

Physicochemical Properties Of Ganeshganj Pond, Kota, Rajasthan**Upendra Pal Singh****Research Scholar****Department of Zoology****Government College****Kota****Rajasthan****(Received:10April2022/Revised:25 April 2022/Accepted:5May2022/Published:13May2022)****Abstract**

Kota district situated in the southwestern parts of Rajasthan has a total area of 5198.15 sq. km. Chambal is the principal perennial river of the district. An integrated study of physico-chemical characteristics was undertaken in the present survey. Though the selected water bodies exhibit narrow fluctuations in pH, alkalinity, total hardness, and fluoride contents but considerable variation were observed in the TDS values.

Introduction

Water is a most abundant physical substance and transparent liquid on earth. In water molecule two atoms hydrogen and one atom oxygen are present. Water is the foundation of all form of life. Water is an essential natural resource for life of human beings, plants and animals on water planet. All processes of life are directly or indirectly connected to water therefore human beings cannot survive much longer without water, as water plays a central and critical role for every cell and organ system in the human body to function properly. Water is responsible for every activity in human body. In developing countries safe and sufficient drinking water supply is a crucial issue in rural and in many urban areas⁴¹. In rural areas groundwater is a reliable and finite source of water. The most common sources of water for irrigation and various purposes are surface water.

Major Water Compartments

Water compartments are a large area where water is stored. Water is stored in various global compartments. The major water compartments on earth are specified as follows:

1. Oceans and seas: The Ocean is a largest compartment of saline water that covers much of the Earth's surface. Oceans cover about 70% of the Earth's surface and the oceans contain roughly 97% of the Earth's liquid water. The Oceans and seas have great effect on the weather and temperature on earth. The Oceans moderate the Earth's temperature by absorbing incoming solar radiation. The biomass in the oceans is over the 4 billion Tons.

2. Glaciers, Ice and Snow:

Glaciers are slow moving rivers of ice. It takes a long time to form a glacier. Glacial ice often appears blue when it becomes very dense.

3. Rivers and streams:

Rivers are essential not only to humans, but to all form of life on the earth. Rivers and streams help to shape the features of the Earth. They help to drain rainwater and provide habitats for many species of plants and animals. Rivers make up only about 0.2 percent of all the fresh water on Earth. Rivers and streams carry water, organisms and important gases to many areas. Rivers are providing the power for hydroelectric plants. Ultimately rivers and streams deposit that water in the ocean.

4. Ponds and Lakes:

A pond is a small area of fresh water. It is different from a river or a stream because it does not have moving water. The bottom of pond is usually covered with mud and Plants grow along the pond edge. Some ponds are formed naturally and some other ponds are man-made. Pond is a reservoir of rainwater. Pond is smaller than lake and lake is deeper than a pond.

Lakes are inland bodies of slowly moving water. Lakes are varied in terms of origin, occurrence, size, shape, depth and other features. Most lakes on Earth were formed by glacier activity. Lakes can be very deep or shallow. Lakes get water from precipitation, from rivers and streams and from underground water.

5. Wetlands:

Wetland is a place where the land is covered by water, either salty or fresh. These are some of the most productive habitats on the Earth. Wetlands are variable and dynamic water bodies where water covers the soil. They are freshwater, brackish or saline, inland or coastal, seasonal or permanent, natural or man-made. Wetlands are most important ecosystems to human survival and development. Wetlands are a critical part of our environment. They protect our shores to reduce the impacts of floods, absorb pollutants and improve water quality. Names of different type's wetlands are swamp, marsh and bog. Many animals use wetlands for all of their life- cycle. The most significant social and economic benefit that wetlands.

Methodology

This describes the methods of sample collection and analytical procedure adopted for analysis of pond water samples of Kota district using different analytical methods. The samples were collected as composite samples; at every village site, samples were collected from four different points of each village and then mixed together *i.e.* from thirty villages samples were collected from one hundred twenty points. Samples were collected from various sampling sites of Kota district as composite samples for assessment and characterization of their physicochemical properties.

Sampling Methods

Good quality narrow mouth screw-capped polypropylene bottles of five-liter capacity were used to collect the sample. Bottles first washed with dilute nitric acid than thrice with DM water (Demineralised). Before sample collection bottles were rinsed thrice with water to be sampled and then samples were collected.

Sampling Sites

One village Ganeshganj pond tehsil pipalda of Kota district.

Labeling of the samples

Every sample was coded adequately and mark code on sampling bottles by permanent marker at two places, recorded all the information regarding name of the sampling location, source and date of collection in field book to avoid any confusion and error.

Collection of Samples

Before collection of sample the pipeline of bore wells / hand pumps were flushed for a sufficient period of time, so that actual sample can be collected which represents the actual quality of groundwater. The samples were collected from five spot and then mixed together. Sample bottles were rinsed thrice with the water to be collected and then filled completely to avoid encroachment of air bubble. Sample bottles screw-caped tightly and brought to the laboratory. The samples were preserved in refrigerator at 4⁰C. The analysis of pH was made in field with the help of systronic make portable pH meter.

Examination of Samples

Samples of various locations were analyzed for determination of degree of pollution with respect to the following physicochemical parameters opted for investigation.

- pH
- T.D.S. (Total Dissolved Solids)
- T.H. (Total Hardness)
- Conductivity
- Temperature
- T.A. (Total Alkalinity)
- Chloride
- Nitrate
- D. O. (Dissolved Oxygen)
- B.O.D. (Biological Oxygen Demand)
- C.O.D. (Chemical Oxygen Demand)

Results and Discussion

The purpose of this is to discuss the findings which have emerged from the research work. The physicochemical assessment of pond water samples of ganeshganj of Kota District was used to evaluate the suitability of pondwater for drinking, industrial and agricultural purpose. A sensitivity analysis showed that now a day's pondwater quality deteriorated. Main factors affect the hydrochemistry of pondwater of Kota District is wastewater and agriculture activities. Pondwater source is considered the main water supply source for all kind of human usage in the villages of one tehsils of Kota district (domestic, agricultural and industrial).

S. No	Parameter	Ganeshganj Pond
1.	pH	7.39
2.	Temperature	30
3.	TDS mg/L	976
4.	Total Hardness mg/L	164
5.	Conductivity MHO/cm (at 25° C)	1260
6.	DO mg/L	2.73
7.	BOD mg/L	5.64
8.	COD mg/L	94.08
9.	Alkalinity mg/L	76
10.	Chloride mg/L	288
11.	Nitrate mg/L	6.08
12.	Latitude	N25°30'1''
13.	Longitude	E76°22'39''
14.	Altitude	227.1m(736.39 ft)

The dissolved oxygen content varies significantly throughout the day. Dissolved oxygen levels are normally lowest around morning and highest at some time in the evening.

Conclusion

The tropical status of a water body can be evaluated by its physicochemical parameters which would help to formulate the control measures and monitor the impact of human activities on biological diversity of the water body. In the present study it is clearly seen that the physicochemical characteristics of water is greatly influenced by the anthropological activities and hence it directly affects the phytoplankton population residing in water bodies.

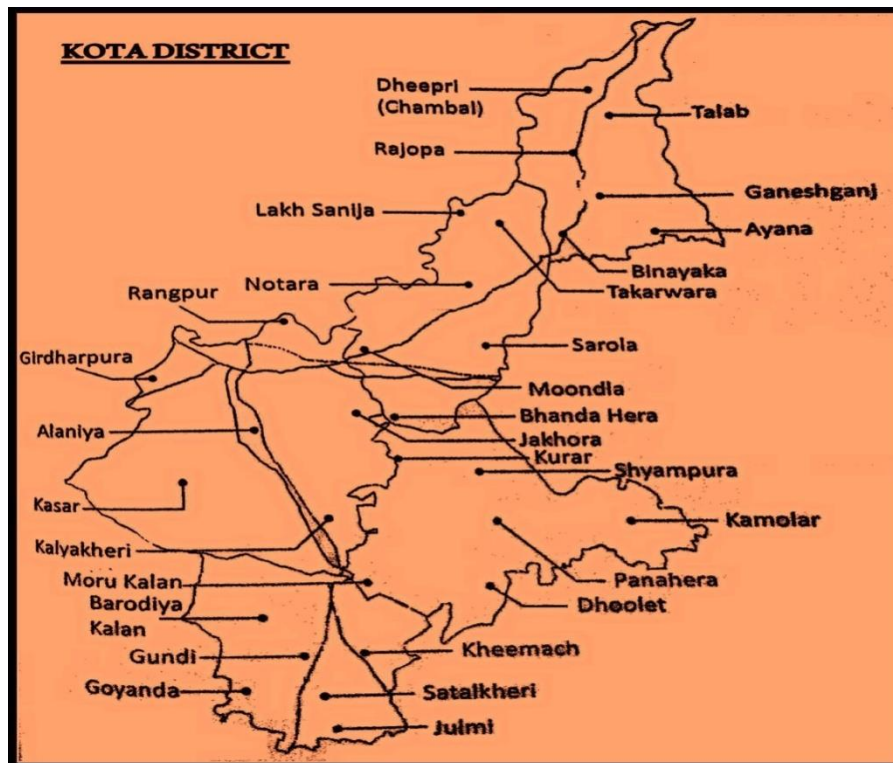


Fig. 1: Locations of sampling sites in Kota district

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