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Environmental Quality of Selected Temple Ponds in Tiruchirappalli

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In the present study, water quality of selected temple ponds was determined in Tiruchirappalli. The results revealed that Thiruvarambur Pond was found to be highly polluted, while water collected from Srirangam pond was less polluted. Srirangam pond is situated inside the temple premises. This protects the pond from contamination by people and animals from outside. Other ponds are situated just outside the premises and hence there in no protection. People living around these ponds use them for bathing, washing and other activities, thus polluting these ponds. Stray animals also visit these ponds frequently and pollute them.

INTRODUCTION

Tamilnadu is a rain-fed state. It depends mainly on water stored in lakes, ponds and under the ground. Kings and rulers of the state with their long-term vision, created ponds and lakes to conserve water. Temples were constructed with ponds, 'Kulums' either inside or alongside. These temple ponds served the purpose of storage as well as recharge of ground water. The 'Kulums' or temple tanks have which were used for providing water. The paucity of water in the state required all homes to be built facing the tank, necessarily a square or a rectangular so that the water would run-off the slopping roofs in to the tank. There are several archeological evidence of the construction of tanks in ancient and historical India. Nearly every south Indian village has a temple and a tank. The water of the tank was used for drinking purpose, washing hands and feet before going into the temple and sometimes for irrigating temple lands. Its limited use meant that it maintained ground water levels thus ensuring sufficient water in the domestic wells through the hot summer months. Sacred tanks helped to maintain water level.

In recent times temple tanks have fallen into disrepair. Houses have been built around the tanks which contaminated and tarred, thus preventing ground water from seeping in. Today sewages flows into the temple tanks; as the devotees and public wash their clothes and body with detergents and soap, they pollute the water and making it unfit for drinking or for any other cleansing utilization. Some aquifers have lowered levels and the limited ground water intrusion has resulted in many temple tanks going dry. Over exploitation of ground water has also resulted in saline sea water entering many of the tanks, in costal region. In this present study,environmental quality of selected temple ponds in Trichirappalli is determined. Many studies have been undertaken to areas the environmental quality of temple ponds (Arun *et al.,* 1996; Bahura *et al.,* 1993; Pandey *et al.,* 1993; Sharma *et al.,* 2007; Subbamma and Ramasarma, 1993).

MATERIAL AND METHOD

The water samples were collected from 5 famous temple tanks in Trichirappalli, namely Srirangam, Rockfort, Samayapuram, Vayalur and Thiruverambur. Samples from temple tanks were collected in acid washed plastic cans from a depth of 1m; the samples for bacteriological examinations were collected in glass bottles that had been cleaned and rinsed with distilled water and sterilized in

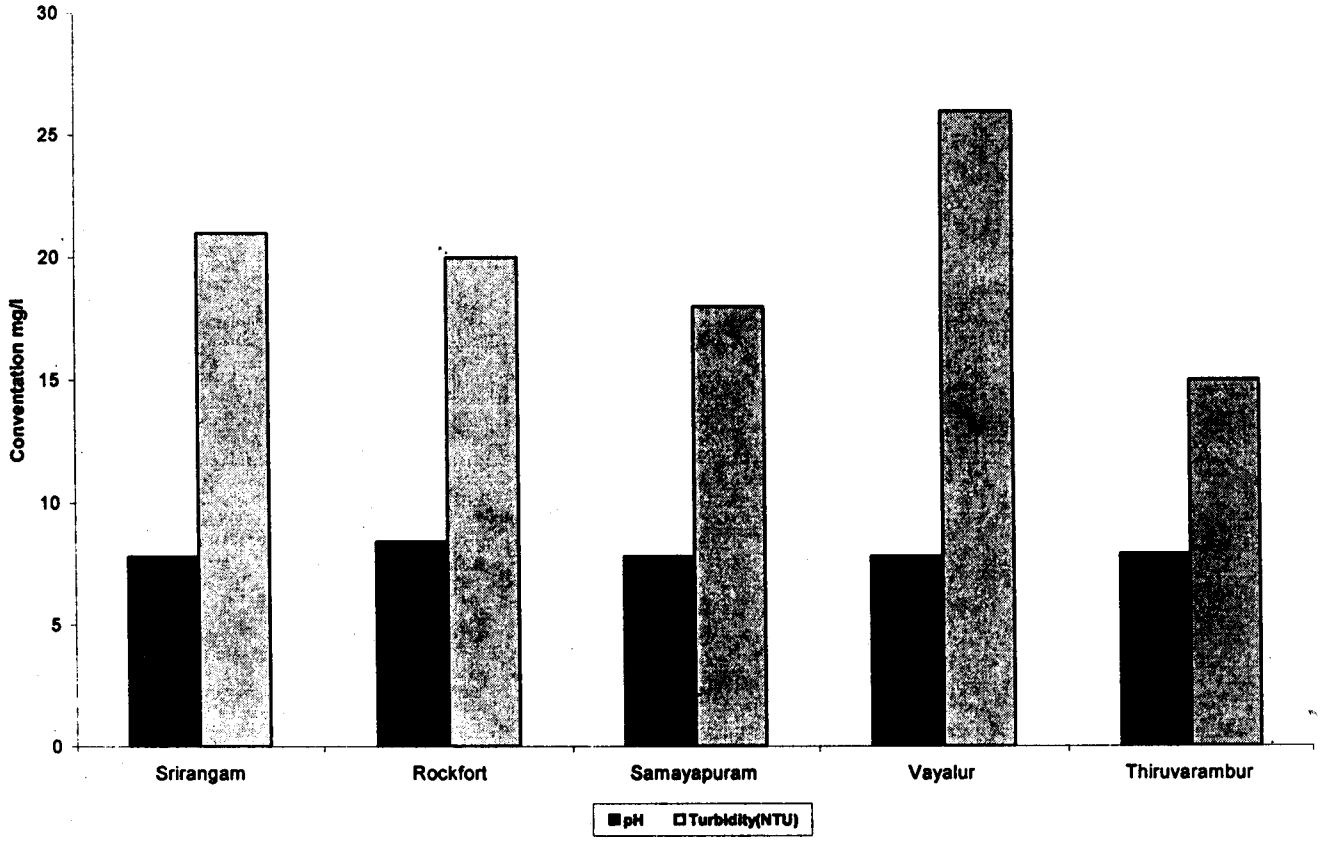

Figure 1. *The pH and turbidity content of water colleted from temple ponds in Tiruchirappalli*

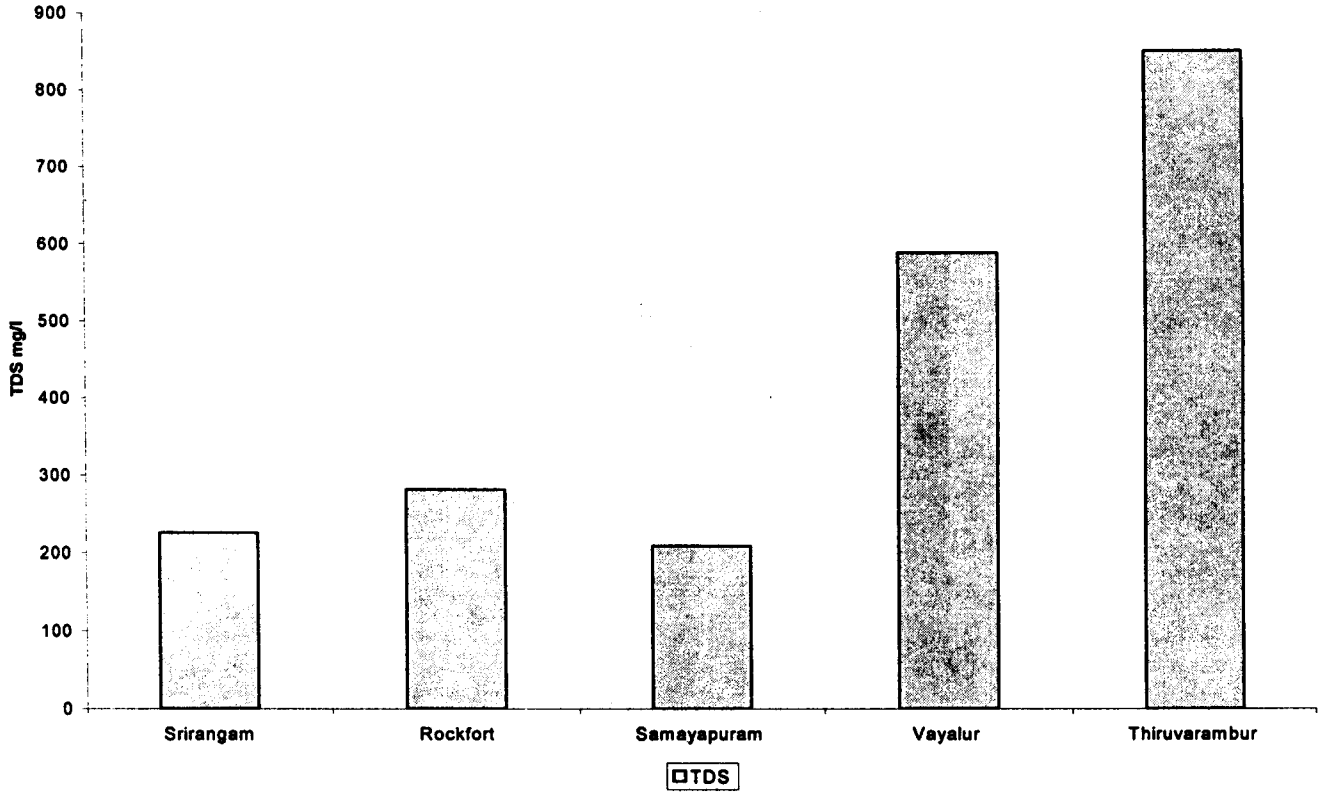

Figure 2. *TDS content of water colleted from temple ponds in Tiruchirappalli*

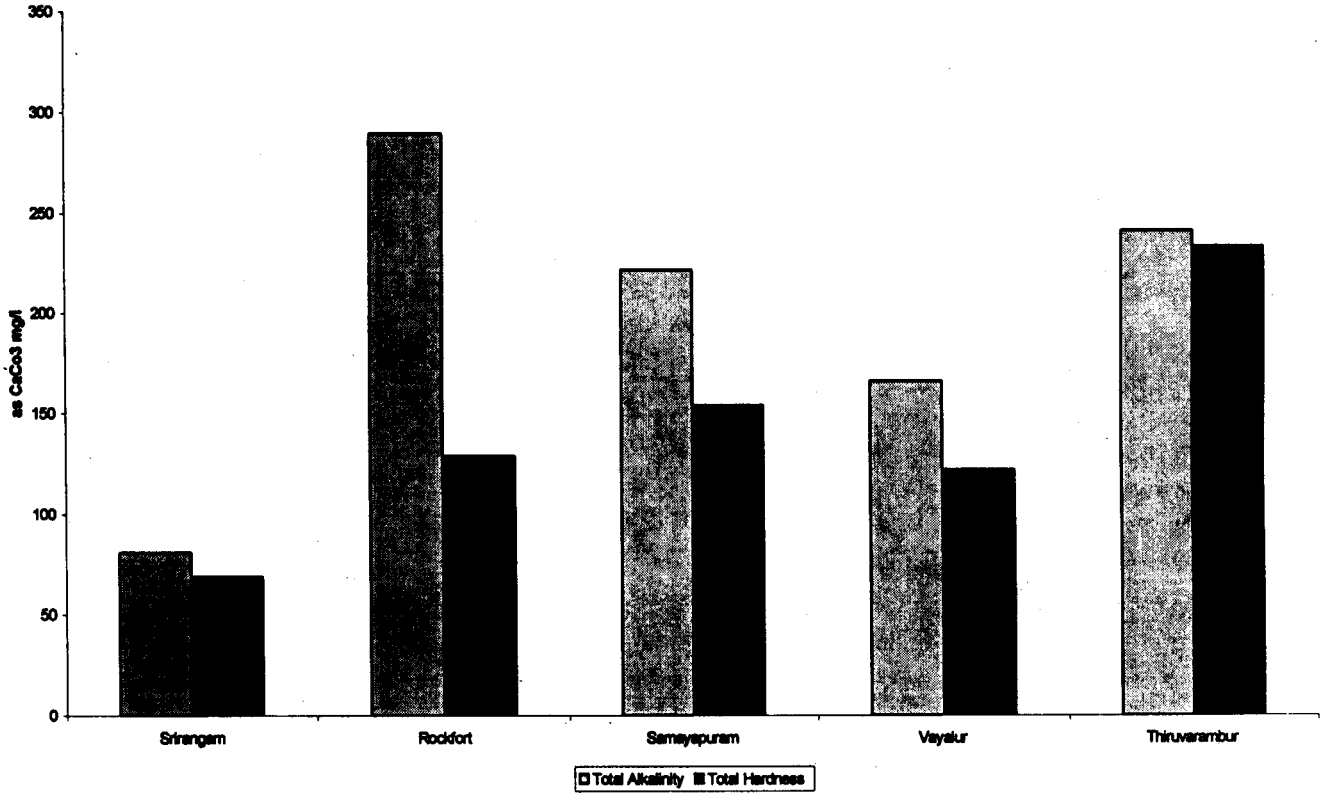

Figure 3. *Total alkalinity and total hardness content of water collected from temple ponds in Tiruchirappalli*

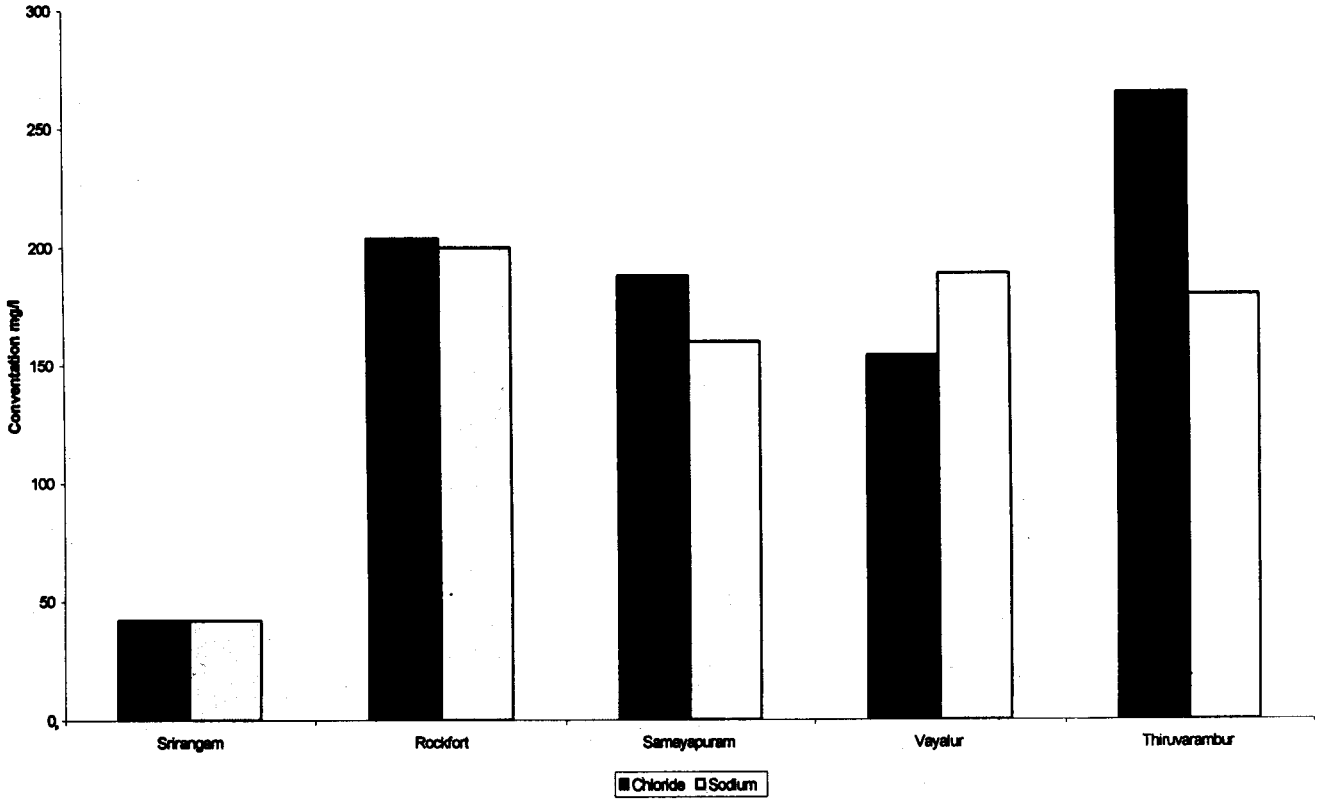

Figure 4. *Chloride and sodium content of water collected from temple ponds in Tiruchirappalli*

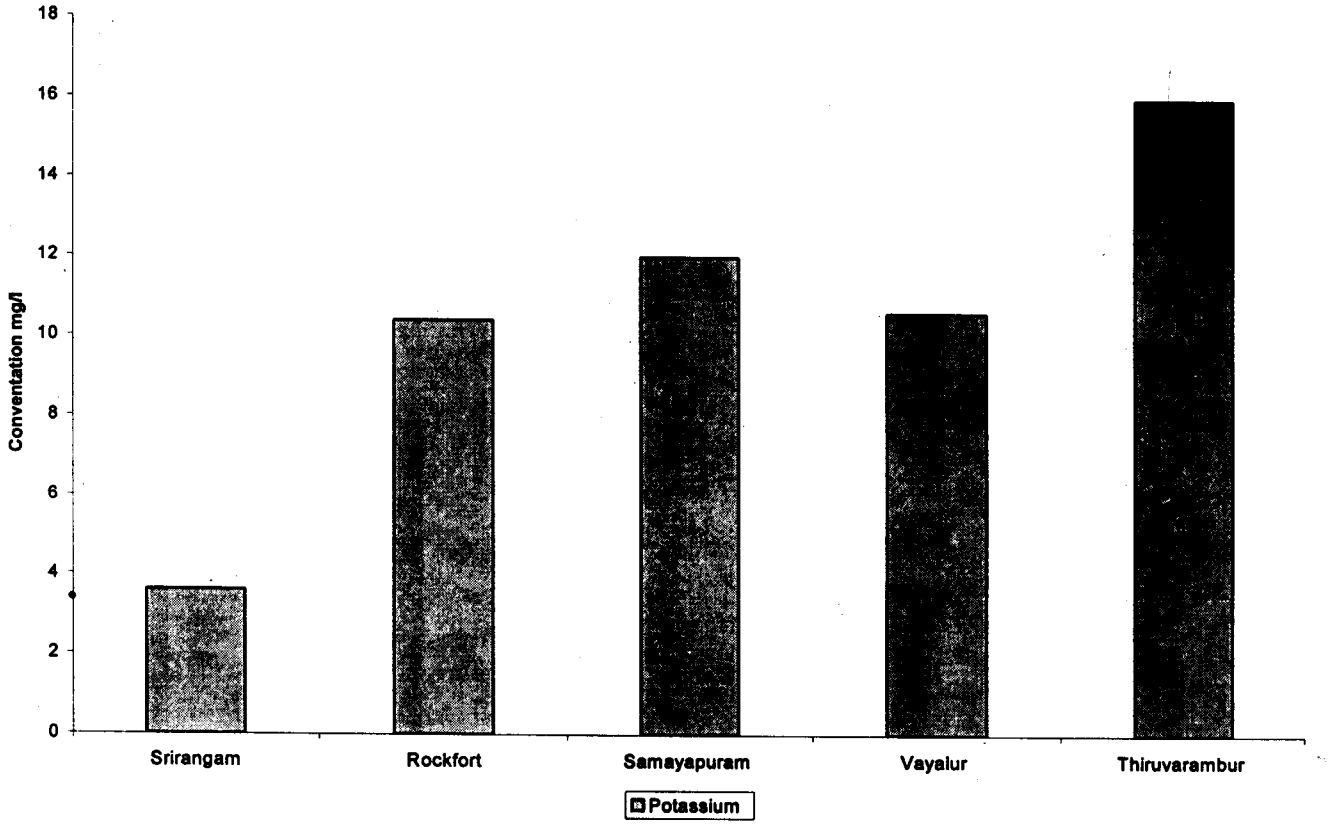

Figure 5. *Potassium content of water collected from temple ponds in Tiruchirappalli*

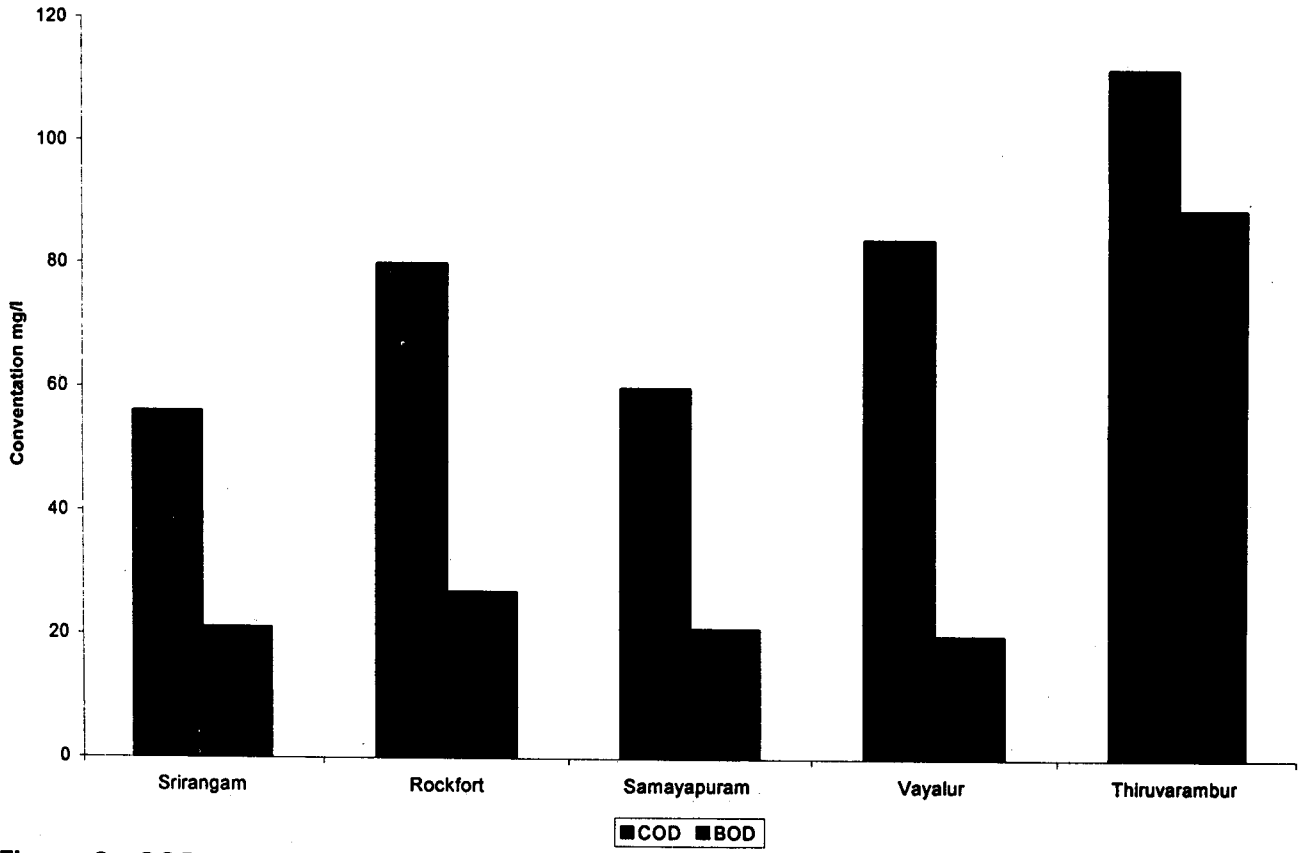

Figure 6. *COD and BOD content of water collected from temple ponds in Tiruchirappalli*

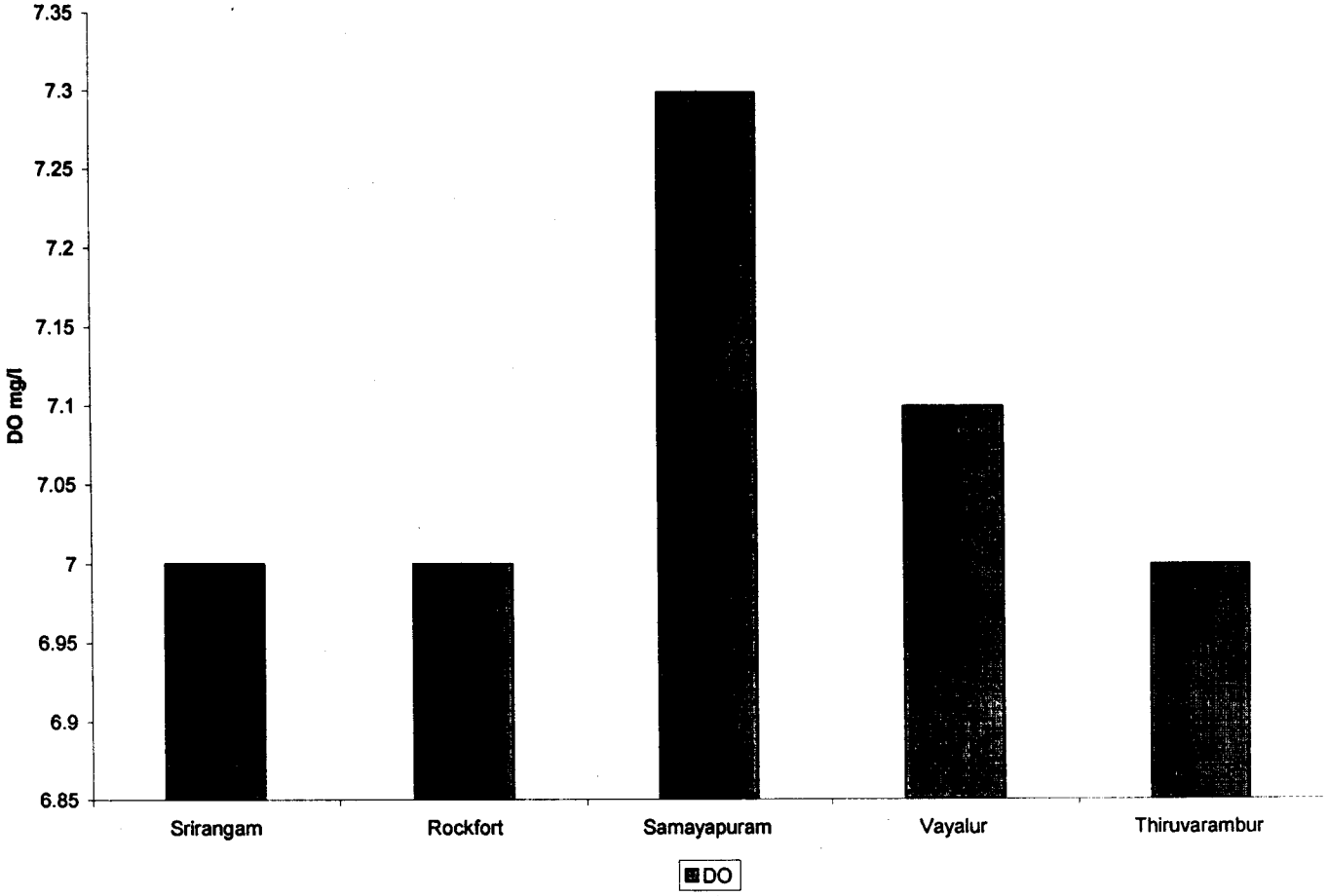

Figure 7. *Dissolve oxygen content of water collected from temple ponds in Tiruchirappalli*

Table 1. *Biological charateristics of water from temple ponds in Tiruchirappalli*

	Srirangam	Rockfort	Samayapuram	Vayalur	Thiruverambur
Phytoplanktons (Dominant)	Oscillatoria and Spirulina	Spirogyra and Anabena	Oscillatoria and Spirogyra	Spirulina	Oscillatoria
Zooplanktons (Dominant)	Zoglea	Cyclops	Nepa	Zoglea	Cyclops
Faccal coliform	Too numerous to count (TNTC)				

hot air ovens in a range or 160-180°C. Great care was taken to avoid external contaminations. The physico-chemical and bacterological characteristics of water sample were assessed as per standard methods (APHA, 1975).

RESULT AND DISCUSSION

The physico-chemical characteristics of water samples of selected temple ponds are presented in figures 1 to 7. Biological characteristics are presented in table 1. The pH is one of the important factors in the water quality management. The pH values ranged between 7.8 to 8.4. Higher pH 8.4 was found in Teppakulam indicating alkaline in nature. The pH value was some what higher in Teppakulam pond. However, pH values of water found all ponds were within the prescribe range. The turbidity gives the water a cloudy appearance (or) shows up as dirty sediment. In all the water samples the tubidity level was extremely high above the permissible limit. It may be due to discharge of 'abishekam water' and/or contamination from other sources. High TDS was

observed in Thiruvarumbur temple (849 mg/L) while low TDS in Samayapuram temple (209 mg/L). TDS exceeded the standards in Vayalur and Thiruvarambur. Water is fed from Uyyakondan Canal to these ponds. Other ponds are fed from Cauvery or Kollidam rivers. Vayalur is situated at the upstream of the Uyyakondan, Thiruvambur is situated at down stream. Uyyakondan canal passes through many villages and Trichirappalli city. There are chances that the canal is polluted along its course resulting in high TDS.

The mean total hardness values in the pond water were between 69 to 234 mg/L. The highest value was noticed in Tiruvarampur temple tank. High alkalinity was found 290 mg/L in water from Teppakulam temple tank. The mean DO content of the temple pond varied between 7.0 to 7.3 mg/L. The DO values were higher in the Samayapuram. The mean COD showed highest value in Thiruvarmabur (112 mg/L) followed by Vayalur (84 mg/L) and the minimum COD (50mg/L) was observed in Srirangam temple tank. The values are very high as compared with the standards. BOD values ranged from (20mg/L) to (89mg/L). It was above the prescribed standards in all the samples. BOD in Thiruvarambur was high (89 mg/L). The high values of COD and BOD indicate the pollution by biodegradable materials. This may be attributed to human activities in and around the pond.

Chloride values ranged from (42 mg/L) to (265 mg/L). Chloride was one of the major anions found in water and are generally combined with calcium magnesium (or) sodium. High choloride content indicates the accumulation of the polluting substances in these tanks. The concentration of sodium ranged from (42 mg/L) to (200 mg/L). The concentration of potassium ranged from (56 mg/L) to (122 mg/L). Potassium is a naturally occurring element. Its concentration, however, is quite a lower than that of sodium. The faecal coliform level was very high in (TNTC). It is very high as compared with the prescribe standards. It can be concluded that the temple tanks are polluted heavily. Pollution is due to the intrusion of sewage with excremental pollutants discharged by warn blooded animals including humans. This indicates that the water from all these temple, ponds is unsafe for drinking and other domestic use.

Planktons

The colour of the water is slightly green. The water contains phytoplanktons, such as anabena, oscillatioria, spirogyra, and zooplanktons, such as cyclops and zoglea, etc.

CONCLUSION

Of all the water samples, water collected from Thiruvarumbur pond was found to be highly polluted while water collected from Srirangam pond was less polluted. Srirangam pond is situated inside the temple premises. This protects the pond from contamination by people and animals from outside. Other ponds are situated just outside the premises and hence there in no protection. People living around these ponds use them for bathing, washing, etc., thereby pollute them. High BOD, COD and TDS values clearly indicate that these ponds are seriously polluted. Thiruvarambur ponds is fed by Uyykondan canal at its extreme downstream Uyykondan canal is polluted by various point and non point sources along its course. As such the water entering the Thiruvarambur ponds is already polluted. In addition, human activities worsen the water further. It is imperative to safeguard these temple ponds from pollution. Stringent measures can be adopted to prevent the humans and other animals from polluting these ponds. Unauthorized entry to these ponds must be prohibited.

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