Seasonal Physico-Chemical Study of MisirPond Waterin Birkona ,Bilaspur Chhattisgarh

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Abstract:-Life on the earth is never possible without water. Water is one of the essential constituents of the environments. This study was designed to assess the quality of Misir pond's water in Birkona panchayath village, Bilaspur District in Chhattisgarh state has been evaluated on a seasonal basis from May 2019 to January 2020. The water Samples were analysed, for various physico-chemical characteristics like Transparency, Temperature, pH, TDS,Conductivity etc. The following ranges were obtained for the parameter assessed such asTransparency(15-27cm),pH(7.9-8.5), Temperature (24-28C) , TDS(176-266), Electrical conductivity(259-573µs/cm).The experimental values of various physico-chemical parameters of water samples results were largely within the WHO and ICMR standards limits.

Keywords: Physicochemical parameters; Water quality; purification treatment

Introduction:

Life on the earth is never possible without water. Water is one of the most essential constituents of the environments. Less than 1% water is present in ponds, lakes, rivers, dams, etc., which is used by man for industrial, domestic and agricultural purposes. Ponds are useful in many ways and it is one of the methods of artificial infiltration of underground water. Water quality in an aquatic ecosystem is determined by many physical, chemical and biological factors(Nayar R. et. al 2019)[1]. The term water quality was developed to give an indication of how suitable the water is for human consumption [2].

Most of the population of Birkona resides invillages and their main occupations areagriculture and animal husbandry. Ponds are the source of fresh waterfor villagers and they mainly depend upon pond waterfor drinking and bathing of their livestock's, productionof fisheries, irrigation etc [3]. At present the water quality ofvillage ponds is declining at alarming pace due toencroachment by villagers, dumping of domestic waste,loading of the periphery by cow dung cakes,consequences of infilling, land drainage, changes in theirmany traditional uses and dumping of industrial waste inurban areas [4]. There is also a lack of legal and institutionalframework for small water bodies, therefore, they areignored in comparison to large water bodies (i.e. lakes,rivers). All these factors are responsible for degradationof village ponds. The temporary ponds are most affectedas they are inconspicuous and poorly known due to theirtemporary nature and small size and have been frequentlydestroyed by anthropogenic activities[5]. Due to use of contaminated water the human andlivestock's population are continuously exposed to varietyof water borne diseases. Need of the hour is to giveparticular emphasis on conservation and management ofvillage ponds as an important national/international issuewhich should be given equal or higher importance asnational development or economic development of anycountry[6]. Therefore, the present study was planned toassess the status and quality of pond water of Misir pond birkona Bilaspur Chhattisgarh .

Materials and Method

Study period:

Water samples were analysed from to time morning 8.00a.m.to 10 a.m. on and from May2019 to January 2020.

Analysis of the sample:

Water samples were analysed by digital parameter on the study site .Pond sample also analysed in four differentdirection [North,West,EastSouth]

Seasonally samples were collected to analyse Physico Chemical parameters of the selected pond. at the site,Transparency wasMeasured by Secchi Disk, Thermometer and a digital pH meter were used to record the

Temperature and the pH of the pond water respectively. Conductance of water was determined using by digital conductivity meter and TDS was measured by Digital TDS Meter.

Physico-chemical parameters of these samples were determined by

using standard procedures

Table:1-Standard Method of Physico-Chemical Parameter

S.No.	Parameter	Method
1	Temperature	Measured with a mercury the Thermometer
2	Transparency	Measured by Secchi Disk
3	pH	Measured by Digital pH Meter
4	TDS	Measured by Digital TDS Meter
5	Conductivity	Measured by Digital Conductivity meter

Results and Discussion: -Table: 2

Parameter	Pre Monsoon	Monsoon	Post Monsoon	Winter
Temperature	28	26	27	24
Transparency	25	15	23	27
pH	8.4	8.1	7.9	8.5
TDS	252	266	254	176
Conductivity	573	259	565	464

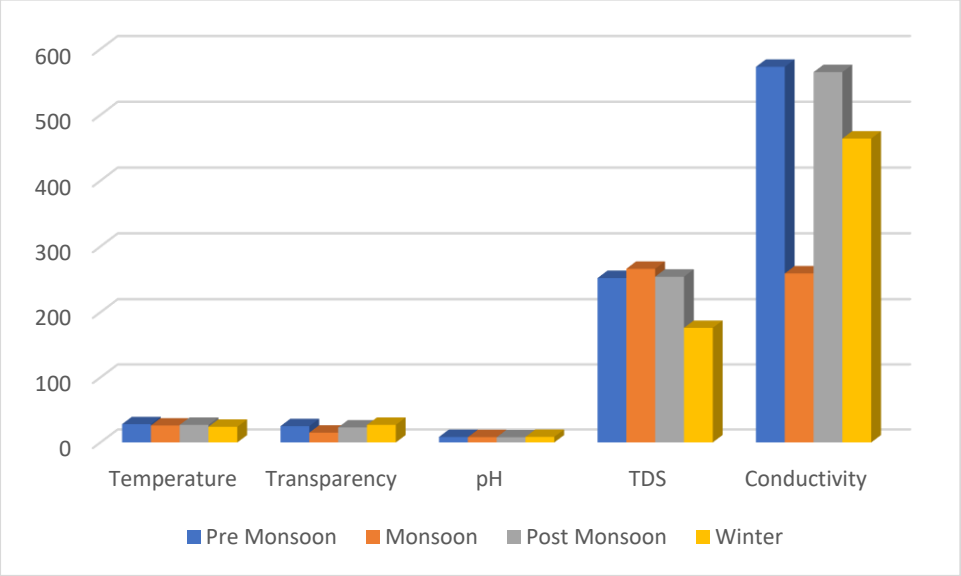

Figure 1: seassonal Variation in Physico-Chemical parameters of water samples from in of Misir pond during month May 2019-Jan2020

Temperature in the water is important for its effects on the chemistry and biochemical reactions in the organisms. Based on the results it was noted that the temperature fluctuated in between 24°C to 28°C. The lowest value (24°C) was found in site S-W and the highest temperature value (28°C) at site S-N. Water and waste waters are of course subject to the effects of ambient temperature and can be very warm during summer.

Transparency is the measure of suspended minerals, bacteria, plankton and dissolved organic andinorganic substances. It is often associated with surface water sources. In most waters, turbidity is due to Colloidal and extremal fine dispersions. The values varied between 15 cm to 27 cm except for S-N the results showed the transparency of North direction is very turbid and 15 cm recorded in month of May.as maximum suspended particles are present in North direction.

pH is a measure of free hydrogen ion and hydroxyl ions in the water. pH is an important indicator of water that is changing chemically. For drinking water, a pH range of 7.9-8.2 is recommended. He maximum value of pH

was recorded as 8.2 at station S-N which is higher than the permissible limits of WHO and showing basic nature of water in north direction of Misir pond and the minimum value of pH was recorded as 7.9 at station S-E.

The Total Dissolved Solids fluctuate from 176 mg/l to 266 mg/l. the maximum value (266 mg/l) was recorded in the month of July.

Conductivity is the ability of an aqueous solution to conductthe electric current. Conductivity is a useful tool to evaluate the purity of water conductivity of water was ranged from 259-273 µs/cm.

Conclusion

The variations in the water quality parameters are evident in all the Physico –chemical parameters examined. The present study concluded that Misir pond water of study area was moderately pollutedin respect to analysed parameters. pH, TDS were found within permissible limit but the higher values of Conductivity in present study attributed pond water was not fit for drinking purposein reason of not clean. It needs to aware local villagers to safeguard the precious pond and its surrounding.

Acknowledgement : We express our sincere thanks to Management and Principal of D.P.Vipra College Bilaspur C.G providing all the research facilities in the Laboratory of Department of Chemistry. We are heartily thankful to senior professor and Chairman, Board of the Chemistry Dr. Kiran Vajpai We also thanks to Prof.Deepak Tiwari, Asstt. Prof. Department of Chemistry for guidance and encouragement throughout this work.

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