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Study Of Physico-Chemical Parameters Of Ponds Water Rural Area in Gram Panchayat Karra, District Satna, Madhya Pradesh, India

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ABSTRACT

This research article deals with the study of physico-chemical quality of ponds water sample of rainy season July-septumber2021, in gram panchayat karra district satna Madhya Pradesh (India) quality of water is an important criterion for evaluation the suitability of water for drinking. Fishers and agriculture and irrigation purpose where as the quality of surface. Ponds as well as ground water depends on various chemical constituents and their concentration. Analyzed for various physic-chemical characteristics like temperature, Color, turbidity ph. Electric conductivity, Chloride total alkalinity, total hardness calcium ion . Magnesium ion dissolved oxygen. Considering winter season And observe values were compared with standard Values.

Key wards:- physico-chemical property, parameter, ponds-water, water quality index (WQI)

Introduction

Water is a liquid substance it is a gift of nature like fire and air. Water has three farms it turns into vapor when boiled into ice under the pressure of cold is a l liquid when normal water is a compound of two gases hydrogen and oxygen. There are two parts of hydrogen and one part of oxygen in water. Pure water has no particular shape color, or taste if takes the shape of the pat in which it is kept.

The incidences of tropic metals in fish pond water affect, the majority of water available on earth is saline in nature, and only a small quantity exists as fresh water fresh water has become a scarce commodity due to over exploitation and pollution. (Basavaraja simpi et al.)[1] the

parameters influence each other and govern the distribution and abundance of flora and fauna. (shinde et al.)[2] water being an important source as it is highly used in agriculture, industries etc. (kumar 1997)[3] pond are considered t o be a useful source of water far ancient people. In general, seasonal changes in the nature of water results in the variation in the population of specific algae in the aquatic bodies.(Sharma et al.2016)[4].

The water of ponds are polluted mainly due to discharged water, waste water from residential area. Sewage outlets, solid wastes detergents, Auto mobile & oil waste (Bhuiyan J.R. Gupta S.A 2006)[5] pollution of surface and ground water is great problem to rapid urbanization and Industrialization.

Water quality indicates the chemical, physical, biological and radiological characteristic of water (Diersing 2009)[6] the determinant of good growth in water body includes hp. Conductivity, dissolved oxygen. Hardness, alkalinity, temperature, free co_2 and contents of chloride, nitrate and sulphate etc. different studies were carried out the winter season variation physicochemical parameters of water from different ponds as well as other water bodies in different areas. (Kumar et al 2017, Nasim 2017, Adedji et al 2018)[7] industrial, sewage and municipal wastes are being continuously added to the water reservoirs affecting the physico-chemical quality of water making it unfit (Dwivedi and panday 2002)[8]

There were no such studies from this region and therefore a study of some physico-chemical parameters was undertaken in ponds from gram panchayat karra areas to check the pond water quality.

Materials and methods -

Description of Study Area-

Gram Panchayat Karra In Ramnagar Tehsil District Satna Madhya Pradesh India it belong to Rewa division it is located 59km towards south from district head quarters satna 3km from Ramnagar 461km from state capital Bhopal for this study a survey was under taken of rainy season 2021, of pond water in Gram panchayat karra of to collected water sample in selective area.[(9)]

Sample collection-

Water samples were collected from July-Septumber 2021 from the above mentioned ponds in plastic bottles each of two liter size the containers were properly washed with diluted hydrochloric acid and then rinsed with normal water fallowed by distilled water and then with sample water.

Analysis of pond water sample-

The collected pond water samples were analyzed far different physical chemical parameters such for as temperature of water (wt) was measured by using mercury bulb thermometer. PH was measured with Ph meter (systronics) conductivity was measured by conductivity meter total alkalinity (Ta) dissolved oxygen(Do) was estimated by winker method fixation of sample Was done in the field using magnesium sulphate and potassium iodide. Free carbon dioxide (FCO) was measured by titrating against 0.05 n sodium hydroxide using phenolphthalein indicators (APHA 2005) Hardness was measured titrimetrically against EDTA. Nitrate and phosphate was estimated by Using the spectrophotometer UV and visible spectrophotometer by following the standard procedure.

Map location of sampling site (10)

Methods analysis's of pond water in rainy season

(Laboratory analytical method)[11]

SL.NO.	**Physicochemical Parameter**	**Methods**
1	Temperature^{0}C	
2	Ph	Potentiometer(ph) meter
3	Alkalinity mg/l	Argentometry (titration)
4	Electric conductivity (mg/l)	Conductivity probe
5	Chloride(mg/l)	Argentometry(titration)
6	Total hardness(mg/l)	Complexometry EDTA titration
7	Calcium(mg/l)	Argentometry(titration)
8	Magnesium(mg/l)	Argentometry(titration)
9	Total dissolved solid(PPM)	TDS probe.
10	Fluoride(mg/l)	ion analyzer
11	Iron (mg/l)	Spectroscopy
12	Nitrate(mg/l)	Spectroscopy
13	sulphate (mg/l)	spectroscopy

Table 1 laboratory analysis method

Standards for drinking water [12]

P = permissible limit

E = excessive limit

	ISI		ICMR		WHO	
Parameters	**P**	**E**	**P**	**E**	**P**	**E**
Physical						
Color	10	50	5	25	5	25
Taste	Un-objected		Un-objected		Un-objected	
Turbidity	10	25	10	25	10	25
Chemical						
ph	6:5-8.5	6.5-9.2	7.0-8.5	8.5-9.2	7.0-8.5	8.5-9.2
Electrical Conductivity	-	-	-	-	500	1500
Alkalinity	6.0	9.0	6.0	6.0	8.8	9.5
Chloride	250	1000	250	1000	250	600
Total hardness	300	600	300	600		
Calcium	75	200	75	200	75	200
Total dissolved solid	300	600	300	600	500	1500
Fluoride	0.6-12		1.0	2.0	0.5	1.0-1.5
Iron	0.3		1.0	2.0	0.5	1.0-1.5
Nitrate	45		30	50		1.5
Sulphate	150	400	200	400	200	400

Table – 2 Standards for Drinking Water

RESULT AND DISCUSSION -

The results obtained in the physico chemical analysis of the water samples collected from the rainy season in 2021, ponds throughout listed result the below (table-3)

analysis of pond water sample of gram panchayat karra

Uo = un-objectible.

Parameters	**July 2021**	**August 2021**	**September2021**

Physical	**R1**	**R2**	**R3**
Color			
Taste	U.O	U.O	U.O
Temperature	27.4	25.6	24
Chemical			
Ph Temperature	7.6	7.4	7.9
Electrical Conductivity ppm	186	190	200
Alkilinity	180	179	195
Chloride mg/l	44.3	48	51.2
Total hardness mg/l	200	195	210
Calcium ion mg/l	48	55.5	64.2
Magnesium ion mg/l	15	17.44	19.45
Total dissolved solid mg/l	290	228	230
Fluoride	0.2	0.1	0.4
Iron	0.12	0.19	0.9
Nitrate	5.2	4.6	3.6
Sulphate	19.1	22.3	16.8

Table – 3 Result of physicochemical analysis of pond water of gram panchayat karra

Temperature -

The average water temperature are revived have between under the average of p-1, p-2, and p-3 pond was found to be 24^0C, and 27.4^0C the water temperature was fond suitable for fish growth temperature was fond suitable for fish growth due to sanding water and relatively small size of those water bodies. According to**(welch 1952)**[13]

Potential of hydrogen (ph) -

Ph was measured by ph meter, ph value of pond water varies between 7.4 to 7.9 during rainy season espectively indicating well permissible limits this Ph range is considered to be congenial for aquatic production owing to greater availability of mast the nutrient elements and also due to increased biological activities under this ph range, (Boyd, 1978)[14]

Electrical conductivity

Electrical conductivity varied form 186 to 200 micro mhos/cm in rainy season respectively I is a maximum for sample no.1 the EC value depends on several factors like the presence of ions. Their concentration, mobility, valance and temperature of measurement (sastry et al 1999)[15]

Total dissolved solid (TDS) (mg/l)

The electrical conductivity of water sample correlates with the concentration of TDS of water. The range of TDS of analyzed water samples varied between 317 to 560 mg/l in rainy season. All sample are non saline as per the salinity classified suggest by robinove et al 1958. TDS increase the nutrient status of water body which was resulted into eutrophication of aquatic bodies.(singh and mathur.2005)[16]

Total alkalinity-

Total alkalinity is the buffering capacity of water, it is constituted principally by carbonate and bicarbonates of calcium, magnesium, potassium and sodium and other bases .the alkalinity ranged from 179ml/g to 195 mg/l alkalinity was inversely related to the water level. The reported high alkalinity during the rainy season followed by step fall in the monsoon. In related view.(Mishra et al. (2008)[17] reported high and low alkalinity in season.

Total hardness-

The present study in total hardness is the 195 to 210 mg//l in rainy season. Upadhyay (2013)[18] was reported total hardness was high during winter season result were observed in the present study.

Chloride-

The chloride ranged from 44.3 to 51.2 mg/l in rainy season chloride of all sample was below the permissible limit. The optimum concentration of chloride ions in fresh water aquaculture are lacking.1-100 ppm concentrations are usually consider to be favorable (Chattopadhyay1998)[19]

Nitrate-

The nitrate concentration of the water samples range from 3.6 to 5.2 mg/l. the maximum nitrate content was found in the pond 3 in the present investigation maximum concentrations of nitrate was recorded during the monsoon and minimum during the winter season in site all of dodhe wter reservoir of Tasgaon Tahsil, Maharastra. Jakhar and rawat (203)[20]

Sulphate-

The sulphate concentration of the pond water samples varied from 16.8 to 22.3 mg/l in pond. The result should that the pond water have permissible range of sulphate ions physicochemical water quality constraints are substantial to the firmness of marine and other water ecologies (Sargaonkar and Deshponde, 2003)[21]

Conclusion-

After the carefully study and analysis, interpretation and discussion the numerical data to following conclusion have been drawn for the physico-chemical analysis of pond water in gram panchayat karra. During Rainy season, 2021-22 the collected Sample from pond water of sample R1-R2 and R3, Most of the parameter within in the acceptable limit, among all the studied of pond water in highest value for PH and TDS but acceptable limit have been other parameter Electric conductivity, chloride, fluoride, magnesium, alkalinity total hardness and TDS are also have between under the permissible limit according to WHO. Will through these more status of this pond water sample. Over all detailed analysis of pond water of rainy season involving other related parameter show the good status. Further detailed analysis in different season and other related involving parameters as well, throw more status and light characteristic properties of these pond.

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