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Water Quality Analysis and Treatment of Contamination Water by Eco Clean Solution in Noyyal River Basin

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ABSTRACT: The Noyyal River is a significant river in the Indian state of Tamil Nadu. It is a tributary of the Kaveri River, one of the major rivers in southern India. Nowadays, The Noyyal River has faced severe pollution problems, primarily due to the discharge of untreated or inadequately treated industrial effluents. These paper aims to evaluate the analysis of water quality parameter and treating the water in noyyal river for the acceptable usage of water for our domestic purposes. The major water quality parameter (i.e., Physico-chemical properties) which need to be identify are Total Dissolved Solids, Total Suspended Solids, Determination of pH, Determination of chloride content, Conductivity, Determination of sulphate content, Turbidity, Iron content, Manganese content. The main objective of this study is to treat the water by Eco clean method. The Eco-clean is nothing but the reagent used to treat the water which was mixed by the pollutant, it was very capable to absorb the pollutant. This method is environmental friendly method because the reagent is made only by the plants not used by the chemicals. Hence it is considered as environmental friendly process. The treated water which was obtained using the eco clean method is acceptable usage of water for our domestic purposes.

KEYWORDS: Noyyal River, Water Quality Parameters, Eco clean.

I. INTRODUCTION

Water quality is a measure of the condition of water relative to the needs of living organisms and the environment. It can be assessed based on various factors including- Chemical Parameters: Concentrations of substances like chlorine, lead, nitrates, and heavy metals. Physical Parameters: Turbidity, color, odor, temperature, and the presence of floating debris. Biological Parameters: Presence of microorganisms such as bacteria, viruses, and algae. pH Level: Measures how acidic or alkaline the water is, which can affect the solubility of nutrients and contaminants.

Maintaining good water quality is crucial for health, environmental sustainability, and economic reasons. Contaminated water can lead to health problems, impact ecosystems, and require costly treatment processes.

In addition to these we also need to discuss about the Eco clean,

Eco clean refers to a brand or concept related to environmentally friendly cleaning products and solutions. These products are designed to be effective at cleaning while minimizing their impact on the environment. The focus is typically on reducing harmful chemicals, promoting sustainability, and often using biodegradable or non-toxic ingredients.

Key aspects of Eco clean products are, Biodegradable Ingredients: Components that break down naturally without leaving harmful residues. Non-Toxic Formulas: Avoidance of chemicals that can cause health issues or environmental damage. Reduced Environmental Impact: Formulas and processes designed to minimize energy use and pollution.



II. WORKING PROCEDURE

Samples were collected from the polluted area in noyyal river water and the water samples are taken to test the physical, chemical, biological characteristics. The major tests taken are Total suspended solids, Total dissolved solids, ph value, Conductivity, Turbidity, Chloride content, Sulphate content, Iron content, Manganese content. The appropriate procedures are made to found the values of tests. The tested values are noted for future comparison of treated water samples.

III. METHODOLOGY AND EXPERIMENTAL SET UP

Eco clean 2300 is a combination of Azadirachta indica (Neem)-Antibacterial disinfectant with coagulative properties, Moringa olifera (Drumstick)-Flocculant and turbidity reducer, Strychnos potatorum (Cleaning nut)- Flocculant and turbidity booster and Occimum sanctum (Tulasi)- Disinfectant and oxygenator. Acceptable usage of eco clean is 40 to 50 ppm dosing in 1 litre of sewage water gives the treated clean water. 500 ml of untreated water are taken in a beaker and 20 ppm of single drop of eco clean 2300 are added to these. Both the water and the reagent are mixed thoroughly. The flocculation starts, it is nothing but the separation of suspended solids from the water. Solid wastes get separated and settled at the bottom of the beaker. The reagent doesn't induces the flocculation and also disinfectant the water. The treated water is then clean and it was free from the impurities. The untreated water is changed into the acceptable usage of treated water for our domestic purposes.

IV. EXPERIMENTAL RESULTS

The untreated sample test values are compared with the treated water with eco clean solution, The U.S. Environmental Protection Agency (EPA) suggests that TSS levels should generally be below 30 mg/L for water bodies to support aquatic life, The untreated water samples TSS can be measured as 35 mg/L which is mainly due to the industrial effluents containing the solid wastes and when treated with the eco clean solution the TSS values are found to be 29 mg/L within the limit of 30 mg/L.

The permissible limit for TDS in river water is between 500- 2000mg/l. The untreated water TDS is found to be 1245 mg/l and by treating with eco clean solution we have achieved the limit that is 960 mg/l which both are within the limit. The permissible limit for pH in river water is between 6.5 to 8.5. The untreated water pH is found to be 7.32 and by treating with eco clean solution we have achieved the value that is 6.75.

For most natural river systems, conductivity levels typically range between 50 and 500 ($\mu\text{S}/\text{cm}$). This range generally reflects a healthy balance of dissolved ions and minerals. The untreated water conductivity value is found to be 2463 $\mu\text{S}/\text{cm}$ and by treating with eco clean solution we have achieved the value that is 2145 $\mu\text{S}/\text{cm}$ which is not within the limit but by using the eco clean solution the value we obtained gets decreased.

As per the WHO guidelines suggest that turbidity levels in drinking water should not exceed 5 NTU. The untreated water turbidity level is found to be 4.5 NTU and by treating with eco clean solution we have achieved the value that is 3.5 NTU which both are within the limit as WHO guidelines.

The desirable limit for Chlorides for the river water is between 250-1000mg/l. The Untreated water chlorides test value is 440mg/l and the Eco clean treated water chlorides is 360 mg/l which both are within the desirable limit.

The desirable limit for Sulphate content for the river water is between 200-400mg/l. The Untreated water sulphate content test value is 47 mg/l and the Eco clean treated water gives the sulphate content is 56 mg/l which both are within the desirable limit.

Iron levels in river water should be kept below 0.3 to 1.0 mg/l to avoid significant impacts on water quality and aesthetics. The Untreated water iron content test value is 3.4 mg/l and the Eco clean treated water gives the iron content value is 2.3 mg/l when used with the eco clean solution the values gets decreased.

Manganese is a naturally occurring element in water, and typical concentrations can range from 0.01 to 0.5 mg/L. Higher levels may be present due to geological conditions or contamination. The Untreated water Manganese content test value is 1.3 mg/l and the Eco clean treated water gives the manganese content is 0.7 mg/l which are nearly within the desirable limit.

Comparison of water quality parameters of untreated water with treated water by eco clean solution,

S.NO	PARAMETERS	PERMISSIBLE LIMIT	UNTREATED WATER	TREATED WATER
1	Total Suspended Solids	< 30 mg/L	35 mg/L	29 mg/L
2	Total Dissolved Solids	500- 2000mg/l	1245 mg/l	960 mg/l
3	pH	6.5 to 8.5	7.32	6.75
4	Conductivity	50 and 500 µS/cm	2463 µS/cm	2145 µS/cm
5	Turbidity	< OR = 5 NTU	4.5 NTU	3.5 NTU
6	Chloride Content	250-1000mg/l	440mg/l	360 mg/l
7	Sulphate Content	200-400mg/l	47 mg/l	56 mg/l
8	Iron Content	0.3 to 1.0 mg/l	3.4 mg/l	2.3 mg/l
9	Manganese Content	0.01 to 0.5 mg/L	1.3 mg/l	0.7 mg/l

V. CONCLUSION

From the test values, we found that the river water is being polluted due to the industrial effluents and residential or human activities and it is not within the permissible limit which was prescribed by WHO and other standards. When treating with the eco clean solution, the data which was obtained are nearly to the prescribed permissible limit by WHO and other standards. And some of the values are within the permissible limit. Even though, some of the parameter are not within the permissible limit it was more capable to use for domestic or agriculture purposes and not suitable for the drinking purposes. By using the eco clean solution we enhance sustainability and reduce the environmental impact of wastewater treatment while maintaining effective pollution control.

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