

PHYSICOCHEMICAL ANALYSIS OF WATER PONDS IN BURHAR TEHSIL DIST SHAHDOL, INDIA

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Abstract: The surface water quality of some stagnant water bodies like ponds in "BURHAR TEHSIL DIST SHAHDOL" have been investigated experimentally by analyzing the physicochemical parameters. Pond water has been analyzed to find the suitability for drinking and irrigation purpose. The physicochemical parameter of water such as pH, temperature, alkalinity, TDS, TSS, total hardness, phosphate, nitrate, chloride, DO and BOD have been studied. By observing the result it can be concluded that the parameters which were taken to study are above the permissible limit of drinking and irrigation standards. The results reveal that overall water quality was found unfit for drinking purpose.

Keywords: Pond, Physicochemical Parameter, DO, BOD, Alkalinity.

Introduction: "WATER" is an essential element, without water we cannot survive. Water is also very useful for multipurpose work due to which continue use of water leads to ground water degradation. Water is the precious gift of nature to human being and pure water is an important resource of mankind, because it is directly related to human well being. Now a day's water is going to be polluted day-by-day with increasing urbanization. Although three fourth part of earth is being surrounded by water but a little portion of it may be used for significant purposes. This little portion of water is not even safe due to increased pollution. The surface water bodies are the abundant and important sources of biological life. These are unfortunately under lots of environmental stress and getting polluted as consequence of manmade activities. There is a fact about the water bodies as they are the mirror of their environment as well as they reflect the society exists around surface water bodies and collect all Sins of humanity. Surface water is the most common source of consumers in most of the cities through municipal water supply. In this manner, more stringent treatments would be required to make the surface water potable. The prominent source of surface water pollution is domestic sewage, industrial waste water and agricultural run-off. There is an importance and need to study about surface water bodies. In many cases, application of fertilizers agricultural lands, pesticides, manure, and lime refuse dumps etc. are the main source of surface water and ground water pollution. Surface water is generally using for drinking and irrigation purposes in India. Therefore, we carried out studies of physicochemical parameters of Burhar Area pond water whether it is fit for drinking or some other purposes. Universal access to safe drinking water and sanitation has been promoted as an essential step in reducing the preventable diseases.

Study Area: Burhar Area (Gopalpur, Vikrampur, Banyan Tola Burhar) are located at Burhar Station on Bilaspur, katni Section of South East Railway. it is Situated at Shahdol District of Madhya Pradesh India. Area/Location sample ID Geographical position $23^{\circ} 13' 0''$ N and $81^{\circ} 32' 0''$ E 1.Gopalpur Village (Pond) 2. Vikrampur Village (Pond) 3. banyan tola Burhar (Pond).

S.no	Area/Location	Sample id
1	Gopalpur Village (Pond)	Station 1
2	Vikrampur Village (Pond)	Station 2
3	Banyan tola Burhar (Pond)	Station 3

Material and Methods: Environmental pollutants affect the aquatic ecosystem in a synergistic manner, which cannot be detected comprehensively by determination of selected physical-chemical parameters alone. Whereas, biological system can integrate all environmental variables over a long period two times of effects which can be easily measured and quantified.

Physico-Chemical Assessment: Physico-chemical characterization of river pH, Hardness, total alkalinity, phosphate, chloride, Calcium, Magnesium, and Nitrate values, C.O.D, B.O.D., total alkalinity, Temperature, pH, dissolved oxygen (DO), total dissolved solid (T.D.S).

Data Processing for Statistical Analysis:

Sr. No.	Studied Parameter	Method Used
1	pH	Recorded by pH meter
2	Hardness	EDTA Method
3	Total alkalinity	Neutralizing with Std. HCl
4	Phosphate	Spectrophotometric
5	Chloride	Mohrs method
6	Nitrate	Spectrophotometric
7	Sulphate	Spectrophotometric
8	B.O.D.	Titrometric
9	C.O.D.	Titrometric
10	D.O.	Titrometric

Table 1: Results of Physicochemical Parameters of Various Ponds

Sr. No.	Parameter	World Health Organization		Gopalpur Pond	Vikrampur Pond	Banyan Tola Pond
		Highest Desirable	Maximum Permissible			
1	Color	-	-	Slight Tarbush Whitish	Slightly Greenish	Colorless
2	Temperature	-	-	23.0	24.5	26.5
3	pH	7.0-8.5	6.5-9.2	7.7	7.5	7.8
4	Conductivity	-	-	259	255	265
5	BOD	-	-	10	21.5	3.2
6	COD	-	-	60.5	151.5	50.6
7	DO	-	-	5.2	6.3	5.5
8	TH	100	500	370	380	360
9	Ca hardness	75	200	310	380	360
10	Mg hardness	30	150	54	55	60
11	TDS	-	-	467	265	654
12	TS	500	1500	545	298	650
13	TSS	-	-	40	33.0	41.2
14	Chloride	-	-	88.50	54.5	123.2
15	Alkalinity	-	-	20	33	30

Results and Discussion: By the study of all physico chemical parameter of water sample in and around Burhar area pond shows it is observed that Gopalpur, Vikrampur and Banyan tola ponds so much pollution it may be caused by various human activity for these domestic purpose. These sample cannot use for drinking purpose. They are use for irrigation purpose only.

The pH values were found in the range of 7.6-7.7 and thus slightly alkaline trend reveals in every pond sites. The pH affects most of the biological processes and biochemical reactions in water body (Arya et al 2011a, b). Temperature is one of the most important factor of aquatic environment. Temperature play a crucial role in physicochemical and biological behavior of aquatic ecosystem (Mahima Chaurashia, 2007). Temperature values were ranging from 22°C to 26 °C. It shows the variation in temperature according to its location.

The total alkalinity values ranged between 20mg/L to 35mg/L. It was minimum in Gopalpur pond (19.2mg/L) where maximum in Vikrampur pond (33mg/L). Chloride content ranges from 54.5mg/L to 123.2mg/L in Gopalpur, Vikrampur and Banyan tola pond. Chlorides are toxic to most plants so they should be checked for irrigation water. Total hardness Gopalpur, Vikrampur and Banyan tola pond was calculated as 370mg/L,

380mg/L and 360mg/L respectively. Due to addition of sewage and large scale human use this might cause elevation of hardness (Dakshini & Soni, 1997; Kumar, 2000; Mohanta & Patra, 2000). Dissolved oxygen is important parameter in water quality assessment and reflects the physical and biological processes of aquatic life. BOD depends on temperature, extent of biological activity, concentration of organic matter and microbial population such as bacteria and fungi (Prasanna & Ranjan, 2010). In this study maximum DO and BOD value was found in Vikrampur pond is 21mg/L and 6.3mg/L where minimum value found in Gopalpur, Vikrampur and Banyan tola pond is 3.2mg/L and 5.5mg/L respectively. Same as values of total dissolved solids and total suspended solids for Gopalpur, Vikrampur and Banyan tola ponds were 465 mg/L, 40 mg/L, 265 mg/L and 33 mg/L, 654 mg/L, 41mg/L respectively. Banyan tola pond shows the maximum values of TDS and TSS. TDS and TSS increased mostly by sewage discharge.

Conclusion: In the present investigation results of physicochemical parameters clearly shows Gopalpur, Vikrampur and Banyan tola ponds that the water is unfit for drinking purpose without treatment and also struggle for their existence. They are used for irrigation purpose only. There is a need of awareness among the local people to maintain the ponds. Intermittent cleaning of these ponds may be helpful to retain water purity.

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