



# Zooplankton biodiversity of Chalbardi lake near Bhadrawati, Chandrapur District Maharashtra, India.

Bansod MA<sup>1</sup> and Harney NV<sup>2</sup>

<sup>1</sup>Research Scholar, IHLRSS in Zoology, <sup>2</sup>Department of Zoology, Nilkanthrao Shinde Science & Arts College, Bhadrawati, Dist. Chandrapur - 442902

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## ABSTRACT

Chalbardi lake is the principal fresh water body of Bhadrawati tehsil, Chandrapur district of Maharashtra state. This lake spread over the area of 24.3 acre. Due to anthropogenic activities water quality of this lake is deteriorating with an enormous rate. The study of this lake takes for the year to assess the types of zooplankton present in this lake. The biodiversity of this lake was represented by 6 different groups of zooplankton like Protozoa, Rotifera, Cladocera, Copepoda and Ostracoda with 19 different tpes of species. The water of this lake is utilised for different activities like washing clothes, bathing and open defecation causing deterioration of water quality.

**Keywords:** Chalbardi lake, Bhaderawati, Zooplankton

## INTRODUCTION

Lakes are important resource of water for civilization to sustain life as well as to balance ecosystem. Living organisms needs good quality water for their daily activities if such water gets polluted due to pollutants may cause severe health problems as well as aquatic ecosystem also gets disturbed.

Zooplankton are microscopic organisms feeds on phytoplankton major groups of zooplankton includes Protozoa, Rotifera, Cladocera, Copepoda and Ostracoda. Study on zooplankton are made by researchers like Sharma (1980), Michael and Sharma (1988), Mishra and Saksena (1998), Dhanpathi and Rama Sarma (2000), Pandit *et al.* (2007), Paulose and Maheshwari (2008), Ahangar *et al.* (2012), Dagne *et al.* (2008), Ahemad *et al.* (2012), Sitre(2012), Symons *et al.* (2012), Smitha *et al.* (2012), Ezhili *et al.* (2013), Kadam *et al.* (2014), Kapoor (2015), Pawar (2016) and Kengar (2017).

Zooplankton act as food for higher consumer level. They respond quickly for increase in abundance of phytoplankton. Zooplanktons exist in wide variety of environmental conditions but still few physicochemical factors like light, tempera-ture, salinity, pH influence

the abundance of species. Zooplanktons are good indicators of changes in water quality. The aim of this study is to evaluate biodiversity of Chalbaradi Lake of Bhadrawati Tehsil of Chandrapur district Maharashtra.

**MATERIALS AND METHODS:**

The Chalbaradi lake is principal fresh water body of Chalbaradi village and it is situated on the East side of Bhadrawati. This lake is spread over area of 24.3 acre. The water of this lake is used for washing clothes, bathing, fishing, agriculture and for other domestic purpose causing decreasing water quality as many pollutants, detergents, mixes in water. Due to siltation the lake basin is swallowed down presently and due to growth of aquatic weeds the water level is decreasing at a fast rate if such situation is continuously in progress such beautiful water body will be perish due to negligence.

In present study of zooplankton biodiversity samples were collected from surface water from three sites of lakes viz. site A, Site B and Site C by filtering 50 litres of lake water through nylon bolting silk cloth ( mesh size 45 µm). then samples were fixed using 4% formalin the identification of zooplankton was done in laboratory using Edmondson (1959), Tonapi (1980) and Battish (1992).

**RESULTS AND DISCUSSION**

The zooplankton fauna of lake is represented by 19 different species (Table 1). Phylum protozoa is represented by 4 species, Phylum Rotifera represented by 7 species, Phylum Cladocera represented by 4 different species, Phylum Copepoda represented by 2 different species, Phylum Ostracoda represented by 1 species. Maximum 17 species were observed in Summer i. e. in April while minimum 4 species were recorded in winter i.e. November.

**Table 1 - Biodiversity of Zooplankton in Chalbaradi Lake**

Sr No.	Group/Species	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
1	<b>PROTOZOA</b>												
	<i>Actinophrys sol</i>	+	-	+	-	-	-	-	-	+	-	-	+
	<i>Diffflugia constricta</i>	+	-	-	-	-	-	-	+	+	+	+	-
	<i>Holophyra Africana</i>	+	-	-	-	+	+	-	-	-	-	+	+
	<i>Prorodon griseus</i>	+	-	-	-	-	-	+	+	+	-	+	+
2	<b>ROTIFERA</b>												
	<i>Branchionus falcatus</i>	+	-	-	-	-	-	-	+	+	-	-	+
	<i>Branchionus forficulata</i>	-	-	-	-	-	+	-	+	+	-	+	+
	<i>Branchionus angularis</i>	-	+	+	+	-	-	-	-	-	+	+	+
	<i>filinialongiseta</i>	+	-	+	-	-	+	-	+	-	-	-	+
	<i>Keratellacochelearis</i>	-	-	+	-	+	+	+	+	+	-	-	-
	<i>Lecane bulla</i>	+	+	-	-	-	-	-	-	+	+	-	+
	<i>Testudinella amphora</i>	-	-	-	-	+	+	+	+	-	-	-	+
3	<b>CLADOCERA</b>												
	<i>Diaphanosomasinghalense</i>	+	+	+	-	-	+	-	+	-	-	-	+
	<i>Chydorus parvus</i>	-	-	+	-	-	-	-	+	+	+	-	+
	<i>Macrothrix rosea</i>	+	+	-	+	-	+	-	-	+	+	+	+
	<i>Moinadaphniamacleayi</i>	+	+	+	+	+	+	-	-	-	+	+	+
4	<b>COPEPODA</b>												
	<i>Cyclops sp.</i>	+	+	-	+	-	-	+	+	+	-	-	+
	<i>Mesocyclops sp.</i>	-	-	-	-	+	+	-	-	-	-	-	+
5	<b>OSTRAPODA</b>												
	<i>Cypris sp.</i>	+	+	+	+	-	-	-	+	+	+	+	+
	<b>TOTAL</b>	<b>12</b>	<b>8</b>	<b>9</b>	<b>6</b>	<b>6</b>	<b>10</b>	<b>4</b>	<b>11</b>	<b>11</b>	<b>7</b>	<b>8</b>	<b>16</b>

It has been observed that in monsoon due to availability of large amount of organic detritus ostracoda group present in abundant in monsoon in lakes similar observation was found by Tonapi (1980) reported maximum population of Ostracoda in monsoon due to availability of organic detritus while in summer i.e. in April month due to sun's heat the amount of water level in lakes decreases.

The mostly observed group is Rotifera with about 7 different species. Rotifers serve as important food source for large aquatic animals, Rotifers have an important role in the aquatic ecosystem as bio indicator of water quality (Bledzki and Ellison, 2003; Casanova, 2009) *Branchionus falcatus* and *Keratella cochlearis* observed in all seasons. Different species like *Branchionus forficulata*, *Branchionus angularis* observed in different seasons.

The occurrence of *Branchionus angularis*, *Filinia longiseta*, *Brachionus forficulais* an indicator of (eutrophication) organic pollution and subsequent enriched status of the reservoir water (Schindler and Noven, 1971; Rao and Durve 1989).

The Cladocerans are primary consumers feeds on algae and minute particles and thus influence on aquatic food chain. In present study it is observed that 4 different species of cladocerans. Like *Moina*, *Macrothrix*, *Chydorus*, *Diaphanosoma* out of them presence of *Moina* indicates due to organic pollution lake is in highly degraded condition. According to Datta Munshi (1995) abundance of Cladocera can be attributed to thick deposit of organic matter in the aquatic environment. In present investigation it is observed that lake is slowly rich in organic contents containing macrophytes with different types of detritus.

So, it can be inferred from present investigation that aquatic ecosystem of lake is degrading as presence of pollution indicators forms and slowly this beautiful lake will perish or will may lost from human use.

**Conflicts of Interest:** The authors declare no conflict of interest.

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