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Research Article

STUDY ON SOME PHYSICO CHEMICAL CHARACTERISTICS OF MAIN WATER RESOURCES OF JODHPUR CITY

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ABSTRACT
Physico Chemical monitoring of Kaylana Lake water was carried out during the month of July and August 2010-11. The sampling points were selected on the basis of their importance. The analysis was carried out for the parameters namely temperature, pH, DO, BOD, COD, Chloride, Nitrate, Sulphate, Phosphate, TDS, Calcium and Magnesium. The results obtained in the present investigation revealed that the sewage and the discharge of untreated effluents have contributed considerable pollution to the Kaylana Lake water in which water is mainly lifted from the Rajasthan Canal and is unsafe for consumption of human use and therefore needs serious attention.

Key Words: *Water Pollution ,Kylana Lake,Takht Sagar, Lal Saagar BOD,COD*

INTRODUCTION
Water is the most important component of our life. We can not live without water. Any variation from normal composition leads to water pollution. In Jodhpur the main reservoirs of raw water in the city are Kaylana, Takht Sagar and Balsamand lakes. All these reservoirs receive water from Rajiv Gandhi Canal. Kaylana Lake in Jodhpur, Rajasthan is located 8 kms to the west of Jodhpur on the Jaisalmer road. Pratap Singh, the then Prime Minister of Jodhpur, got the lake constructed in 1872. This artificial lake is spread over 84 square kms. Where the lake now lies, was once an area having palaces and gardens of the two rulers of Jodhpur. They were destroyed to make the Kaylana Lake. Near to the lake is a Dak Bungalow of PHED, the Irrigation department. NOW the main source of water is Indira Gandhi Canal water coming from Punjab. Increased population, seepage, urbanisation, addition of effluents etc are making this water unsafe due to impurities. Therefore, the continuous and periodical monitoring of water bodies for water quality is necessary. The wide range of contamination source is one of the main factors contributing to the need of water quality assessment.

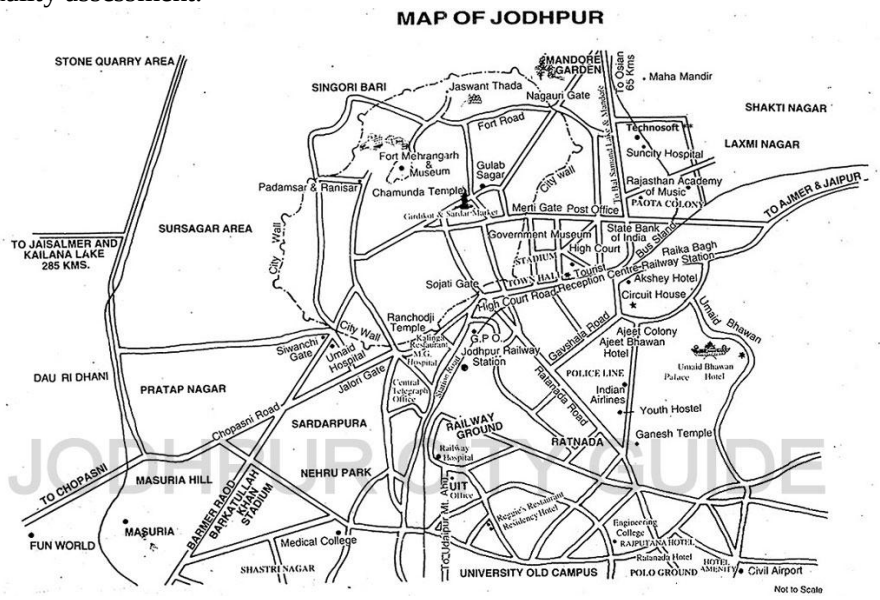

Figure 1: Map of Jodhpur showing water resources studied

Figure 2: KYLANA LAKE (main water resource)

Figure 3: Balsamand Lake

MATERIALS AND METHODS

100 water samples from six different sites were collected from different areas of Jodhpur region. These water sources are extensively used for drinking and other domestic purpose. The samples were collected in BOD bottles and plastic jerry canes and brought to the laboratory with necessary precautions. All samples were labeled properly. Some parameters like temperature, velocity, pH and dissolved oxygen were measured on site. Grab sampling was generally applied during the sampling. Water samples were analysed by standard methods.The samples were analyzed for following physicochemical parameters:

Water Temperature (ºC), velocity(m/s), pH, hardness (mg/l), turbidity (JTU), total dissolved solids (mg/l), total suspended solids (mg/l), electrical conductivity (µmho/cm), free CO_2(mg/l), dissolved oxygen (mg/l), B.O.D. (mg/l), C.O.D. (mg/l), alkalinity (mg/l), chloride (mg/l), calcium (mg/l), magnesium (mg/l), sodium (mg/l), potassium (mg/l),carbonate (mg/l), bicarbonate (mg/l) and sulphate (mg/l).

Eleven parameters were taken for calculation of water quality index: Ca, Mg, Na, K, NO_3^-, SO_4^{2-}, Cl^-, hardness, TDSD, B.O.D. and total alkalinity.

It is an established fact that the more harmful a given pollutant is, the smaller is its standard permissible value recommended for drinking water.

The pH and electrical conductivity were measured by using portable meters. The concentration of magnesium, calcium, hardness, sulphate, nitrate, salinity, was estimated by volumetric methods and the results are compared with BIS standard.

RESULTS AND DISCUSSION

Water quality evaluation for domestic purpose, the result obtained from analysis water sample from different places of Jodhpur like Kaylana, Lalsagar, Takhtsagar, Paota, Shiv Mandir, Ratanada, University campus, K N College, Basni, Kudi regions are given in Table.

Table 1: Physico-Chemical and Bacteriological Characteristics of Different Water Sources at Jodhpur in Year 2010

Parameters	Acceptable limit	Drinking water (Household)	Chopasani Filter House	Bal. Filter House	Kaylana Lake	Lal Sagar	Takhat Sagar
pH	6.5-8.5	7.6	7.3	7.6	7.6	7.5	7.8
Turb. (NTU)	<5.0	1.2	0.8	4	20	1	3.5
Cond. µs/cm	<600	2.56	230	900	650	1200	11500
TDS	<500	180	160	185	270	700	650
Hardness	<300	110	125	175	170	300	250
Res.C1	<0.20	0.3	0.3	0.1	0.3	0.1	0.15
Temp. (^{0}C)		30	25	30	30	30	30
C1	<250	40	27	80	80	120	115
F	<1.0	0.12	0.2	1.2	1	0.5	0.3
NO_3	<45	15	5	10	12	20	15
SO_4	<200	60	35	80	100	150	120
Alkalinity	>7.5	120	80	130	170	200	150
DO	<2.0	7	0.2	7	5	5	6
BOD	<2.0	1.25	0.9	1	1.8	1.1	1.5
TC	<50	2500	135	150	12000	13000	11500
FC	0	200	0	3	80	180	160
FS	0	20	0	3	150	250	225

Values of all parameters are in mg/L. Bacterial colonies as counts per 100 ml.

A Comparison of physico-chemical characteristics of ground water samples has been made with drinking water standards.

The results of drinking water samples collected from tap water of the household were, filter house, water resources. The observations revealed that pH, turbidity conductivity, TDS, nitrates alkalinity and dissolved oxygen in almost all samples were reported outsides the acceptable limits of Indian standards of drinking waters. The bacteriological examination of these household drinking water samples shows that total coliform (TC), Faecal Coliform (FC) and Faecal Streptococci (FS) were present outside the acceptable limits of drinking water standards described as it should be nil. This may be due to contamination of water pipelines lying close to sewer lines. The presence of total coliform in a small number was also observed even in the filter house water samples.

Conclusion

The results of physical, chemical and bacteriological characteristics of water samples collected from Kaylana Lake, Balsamand, filter house, Tap Water, samples are shown in table 1.

It was observed that the annual averages of conductivity, total dissolved solids (TDS), total hardness, dissolved oxygen, nitrates, sulfates, alkalinity and chlorides of water resources were outside the limits of drinking water standards, whereas most of the parameters in tap water samples of household drinking water samples were within acceptable limits.

The presence of total coliform, faecal coliform and faecal streptococci were also observed in all water samples collected from different water sources. This can pose serious threat to the health of human life. Therefore proper treatment of water should be done to prevent various diseases.

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