

# **LIMNOLOGICAL STUDY DURING RAINY SEASON OF BICHARLI POND (A WATER RESERVOIR) AT BEAWAR (RAJASTHAN)**

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## **ABSTRACT**

Water reservoirs provide the society numerous and crucial ecological services. Limnological studies of Bicharli pond (a water reservoir), Beawar were conducted during rainy season from July to October 2014 to find out its physico-chemical condition and their effect on planktonic population. Zooplanktons are the prime trophic link between primary producer and fish hence the fish population directly depends on the zooplanktons. Result reveals that phytoplankton and zooplankton populations depend directly or indirectly on different physico-chemical factors which interact with each other.

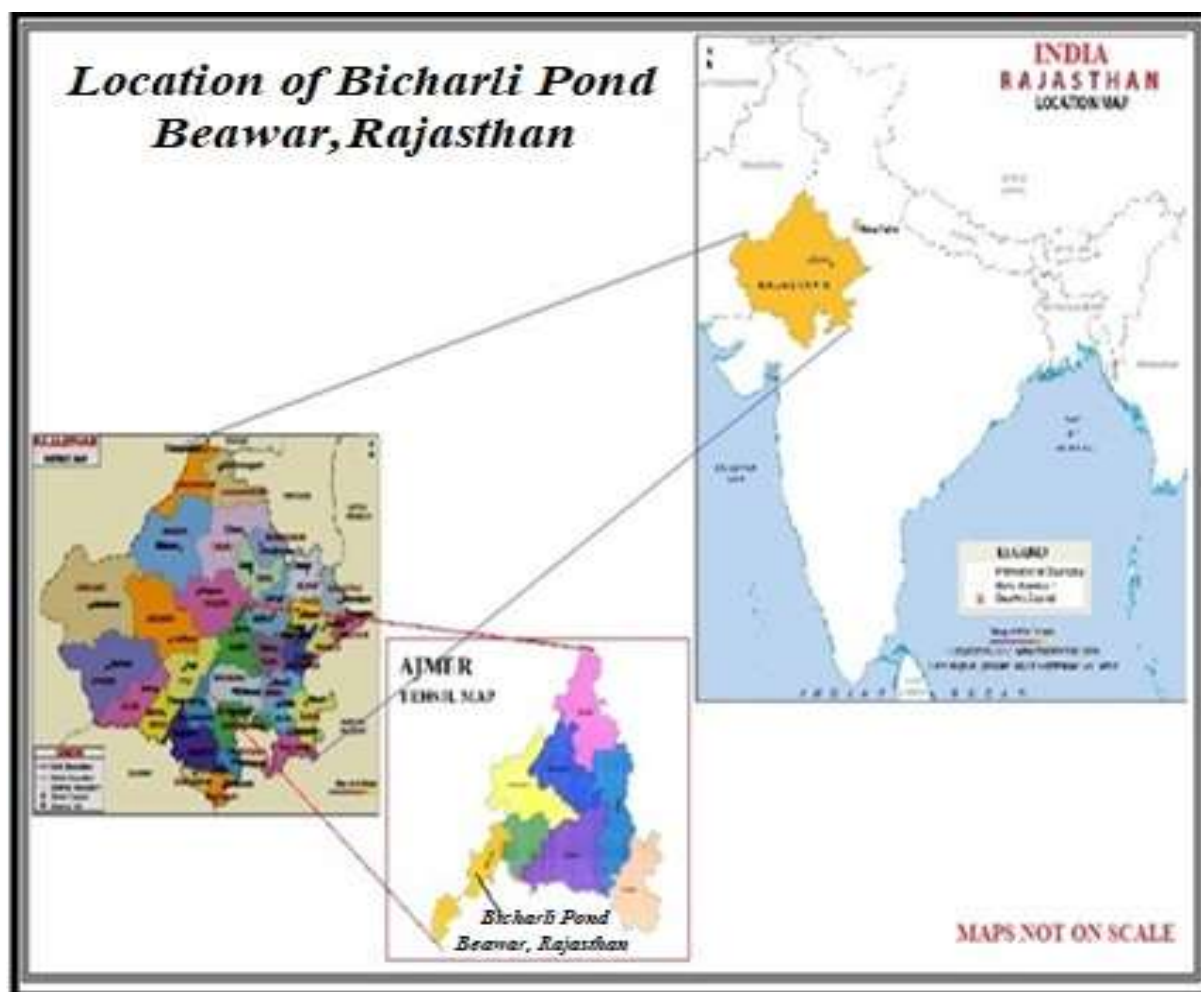
**Key Words:** Limnology, Fresh Water Reservoir and Planktons

## **INTRODUCTION**

Water reservoirs provide the society numerous and crucial ecological services. Wetlands are in fact the most species diverse habitats. They are enormously valuable to humanity as they are aesthetically attractive, pleasing, they provide water, food and timber, and also protect us from floods and droughts and offer recreation. The present paper attempts to present some physico-chemical and biological properties of Bicharli pond (a water reservoir), of Beawar, Rajasthan during rainy season from July to October 2014.

## **STUDY AREA**

This reservoir is situated at 25°01'N and 79°29'E on Delhi Bombay highway No.8 and is 55 km. from Ajmer. It is perennial pond which is annually filled by monsoon water. The water of the pond is being used for bathing and drinking purposes by cattle. It is also used for irrigation purpose and fish farming by the fisheries department of Rajasthan Government.



**Figure- 01** Location of Bicharli pond (a water reservoir), of Beawar, Rajasthan

## MATERIAL AND METHODS

The study began in July 2014 and continued through October; water sampling was done by ruttner water sampler from sub-surface. Along with sampling, temperature and pH were noted by using water analyzer kit. Total alkalinity and dissolved oxygen were analyzed titrimetrically by following Adoni (1985). For the sampling of plankton, water samples were collected twice in a month and brought to the laboratory for identification as to record their organism (no. / ltr) according to haemocytometer counting chamber Sedgwick-rafter counting cell using microtransect method (APHA,1989).

## OBSERVATIONS

The results are presented in table-01. Water temperature ranged from 24.6<sup>0</sup> to 28.6<sup>0</sup> centigrade, pH from 7.3 to 7.8 whereas the transparency of water varied from 3.17 to 5.58 ppm. Total alkalinity ranged from

84.20 to 102.68 ppm in the month of July. The phytoplanktons were maximum in (2765 organism/1tr.) in July and minimum (1031 organism/1tr) in September. Maximum zooplanktons were (1298 organism/1tr.) in September and minimum in (476 organism/1tr.) in July respectively.

Table-01 Some Physico-chemical and Biological factors of Bicharli pond (a water reservoir) of Beawar, Rajasthan

Parameters	July	August	September	October	Average	
1. Temperature		28.6	26.1	27.4	24.6	26.68
2. pH	7.8		7.5	7.3	7.3	7.48
3. Transparency(cm)		13.10	17.77	20.62	22.51	18.5
4. Dissolved oxygen(ppm)	3.71		4.54	5.05	5.58	4.72
5. Total alkalinity(mg/l)	102.60		98.40	89.66	84.20	93.72
6. Phytoplankton organism/Ltr	2765	1044	1031	1100		1485
7. Zooplankton organism/Ltr	476	715	1298	1180		917.25

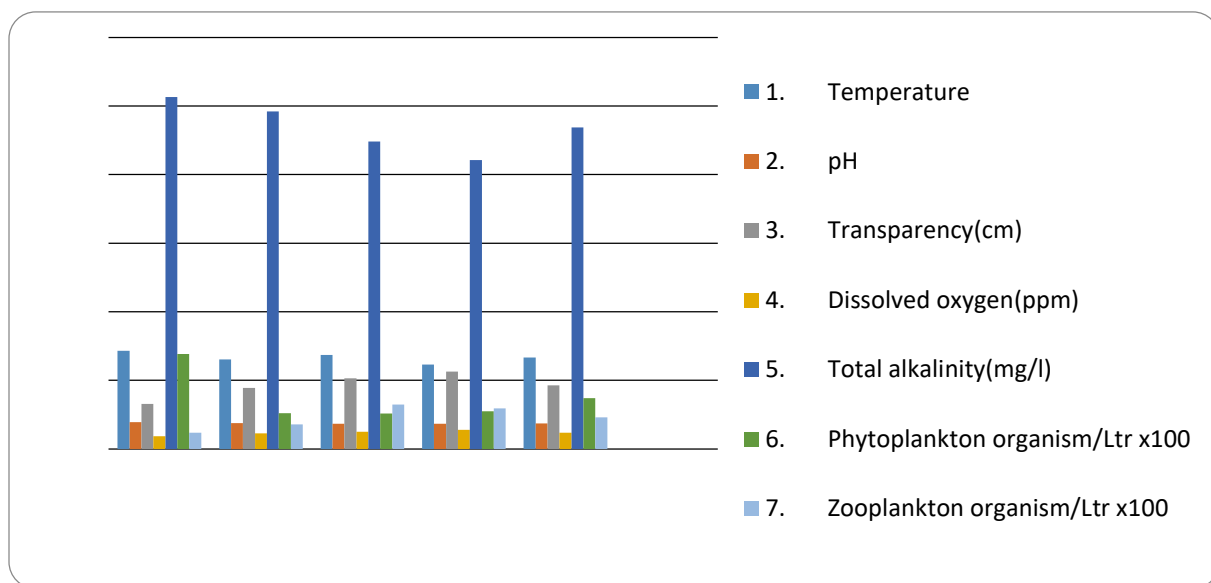


Figure-03 Some Physico-chemical and Biological factors of Bicharli pond (a water reservoir) of Beawar, Rajasthan

## DISCUSSION

The composition and distribution of aquatic production is governed by several limnological factors of water body. Among the physical factors temperature is considered important in controlling the fluctuation of plankton but Chako and Krishnamurty (1954) could not establish any co-relation between water temperature and plankton variation. In the present study, during rainy season the temperature was directly proportional to plankton. Kant and Anand (1978) have also recorded similar relationship with temperature. High pH during July which gradually

decreased till October was perhaps due to the maximum presence of water. The range of pH varied from 7.3 to 7.8 which is in agreement with the work of Verma and Dattamunshi (1987) and Kumar (1993). The total alkalinity was maximum in July which may be due to collection of rainy water having rich chemical substances. The higher values were favourable to planctonic growth. According to Ramakrishanaiah and Sarkar (1982) fairly high total alkalinity values were favoured in this season. The total alkalinity values showed increase in Krishnamurty summer and gradual decrease through the monsoon and winter period in the present study which support the observation of Mansoori *et al.* (1993 Kumar). The amount of dissolved oxygen increase ranging between 3.71 to 5.58 ppm in the pond water. In the present stud, low oxygen values coincided with high temperature. A significant negative correlation was established between water temperature and dissolved oxygen. In such condition the plankton can thrive well, as also found by Verma and Dattamunshi (1987), Mansoori *et al.* (1993) and Kumar A. (1995).

From the above study it can be concluded that phytoplankton and zooplankton populations depend directly or indirectly on different physico-chemical factors which interact with each other. In the present investigation total plankton density showed marked and significant co-relation with water temperature, pH, dissolved oxygen and alkalinity.

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