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Comparision Of Nutrients Concentration In The Pond Water Samples Near Hospital Areas

G.V. Shyla Sree[1]* and B. Indirani[2]

Department of Chemistry, S.T. Hindu College, Nagercoil, Kanyakumari District,
E.mail ID : sreeshyla.gv@gmail.com
Principal, Sree Devi kumari, Women's College, Kuzhithurai, Kanyakumari District

ABSTRACT

The term nutrients in the aquatic system refer to dissolved inorganic substances which are found in low quantities and are utilized by photosynthetic organisms. Nutrients play a major role in the growth of aquatic plants and animals. Nutrients come from a variety of sources. Nutrient pollution, a form of water pollution, refer to contamination by excessive inputs of nutrient. Nutrients come from a variety of sources. Sources of nutrient pollution include surface run off from farm fields, discharge from septic tanks, sewages from hospitals etc., Pet and wild life wastes are also sources of nutrients. Excessive nutrients can lead to more serious problems such as low levels of dissolved oxygen in water. Algal growth can block sunlight that is needed for plants and these causes, lower dissolved oxygen and low sunlight leads to death and decomposition of the algae which further leads to the lowering of dissolved oxygen and kill all the aquatic organisms. Pollution of fresh water occurs due to the four major reasons which are, excess nutrients from sewage, waste from industries, hospital wastes and run off from urban areas. The present paper deals with the amount of nutrients in the pond water samples near hospitals. Pond water samples were collected during premonsoon (March, April, May) and monsoon (June, July, August) seasons. The presence of Calcium, Magnesium, Sodium, Potassium were analysed.

KEYWORDS : Pond water, Nutrients, Sewages, Calcium, Potassium.

***Corresponding author**

Dr.G.V. Shyla Sree

Assistant Professor,

Department of Chemistry, S.T. Hindu College,

Nagercoil, Kanyakumari District,

E.mail ID : sreeshyla.gv@gmail.com

INTRODUCTION:

Plants and animals cannot survive without fresh water, because all the organisms are made up of mostly water. Water quality conditions in a pond are controlled by both natural processes and human influences. Natural factors such as the source of the pond water and the types of rock and soil in the pond water shed will influence the water quality characteristics. More serious water quality problems originate from land uses (or) other activities near (or) in the pond. The survey undertaken on the general limnology of the major ecosystems of India showed that no aquatic are completely free from pollution. (Sreenivasan and Pillay, 1972). The present work involves the analysis of nutrient contents in the pond water samples near Hospital areas. Sample I is collected from a pond in Suchindrum, a panchayat town in Kanyakumari District which is an important Pligrim centre and the site of the famous Thanumalayan temple. The sampling site is a pond and there are two private hospitals nearby. The area is completely surrounded by paddy field. Sample II is Putheri Pond, it is situated in Putheri Village. The construction of an over bridge over the pond is in progress and there is a multispeciality hospital near the sampling site (CBH). The sample III is collected from a pond 8 kms from Nagercoil town. The nearest village is Aloor, which is at 4 kms from Chunkankadai. The water from this pond has been used for bathing, washing clothes and animal washing. There are three hospitals near by sampling site (Neuro Hospital and two Ortho Hospitals).

EXPERIMENTAL SECTION :

Regular monthly collections of the samples were made. The amount of nutrients were analysed as per the standard methods described in APHA (1995). The amount of calcium and magnesium in water samples were determined by titrating a definite quantity of water sample against 0.01m EDTA solution in the presence of ammonia buffer using Eriochrome Black - T as indicator. The amount of calcium alone in water samples was determined by titrating a definite quantity of water sample against 0.01m EDTA solution in presence of 8% NaOH solution using muroxide as

indicator. The difference between these two values corresponded to the amount of magnesium in water samples.

Sodium and Potassium were estimated by Flame Photometric method. The flame photometer was standardized using the standard Na/k solution of 100(mg/*l*) and adjusted the flame photometer reading to 100. In order to determine Sodium concentration, filter 589(nm) was used and for potassium filter 769(nm) was used. The intensity of emission is directly proportional to its concentration in the sample.

RESULTS AND DISCUSSION:

Table 1 : Concentration of calcium (mg/l)

Months	I	II	III
March	37	24	16
April	34	19	21
May	32	27	16
June	22	16	13
July	9	11	2
August	22	16	13

Table 2 : Concentration of magnesium (mg/l)

Months	I	II	III
March	37	19	13
April	30	27	3
May	42	6	5
June	13	6	6
July	35	2	6
August	6	15	5

Table 3 : Concentration of sodium (mg/l)

Months	I	II	III
March	37	19	13
April	30	27	13
May	11	25	13
June	27	19	21
July	5	10	2
August	39	42	16

Table 4 : Concentration of potassium

Months	I	II	III
March	6	2	3
April	6	5	3
May	13	3	3
June	2	1	1
July	0.71	1	1.76
August	5	5	2

In the present study, high values of calcium, magnesium were recorded during the premonsoon and low values were recorded during the post monsoon seasons. These finding coincide with the findings of FAO (1975) . The high content during the premonsoon might be due to evaporation and lack of rain and low value during the monsoon and post monsoon seasons might be due to dilution. In both the cases there was depletion in concentration during the monsoon and post monsoon seasons. This is matched with the findings of B.R.Kiran *et.al.*, (2007). The slightly higher values of calcium and magnesium in sample (11) is due to construction work of over bridge over the pond and also due to mixing of hospital sewages.

In the present study the sodium, potassium contents are within the permissible limits as recommended by WHO (1984). In the present study minimum concentration of sodium was recorded during the monsoon season and high value was recorded in the post monsoon. These agreed with the findings of Ramani *et.al.*, (2012). The higher values of sodium and potassium in sample (1) is due to the Agricultural run off from the nearby paddy fields and also due to the mixing of hospital sewages from the nearby hospitals. The results were shown in the following tables (1, 2, 3, 4).

CONCLUSION:

Analysis of the water samples revealed that they are polluted by the wastages from hospitals, mixing of fertilizers, mixing of human and animal wastes etc.

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