

Physico-chemical studies of ponds water with special reference to water quality

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(Received: April 15, 2007; Accepted: May 09, 2007)

ABSTRACT

Physico-chemical studies regarding the water quality assessment of pond water was conducted during the month of January 2006. Water samples were collected from four sampling ponds and the parameter like temperature, pH, total hardness, Ca, Mg, were measured. The value of these parameters are indicated in the table which shows that water quality is totally unfit for drinking purpose of pond (3) and pond (4) but pond (1) and pond (2) is fit for domestic works.

Key words: Physico-chemical studies, Pond water, water quality.

INTRODUCTION

Water is one of the most essential constituents of the environments. It is the vital source of a kind of life on earth. The present realization is clear about the limited resources and competing demands. This indeed has placed an urgency on the protection of quality of water a vital natural resources.

The natural and man made factors responsible for water pollution. Sewage sullage solid wastes etc produces significant amount of chemical besides heavy metals which could adversely effect the human health, vegetation aquatic life forms and ecosystem. The physico-chemical parameters are disturbed due to introduction of several in-organic ions. A part from these ions introduction of several other inorganic and organic wastes disturb the quality of water. Such as hardness, Ca and Mg hardness, pH Increase in the concentration of these parameters beyond permissible limit adversely effect the aquatic flora and fauna which in turn effect the ecosystem of water body sometimes causing adverse damages. The present study was undertaken to ascertain the

quality of water in different ponds near newara village at Bilaspur district.

MATERIAL AND METHODS

The samples were analysed for physico-chemical parameters according to the standard methods. Water samples from four ponds (1 to 4) were collected in the month of January 2006. Samples were usually collected in the 8.30 A.M. to 10:30 A.M. from pond 1 to 4 pond 4. Water qualities undergoes both seasonal and yearly fluctuations.

Physico-chemical analysis

Temp

Temp of the pond water was recorded at the time of collecting the samples.

pH

pH of the water is very important for the aquatic growth it was determined with the help of pH meter.

Total hardness

The metallic cations other than those of alkali metals when expressed as equivalent to CaCO_3 represent the total hardness.

Table - 1: Physico-chemical analysis of pond water of Newara village, 2006

S. No.	Parameters	Unit	Pond I	Pond II	Pond III	Pond IV
1	Temp	°C	21.34	21.34	19.34	20.67
2	pH		7.94	7.98	9.97	8.95
3	Total Hardness	mg/L	113.44	103.22	105.78	201.08
4	Ca Hardness	—	95.60	66.61	75.53	127.70
5	Mg Hardness	—	11.59	8.95	9.02	8.28

Ca hardness

The quantities is natural water generally vary from 10 to 100 mg/L. Calcium as such has no hazardous effects on human health. In fact, it is one of the important nutrients required by the organisms.

Mg hardness

Magnesium also occurs in all kind of natural waters with calcium but its concentration remains generally lower then the calcium. Its high concentrations as 500 mg/L is responsible for unpleasant taste to the water.

Ca-H normally occur in combination with carbonate ions.

In the present study some of the parameters are well within the peronissible limit of WHO (1978) and ISI while some are exceeded beyond the limit. It shows the water is unfit for drinking and cooking purpose but is more suitable for fish culture. But with adequate treatment processes the water could be made available for drinking purpose.

RESULTS AND DISCUSSION

The results shows that at all the four ponds in the water system the value of pH was observed in the range of 7.9 to 9.9. High pH value induces formation of trihalomethanc which are toxic in nature. The value of total hardness, Ca-H and Mg-H were observed in the range of 130-210, 67-128 and 8-12 mg/L. Mg-H is absolutely essential for chlorophyll bearing algae and plants whereas

ACKNOWLEDGEMENT

The authors are thankful to Principal Dr. A.K. Tripathi, Head Department of Botany, Dr. Asha Kaushik, for providing available library and laboratory facilities time to time along with giving invaluable suggestions during the course of carrying out experimental work. Further the author is also thankful to Dr. M.F.K. Khokar, Retired Principal, Govt College Masturi, for his intellectual support and encouragement.

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