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Physico-Chemical Characteristics of the Water of the Rajsamand Lake

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Abstract

RAJSAMAND Lake is located between the twin cities of Rajnagar and kankroli it remains draught from a period of decade after that period a moderate amount of water come in to it so in the present status it is necessary to study the physico chemical parameters of the water quality. Whereas certain deviate or more from the Indian and USPH standard and main fish fauna and presence of gastropods reflacts the eutrophic state of the lake.

Keywords: Rajsamandlake, Eutrophic, Sacchki Disks, Penetration, Calibration, PPM (Part Per Million), Buffer, Acid Neutring Capacity, Hardness.

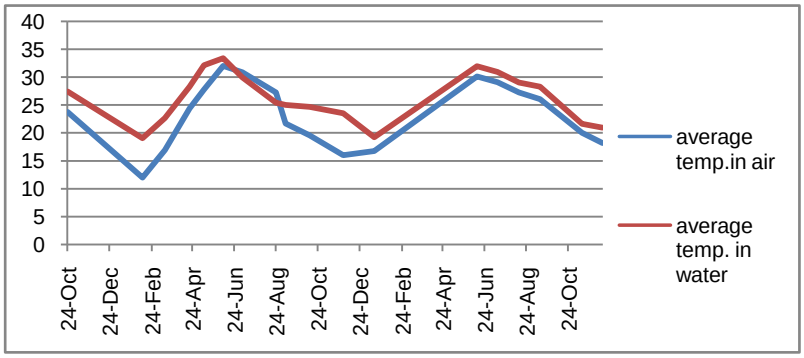
Introduction

Morphological features the Rajsamand district is located at the longitudes between $73^0$28' to $74^0$18', latitudes of $24^0$46' to $26^0$1' north with 532.50 meters altitudes .the average rainfall in this region is 794 mms. Rajsamand Lake is the biggest and beautiful artificial lake in Rajasthan located at the Rajsamand district headquarter and is the only district named after the name of rajsamand lake. This Lake is constructed in 17th century by maharaja Raj Singh to give the relief to farmers and worker suffered from Draught and famine of 1661.Initially this lake is known as Dam. Water in this Lake comes from Gomati , kelwa and Tali rivers now in these days water brings from Nandsamand by khari feeder to fill up the lake. The max length of the lake is 6 km and depth is 18metre, with2.5km width. This Lake becomes draught in 2001 and now 2009 refill by the moderate amount of water so it is necessary to study the physico- chemical parameter as well as fish fauna in present status of this Lake.

The Main Text: Parameters of Study

Temperaturein Air & Water

Temperature is the most important ecological factor which has been all round effect on the many sided activities of the animals live in the water. In fact temperature affect the working condition of all life forms and every aspect of the metabolism is related to the temperature. Temperature is measured by digital MEXTECH Multi- thermometer.



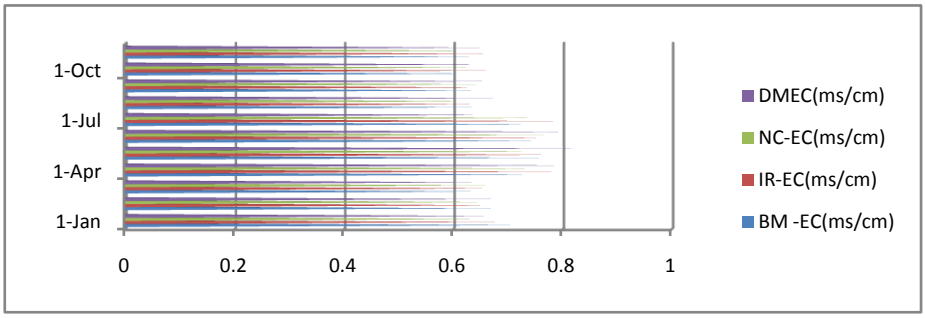
Hydrogen Ion Concentration in –Log(H+)

PH is determined value based on a defined scale similar to the temperature. This means that ph of the water is not physical parameter that can be measured as a concentration of hydrogen ion or in a quantity. Determination of the pH by digital ph meter of Eutech instrument (eco ph2 tester) automatic handy pH tester is well known with specification.

Electrical Conductance

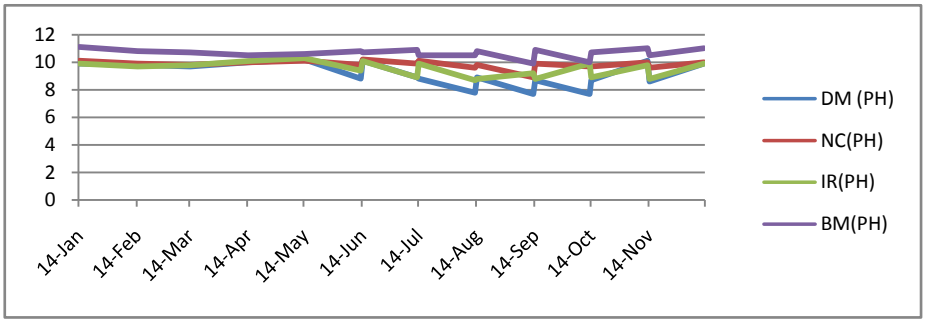
Electrical conductance of the water reflects the first information about the presence cations anions in the water. The study consist

measurement of the electrical conductance at the point of study by eco tester EC low .the instrument specifications are Range..to 1990µs,resolution10 µs, accuracy+-1%full scale, No of calibration point 1 point calibration standard solid separately,caliberationh method digital push button, automatic temperature compensation, non volatile memory, hold function, auto off, LCD dispel, Power (4) A76/LR44 batteries included, operating temperature.



Transparency (Depth of Visibility)

Secchi disk, as now used is a circular metal plate, 20 cm in diameter, the upper surface of which is divided into four equal quadrats and so painted that two quadrants directly opposite to each other are black and the intervening ones white.

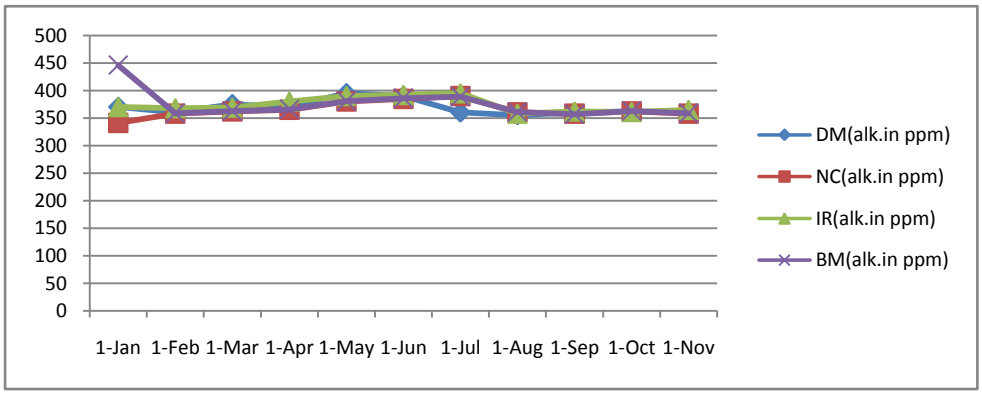


Total Dissolved Solid

"Dissolved solid "refer to any materials, salts, metals, cations or anions dissolved in water. This includes anything present in water other than pure water (H2O) molecules and suspended solids. (suspended solids are any particles/substances that are neither dissolved nor setteled in the water, such as wood pulp.)

Alkalinity

Alkalinity is a measure of the capacity of water or any solution to neutralize or "buffer" acids. This measure of acid-neutralizing capacity is important in figuring out how "buffered" the water is against sudden changes in pH.



Chloride

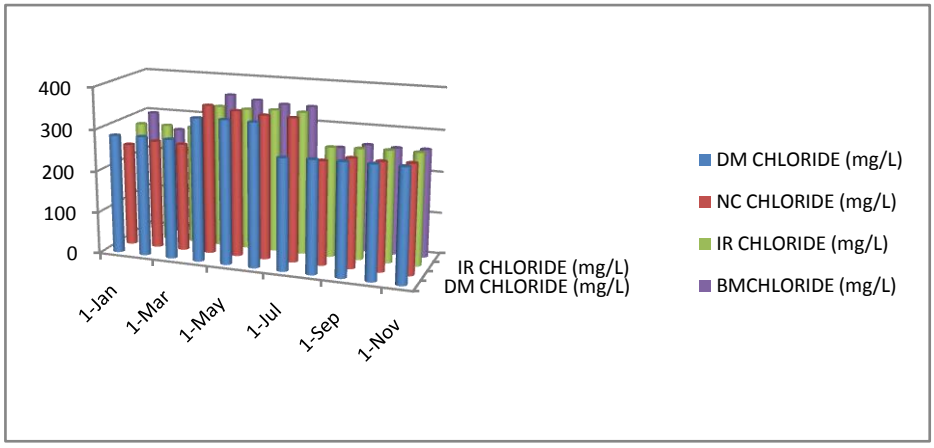
Chloride, in the form of the cl- ion, is one of the major inorganic anions, or negative ions in saltwater and freshwater. It originates from the dissociation of salts, such as sodium chloride or calcium chloride, in water.

$NaCl(s)$ .....> $Na^{+}(aq) + Cl^{-}(aq)$

$CaCl_2(s)$ .....> $Ca^{2+}(aq)^{+} + 2Cl^{-}(aq)$

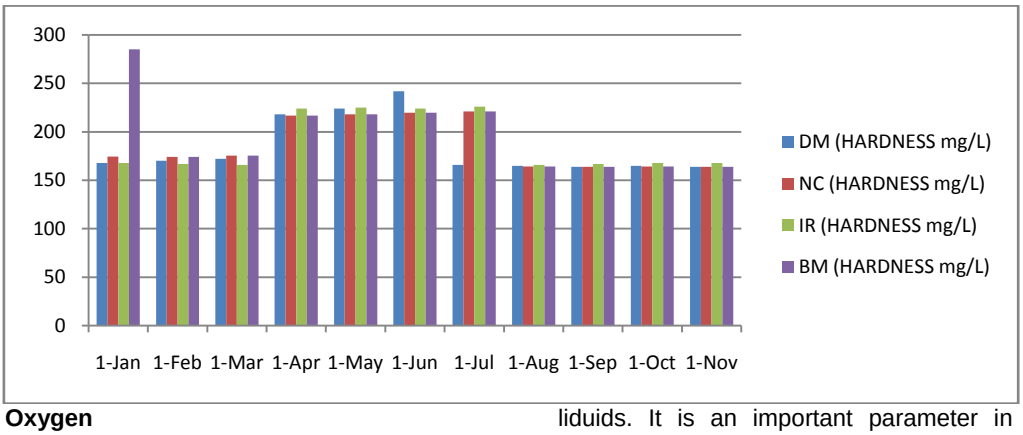
This salts, and their resulting chloride ions, originate from natural minerals, saltwater intrusion in to eustaries, industrial pollutions.

There are many possible source of manmade salts that may contribute to elevate chloride readings. Sodium chloride and calcium chloride, used to salt roads, contribute to elevate chloride levels in streams. Chlorinated drinking water softeners often increase chloride level in wastewater of community.



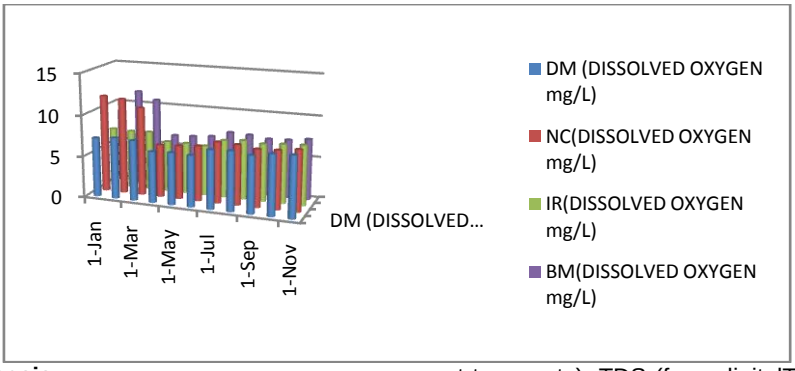
Hardness of Hardness Determination of Hardness of the Water

One of the factors that establishes the quality of the water supply is its degree of the hardness.Hardness is defined as calcium and magnesium ion content.since most analyses do not distinguish between Ca2+ and Mg2+, and since most hardness is caused by carbonate mineral deposits. Hardness is usually reported as parts per million (ppm)of calcium carbonate (by weight). A water supply with a hardness of 100 ppm contains the equivalent of 100 g of calcium carbonate in one million gram of water or 0.1 g in one litre of water since the density of water is about one gram/mL.



Dissolved Oxygen

Dissolved oxygen (DO) refer to the level of free, non-compound oxygen present in water or other liduids. It is an important parameter in assessing water quality because of its influence on the organisms living within a water body



Concept and Hypothesis

The physico-chemical parameters explain the water quality and either it is safe for drinking as well as other purposes.

Research and Design

The analysis of water variables such as, temperature (from thermometer), pH (electronic handy digital pH meter), depth of visibility (from sachhi disc at two spots), TDS (from digitalTDS meter) Dissolved oxygen (digital dissolved oxygen meter) were measured in the field. Alkalinity (through titration), hardness (through titration), phosphates (checker) were measured in the laboratory within the period of 24 hrs of sample collection. The standard method (APHA, 1985) were used for the analysis of parameters etc.

Summary of Findings

S.No.	Temperature in Air	Temperature in Water	Ph	Elec. Con. (Mho)	TDS	Depth of Visibility	Alkalinity	Hardness	Chloride	Do
	1	2	3	4	5	6	7	8	9	10
min.	12	19.1	8.8	642.5	247.5	83.46	348.5	160.75	258.25	5.62
max.	33.2	33.4	10.4	795	378.7	141.66	403.5	234.5	403	9.57
average	22.14	25.03	9.26	664.3	295.6	119.3	370.2	186.7	305.8	7.87

Conclusion

On the basis of the physico chemical parameters of lake, diversity of fish species and diversity of molluscans species rajsamand lake is eutriophic and the status becoming more and more eutrophic day by day. Man-made urban freshwater rajsamand lakes provide numerous gastropods to be the most common. In this study, benefits to human beings directly or indirectly. In this bivalvia was the second dominant order and gastropoda was study, a total of most common three species was recorded from gastropoda order, which suggested that urban different freshwater lakes Udaipur region and the aquatic lakes of rajsamand polluted and rich in aquatic mollusks species and their abundance varied among the vegetation.

Suggestion

1. This enhance the knowledge regarding the water quality, fish fauna and gastropods diversity.
2. It also creates awareness among the society persons for safe use of water after treatment or by using ROs to reduce the TDS levels.
3. Aware the people to keep up lake neat and clean from pollution.

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