ORIGINAL RESEARCH PAPER

Zoology

KEY WORDS: BOD, TDS, Hardness, alkalinity, chlorinity, pH, water quality, and physico-chemical parameter.

AN EVALUATION OF THE WATER QUALITY IN ANNA SAGAR, AJMER (RAJASTHAN) DURING THE YEARS 2023- 2024.

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ABSTRACT

The current study was carried out with the purpose of determining the physicochemical properties of a water sample taken from the Anna Sagar Ajmer , which is located in the Ajmer metropolitan area. A wide range of physicochemical properties, such as pH, total hardness, total alkalinity, chlorinity, turbidity, and dissolving oxygen, were investigated using the samples that were connected to the laboratory. The quantity of phytoplankton, which is the primary source of nutrition for aquatic organisms, decreased as a result of increased pollution. In addition, the salinity of the water has an effect on aquatic organisms that migrate. Amarong the factors that have contributed to the decline are environmental modifications, litter, water pollution, deforestation, trash removal, hazardous chemicals, human disturbance, pesticide spread, agrochemical contamination, global warming, and other factors. The findings indicate that a number of the water samples include chemical constituents that are elevated to levels that exceed the acceptable limits set by the Bureau of Indian Standards (B.I.S.). These chemical constituents have a wide range of adverse consequences. In the purpose of this investigation, the term "regional water contamination" will be used to refer to any type of water pollution that may be identified at the regional level. Taking into consideration these findings, it is recommended that any water source located within the research region be analysed prior to its utilization for its portability as well as various applications in the home or industrial setting.

INTRODUCTION:

There is no life without water, which is a resource that is both valuable and limited. Approximately 75% of the stuff in the earth's crust is composed of it.

Water, which is an essential component of life, is a wonderful gift from God. Water is also important for life. Without a doubt, water is the most fundamental component of virtually every living thing. A great number of flora and fauna belonging to a variety of groups thrive in the aquatic environment, and they play a key part in the development of our society. The basic necessity of the living organism and the requirement for every living organism to be in a healthy state. Most animals and plants contain more than 60% water by volume. Our life would never develop on our planet without water. A scientific judgment of the worth of these water bodies but that comes under hydrology and limnology, is of considerable importance for their effective management especially for their biological productivity.

Any mineral that comes into touch with water will dissolve it since water is a universal solvent. Water obtains its particular flavour from dissolved minerals and gasses; without these ingredients, water would taste boring. Water plays a significant role in the hydrological cycle, which permits the continent's water to behave distinctively.

As a result of the growth of businesses, technological advancements, population, and water consumption, our land and water resources are currently experiencing a greater degree of strain than they did a few years ago. Concerns about the environment that are of the utmost importance include the protection of water and resources and the enhancement of environmental quality.

A little less than twenty-five percent of Rajasthan's water sources have a number of problems with their quality. In 16%, there is an excessive amount of fluoride. In excess of the salinity, there is 9%. It is necessary to perform regular and ongoing monitoring of water bodies to determine the quality of the water. The fact that there are many different causes of contamination is one of the key reasons why it is required to conduct an assessment of the water quality.

METHODOLOGY AND MATERIALS.

Water samples were collected from the Anna Sagar , Ajmer region on a monthly basis for a period of twelve months. Drinking is just one of the many residential applications that can be found for these water sources. Following a thorough rinsing with distilled water, the samples were collected into a high-quality plastic bottle that had a capacity of two liters. The process of collecting, preserving, analysing, and interpreting water according to a variety of processes and methodologies.

Methodological Approach:

In order to determine the physicochemical characteristics of the water sample, the traditional procedures were utilized as the analytical approach. Both the temperature and the pH were measured with the help of portable equipment. In order to determine the concentrations of calcium, hardness, sulphate, nitrate, and salinity, volumetric methods were utilized in the calculation process. A comparison was then made between the results and the B.I.S. standards.

RESULTS AND DISCUSSIONS:

Table 1 presents the findings that were obtained from the examination of a water sample taken from the Anna Sagar Ajmer (Rajasthan) region. These findings pertain to the enhancement of water quality for residential purposes. In compliance with the criteria for drinking water, the physicochemical characteristics of the water sample have been determined.

Table 1 Physicochemical Characteristics Of The Water In Anna Sagar, Between The Years 2023 And 2024.

Months	TEMPERTURE	TDS	PH	SALINITY	TOTAL	CHLORIDES	TOTAL	DISSOLVE
MONTH					ALKANITY		HARDNESS	OXYGEN
APRIL	27	216	7.2	275	92	20	110	4.2
MAY	30	320	7	276	113.8	21	121.8	4.4
JUNE	34.2	222	6.9	280	112	22	122.4	5.1
JULY	32.3	321	7.1	278	103.8	20.8	124.9	3.3
AUGUST	29.4	418	7.2	268	128	14	160	4.2
SEPTEMBER	26.1	317	7.3	267	102.9	14.8	175.5	3.4
OCTOBER	20.1	315	7.5	264	129.9	14.7	155	5.5

NOVEMBER	19.4	413	7.6	263	105.5	15.1	160.3	6.7
DECEMBER	15.5	310	7.3	258	98.9	15.3	134.2	6.1
JANUARY	13	417	7.5	250	109.8	15.2	108.5	6.8
FEBUARY	18.5	312	7.3	255	90.4	15.8	106.6	5.6
MARCH	24	364	7.8	260	98.8	16	109.9	5.4

pH:

The water in the Aana Sagar , Ajmer region had a pH value that ranged from 6.9 to 7.8. This indicates that the water has a potential for hydrogen. The results indicate that the water sample taken from the Ajmer region is found to be quite alkaline. There is no violation of the permissible limits by the water samples.

Total Hardness(TH)

This experiment utilized a water sample that had a hardness that ranged from 108.5 to 175.8 mg/l across its whole spectrum. When sorting the water samples from the research region, the hardness (B.I.S.) of the water is taken into consideration.

Total Alkalinity (T.A.)

Which indicates that the water has a constant amount of dissolved carbon in the form of bicarbonates, hydroxides, and other forms of carbon dioxide. These are the principal sources of alkanity, which can be easily measured using an acid titration to determine the concentration. According to the categorization of the study by the B.I.S., the alkanity ranges are between 92 and 129.9 mg/l.

Chlorids

When there is an excessive amount of chloride in water, it has a salty taste, and it can have negative effects on people who are not accustomed to being exposed to high chloride levels. Depending on the location of the research, the chloride concentration can range anywhere from 14 to 22 mg/l.

Temprature

January was the month in which the water's temperature reached its lowest point, which was 13 degrees Celsius. This was the lowest point in the water's annual cycle. The temperature continued to rise steadily until it reached 34 degrees Celsius in June.

Total Dissolve Solid (TDS)

It is fluctuated between 216 and 417 mg/l in the area that was the subject of the research.

Dissolve Oxygen

In the current sample, the month of August had the lowest value for the amount of oxygen that was dissolved (2.1 mg/l). The introduction of turbid water is the root cause of this phenomenon. 10.8 mg/l was the highest D.O. value that was ever recorded in the month of January. Both production and the temperature being at a reasonable level contributed to this result. This oxygen that has been dissolved in the water The concentrations in the study area ranged from 3.3 to 6.8 mg/l.

DISCUSSION

According to the findings of the research that was discussed earlier, it was found that during the course of the investigation, each parameter in the water sample that was gathered from the Anna Sagar in the Rajasthan which is located in the city of Ajmer, exhibited some degree of variation.

Based on the average levels of dissolved oxygen, pH, and hardness, it was clear that Anna Sagar water is suitable for agricultural purposes and the production of fish.

The most essential environmental concerns, which include the protection and enhancement of the quality of water and resources, are those that pertain to the environment. A little less than twenty-five percent of Rajasthan's water sources have a number of problems with their quality.

In 16%, there is an excessive amount of fluoride. Continuous and frequent monitoring of water bodies is required to ensure that the water quality is maintained. because it is required to do an assessment of the water's quality in order to determine the various causes of contamination.

Increased pollution led to a decline in phytoplankton, the principal food source for birds. Among the factors that have contributed to the reduction of organism include environmental alterations, litter, water pollution, deforestation, trash disposal, toxic chemicals, human disturbance, pesticide distribution, agrochemical contamination, global warming, and other factors.

REFERENCES:

1. WHO (2004) Guidelines for Drinking Water Quality (3rd Ed.), Geneva, Switzerland:WHO.
2. APHA (2005): Standard methods for the examination of water and waste water. 21st ed., American Public Health Association, Washington, DC, USA.
3. SHAMSUNDER (2007). Aquachemistry of the GOPAL SWAMY River in Chitradurga, Karnatka Indian J Env. Pro., 27 (5): 420–424.
4. Abida, B., S. Harikrishna, and I. Khan (2009). Analysis of heavy metals in water, sediments, and fish samples of Madivala lakes in Bangalore, Karnataka. Inter J Tech Res-CODEN (USA), 2:249.
5. SUKHDEV KUNDU (2012). Assessment of surface water quality for drinking and irrigation purposes: A case study of the Ghaggar River System. Surface waters, Bulletin of Environment, Pharmacology, and Life Sciences, 1(2): 01–06.
6. Devi Av Baskarans, Kumar Sr. (2013). Physicochemical parameters and zooplankton diversity of A temple pond in Virudhonagar, Tamil Nadu. International journal of science, environment, and technology, 2(2): 250–257
7. DEY D MUKHARJEE D, SAHA NC (2015) A study on the seasonal fluctuation of water quality and zooplankton diversity in terms of the ecological health of five natural water bodies in west Bengal Indian journal of fundamental and applied life science, 5(1): 65–72.
8. Verma et al. (2016) Assessed phytoplankton diversity is important for evaluating the suitability of water for irrigation and drinking purposes.