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Seasonal Variation of Physico-Chemical Parameter of a Non Saline water Area, Indra Gandhi Nahar in Surewala Village, District Hanumangarh, Rajasthan

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Abstract – The Recent research deals with the analysis of fresh water quality of Indra Gandhi Nahar in Surewala Hanumangarh District with regards to physical-chemical factors like water Thermogenesity of water , Hydrogen ion concentration, Electrical conductivity(EC), Turbidity, Dissolved oxygen (DO), Total alkalinity (TA), Total Hardness, Total Dissolved Solid, Chloride and phosphate (PO43-). The physico chemical characteristic of Indra Gandhi Nahar in Surewala villege is found to be highly fluctuated with seasonal variations during the present investigation. Higher level of DO analysed during winter season and that represent reciprocity against Thermogenesity of water, TDS, EC which have higher level in summer. The researches explain that the quality of water is higher than fresh water limits and highly polluted.

Ketwords: Physico- Chemical Parameters, Water Quality, Pollution

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Water is a prerequisite for the existence of life. The water is limiting factor for many aspects of life such as economic growth, environmental stability, biodiversity conservation, food security and health care. Potable water is important resources for the survival ship of all living organisms. It is also necessary for humans because they are depend on water forAgriculture, industrial and Domestic uses, as well as cultural requirements [(1)]. Many areas in the country are facing a serious problem of not only scarcity of water, but also of its poor quality and polluted level high. Urbanization and Industrial activities lead the water contamination. It's a serious problem now a day. Analysis of the quality of water is essential to take a safety measures to protect & preserve the natural ecosystem [(2)].

AIM

The main aim of this study is find out physio chemical properties of Indra Gandhi Nahar in Surewala villege in Hanumangarh District and search the level of pollution.

REVIEW OF LITERATURE

Study of Seasonal fluctuation with Special Reference to Physico-chemical parameters in Tulshi Reservoir of Kolhapur District (M.S.), India (Koli and Muley, 2012)[3]. Physico-chemical parameters like atmospheric and water temperature, turbidity, pH, dissolved oxygen, salinity, total dissolved solids, chlorides, hardness, BOD and Nutrient were analyzed.

A.D. Smitha, P. Shivashankar (2013)[4] observed that Temperature, turbidity, nutrients, hardness, alkalinity and dissolved oxygen are some of the important factors that play a vital role for the growth of living organisms in the water body. V.Sajitha , Ashok, Vijayamma Smitha (2016)[5] reported that physico-chemical Characteristics e.g Temperature, pH, EC (Electrical Conductivity), TDS (Total Dissolved Solids), TA (Total Alkalinity), DO (Dissolved oxygen), TH (Total Hardness), NaCl (Salinity), Ca^{++} (Calcium), Mg^{++} (Magnesium), Cl^{-} (Chloride), Na^{+} (Sodium) and K^{+} (Potassium). The quality of pond water in Athiyannoor panchayath, Thiruvananthapuram District, Kerala.

MATERIAL AND METHODS

The fresh water body Indra Gandhi Nahar Located near Surewala villege. A village Surewala (Hanumangarh District Rajasthan), India. In this research work analysis isdone according to seasons e.g Summer, Rainy and Winter. The research work based on the physical and chemical standard such as Thermogenesity of water, Hydrogen ion concentration, Transparency level, Dissolved oxygen, Total Alkalinity, Electrical Conductivity,Total Hardness, Total Dissolved Solid, Chloride and phosphate. The present work was carried out during the year 2016-2017. The water samples were collected from Surewala at monthly intervals from April 2016 to March 2017 during 8.00 – 10.00 am in fresh unsullied plastic bottles. Temperature and pH were recorded on site. Dissolved oxygen was analyzed by using Winkler's modification method

Analysis of water quality parameters:

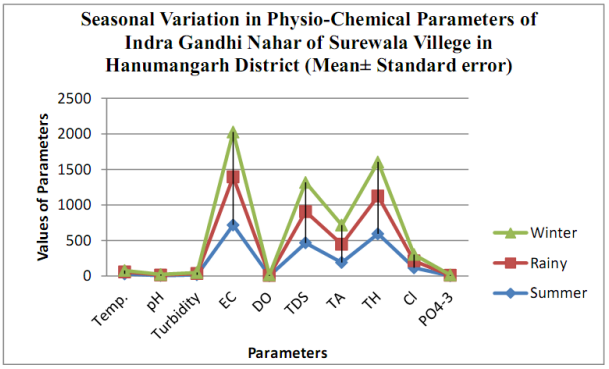
Water temperature is measured *in situ* by using hand mercury thermometer, pH estimation by Electronic pH –meter (Systronics Type-335). Turbidity was measured by Water Analyzer, Turbidity meter; Electrical conductivity was measured by conductivity meter. For the estimation of other parameters and the sample is taken to the laboratory. The study of various physico-chemical Parameter is done as given the standard methods given by APHA (2004) and Trivedi and Goel (1984)

RESULTS AND DISCUSSION

Physico-chemical parameter of fresh water pick up during the recent research (during April 2016 – March 2017), (Mean with Standard Error) is presented in table.

Parameter	Summer	Rainy	Winter
Temperature (°c)	31.8±0.092	28.5±0.044	18.02±0.058
pH	7.3±0.120	7.5±0.1	8.4±0.086
Electronic Conductivity (µm cm^{-1})	718.1±1.302	678.7±0.902	632.3±0.706
Turbidity (NTU)	19.02±0.165	16.5±0.158	15.0±0.198
Dissolved Oxygen(mg/l)	4.2±0.102	5.5±0.106	5.9±0.070
Total Alkalinity (mg/l)	190.3±0.280	257.4±0.415	270.5±.0396
Total Dissolved Solid(mg/l)	466.7±0.845	441.1±0.589	410.9±0.444
Total Hardness (mg/l)	595.2±0.751	530.4±0.796	480.4±0.659
Chloride (mg/l)	116±0.342	97±0.330	90.1±0.276
Phosphate (mg/l)	4.8±0.115	6.3±0.174	5.2±0.150

The data on water quality reveals water temperature was ranged from 18.5°C to 33.2°C.The thermogenesity of water was found to be lower in winter season, while in the summer season exhibited the higher thermogenesity of water. The high value of Hydrogen ion concentration show the considerable variations are observed during experimental period was ranged from 7.3 to 8.4. So the pH of water was higher in the winter season and lower in the rainy and summers. This Variation in pH can be caused by industrial waste coming into Indra Gandhi Nahr from nearby industries. The EC of sample was higher (718 mg/l) in summer season and lower (632 mg/l) in winter season. EC is a high capacity to conduct electrical current; it signifies the amount of total dissolved solid. Similar result was given by Narayana *et. al.,*[7] Kedar *et.al*.,[8.] The Turbidity ranged from 15.0 mg/l to 19.0 mg/l. Turbidity in water is due to colloidal and extremely fine dispersions, suspended matter such as clay, silt, finally divided organic and inorganic matter plankton and other micro-organism also contribute to turbidity. The dissolved oxygen (DO) ranged from 4.2 mg/l to 5.9 mg/l. The dissolved oxygen of sample was higher during the winter season while the monsoon season has less amount of dissolved oxygen. High D.O. content can be due to increased photosynthetic activity of autotrophs.



The alkalinity values were maximum during winter (270 mg/l) and minimum during summer (190 mg/l). The alkalinity rise during to summer season and winter season was due to the concentration of elements in water and become less was due to dilution caused by the rainwater which are mixed with many pesticides during monsoon. The result is also given by Mishra *et. al.,*[9] and Arya et. al.,[10]. TDS displayed a broad range of variations with a maximum value of 466.7 mg/L and minimum of 410.9 mg/L. The TDS values were maximum during summer season and least TDS values were during winter. The Hardness of non-saline water is mainly by the content of calcium and magnesium bicarbonate & carbonates (Temporary hardness) and with sulphate, chloride (Permanent hardness). In the recent study it ranges was 595.2-480.4 mg/l. Chloride content was ranged from 90 mg/l to 116 mg/l.

Chloride content was high in summer season and less during winter season. The beginning of chloride in above water is from weathering and natural process of damage of sedimentary rocks, municipal and industrials, wastes discharge municipal influence etc. Many organisms utilize both forms of phosphorus; however inorganic phosphate used by plants than organic phosphate. The value of phosphate ranged from 4.8 mg/l to 6.3 mg/l.. Studies of physico-chemical characteristics have been supported by many workers [11-12].

CONCLUSION

It was studied the effect of seasonal variations on water qualities of Indra Gandhi Nahar in Surewala villege of Hanumangarh District. The investigations show that water of this research area are polluted due to industrial waste from various industries of Punjab. In the Present study provides a base line data for the conservation and monitoring of the Indra Gandhi Nahar water quality. It was found that the Indra Gandhi Nahar water was low suitable for drinking, irrigation purpose and low useful for human and animal health.

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