RESEARCH ARTICLE

WATER QUALITY ANALYSIS OF KANYAKUMARI DISTRICT, TAMILNADU

*Dr. Karthiksaravanan

Department of zoology, Annamalai University, Annamalai Nagar, Chidambaram, Tamil Nadu

ARTICLE INFO	ABSTRACT
	Water samples have collected from different places of Kanyakumari District, Tamilnadu, India and analyzed for different water quality parameters. Effects of municipal sewage, agricultural runoff on the water quality have been examined. The significance of This study entails determination of physical, chemical parameters of water samples. The ground water was originated to be hard forever due to its topographical character. The water was found a little alkaline. The examined values were compared with the standard values to appraise the pollution load. The results exposed that most of the water samples were within the confines in a few features according to the water quality standards.

INTRODUCTION

The ground water quality in the different locations of Kanyakumari District is prejudiced by a range of natural processes and anthropogenic performances. The whole collection of life in water is exaggerated due to pollution in water1. In many areas, wastewater is inclined into the natural water bodies due to their ability to incorporate and dilute the injurious ingredients of the effluents. The trouble of river water quality worsening is mainly due to human actions such as expulsion of industrial and sewage wastes and agricultural runoff which are key root of ecological harm and cause severe health risks succumbs are being affected or vulnerable in numerous cases. This study explores water quality tendency and recognizes the major basis of pollution in the ground water. Physico-chemical distinctiveness of river water influences the biological characteristics and it is sign of the feature of water [3-7]. The intention of the study spot is to evaluate the current water quality in the course of analysis of some preferred water quality parameters like pH, conductivity, TH, TDS, alkalinity etc. In this study, a challenge has been prepared to study the environmental stipulation along the land and forecast the pollution category.

MATERIALS AND METHODS

Water samples have collected from three different parts of Kanyakumari District. These spots are the agriculture based areas in Kanyakumari District.

Corresponding author: **Dr. Karthiksaravanan,**
Department of zoology, Annamalai University, Annamalai Nagar, Chidambaram, Tamil Nadu.

The samples have taken during the period of January 2012 – June 2012. Bore water sample (Nearby [about 300ft] Sewage effluent) - Sample 1, Bore water sample (Faraway [about 1000ft] Sewage effluent) - Sample 2, Municipal Supply water sample - Sample 3. One liter pet bottles were used for the compilation of water samples for different quality parameter studies. Before the sample collection, all the bottles were washed with dilute acid followed by distilled water and before taking water samples, the bottles were rinsed three times with the respective samples. The test bottles were labeled with date. Samples were gathered in the month of January 2012 – June 2012. Chemicals used were of Analar Grade. For the analysis of pH, electrical conductivity, total dissolved solids, alkalinity, chlorides, total hardness, sulphate and organic matter, standard procedures were followed in this study.

RESULTS AND DISCUSSION

Hardness: The WHO precised the total hardness to be within 200-600 ppm of CaCO3. Hardness values of water samples assorted from304.15-364.23 ppm. Permanent hardness values vary from 88.26 to 106.55 ppm. Temporary hardness values diverge from 217.78 to 280 ppm. The pragmatic hardness values of all water samples were within the limits given by WHO, which is fit for drinking purpose and irrigation purpose also.

Temperature: The temperature of water has direct and indirect effects on almost all factors. For example, the amount of oxygen that can be dissolved in water is fairly managed by temperature.

Table 1. Comparision studies

S. No	Parameter	Sample - 1 (ppm)	Sample - 2 (ppm)	Sample - 3 (ppm)
1.	Temperature	28° C	28° C	28° C
2.	Total hardness	364.23	323.18	304.15
3.	Permanent hardness	95.54	82.18	103.25
4.	Temporary hardness	273.22	256.12	214.13
5.	Hydroxide alkalinity	75	50	50
6.	Carbonate alkalinity	0	0	0
7.	Bicarbonate alkalinity	0	0	0
8.	TDS	116	108	101
9.	Dissolved Oxygen	9.65	8.23	8.54
10.	pH	8.1	7.7	7.9
11.	Conductance (μS/cm)	131	123	106
12	Chloride	185.18	113.21	72.14

If, water temperature raise beyond their normal ranges for too elongated, plants and animals in waterways can become hassled and expire. Some of the aspects that influence water temperature are heat swap on the earth surface under restricted radiation in and out. Increases in yearly mean water temperature values of about 1.5ºC, and changes in summer mean temperatures of more than 2º C, would have an brunt on the thermal environments of freshwater faunas (Pockl et al., 2003; Bruce and Franz, 2007). Alkalinity The typical enviable limit of alkalinity in drinking water is 120ppm (WHO, 1984). The highest permissible level is 600ppm. In this study, the average values of alkalinity were within the pleasing limits in all the water samples. The assessment of alkalinity in water affords an idea of natural salts present in water. The source of alkalinity is the minerals which dissolve in water from soil. The different ionic groups that give to alkalinity include bicarbonates, hydroxides, phosphates, borates and organic acids. These features are accountable for the alkalinity of water sources. The sewage, drain water, may direct to increase in alkalinity of surface water in future.

Total dissolved solids: TDS is total solids present in the water. High TDS levels can build water taste like minerals and create it objectionable to drink and source water balance troubles for organisms. Low TDS levels may bind growth of aquatic life. Phytoplankton and floating aquatic plants, for example, totally need the nitrates and phosphates dissolved in the water because they have no origin to take up those nutrients. Total dissolved solids grounds toxicity through enhance in salinity, transforms in the ionic composition of the water and toxicity of individual ions. Increases in salinity have been exposed to cause shifts in biotic communities, limit biodiversity, exclude less-tolerant species and cause acute or chronic effects at specific life stages (Phyllis and Lawr). The total dissolved solids (TDS) in the water samples composed in three different areas assorted from 101-116ppm.

Dissolved oxygen: The dissolved oxygen in water depends on aspects like pressure, temperature, and altitude and chloride concentration. It plays a key task in various metabolic behaviors. Low oxygen content in water is typically connected with organic pollution. The solubility of atmospheric oxygen in fresh water varies from 14.6mgs/L at 00 C to about 7 mgs/L at 350 C at 1 atmosphere pressure. This evidently signifies that the solubility of atmospheric oxygen decrease with increase of temperature. DO is ranged from 8.23 to 9.65 mg/l in the derived samples. In this analysis, the dissolved oxygen of sample 2 is originated to be low when comparing with the other water samples.

pH: pH is indicate that the acidic or alkaline nature of water quality. It is noticeable that the pH value is within the drinkable restrictions as it ranged from 7.7-8.1. Ground water with a pH of 5.5 and below is principally at hazard. The pH of ground water can also be worsted by organic acids from crumbling plant life or the disbanding of sulphide minerals. Low pH level causes aquatic species destroy by stressing animal organism and causing physical harm, which in turn create them more defenseless to disease. It is believed that the temperature of the atmosphere and the animal and plant behaviors, caused by it, has much persuade (Hanya, 1949; Bahadur and Chandra, 1996). In this analysis, the samples are within the permissible range.

Conductivity: The water conductivity (EC) mean values ranged from 138-380 µs cm-1 (Shiddiky, 2002)14. The highest and the lowest values acquired were 106 µS.cm-1 and 131 µS.cm-1, respectively. These designate that the ground water had dissimilar quality in different places. The higher EC Values show the occurrence of higher concentration of dissolved salts in the sample 1 and EC values are a excellent assess of the comparative distinction in water quality between different aquifers make it not suitable for drinking purpose.

Chloride: The permissable boundary of chloride in drinking water have to be 250 ppm (WHO, 1984). The chloride salts in surplus of 100 ppm give brackish taste to water. When united with calcium and magnesium, may enhance the corrosive action of water. In this study, Chloride concentrations were varying from 72.14 to 185.18 ppm. The values of chloride derived in the ground water were within the limit.

Conclusion

The present study illustrates the samples can be used for household purpose. The agricultural run off, urbanization, domestic sewage etc., have not been exaggerated greatly. The landscape may be the one of the cause for hardness and alkaline nature.
Typically the pollution is taking place through soil easily. Since the sample 3 was collected from municipal water supply, the contamination was not much. Among the three the sample 3 was better than the other two. The samples can be used after decontaminate them for drinking water.

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