



## **Physico-chemical Characteristics of a Fresh Water body, Dadri, District G.B. Nagar, U. P.**

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### **ABSTRACT**

*Present study has been conducted to study the physico-chemical characteristics of a fresh water body located at Dadri, District G. B. Nagar (U. P.). Water samples collected were analyzed for some physico-chemical parameters i.e. Water temperature, pH, Total Solids, Hardness, Dissolved oxygen (D.O.), B.O.D, Chloride, Phosphate and alkalinity etc. These parameters were found in higher concentration above freshwater limits.*

**Keywords:** Physico-chemical characteristics, water quality, Dadri.

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### **INTRODUCTION**

Water is one of the most essential components for the existence of life on the earth. It covers about 2/3<sup>rd</sup> of earth surface. However, only 1% of the water resource is available as fresh water for human consumption and other activities. To fulfill human needs water quality of a fresh water body should not be abused and polluted. Water quality gets degraded when pollutants get accumulated in these water reservoirs [1].

Study of physico-chemical properties of an aquatic ecosystem is important, because fluctuation in the water quality has an influence on the biotic communities. Present study has been carried out to assess the water quality of a fresh water body by studying its physico-chemical characteristics [2]. This water body receives water from domestic discharges and rain water which accumulates during rainy season which is regularly used for agriculture, bathing, washing of clothes, and fishing by local people.

### **MATERIAL AND METHODS**

The fresh water body is a pond located near Dadri, District G.B. Nagar, U.P. (India). The Present work was carried out during the year 2003- 2004. Water samples were brought to the laboratory and some physico-chemical parameters were taken into consideration. The parameters such as Water temperature, pH, Total solids, Hardness, Dissolved oxygen (D.O.), Biological oxygen demand (B.O.D.), Chloride, Phosphate and alkalinity were estimated at periodic intervals. Temperature and pH were recorded on site. Dissolved oxygen was analyzed by using Winkler's modification method.

### **RESULTS AND DISCUSSION**

Results of physico-chemical parameters are given in Table-1.

The data on water quality reveals water temperature was ranged from 17 °C to 33 °C. During winter season the water temperature was found to be minimum, whereas the summer season exhibited the maximum water temperature. Total solids were ranged from 240 mg/l to 390 mg/l. These solids are mainly organic in nature and can pose serious problems of pollution. The pH was ranged from 7.6 to 8.5. The pH of water was relatively high in the winter season and low in the monsoon and summers. This variation in pH might be due to household detergents coming into pond water from nearby houses and also due to cattle bathing.

**Table 1:** Observed values of some physico-chemical parameters of the pond.

Parameters	Range	
	Minimum	Maximum
Water temperature(°C)	17	33
Total solids	240	390
pH	7.6	8.5
D.O.	4.3	9.0
B.O.D.	4.6	8.2
Alkalinity	242	470
Hardness	252	310
Chloride	48	72
Phosphate	1.2	2.4
Calcium	86	140

The dissolved oxygen (D.O.) ranged from 4.3 mg/l to 9.0 mg/l. The dissolved oxygen of water samples was found maximum during the winter season whereas the monsoon season exhibits least amount of dissolved oxygen. High D.O. content might be due to increased photosynthetic activity of autotrophs while low content might be due to increase respiration of organisms, low photosynthetic rate and increased organic matter decomposition. B.O.D. was ranged from 4.6 mg/l to 8.2mg/l.

Alkalinity ranged from 242 mg/l to 470 mg/l. Alkalinity is generally influenced by the salts of carbonates, bicarbonates, phosphates, nitrates. Hardness was ranged between 252 mg/l to 310 mg/l. The pond water is included under very hard category. Hardness is governed by the contents of calcium and magnesium salts, largely in combination of calcium with bicarbonates and carbonates giving temporary hardness, and magnesium with sulphates, chlorides and other anions of mineral acids causing permanent hardness.

Chloride content was ranged from 48 mg/l to 72 mg/l. Chloride content was high in summer season and less during winter season. The higher concentration of chloride is considered to be an indicator of higher pollution due to higher organic waste of animal origin and also due to increased temperature and evaporation of water. The value of phosphate ranged from 1.2 mg/l to 2.4 mg/l. The calcium was recorded in the range of 86 mg/l to 140 mg/l. Studies of physico-chemical characteristics have been supported by many workers [3-12]

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