

Studies on physicochemical parameters of Ranitalab pond, Rewa (M.P)

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Abstract

Water is imperative to existence on earth. It is a treasured gift of nature which is crucial for the survival of plants, animals and human beings. Present investigations have been carried out on the Physicochemical factors of Ranitalab pond in district Rewa. Many of the parameters had been observed below the permissible limits for ingesting water as advised with the aid of WHO. A whole of 18 parameters have been analysed and their seasonal variations in the November 2014 to October 2015 have been discussed.

Keywords: physicochemical, parameters, ranitalab pond, Rewa

1. Introduction

Man is based for his food grant absolutely on the merchandise of land, water, plant life and animals of the earth. Ever in view that the flip of this century progress in limnology has been speedy and for reaching, as a result of which it has come to be as integrated and coherent department of science (WHO 2004) [1]. A learn about of freshwater habitat with unique reference to its physico-chemical, geological and biological traits is termed as limnology. The study of limnology is of great significance to human race as the organic and physico-chemical date of this branch can be beneficial for rapid development and boom of fishes. The importance of essential productiveness is also well realised virtually in fish culture programmes. Besides that, elucidation of the physico-chemical prerequisites in lakes, reservoirs, ponds and rivers are utilized for tiding over difficulties in filtration of ingesting water. Thus it is very lots vital for a wholesome growth. But it may additionally become hazardous for life, if one uses water polluted with damaging or with toxic resources and bad sanitation. Mishra, *et al.* 2009 [2], Tewari, *et al.* 2010 [3], Sirajudeen, *et al.* 2014 [4], Kumar and Kumar 2015 [5] Water satisfactory parameters grant the foundation for judging the suitability of water for its targeted uses and to enhance current conditions. For best development and administration for the beneficial uses, modern-day information is wanted which is provided through water first-class programmes (Lloyd, 1992) [6]. We rely on water for domestic needs, irrigation, sanitation and disposal of wastes. The first-class and volume of surface water our bodies like lakes and tanks rely upon the climate, catchments, geography of the area and the inputs and outputs both herbal and artificial (Gray, 1994) [7]. The water exceptional of lakes can be degraded due

to microbiological and chemical substances contaminants. In water natural impurities are in very low amounts. Lakes, dams, rivers are necessary source of sparkling water.

2. Materials and Methods

The present research work will be physicochemical parameters of Ranitalab pond, Rewa. This ancient geographical vicinity provides Ranitalab pond Rewa city water bodies.

Samples of the water for physicochemical characteristics were analysed according to well known techniques of APHA (1998) [8] and Paka and Rao (1997) [9]. Water samples had been accrued at some stage in morning hours in between 8.30 to 10.30 a.m. with one litre containers from the pond in three seasons. To find out about the water best and its seasonal variations, the water samples are gathered all through summer, monsoon and iciness seasons. Some of the results have been recorded at the sampling websites whereas the others had been recorded in the laboratory. The parameters discovered have been Temperature, Transparency, pH, Dissolved Oxygen, CO₂, Conductivity, Alkalinity, Total solids, Calcium hardness, Magnesium hardness, Total hardness. The color of temple pond water used to be found visually. Hydrogen ion awareness was determined with the assist of BDH slim range pH strips. Later on, to affirm the results the pH used to be additionally measured in the laboratory through the phillip's digital pH meter. Total hardness was measured by ammonia buffer and EDTA method.

3. Results and Discussion

The seasonal variation of physico-chemical factors under observation is shown in Table 1.

Table 1: Seasonal variation of physicochemical factors in Ranitalab pond from November 2014 to October 2015

S. No.	Parameters	Winter season	Summer season	Monsoon season	Avg.	SD
1.	Temperature	21.42	24.05	25.93	23.80	±2.27
2.	Transparency (cm)	48.46	30.48	28.02	35.65	±11.16
3.	pH	8.67	8.27	7.61	8.18	±0.54
4.	Dissolved Oxygen (mg/l)	8.63	7.68	7.50	7.94	±0.61

5.	CO ₂ (mg/l)	25.28	35.68	30.77	30.58	±5.20
6.	Conductivity (µmhos/cm)	293.387	383.38	237.483	304.75	±73.61
7.	Alkalinity (mg/l)	143.07	145.13	107.03	131.74	±21.43
8.	Total solids (mg/l)	147.60	195.93	104.53	149.35	±45.73
9.	Calcium hardness (mg/l)	164.80	204.25	123.73	164.26	±40.26
10.	Magnesium hardness (mg/l)	4.54	7.81	4.18	5.51	±2.00
11.	Total hardness (mg/l)	191.51	212.06	127.91	177.16	±43.87

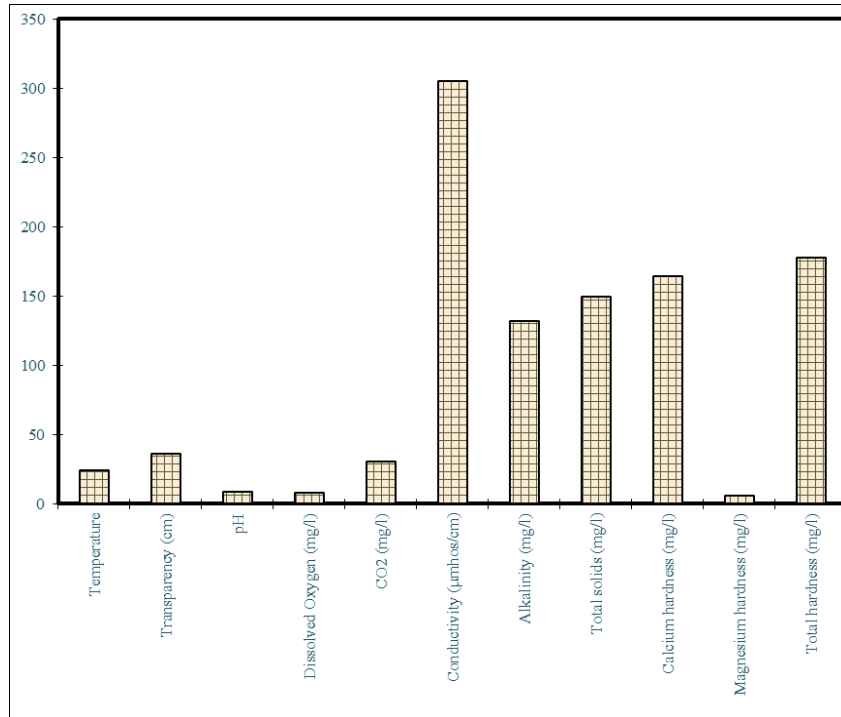


Fig 1: Average seasonal variation of physicochemical factors in ranitalab pond from November 2014 to October 2015

During the current investigation the values of water temperature of the Ranitalab pond for the duration of the summer, monsoon and wintry weather seasons have been 24.05, 25.93 and 21.42°C respectively. It additionally exerts profound direct or indirect affect on metabolic and physiological behavior of aquatic ecosystem (Welch, 1952)^[10]. Water temperature exerts a major impact on the biological endeavor and boom of aquatic organisms. Higher the water temperature, the increased is the organic activity. The transparency values as interpreted Secchi’s dis-changed from 28.02 to 48.46 cm. The suggest ±SD values of transparency had been recorded as 35.65±11.16cm at some point of study period. According to Boyd (1981)^[11] the obvious color of water is caused by means of suspended matter, which interferes with light penetration. These consequences had been in line with the findings of Mahboob (1992)^[12].

The variants of pH values during the learn about showed no fantastic significance. The highest cost was once noticed in iciness season and lowest in monsoon season. Dissolved oxygen of the Ranitalab pond was once 8.63 mg/l in winter, which is the easiest and the lowest values was once noticed in monsoon.

Carbon dioxide is one of the essential constituents of an aquatic ecosystem. The abundance of carbon dioxide exerts certain specific effects on aquatic bioata. The pond exhibited maximum carbon dioxide as 35.68 mg/l during summer whereas the lowest concentration of carbon dioxide (25.28 mg/l) was recorded during winter season. Cole (1975)^[13] noted that free CO₂ supply rarely limits the growth of phytoplankton. Alternately, the bicarbonates are

utilized as a source of carbon by the photosynthetic activity of phytoplankton.

Conductivity is a size of the capability of an aqueous answer to lift an electric current. The conductivity fee was once ranged between 237.483-383.38 µmhos/cm. best possible cost of conductivity found at summer season may additionally be attributed to accelerated attention of salts at the backside by way of siltation and sedimentation. The mean ±SD values of Conductivity were recorded as 293.387±73.61 µmhos/cm for the duration of learn about period. This finding is in agreement with that in Vellayani lake (Radhika *et al.*, 2004)^[14]. The conductivity value found all the sampling websites are within the permissible limit indicating water is no longer polluted with recognize to conductivity.

The minimal values of alkalinity have been recorded in the monsoon season and maximum in the summer season at some point of learn about period. The suggest ±SD values of alkalinity had been calculated as 131.74±21.43mg/l in the study period. Saksena *et al.* (2006)^[15] recorded total alkalinity of water between 5.0 to 142.0mg/l in Ratnagiri (Maharashtra) ponds.

Calcium is determined in higher abundance in all natural water as its most important source is weathering of rocks from which it leaches out. Calcium was discovered in the equal volume and comparatively higher each in summer time and winter seasons whilst lower in monsoon seasons. Magnesium values are poor. Same result are also founded by Rao *et al.* (2010)^[16] and Jena *et al.* (2013)^[17].

Total hardness value of the pond was 127.91 to 212.06 mg/l of which higher value was in summer while the lowest in

monsoon season. The maximum permissible limit for this parameter for drinking water standards is 500 mg/l. Same result are also founded by Pandey and Tiwari (2016) ^[18].

4. Conclusion

In the present investigation results of physicochemical parameters of Ranitalab pond water had been two inside two suited limits. The consequences obtained from the current investigation shall be beneficial in future management of the pond. The physico-chemical two traits two of pond water two suggested that there was no detrimental to pisciculture and consuming water. So there is a need of applicable remedy and restoration for human beings and environment.

5. Acknowledgement

The authors are greatly indebted to Principal & Dr. S.N. Shukla, Prof. of Zoology, Govt. Science P.G. College, Rewa (M.P.) who permitted to carry out this work at the centre.

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