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RESEARCH ARTICLE

IMPACT OF DISSOLVED OXYGEN AND TEMPERATURE ON COPEPODS IN CHAKKI TALAB, TELANGANA, INDIA

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ABSTRACT

The present study was conducted for a period of one year, October 2015 to September 2016 to study the effect of temperature and dissolved oxygen on copepods of Chakkitalab. Copepods exhibited negative correlation with dissolved oxygen and positive correlation with water temperature. The copepod occurrence throughout the study period indicates organic pollution in the lake.

INTRODUCTION

In a freshwater ecosystem, the zooplankton are important and constitute basic link of the food chain (Madusudhana Rao *et al.,* 2014). The density and diversity of zooplankton are greatly influenced by the different physicochemical parameters of water (Wetzel, 1975). Zooplankton serve as bio indicators and well-suited tool for understanding water pollution status (Chitra, 2013).Freshwater copepods constitute one of the major zooplankton communities occurring in all types of water bodies(Gajanan and Satish,2014). Copepods feed on bacteria, phytoplankton detritus, ciliates, rotifers and fish fingerlings (ZannatulFerdous and Muktadir, 2009). Copepod occurrence and distribution influence the status of water quality. By nature they prefer eutrophic conditions to grow in high number. Copepods are highly sensitive to anthropogenic disturbances and also provide vital information on paleoclimatic, paleolimnological status of water bodies (Ravichandran and Jeyam, 2014).In this regard the present investigation is done to study the impact of temperature and dissolved oxygen on copepods of Chakkitalab.

MATERIALS AND METHODS

Bodhan town is spread 21.36 km^2. The town Bodhan is located at latitude 18°39 36 N and longitude 77°52 47 E.

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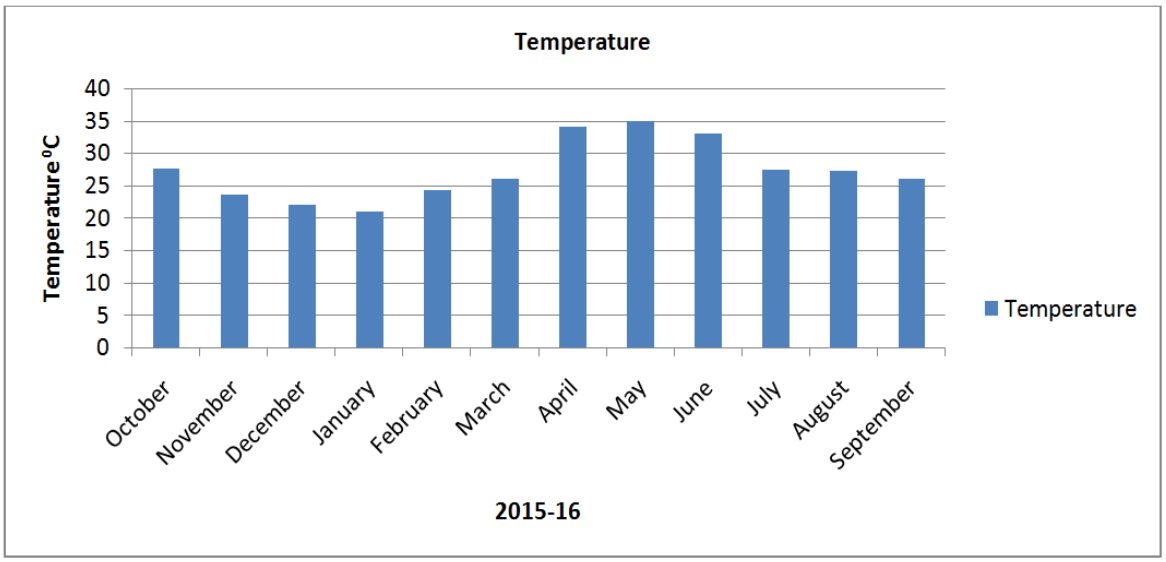
The Chakkitalab is a lake located on the south side of Bodhan town near residential localities. Sampling and physicochemical investigation was carried out according to standard methods APHA (1989). Zooplankton samples were obtained by passing 50 L water through plankton net in each depth. Zooplankton samples were preserved in 4% formalin. Identification of Copepods was done with the help of fresh water biology Edmondson (1965). Counting of organisms was done using Sedgwick- Rafter counter and the dilution technique.The population density of Copepods is represented per liter of water.

RESULTS AND DISCUSSION

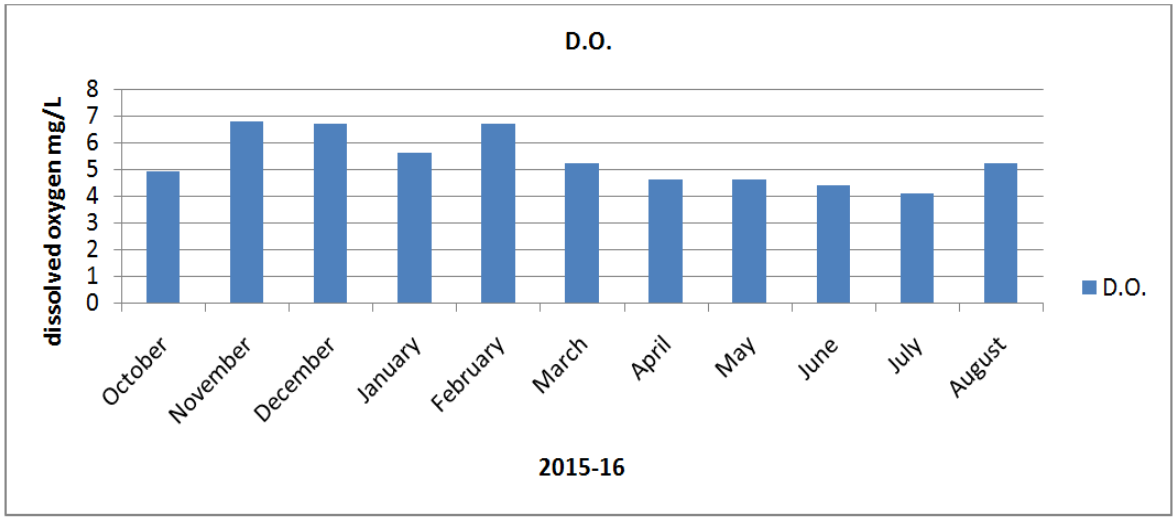
Temperature

Temperature is one of the essential environmental factor which influence the growth and distribution of flora and fauna. The surface temperature in the Chakkitalab ranged from 21 ºC to 35 ºC (Graph 1). Highest temperature was recorded in May and lowest in January. This was in accordance with the seasonal atmospheric temperature. The variation in temperature is smaller as any change occurs more slowly in water than in air (Solanki *et al.,* 2006).

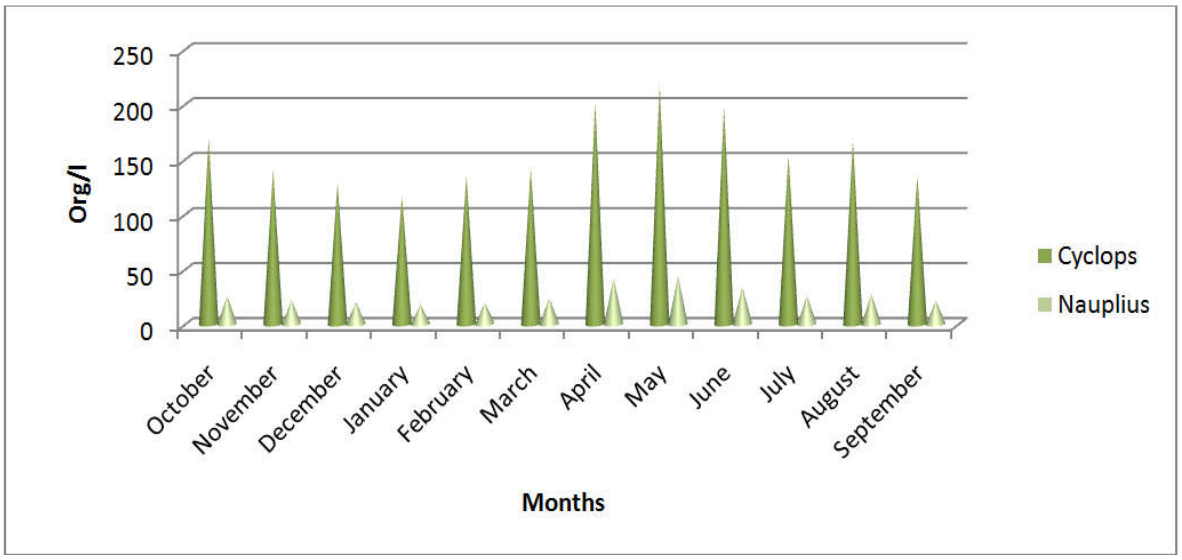
Dissolved oxygen: Dissolved oxygen is one of the important parameters in water quality assessment and reflects the physical and biological processes prevailing in waters (Solanki V. R. *et al.,* 2007).



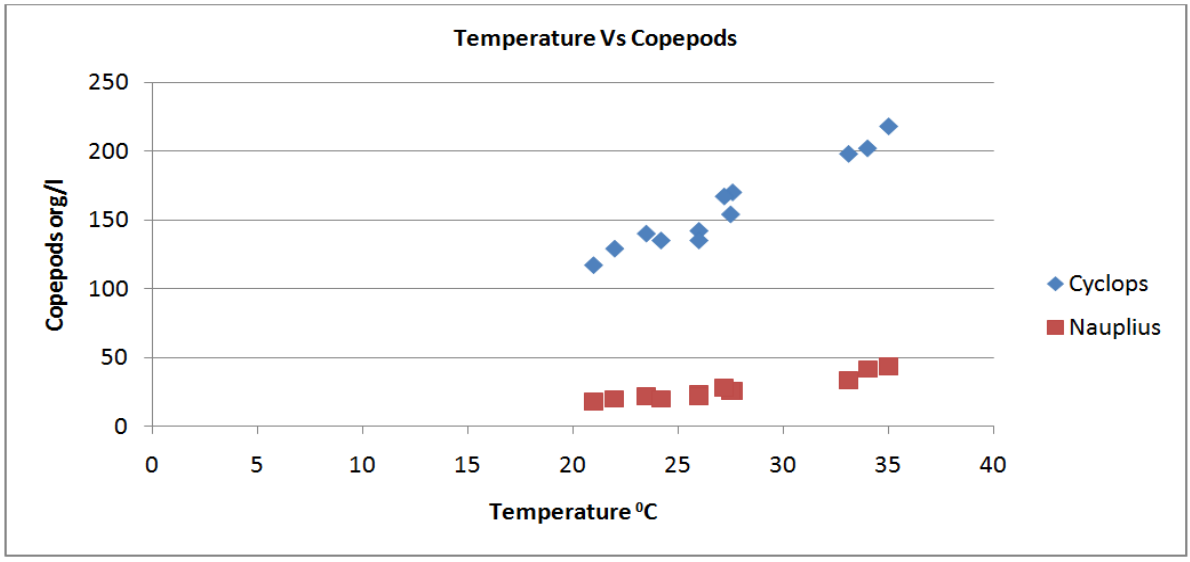
Graph 1. Monthly variations of Tempertaure of ChakkiTalab during 2015-16



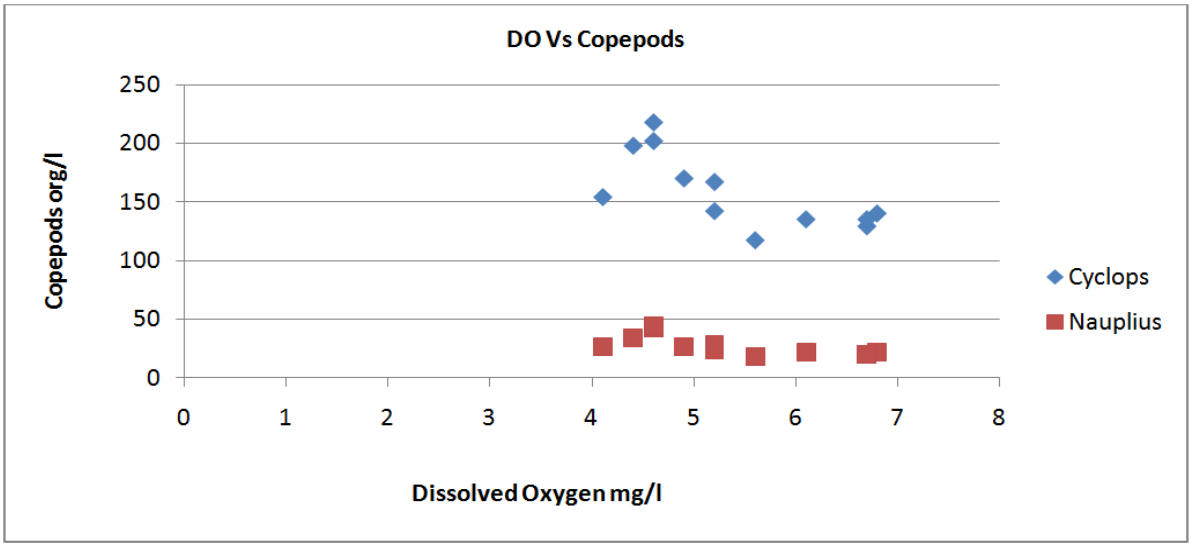
Graph 2. Monthly variations of Dissolved Oxygen of ChakkiTalab during 2015-16



Graph 3. Monthly variations of Copepods of ChakkiTalab during 2015-16



Graph 4. Correlation between Temperature and Copepods



Graph 5.Correlation between Dissolved Oxygen and Copepods

In the present study the dissolved oxygen of Chakkitalab varied from 4.1 to 6.8 mg/L with an average of 5.40 ± 0.96 mg/L (Graph 2). Dissolved oxygen levels varied from 4.40 to 13.70 mg/L in Bellal Lake with an average of 8.41±3.05 mg/L (Solanki *et al.,* 2014) and the dissolved oxygen varied from 1.70 to 7.60 mg/L with an average 3.17±1.52 mg/L in Pandu lake of Bodhan (Solanki *et al.,* 2010). Low levels of dissolved oxygen may be due to discharge of untreated domestic sewage into the water body.

Copepods

Copepods were represented by Cyclops and Nauplius. These copepods were present in the samples throughout the period of investigation. Copepods density was maximum during May and minimum in January (Graph 3). In our present study Copepods exhibited positive correlation with temperature (Graph 4) and negative correlation with dissolved oxygen (Graph 5). Our results are in conformity with Koli and Muley (2012) in Tulshi reservoir, Maharashtra, Panwar and Malik (2016) in Bhimtal lake, Uttarakhand and Bera *et al.,* (2014) in Kangsabati Reservoir, West Bengal.

Conclusion

Presence of abundant copepods throughout the study period indicates the eutrophic nature of Chakkitalab.

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