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STUDIES ON WATER QUALITY PARAMETERS OF DRINKING WATER OF BALRAMPUR CITY, CHHATTISGARH

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ABSTRACT

This Paper Present to study of the Physico-chemical Parameters of Balrampur city, Chhattisgarh. Monthly Changes In Physical and Chemical Parameters Such as Water Temperature, Transparency, Turbidity, Total Dissolved Solids, pH, Dissolved Oxygen, Free Carbon dioxide, and Total Hardness, Chlorides, Alkalinity, Phosphate and Nitrates. We are analyzed for a periods of one year of pre-monsoon and post monsoon session. All Parameters were within the Permissible limits except fluoride, somewhere hardness etc. The results indicate that the water is Non-polluted and can be used for Domestic, Irrigation and Pisciculture.

Key words: Aquatic**,** Perennial, Physico-Chemical Parameters, Monthly variation.

INTRODUCTION

Increase in urbanization, industrialization, agriculture activity and various human activities have increased the pollution of surface water & ground water. The quality of water is a vital concern for mankind, since it is directly linked with human welfare. It is a matter of history that fiscal pollution of drinking water caused water born diseases which wiped out entire population of these cities (Upadhyay and Sahu, 2014). At present, the menace of water born diseases and epidemics still booms large on the horizons of developing countries. As the safe & potable drinking water is needed. Various treatment methods are adopted to raise the quality of drinking water. Water should be free from the various contaminations viz. Organic and Inorganic pollutants, Heavy metals, Pesticides etc. as well as all its parameter like pH, Electrical Conductivity, Calcium, Magnesium, Total Hardness, Carbonate, Bicarbonate, Chloride, Total Dissolved Solid, Alkalinity, Nitrate, DO should be within a permissible limit .

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For this purpose, all different locations/sampling sites were outlined and samples were collected. The samples were collected in polystyrene bottle of 1.5 L capacity. Before sampling, the bottles were washed thoroughly with the detergent, acid (1: 1 HNO_3 and H_2O by v/v) tap water, and then distilled water. Chemical Parameters were determined by using standard methods immediately after taking them into the laboratory. Usual preservative methods were used to preserve the samples. The samples were analyzed as soon as it was possible. A total of 5 water samples were collected. The sources and locations of samples are given in Table 1.

MATERIALS AND METHODS

The Water Samples from Balrampur were collected from four Different Stations in the Morning Hours between 9 to 11am, in Polythene Bottle Regularly for Every Month. The Water samples were immediately brought in to Laboratory for the Estimation of various Physico-chemical Parameters like Water Temperature Transparency and pH were recorded at the time of Sample Collection, by using Thermometer and Pocket Digital pH Meter. Transparency was measured with the help of secchi disc while other Parameters Such as DO, TDS,

Free CO_2, Hardness, Chlorides, Alkalinity, Phosphate and Nitrate were estimated in the laboratory by using standard methods as prescribed by APHA, AWWA, (Trivedi RK, Goyal PK, 1986; Upadhyay and Chawla, 2014).

RESULT AND DISCUSSION

pH

The pH was alkaline values ranges from 7.7 to 8.9 in pre mansoon and 7.6-9.9 the maximum pH valuein post mansoon session.(8.9) was recorded in the month of May (summer) and minimum (7.7) in the month of September. The factors like air temperature bring about changes the pH of water. Most of bio-chemical and chemical reactions are influenced by the pH. The reduced rate of photosynthetic activities reduces the assimilation of carbon dioxide and bicarbonates which are ultimately responsible for increase in pH, the low oxygen values coincided with high temperature during the summer month (Upadhyay and Tiwari, 2014).

Turbidity

The turbidity of water fluctuates from 12.11-13 NTU in pre monsoon and21.7-29.64 NTU in post session. . The maximum values (12.14 NTU) was recorded in the month of February (summer). It might be due to human activities, decrease in the water level and presence of suspended particulate matter, and minimum value (12 NTU) in the month of march.

Dissolved Oxygen

The value of DO fluctuates from 4.6-4.9 mg/l in pre monsoon session and 4.8-5.0 mg/l in post session. . The maximum values (5.8 mg/l) was recorded in the month of May (summer) and minimum values (4.6 mg/l) in the month of November (winter). The high DO in summer is due to increase in temperature and duration of bright sunlight has influence on the % of soluble gases (O^2 & Co^2). The long days and intense sunlight during summer seem to accelerate photosynthesis by phytoplankton, utilizing Co_2 and giving off oxygen. This possibly accounts for the greater qualities of O_2 recorded during summer. The quality is slightly lesser during winter, reported by (Upadhyay and Tiwari, 2014).

Hardness (calcium and Mangnacium)

The value of Ca hardness fluctuates from 330 to 353 mg/l and Mg hardness 185 to 316 mg/l in pre monsoon session. The maximum value (353 mg/l) was recorded in the month of April (summer) and minimum value (330 mg/l) in the month of October. (Jindal and Upadhyay, 2014) was reported total hardness was high during summer than monsoon and winter. High value of hardness during summer can be attributed to decrease in water volume and increase of rate of evaporation of water. Similar results were obtained in the present study.

Chlorides

The values of chlorides range from 210 to 289 mg/l in pre -session to 310to 340 mg/l. in post session .The maximum value (340 mg/l) was recorded in the month of May (summer) and minimum value (289 mg/l) in the month of February. In the present study maximum value of chloride reaches in summer. Similar results were reported by (Upadhyay and Gupta, 2013).

Phosphate

The value of phosphate fluctuates 0.16-0.19 mg/l in pre session and 0.19-0.28 mg/l. the post session maximum value (0.19) was recorded in the month of August (monsoon) and minimum value in the month of October (winter). The high values of phosphate in August (monsoon) months are mainly due to rain, surface water runoff, agriculture run off; washer man activity could have also contributed to the inorganic phosphate content.

Nitrates

The values of nitrate ranges from 0.063-0.093 mg/l mg/l. the maximum value (0.093mg/l) was observed in the month of July (monsoon) and minimum (0.63mg/l) in the month of November (winter).

Table 1. Parameter value pre & post monsoon

Parameter	Pre mansoon	Post Mansoon
pH	7.7-8.9	7.6-9.9
Electrical Conductivity	373-462 µmhos/cm	272-364 µmhos/cm
Turbidity	12.11-13 NTU	21.7-29.64 NTU
Calcium hardness	330-353 mg/l	370-396 mg/l
Magnesium hardness	185-316 mg/l	196-293 mg/l
Nitrate	0.063-0.093 mg/l	0.083-0.089 mg/l
Phosphate	0.16-0.19 mg/l	0.19-0.28 mg/l
Sulphate	325-449 mg/l	415-493 mg/l
Chloride	210-289 mg/l	310-340 mg/
DO	4.6-4.9 mg/	4.8-5.0 mg/l

CONCLUSION

The observation of this study strongly suggests that drinking water of Balrampur, Chhattisgarh is of very high TDS.

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CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

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