



ANALYSIS OF PHYSICO CHEMICAL CHARACTERISTICS OF CAUVERY RIVER PALLIPALAYAM, ERODE DISTRICT, TAMILNADU

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ABSTRACT

This study was designed to assess the physico-chemical characteristics of Cauvery river three stations (S1- Domestic sewage release place, S2- Pooja waste release place and S3- People dress washing place. Erode. The parameters were analysed such as Temperature, pH, Colour, Odour, Turbidity, DO₂, BOD, COD, Salinity, Total alkalinity and Total hardness. The pH ranged from (8.2 to 8.7), Dissolved oxygen (4.987 to 6.253mg/lit), BOD (13.768 to 17.564mg/lit), as recorded in S1 Place. COD (34.7 to 36.7mg/lit), Calcium (89 to 105mg/lit), Salinity (7.12 to 12.6mg/lit), as observed in S2 place. Total Alkalinity (164 to 198mg/lit), Nitrate (0.32 to 0.45mg/lit) and Phosphate (0.34 to 0.40mg/lit) as analyzed in S3 Place. The finding of the study revealed that the river water is polluted not advisable for human usage without any treatment. This study concluded that the seriousness and responsibility of public to conserve our water resources for healthy living.

KEYWORDS : Physico-chemical characteristics, River water, Pollution, Cauvery River, Domestic sewage, Pooja waste, People dress washing place.

INTRODUCTION

Assessment of quality of river water using various parameters (physico-chemical and biological) and the different ways and techniques to protect the river water have been reported in the literature (Santosh et al., 2008, Yisa and Jimoh, 2010, Shah et al., 2015). One approach for determination of quality of river water is water quality index, found to be an efficient and useful method for assessing the water quality. This method gives an idea about the overall quality of water to the concern policy makers (Asadi et al., 2007).

To assess that monitoring of these parameters are essential to identify magnitude and source of any pollution load. These characteristics can identify certain condition for the ecology of living organisms and suggest appropriate conservation and management strategies. Industries are during their effluents release in to the rivers, there by polluting them severely (Srinivasan et al., 1980. Kakati and Bhattacharya, 1990). Studies in relation to physico-chemical factors of some rivers have been made by a number of workers (Chattopadhyaya et al., 1984; Bhowmic and Singh, 1985; Gill et al., (1993). Agricultural pesticides and insecticides which are further seriously aggravating the problem of pollution both public health as well as aquaculture (Singh and Singh, 1995). Clean drinking water is an essential human requisite for sustenance of life. The aim of the study is to reveal out the pollution status of Cauvery river water in terms of physico-chemical characteristics of water. However, very little information is available in relation to physico-chemical characteristics of Cauvery river water. Hence, the present study was conducted to study the physico-chemical properties of water in the Cauvery river water analysis period of one year from July 2017 to June 2018.

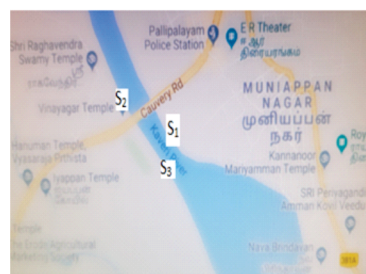
Study Area

The river Cauvery originated from Guddagumalai and flow through Karnataka and Tamilnadu. It runs to Mettur, Bhavani, and Pallipalayam etc., Present study on physico-chemical parameter of Cauvery River in Pallipalayam, Tamilnadu.

MATERIALS AND METHODS

The water samples were collected from three stations in the Cauvery River in the early hours of the day from July 2017 to June 2018. Three sampling stations of Cauvery River stretch, namely (S1) Domestic sewage water jointing place, (S2) Pooja waste released place and People washing dress place. The

water samples were collected for the estimation of water quality parameters and planktons analysis. Physico-chemical parameters: River water samples were collected in a polythene can (5 liter) and were refrigerated in laboratory at 40C. The Physico chemical parameters such as The parameters such as Temperature, pH, Colour, Odour, Turbidity, DO₂, BOD, COD, Salinity, Total alkalinity and Total hardness, Nitrate and Phosphate etc., Analysis the standard methods as for the examination of water (APHA, 2005), practical methods in water ecology and Environmental Sciences (Trivedi et al., 1986) and work book on Limnology (Adoni et al., 1985).



Map showing location of the sampling sites (S1, S2 and S3).

RESULT AND DISCUSSION

The mean value of physicochemical parameters of Cauvery river, Pallipalayam values are presented in the Table 1. In all the three stations pH ranged from 6.2 to 8.7. The variation of pH is due to the fluctuation of discharges from the domestic sewage waste. The mean values of DO, BOD, COD, Calcium, Salinity, Total hardness, Nitrate and Phosphate varied from 4.987 to 6.253, 5.622 to 17.564, 30.2 to 41.4, 0.0012 to 0.0037, 63 to 139, 08 to 26, 164 to 378, 0.25 to 39, and 0.20 to 0.37mg/l¹ respectively

In Station 1, higher level of pH and COD was observed from

mixed with domestic sewage water in river. The permissible limit of pH in drinking water is within 6.5- 8.5 according to Bureau of Indian Standard (BIS). The value of pH in site 1 slightly deviation towards acidity samples can be attributed to the anthropogenic activities like improper irrigation process.

In Station 2, The pH values ranged from 7.2 to 7.6. This range between 6.7 to 7.3 provides an adequate protection to the life of fresh water organisms. Jhingram (1991) reported that pH ranges between 6.2 to 7.3 indicates medium productivity, more than 7.3 highly productive and less than 6.2 low productive nature of water body. Dissolved oxygen content in the water sample ranged from 6.221 to 7.537mg/l in site 2. Mustafa and Ahmad (1985) opined the partial of oxygen dissolved in water depends upon the partial pressure of gas in the air close to water, rate of photosynthesis and oxygen holding capacity of water. Tarzwell (1957) reported that for supporting life, minimum of 3mg/l DO₂ is required. The maximum level of DO₂ was observed in S1, S3 which received the municipal sewage and domestic waste water. In S2 site DO₂ level normal level presented. Salasker and Yeragi (2003) noted that slightly increased Co₂ in winter season. Free Co₂ is essential for photosynthesis and its concentration affects the aquatic fauna and its productivity. In S2 site the total alkalinity was ranged from 210 to 245 ppm. In the water body, the alkalinity is imparted by number of bases viz., carbonates, bicarbonates, hydroxides, phosphates, nitrates, silicates, borates etc., (Kumar and Kakrani, 2000). The salinity of the water sample showed fluctuations during the period of study. It has been found to be maximum level salinity was observed as 26.0mg/Lit in S1site. The minimum level of salinity was observed as 0.12 mg/lit in S3 site. The normal salinity value was recorded in S2 as 7.12mg/lit. The fluctuation in salinity is probably due to fluctuation in total solids (Boyd and Tucker, 1998). The nitrate contents are observed as 0.29 to 39mg/lit in S1 site, 0.29 to 23 in S2 site and 0.25 to 0.27 in S3 site. The phosphate content of water is very important to aquatic organisms. Lanthe and Yeragi (2004) reported the range of phosphate from nitrate content is observed as 0.25 to 37mg/lit in S1 site, 0.20 to 29 in S2 site and 0.20 to 0.32 in S3 site. The maximum contents of nitrate and Phosphate were found in S1, S3 in Table-1 and Fig-2).The presence of higher vegetation in the impoundment station is possible reason for higher level of nutrients. Similar findings were also found by Attab Alam(1995).

Table:1 Mean values of Physico-chemical parameters of the Cauvery River, Erode.

Parameters (mg/lit)	Station-1	Station-2	Station-3
pH	8.2 ± 0.33	7.6 ± 2.56	6.0 ± 0.97
Salinity	26.0 ± 3.31	7.12 ± 0.34	12 ± 0.41
Dissolved Oxygen	6.453 ± 0.60	6.221 ± 0.56	5.617 ± 0.58
Total Alkalinity	276 ± 3.60	210 ± 0.89	164 ± 3.31
BOD	17.564 ± 0.28	5.622 ± 0.23	8.412 ± 0.25
COD	41.4 ± 3.02	34.7 ± 2.47	36.2 ± 2.85
Calcium	120 ± 1.26	80.3 ± 0.83	63.5 ± 0.34
Nitrate	0.39 ± 0.59	0.23 ± 0.54	0.25 ± 0.56
Phosphate	0.37 ± 0.18	0.20 ± 0.17	0.32 ± 0.19

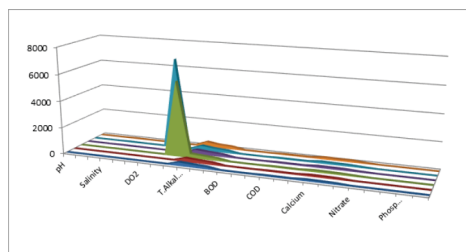


Fig-2. Physico-chemical parameters

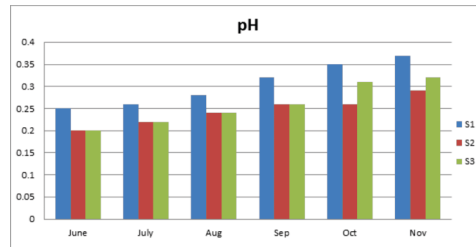


Fig-3. pH values of different samples in study area

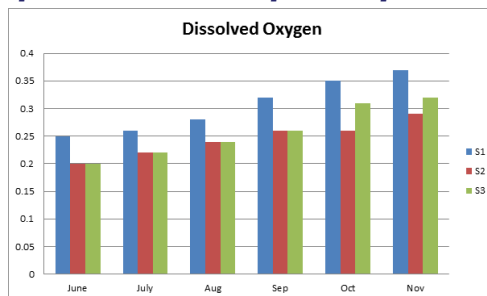


Fig-4. Dissolved Oxygen values of different samples in study area

CONCLUSION

The present work is analysis of physico-chemical parameters are used to reflect a biotic status of an ecosystem and the biological parameters for water quality regulates biodiversity and tropic of an ecosystem. This work account to give awareness among the people about the quality of water and can help reduce the water pollution through housekeeping and management practice.

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