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AN ASSESSMENT OF WATER QUALITY OF RIVER CAUVERY AND ITS TRIBUTARIES ARASALAR WITH REFERENCE TO PHYSICO-CHEMICAL PAREMETERS AT TANJORE DT, TAMILNADU, INDIA

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ABSTRACT : Present work deals with an assessment of some physico chemical parameters of the water bodies of two rivers (Cauvery and Arasalar) which is suitable for human consumption have been carried out during the period of one year (January 2010 to December 2010). Analysis of some physico-chemical characteristics like air temperature, water temperature, transparency, electrical conductivity, total solids, total dissolved solids, total suspended solids, pH, free carbon dioxide, dissolved oxygen, BOD and COD has been done during the investigation period. BOD values were not compiling with WHO guide lines in the River Cauvery and total solids and BOD values were not compiling with WHO guide lines in the River Arasalar. Study indicates the rivers were slightly polluted by anthropogenic performance due to local anthropogenic activities, agricultural runoff and discharge of untreated municipal sewage, religious credence and subject to amend owed to seasons, climate and flows and influx of waters from various tributaries. In addition present study points out that the river Arasalar facing severe pollution followed by the river Cauvery.

Key Words: Physico-chemical characteristics; River Cauvery; River Arasalar; Seasonal variations.

INTRODUCTION

Rivers are a vital component of the biosphere. Although they contain less than one percent of the world's freshwater, their ecological and social significance is enormous. They have many values such as economic (fishing, electricity generation, transport and irrigation), aesthetic (recreation), ecological (biodiversity), water for consumption (water supply for domestic and industrial uses) and conveying waste water discharges (treated or untreated). To maintain these values and their sustainable use, given water quality standard must be met. However, they have been utilized for so long that nature has shown signs of ecological imbalance due to widespread pollution, continuous human activities, and natural phenomena. Water quality is at present a global issue, especially when considering its implications to humanity in terms of water borne diseases. The deterioration of water quality has led to the destruction of ecosystem balance, contamination and pollution of ground and surface water resources. Water quality degradation world-wide is due mainly anthropogenic activities which release pollutants into the environment thereby having an adverse effect upon aquatic ecosystems. Water quality can be regard as a net work of variables (pH, oxygen concentration, temperature etc.,) that are linked and co linked; any changes in these physical and chemical variables can affect aquatic biota in a variety of ways. For every use of the river water different set of contaminants or water quality parameters play deterministic role for water quality assessment. For irrigation use dissolved solids (TDS), pH, sodium adsorption ratio (SAR) and residual sodium carbonate (RSC) are the most important. For other uses dissolved oxygen (DO), Biochemical Oxygen Demand (BOD), carbonaceous oxygen demand (COD), inorganic nitrogen (ammonia and nitrite), phosphorus, suspended solids, hazardous substances, organic pollutants (e.g. petroleum and hydrocarbons) and heavy metals (e.g. mercury and cadmium) are also considered. The contamination by hazardous substance can pose risk to human health in particular via the food chain. However, it becomes more and more difficult to meet such water quality standards because of continuous economic expansion, urban development and growing population pressure. One such resource is the Cauvery River, the major river system of south India and Arasalar is tributary to the river Cauvery.

The primary uses of Cauvery and its tributaries Arasalar were providing water for irrigation and household consumption. The Cauvery, like many major rivers in general, in India faces many problems, including dry summers, wetland filling, large dams, and pollution (Manivasakam, 1996). The degree of pollution is generally assessed by studying physical and chemical characteristics of the water bodies (Duran and Suicnz, 2007). Several studies have been conducted so far to understand the physicochemical properties of rivers in India. Water pollution due to anthropogenic activities in Cauvery River and many of its tributaries, namely, rivers Noyyal, Bhavani, and Amaravathi, has been reported in earlier studies (Senthilnathan 2004, Jameel and Hussain 2005, 2007, K.L.Prakash *etal,* 2007, GovindarajSolaraj *et al*, 2009, Varunprasath 2010). According to their report, effluents from pulp and paper manufacturing, chemical industries, dyeing and bleaching units, and sewage are the major anthropogenic sources of water pollution in Cauvery River. However, there is no published periodical report on hydrochemistry, particularly in Kumbakonam area. In that context, present study was carried out to assess water quality parameters and if there is any monsoonal variation in Cauvery and its tributaries Arasalar. This study will provide baseline information on the trophic status of the rivers for further studies in the Cauvery River and its tributaries Arasalar. The knowledge acquired will be useful in the management of these important ecosystem and natural resources of the river for the survival and continued economic benefits to the community.

MATERIALS AND METHODS

Description of study area

Cauvery originates in Karnataka at Talakaveri, in Kodagu and flows down through Kushal Nagar, Srirangapatna, and Shivanasamudram before reaching Hogennikal and Srirangam in Tamilnadu. In Erode in Tamilnadu two more tributaries join it – Noyyal and Amaravathi. In Trichirapalli, it branches out in to Coleroon and Cauvery. Cauvery again divides in to Arasalar and Cauvery at Papanasam, near Kumbakonam. Kumbakonam in Tanjore district is located at 10º 59' north latitude and 79º 23' longitudes. India, along the certain holy river-edge settlements have grown into religious centers or holy cities. Kumbakonam is one such city in Tamilnadu, along the Cauvery River; located in the delta between the Cauvery and its tributary Arasalar. The city has developed in the delta between the Cauvery River to the north and the Arasalar River, to the south and has a gentle slope from north-west to south-east. In the present context, there are vast agricultural wetlands to the north and south of planning area; with the rivers Cauvery and Arasalar as the main source of irrigation. The mighty Cauvery River in Tamil Nadu is reduced to a number of unused channels and falls into the Bay of Bengal at the historical place of Poompuhar or Kaveripoompatinam about 13kms north of Tharangampadi.

Sampling and analysis of water

Each river (Cauvery and Arasalar) three sampling station designated as station 1 (upstream of the river), station 2 (midstream of the river) and station 3 (downstream of the River) were established for sampling purpose. Water samples were collected from six stations on monthly basis using a standard water sampler for a period of one year (Jan 2010 to Dec 2010). At the time of sampling, the air and water temperature were recorded by using alcoholic bulb and digital thermometer. Light penetration was recorded with the help of sacchi disk. Determination of pH and conductance were all so performed on site using portable meters (Henna pen type, Portugal). For other parameters samples were preserved by adding an appropriate reagent and brought to the laboratory in sampling kids maintained at 4 ºC for detailed chemical analysis by the methods as described by APHA, 1998 and Trivedy et al.,1986.

RESULTS AND DISCUSSION

The range and mean values of physico-chemical parameters (Air temperature, Water temperature, Transparency, Conductivity, Total solids, Total dissolved solids, Total suspended solids, pH, Free Co2, Dissolved oxygen, BOD, and COD) of the river Cauvery and its tributaries Arasalar for a period of one year (Jan 2010 to Dec 2010) are listed in Table 1 and Table 2. While monthly variations of physico-chemical parameters of the river Cauvery and its tributaries Arasalar are presented in Fig1 and Fig 2.

Temperature is an important biologically significant factor, which plays an important role in the metabolic activities of the organism and determining the physico-chemical property of water. The air temperature of Cauvery river and Arasalar river was observed to be in the ranges of from 26°C to 33°C and 27ºC to 32ºC, as shown in Fig-1.a and Fig-2.a respectively. The minimum and maximum (26°C and 33°C) air temperature was recorded in the river Cauvery. The mean value of air temperature was found to be 30.84±3.43ºC, 30±2.85ºC and 30.30±1.43ºC for S1, S2, and S3 in the river Cauvery and 29.92±1.75ºC, 29.53±1.66ºC and 29.46±1.19ºC for S1, S2, and S3 in the river Arasalar respectively. The result showed that there is no significant difference in the air temperature between the two rivers.

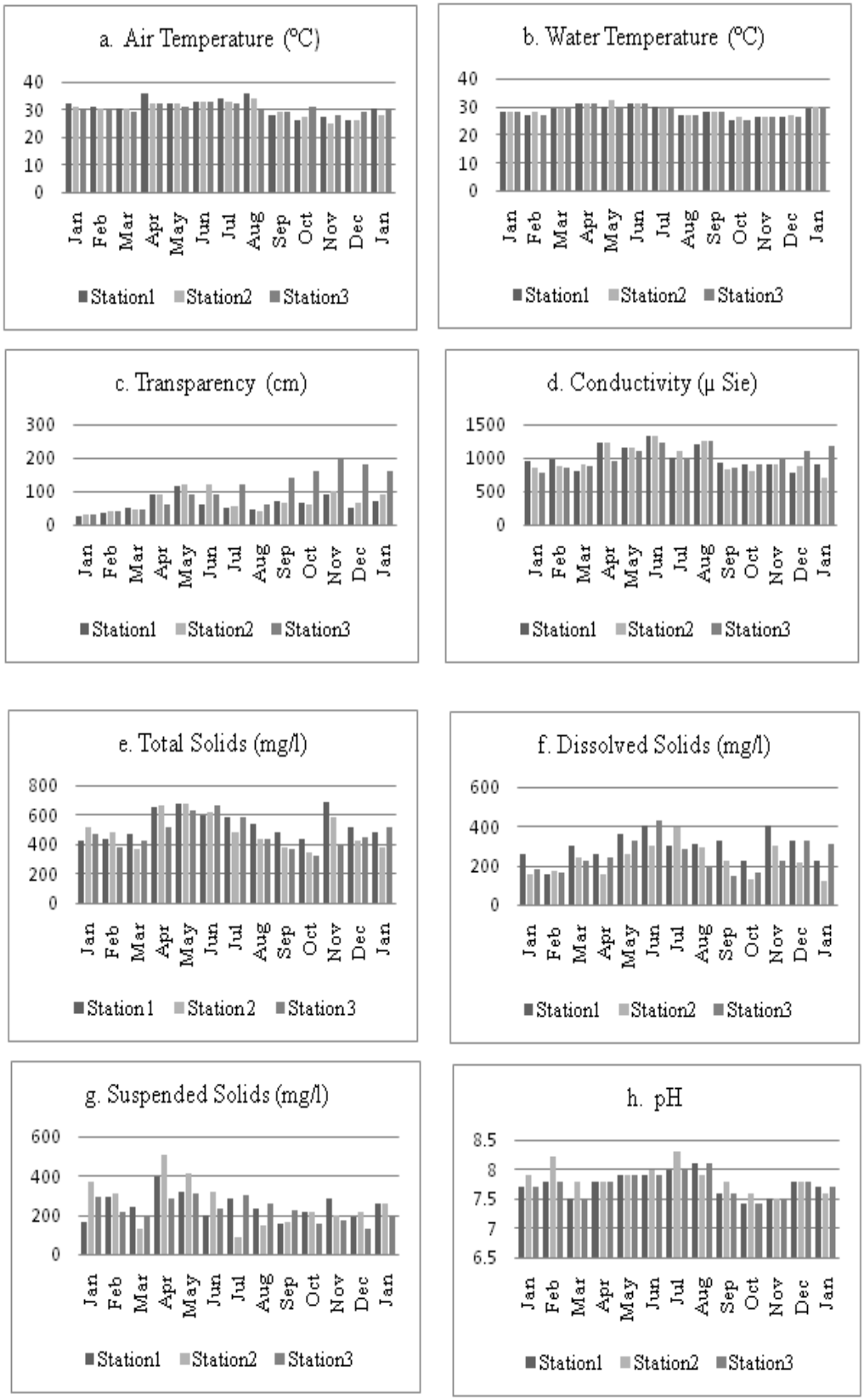
Table 1. Physico-Chemical Parameters of River Cauvery (2010)

Water quality Parameters	Range value			Mean value ± Standard Deviation			WHO Guide line
	S1	S2	S3	Station 1	Station 2	Station 3	
Air Temperature (ºC)	26-36	26-33	28-33	30.84±3.43	30±2.85	30.30±1.43	25
Water Temperature (ºC)	25-31	26-32	26-31	28.23±1.96	28.65±1.88	28.23±1.96	40
Transparency (cm)	40-28	42-160	45-140	111 ± 54.76	96.53 ± 43.03	91.61 ± 34.07	-
Conductivity (µ Sie)	780-1330	710-1320	770-1260	1003.84 ± 169.14	985.38±198.05	1000.76±157.34	1500
Total Solis (mg/L)	420 -680	370 -670	320 -660	536.15±91.51	487.69±113.9	472.30±103.53	600
Dissolved Solids (mg/L)	158 -401	120 -398	167 -425	294.46±70.80	227±81.85	245.84±82.07	-
Suspended Solids (mg/L)	167 -392	131 -502	213 -305	247.53±65.27	254.53±122.19	226.46±57.80	-
pH	7.5 -8.1	7.6 -8.3	7.4 -8.1	7.74±0.20	7.85±0.22	7.74±0.20	6.5-8.5
Free Co2(mg/L)	0.9 -2.0	1.1 -2.1	0.9 -1.9	1.43±0.35	1.53±0.28	1.43±0.35	0.5-2.0
Dissolved oxygen (mg/L)	5.1 -8.0	4.3 -7.6	5.1 -7.8	6.51±1.03	6.35±1.02	6.51±1.03	5.0-6.0
BOD (mg/L)	7.2 -14.1	9.2 -14.5	8.4 -13.1	10.46±2.17	10.61±1.91	10.56±1.46	<2
COD (mg/L)	25 - 40	28 - 48	26 - 45	33.07±4.11	36.92±6.46	34.76±6.63	50

Table 2. Physico-Chemical Parameters of River Arasalar (2010)

Water quality Parameters	Range value			Mean value ± Standard Deviation			WHO Guide line
	S1	S2	S3	Station 1	Station 2	Station 3	
Air Temperature (ºC)	27-33	27-32	28-32	29.92 ± 1.75	29.53 ± 1.66	29.46 ± 1.19	25
Water Temperature (ºC)	26-32	26-32	27-32	29 ± 1.58	28.84 ± 1.62	29 ± 1.47	40
Transparency (cm)	26 -115	29 - 121	30-160	62.61±24.56	70.61±30.48	105.84±58.17	-
Conductivity (µ Sie)	910-1220	810-1280	840-1180	1036.53±92.45	1056.92±140.8	1018.46±90.35	1500
Total Solis (mg/L)	480-750	580-780	570-775	610.76±83.21	655.38 ± 77.20	646 ± 75.56	600
Dissolved Solids (mg/L)	240-425	213-425	320-480	310.46±52.23	308 ± 57.56	347.23 ± 61.64	-
Suspended Solids (mg/L)	213-425	320-410	190-458	300.30±58.16	345.84 ± 61.72	299.69 ± 86.14	-
pH	7.5-8.2	7.6-8.4	7.6-8.3	7.79 ± 0.21	7.93 ± 0.26	7.88 ± 0.26	6.5-8.5
Free Co2(mg/L)	1.1-2.1	1.3-2.2	1.5-2.1	1.71 ± 0.28	1.76 ± 0.28	1.81 ± 0.19	0.5-2.0
Dissolved Oxygen(mg/L)	5.4-7.4	5.1-7.5	5.2-7.7	6.46 ± 0.59	6.36 ± 0.76	6.42 ± 0.80	5.0-6.0
BOD (mg/L)	8.7-14.2	9.7-14.4	9-14	11.9 ± 1.60	12.40 ± 1.60	11.84 ± 1.67	2
COD (mg/L)	30-55	31-64	34-68	40.92 ± 8.58	46.23 ±11.33	47.92 ± 8.80	50

Fig. 1 Monthly variations of physicochemical characters of River Cauvery (2010)



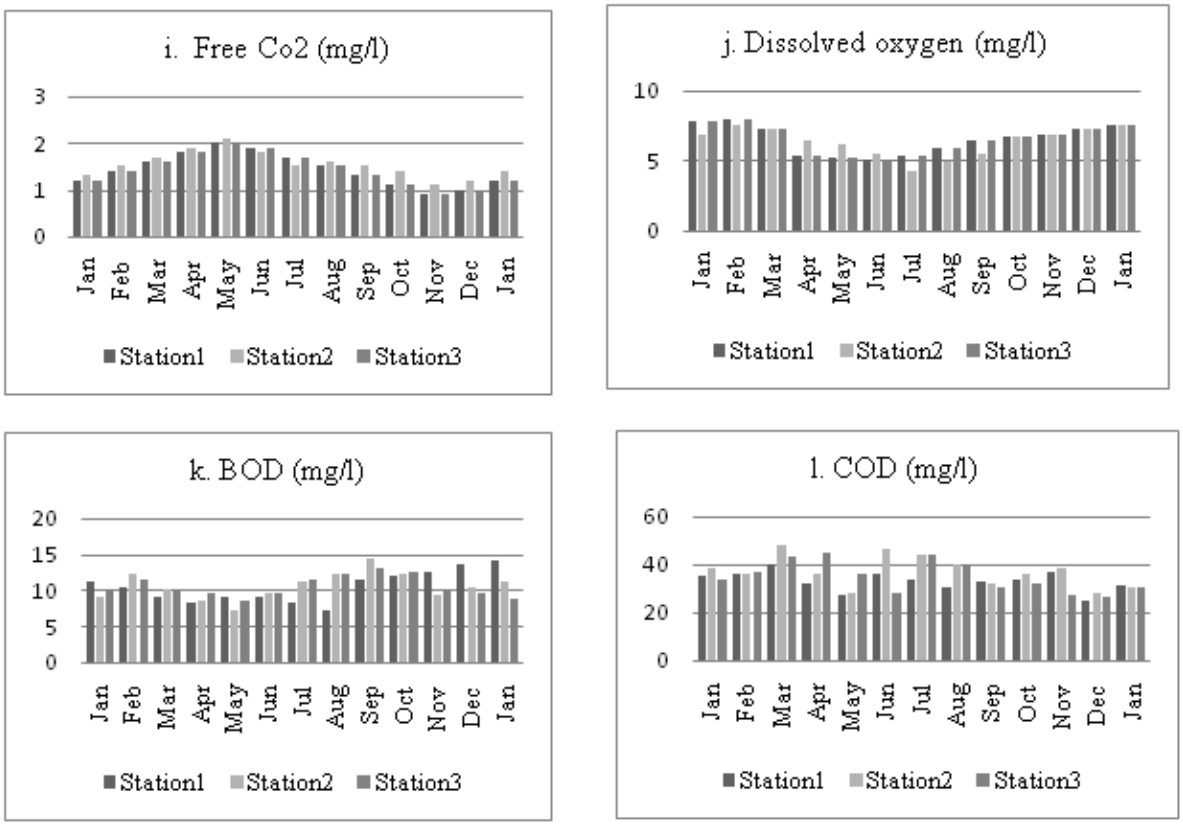
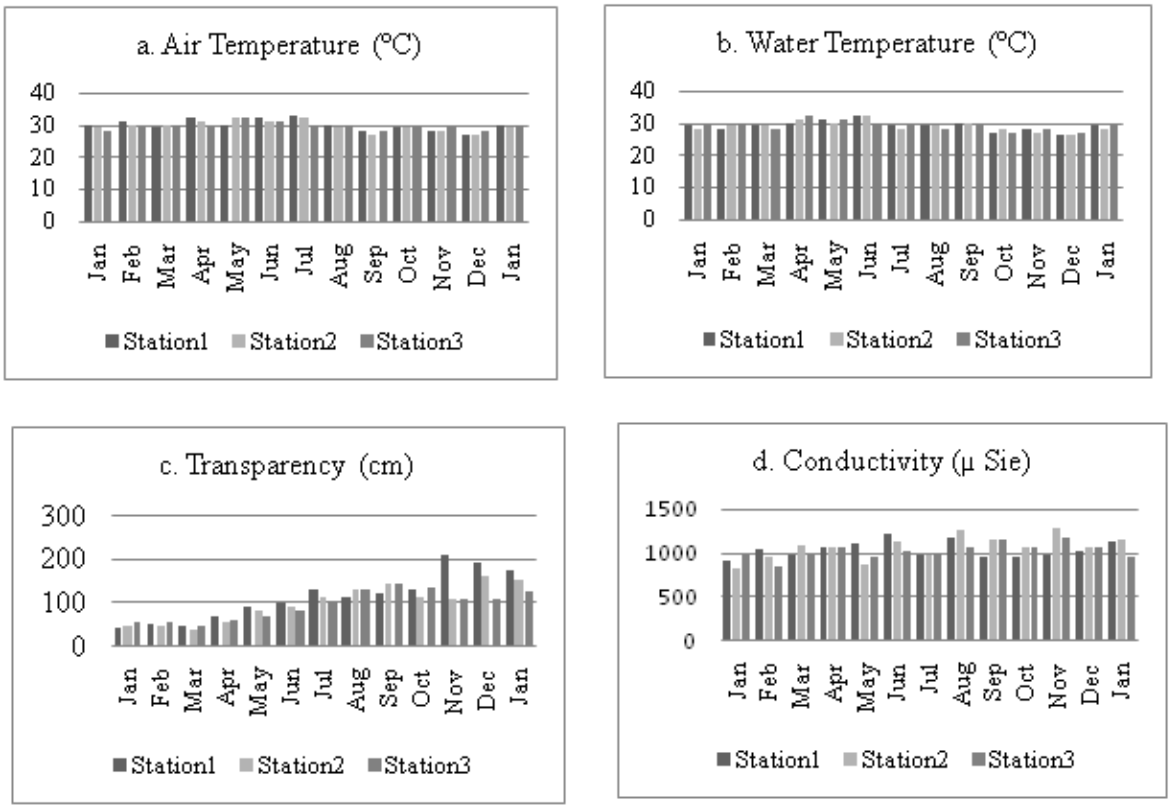
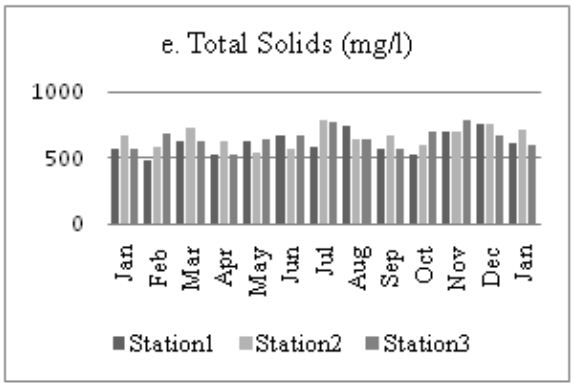
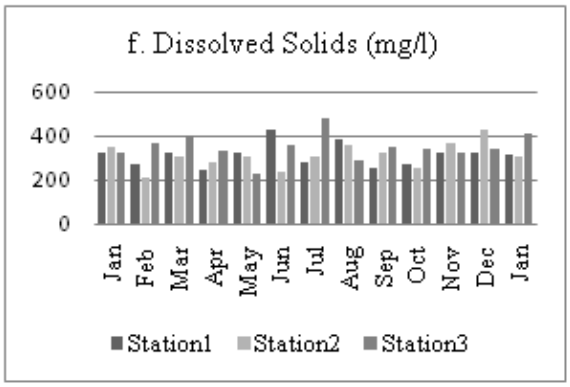
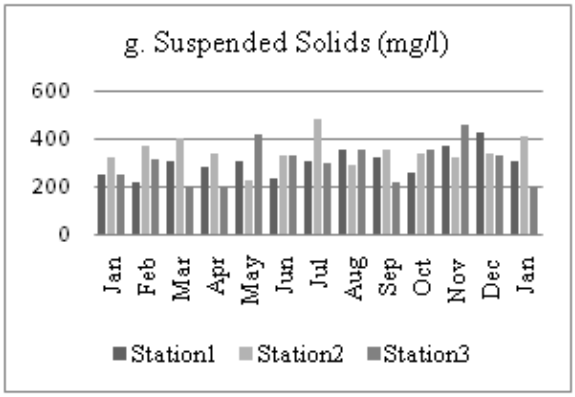


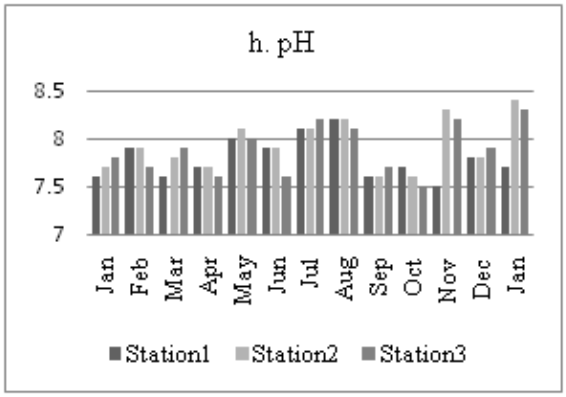
Fig. 2 Monthly variations of physicochemical characters of River Arasalar (2010)

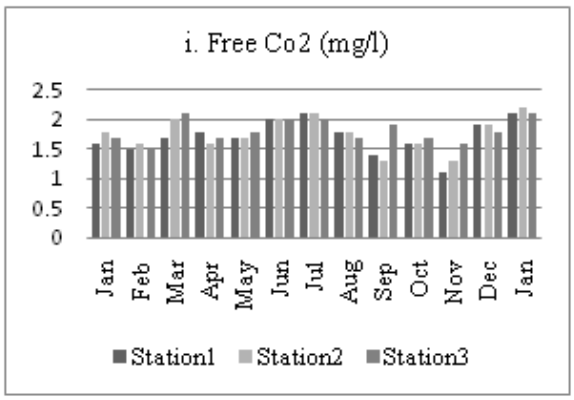


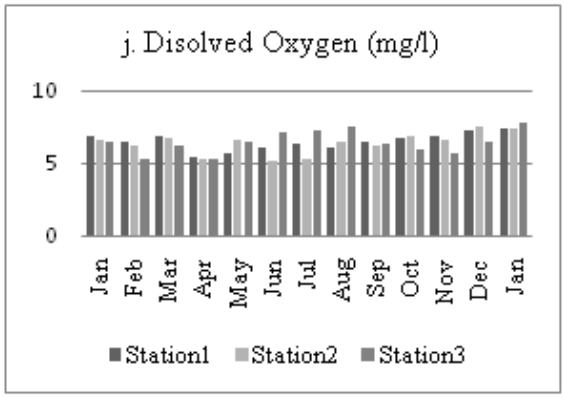

e. Total Solids (mg/l)
1000
500
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Station1 Station2 Station3

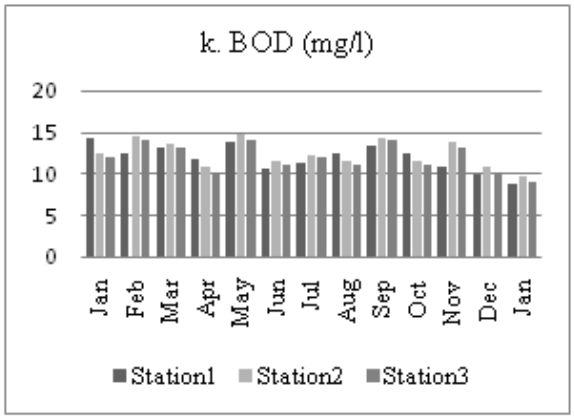

f. Dissolved Solids (mg/l)
600
400
200
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Station1 Station2 Station3

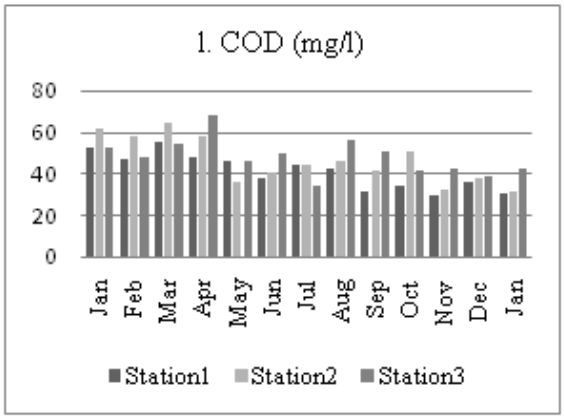

g. Suspended Solids (mg/l)
600
400
200
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Station1 Station2 Station3


h. pH
8.5
8
7.5
7
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Station1 Station2 Station3


i. Free Co2 (mg/l)
2.5
2
1.5
1
0.5
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Station1 Station2 Station3


j. Disolved Oxygen (mg/l)
10
5
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Station1 Station2 Station3


k. BOD (mg/l)
20
15
10
5
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Station1 Station2 Station3


l. COD (mg/l)
80
60
40
20
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
Station1 Station2 Station3

The water temperature was recorded between 25°C to 31°C in the river Cauvery (Fig-1.b) and 26ºC to 32ºC in the river Arasalar (Fig-2.b) during the study period. The lowest water temperature of 25°C was recorded in the river Cauvery and highest water temperature of 32°C was observed in the river Arasalar. The mean value of water temperature in the river Cauvery observed to be 28.23±1.96ºC, 28.65±1.88ºC and 28.23±1.96ºC for S1, S2, and S3 respectively. Similarly in the river Arasalar recorded was 29±1.58ºC, 28.84±1.62ºC and 29±1.47ºC for S1, S2 and S3 respectively. Water samples collected in the river Cauvery showed lower temperature in the monsoon season. In the summer season it was found to be highest. In the river Arasalar the temperature was found more when compare to the river Cauvery. This may be due to mixing of the effluent from the municipal sewage situated in the banks of Arasalar. The variation is mainly related with the temperature of atmosphere and weather conditions. Higher temperature during summer was due to greater heating (Adebowale and Sawyer 2008).

In the present study the transparency was ranging from 26 cm to 121 cm in the river Cauvery (Fig-1.c) and 45 cm to 160 cm in the river Arasalar (Fig-2.c). The lowest transparency of 26 cm was recorded in the river Cauvery and highest transparency of 160cm was observed in the river Arasalar. The mean value of transparency in the river Cauvery recorded was 62.61±24.56 cm, 70.61±30.48 cm and 105.84±58.17 cm for S1, S2, and S3 respectively. Similarly in the river Arasalar recorded was 111±54.76 cm, 96.53±43.03 cm and 91.61±34.07 cm for S1, S2 and S3 respectively. In the river Arasalar the transparency was found more when compare to the river Cauvery. This may be due to the more turbid condition of the river due to the mixing of the effluents. The reason for the minimum transparency in the river Cauvery due to the dilution of the sewage and effluents and also the water flow is more when compare to the river Arasalar. Transparency or light penetration depends on the intensity of sunlight, suspended soil particles, turbid water received from catchment area and density of plankton etc. (Mishra and Saksena, 1991; Kulshrestha and Sharma, 2006). Transparency of river water is also affected due to total solids partly or fully decomposed organic matters, silts and turbulence caused by the currents, waves, human and cattle activities (Singh et al., 1999).

Conductivity is the measure of capacity of a substance or solution to conduct electrical current through the water. The electrical conductivity of water samples of Cauvery river and Arasalar river was observed to be in the ranges of 710 (µScm-^{1}) – 1280 (µScm-^{1}) and 810 (µScm-^{1}) – 1330 (µScm-^{1}), as shown in Fig-1.d and Fig-2.d respectively. The lowest conductivity of 710 (µS cm-^{1}) was recorded in the river Cauvery and highest conductivity of 1330 (µScm-^{1}) was observed in the river Arasalar. This conductivity of average value was found to be 30.84±3.43 (µS cm-^{1}), 30±2.85 (µS cm-^{1}) and 30.30±1.43 (µS cm-^{1}) for S1, S2, and S3 in the river Cauvery and 30.84±3.43 (µS cm-^{1}), 30±2.85 (µS cm-^{1}) and 30.30±1.43 (µS cm-^{1}) for S1, S2, and S3 in the river Arasalar respectively. The value of electrical conductivity was greatest in the river Arasalar due to more concentration of the TDS. The reason for decrease in the values of the electrical conductivity of the river Cauvery due to poor irrigation management, minerals from rain water runoff, or other discharges. Several factors influence the conductivity including temperature, ionic mobility and ionic valences. Conductivity measurement is an excellent indicator of TDS, which is a measure of salinity that affects the taste of potable water (Pradeep, 1998).

Solids refer to matter suspended or dissolved in water or waste water. Waters with high dissolved solids are of inferior palatability. Total dissolved solids are composed of carbonates, bicarbonates, chlorides, sulphates, phosphates and nitrates of Ca, Mg, Na, K, and Mn and organic matter, salts and others particles (Mishra and Saksena, 1991). In the present study the value of total solids (Suspended solids and Dissolved Solids) was ranging from 370 mg/l to 680 mg/l in Cauvery (Fig-1.e, 1.f and1.g) and 480 mg/l to 780 mg/l in Arasalar (Fig-2.e, 2.f and 2.g). The minimum value of 370 mg/l of total solids was recorded in the river Cauvery and maximum value of total solids 780 mg/l was recorded in the river Arasalar. The mean value of total solids in the river Cauvery recorded was 536.15±91.15 (mg/l), 487.69±113.95 (mg/l) and 475.30±103.53 (mg/l) for S1, S2, and S3 respectively. Similarly in the river Arasalar recorded was 610.76±83.21 (mg/l), 655.38±77.20 (mg/l) and 646±75.56 (mg/l) for S1, S2, and S3 respectively.

The Total Dissolved Solids values in the river Arasalar exceed the maximum permissible limits of WHO (600mg/l). In this study the primary sources for elevated TDS level in river water are agricultural runoff, particulate matter of cement and other raw material used in construction of river front, leaching of soil contamination and non point source of water pollution i.e. discharge from industrial and sewage treatment plants particularly during dry season with low water level and relatively low values during wet season might due to dilution effect (Moniruzzaman, 2009). River Cauvery show a lower TDS value than Arasalar. The reason for the minimum total solids in the river Cauvery due to the dilution of the sewage and effluents and also the water flow is more when compare to the river Arasalar. The same is reported by Subbarao *et al*. (1997).

One of the important factors that serve as an indicator of pollution of water body is pH. The pH of natural water can provide important information about many chemical and biological processes and provides indirect correlations to a number of different impairments. pH is the scale of intensity of acidity and alkalinity of water and measures the concentration of hydrogen ions. At the period of study, the pH ranges from 7.4 to 8.3 in the river Cauvery (Fig-1.h) and 7.4 to 8.4 in the river Arasalar (Fig-2.h). The minimum pH of 7.4 was recorded in the river Cauvery and maximum pH of 8.4 was observed in the river Arasalar. The mean value of pH in the river Cauvery recorded was 7.74±0.20, 7.85±0.22 and 7.74±0.20 for S1, S2, and S3 respectively. Whereas in the river Arasalar recorded were 7.79±0.21, 7.93±0.26 and 7.88±0.26 for S1, S2, and S3 respectively. The result also shows that the alkaline pH is particularly due to bicarbonate and not due to carbonate alkalinity. The mild alkaline nature suggests that approximately 95% of CO2 in water is present as bicarbonate. This is favored by the findings of Azeez *et al*. (2000). The acidic pH may be due to the high organic load and decomposition. The rain water is responsible for neutralization and finally to alkaline. The fluctuation of pH in this lotic system may be due to the buffering capacity.

Carbon dioxide in water bodies is contributed by the respiratory activity by animals and other organisms. The Carbon dioxide ranges from 0.9 (mg/l) to 2.1 (mg/l) in the river Cauvery (Fig-1.i) and 1.1 (mg/l) to 2.2 (mg/l) in the river Arasalar (Fig-2.i). The minimum Carbon dioxide of 0.9 was recorded in the river Cauvery and maximum Carbon dioxide of 2.2 was observed in the river Arasalar. The mean value of Carbon dioxide in the river Cauvery recorded was 1.43±0.35 (mg/l), 1.53±0.28 (mg/l) and 1.43±0.35 (mg/l) for S1, S2, and S3 respectively. While in the river Arasalar recorded was 1.71±0.28 (mg/l), 1.76±0.28 (mg/l) and 1.81±0.19 (mg/l) for S1, S2, and S3 respectively. The values of free carbon dioxide were inversely proportional to dissolved oxygen at the sampling station. This may be depends upon plants aquatic animals present in water body as well as alkalinity and hardness of water. According to Koroosh (2009) the free carbon dioxide values were extremely high and high values of free carbon dioxide may result from breakdown of organic matter. The less values of carbon dioxide during rainy and winter season might be due to its utilization in photosynthetic activity or it was being inhabited by presence of appreciable amount of carbonate in water.

Oxygen content of water varies with temperature, salinity, turbulence, photosynthetic activity of algae and higher plants atmospheric pressure *etc.* Concentrations of dissolved oxygen in unpolluted waters are usually about 8-10 mg/l. In the present study dissolved oxygen level ranges between 4.3(mg/l) to 7.8 mg/l in the river Cauvery (Fig-1.j) and 5.1 (mg/l) to 7.7 (mg/l) in the river Arasalar (Fig-2.j). The minimum dissolved oxygen of 4.3(mg/l) was recorded in the river Cauvery and maximum dissolved oxygen of 7.8(mg/l) was also observed in the river Cauvery. The mean value of dissolved oxygen in river Cauvery recorded was 6.51±1.03 (mg/l), 6.35±1.02 (mg/l) and 6.51±1.03 (mg/l) for S1, S2, and S3 respectively. Whereas in the river Arasalar recorded was 6.46±0.59 (mg/l), 6.36±0.76 (mg/l) and 6.42±0.80 (mg/l) for S1, S2, and S3 respectively. Dissolved oxygen is regulator of metabolic activities of organisms and thus governs metabolism of the biological community as a whole and also acts as an indicator of tropic status of the water body (Saksena and Kaushik, 1994). Oxygen is generally reduced in the water due to respiration of biota, decomposition of organic matter, rise in temperature, oxygen demanding wastes and inorganic reluctant such as hydrogen sulphide, ammonia, nitrites, ferrous iron, etc. (Sahu et al., 2000). Prakash (1982) reported that concentration of dissolved oxygen is inversely proportional to the concentration of carbon dioxide.

BOD or biochemical oxygen demand represents microorganism use the atmospheric oxygen dissolved in the water for biochemical oxidation of organic matter, which is their source of carbon. The BOD is used as an approximate measure of the amount of biochemically degradable organic matter present in a sample. The BOD ranges from (mg/l) to 14.5 (mg/l) in the river Cauvery (Fig-1.k) and 8.7 (mg/l) to 14.4 (mg/l) in the river Arasalar (Fig-2.k). The minimum BOD value was recorded as 7.2 mg/l in the river Cauvery and maximum value of BOD 14.5(mg/l) was also recorded in the river Cauvery. The mean value of BOD in the river Cauvery recorded was 10.46±2.17 (mg/l), 10.61±1.91 (mg/l) and 10.56±1.46 (mg/l) for S1, S2, and S3 respectively. Similarly in the river Arasalar recorded was 11.9±1.60 (mg/l), 12.40±1.60 (mg/l) and 11.84±1.67 (mg/l) for S1, S2, and S3 respectively. At both the rivers, the BOD values were high during the study period. The results indicate that the water body had suffered deterioration and degradation due to agricultural runoff and continuous discharge of domestic and municipal sewage. Desirable limit for BOD is 4.0 mg/l and permissible limit is 6.0 mg/l according to Indian standards. BOD demand below 3 mg/l or less is required for the best use. Fokmare and Musaddiq (2002) recorded high value of biochemical oxygen demand (BOD) as 20.00 mg/l in river Purna and said that this river is highly polluted due to organic enrichment, decay of plants and animal matter in the river. Thus, the high value of BOD encountered in both rivers, above the permissible limit of WHO (<2 mg/l), indicates the pollution by biochemically degradable organic wastes from various sources.

COD is the measure of the oxygen required for chemical oxidation of organic matter. The COD ranges from 25 (mg/l) to 48 (mg/l) in the river Cauvery (Fig-1.l) and 30 (mg/l) to 68 (mg/l) in the river Arasalar (Fig-2.l). The minimum COD value was recorded as 25 mg/l in the river Cauvery and maximum value of COD 68 (mg/l) was recorded in the river Arasalar. The mean value of COD in the river Cauvery recorded was 33.07±4.11 (mg/l), 36.92± 6.46 (mg/l) and 34.76±6.63 (mg/l) for S1, S2, and S3 respectively. Similarly in the river Arasalar recorded was 40.92±8.58 (mg/l), 46.23±11.33 (mg/l) and 47.92±8.80 (mg/l) for S1, S2, and S3 respectively. The COD is a measure of oxygen equivalent to the organic matter content of the water susceptible to oxidation and thus is an index of organic pollution in river (Khaiwal et al, 2003). High COD may cause oxygen depletion on account of decomposition by microbes (Sivakumar *et al*. 1989) to a level detrimental to aquatic life.

CONCLUSION

This study provides an informative data and helps to understand the water quality of river Cauvery and its tributaries Arasalar. In river Arasalar, the sampling stations recorded comparatively higher pollutants such as total solids and BOD whereas in the river Cauvery the sampling stations recorded comparatively less pollutants such as BOD. BOD values were not compiling with WHO guide lines in the River Cauvery and total solids and BOD values were not compiling with WHO guide lines in the River Arasalar. Study indicates the rivers were slightly polluted by anthropogenic performance due to local anthropogenic activities, agricultural runoff and discharge of untreated municipal sewage, religious credence and subject to amend owed to seasons, climate and flows and influx of waters from various tributaries. In addition present study points out that the river Arasalar facing severe pollution followed by the river Cauvery.

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