

A Study on Physico-Chemical Parameters of Koilsagar Project, Mahabubnagar District, Telangana.

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ABSTRACT

A physiological background makes it quite evident that water is an important ecological factor in the life of organisms. In the present study water samples were collected from Koilsagar project, Mahabubnagar district in every month during June, 2013 to May, 2014. The Physico-Chemical parameters were studied included Temperature, pH, Total Dissolved Solids (TDS), Turbidity, Hardness, Alkalinity, Phosphate, Chloride, Nitrate, Calcium and Magnesium. The results indicate that the Koilsagar project water is non-polluted and it can be used for Domestic, irrigation and pisciculture.

Key words: Physico-Chemical parameters, Koilsagar Project, Water samples.

INTRODUCTION

Water is an important component to all living beings. It also performs unique and indispensable activities in earth ecosystem, biosphere and biogeochemical cycles[1]. Better quality of water described by its physical, chemical and biological characteristics. But some correlation and possible among these parameters and significant one would be useful to indicate quality of water. The climate characteristic influences the water quality and quantity affects the biodiversity [2].

Koilsagar project is an existing medium irrigation project located near Bollaram (Vill), Devarakadra (Mandal) of Mahabubnagar district of Telangana. The project is a construction

across Peddavagu stream which is a tributary of Krishna River. There are two main canals. The left flank canal is about 14.48 km length and it irrigates 3000 acres and the right flank canal length is 25.74 km and it irrigates 9000 acres. The project is completely enriched by hills on all sides except for a small portion on the South Eastern region where a raised bound extending for about 1.5Km marks its boundary (**Fig. 1**). These water is using for irrigation, drinking and pisciculture purpose. The project remains totally isolated from all other aquatic systems in the area.



Fig.1. View of Koilsagar Project, Mahabubnagar dist.

MATERIALS AND METHODS

The water samples were collected from different sites in the morning hours in plastic bottles and transported immediately to the laboratory for the estimation of different physico-chemical parameters. Water temperature and p^H were recorded at the time of sample collection by using Thermometer and Pocket Digital p^H meter while other parameters such as TDS, Turbidity, Hardness, Alkalinity, Phosphate, Chloride, Nitrate, Calcium and Magnesium by using Indian Standard procedures by [2-4].

RESULTS AND DISCUSSION

The water samples were taken from the project and analysed for physical parameters like temperature, pH, TDS, turbidity has been mentioned in table 1 and chemical parameters like Hardness, Alkalinity, Phosphate, Chloride, Nitrate, Calcium and Magnesium has been mentioned in table 2.

Temperature: In the present study the water temperature ranges from 22 °C to 26.5 °C. The maximum temperature (26.5 °C) was recorded in the month of May and minimum 22 °C in the

month of December. Water temperature in summer was high due to low water level, high temperature and clear atmosphere [6-7] (Salve and Hiware, 2008, Basavaraja Simpi, 2011).

p^H : p^H of the project water was found to be slightly alkaline in nature ranges from 7.3 to 8.2. The maximum p^H value (8.2) as recorded in the month of May and minimum p^H value (7.3) in the month of September. Most of bio-chemical and chemical reactions are influenced by the pH. The higher p^H values suggests that carbon dioxide, carbonate and bicarbonate equilibrium is affected more due to change in physico-chemical conditions [8].

Total Dissolved Solids: The total dissolved solids fluctuates from 165.5 mg/l to 370.8 mg/l. The maximum value (370.8 mg/l) was recorded in the month of July. It is due to heavy rainfall and minimum value (165.5 mg/l) was recorded in the month of April.

Turbidity: The turbidity of water fluctuates from 0.5 to 10.2 NTU. The maximum value of (10.2 NTU) was recorded in the month of March, it might be due to decrease in the water level, human activities, and presence of suspended particulate matter and minimum value (0.5NTU) in the month of October.

Hardness: The values of hardness ranges from 110 mg/l to 196 mg/l. The maximum value (196 mg/l) was recorded in the month of May and minimum value (110 mg/l) in the month of November. Total hardness was high during summer than monsoon and winter [9]. High value of hardness during summer can be attributed to decrease in water volume and increase the rate of evaporation of water.

Alkalinity: The value of total alkalinity fluctuates from 96 mg/l to 184 mg/l. The

maximum value (184 mg/l) was recorded in the month of May and minimum value (96 mg/l) in the month of January. The alkalinity was maximum value in May due to increase in bicarbonates in the water and also high photosynthetic rate [10]

Phosphates: The value of phosphate ranges from 1.5mg/l to 7.8 mg/l. The maximum value (7.8 mg/l) was recorded in the month of August and minimum value (1.5 mg/l) in the month of October. The high value of phosphate in August is mainly due to rain, surface water runoff, agriculture runoff, washer man activity could have also contributed to the inorganic phosphate content [11].

Chlorides: The values of chlorides ranges from 38 mg/l to 72 mg/l. The maximum value (72 mg/l) was recorded in the month of May and minimum (38 mg/l) in the month of January. In the present study maximum value of chloride reaches in summer[12].

Nitrate: The values of nitrate ranges from 9.8 mg/l to 30.5 mg/l. The maximum value (30.5 mg/l) was recorded in the month of June and minimum (9.8 mg/l) in the month of December. The high value of nitrate in June is mainly due to rain, surface water runoff, agriculture runoff, could have also contributed to the nitrate content [13].

Calcium: The values of calcium ranges from 76 mg/l to 165 mg/l. The maximum value (165 mg/l) was recorded in the month of September and minimum (76 mg/l) in the month of May.

Magnesium: The values of magnesium ranges from 64 mg/l to 125 mg/l. The maximum value (125 mg/l) was recorded in the month of October and minimum (64 mg/l) in the month of January.

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Tables:

Table 1: Physical parameters of Koilsagar Project in 2014-2015.

Month	Temperature (°C)	pH	TDS (mg/l)	Turbidity (NTU)
June	25	7.7	276.4	4.5
July	25.5	7.9	370.8	2.4
August	24.5	7.5	358.4	0.9
September	24.5	7.3	315.2	2.2
October	24	7.8	295.6	0.5
November	22.5	8.1	300.5	0.6
December	22	7.8	365.4	1.6
January	23	7.6	262.6	3.5
February	24.5	8.1	279.2	7.6
March	25.5	7.7	280.8	10.2
April	25	7.8	165.5	8.6
May	26.5	8.2	180.4	6.8

Table 2: Chemical parameters of Koilsagar Project in 2014-2015 (Values in mg/l)

Month	Hardness	Alkalinity	Phosphate	Chloride	Nitrate	Calcium	Magnesium
June	132	104	6.2	68	30.5	96	76
July	129	169	7.2	65	29.8	112	80
August	132	176	7.8	48	24.2	148	84
September	127	170	6.5	45	15.4	165	114
October	115	154	1.5	42	13.2	121	125
November	110	165	2.6	40	10.5	153	120
December	135	148	2.4	68	9.8	128	68
January	185	96	2.8	38	12.6	98	64
February	174	110	3.4	65	16.5	101	82
March	148	128	3.6	52	21.6	89	96
April	165	152	4.8	60	23.4	85	97
May	196	184	4.9	72	25.6	76	65