus forbesi*, *Mesocyclops leucarti* and *Halicyclops sp.* Pawar and Pulle (2005) also reported the occurrence of *Cyclops* and *Diaptomus* at Petwadas dam of Hingoli. Patil, G.P. *et al.*, (2008) collected *Cyclops diaptomus* and *Nauplius* as common Copepods in Rishi lake and Yedshi lake of Washim District of Maharashtra. Gadekar, G.P. (2014) also observed and recorded *Diaptomus nauplius* during all three seasons among Copepoda in Railway pond of Gondia.

Subbaram (1992) stated that lakes rich in organic matter support the higher number of cyclopoids suggesting their preponderance in higher trophic status of water. Somani and Pejavar (2004) observed quantitatively dominant cyclopoids copepods in Masunda lake indicating, eutrophic conditions. Similarly, in the present study, dominant of cyclopoids population in site B and site C can be attributed to the eutrophic nature of lake. According to Verma, *et al.*, (1984) and Jain and Dhamija (2000) the cyclopoid copepods were reported as a pollution sensitive taxa in water bodies.

In the present investigation, Copepods are maximum during the winter season and minimum in monsoon season. Kedar (2002) recorded maximum density of copepoda in the month of May and minimum in the month of August. Patil, *et al.*, (2008) reported maximum copepoda during in summer season, moderate during the winter and minimum during the monsoon season in Rishi lake and Yedshi lake of Washim District of Maharashtra. Subbaram (1992) observed peak of copepod during the months of January and February. M.R. Abdar (2013) observed maximum density of copepods were during post monsoon season and minimum in pre monsoon of Morna lake at Shirala (M.S.).

CONCLUSION

In the present investigation the Copepoda are abundance during in the winter season due to organic matter, entry of domestic sewage thus indicating that the preponderance in the higher trophic state of water and minimum copepods in monsoon season.

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Table 1: Yearly variation of Copepods from sites of Gorja Lake during year 2014-15

S.N.	Parameters	A	B	C	Total
1	Copepods	13.50±8.24	10.75±8.10	8.25±6.70	10.83±0.70

Table 2 : Yearly variation of Copepods from sites of Gorja Lake during year 2015-16

S.N.	Parameters	A	B	C	Total
2	Copepods	10.25±7.15	7.00±5.86	6.33±5.91	7.86±0.60

Table 3 : Two yearly variation of Copepods from sites of Gorja Lake during year 2014-16

S.N.	Parameters	A	B	C	Total
3	Copepods	11.88 ± 7.12	8.88 ± 6.87	7.29 ± 6.18	9.35 ± 0.39