

Physico–Chemical Study of Waste Water from Malad, Gorai (Borivali) Rivulets

Sonawane Bhushan B.¹ Dr.P.N.Nemade²

¹Research Scholar ⁴Professor

^{1,2}JJT University, Rajasthan, India

Abstract— Various problems are creating owing to high population rate, of them production of waste water is one of the major problem. Water with waste is called sewage, which appear in the form of solid suspension. Waste water is the constitution of organic, inorganic pollutants, bacteria. Domestic waste from nearby hotels and house kitchen waste transfer to Gorai and Malad creek through different rivulet. In Malad area there is huge slum area where different small scale industries are situated, also there is an Ajanta pharmaceutical Industry is situated from where they transfer waste into Malad creek through a big rivulet. Waste water sample is collected from this outlet twice within the month and various parameters were checked and water sample passed through a coconut charcoal which is made by heating raw coconut shell to burn to form coal, this coal is passed through hot water to form more pores to coal sample. Water sample collected in three different seasons monsoon, premonsoon and post monsoon. Water sample passed through this coconut coal sample and the parameter were checked of the effluent ,the difference between reading of influent and effluent were checked and effluent parameter were tally with standard drinking water parameters and the water was initially tried for aquatic growth and gardening purpose. The parameters like temp, pH, turbidity, total hardness, TDS,COD, BOD, Chloride, Phosphate, Total solid ,DO ,sulphate etc. Parameters were checked as per BIS and WHO. The aim of the research work is to reuse our own waste by using various membranes by a very simple technique so that everyone can do it on personal level with very little cost.

Key words: Gorai, Malad domestic waste water, Quality parameters, BOD, COD, BIS, WHO

I. INTRODUCTION

As a whole, water is the most vital and precious naturally occurring resources not only for human being but also to the whole living community of the earth. By the blessing of God we are cherished by as courage, scientific, intellect, and attitude, hence one should take a benefit of water properly. Water exploitation and careless growth of industrialization and population growth are a few reason of uncountable which can blamed for this intolerable menace of the civilization. The water which is passed into sea water through these two rivulet is not 100 % dirty water ,if we give simple basic treatments then that water is recycled and can again reused for regular routine. The water from these two rivulet is collected and analyzed for various parameters, it is then treated by simple coconut charcoal and analyzed for above parameters and by knowing the difference in reading it was concluded that either the effluent can be used again for various human application.

II. MATERIALS AND METHODS

These two rivulets are situated in Gorai , Borivali (w) and near Atharva Engineering college ,Malad (w) ,India, Maharashtra. The samples were collected from different distance from July 2015 to Dec 2015 for their quality analysis. Waste Water pH and temperature were recorded at the time of collection of samples i.e. on the spot and other physico-chemical characteristics of the waste water samples were carried out by the methods suggested by APHA (4). The averages of the values of different parameters during different season were recorded. The waste water is collected into sterilized polythene bottles and was filtered through coconut charcoal, the waste water is transfer through three different sized coconut char powder and also from xylem membrane and the water is analyzed for different parameters again .

Second material for filtration was used is sap wood (xylem filter)





Fig. 1: Actual photograph of coconut charcoal preparation

III. RESULT AND DISCUSSION

The analysis of different physico-chemical parameters of waste water samples of different sources viz Malad (west) Rivulet and Borivali (west) Rivulet are recorded in table given below. The average temperature of different water samples ranges from 20.4°C to 35°C. The temperature of waste water was found to be maximum in summer and minimum in winter in all the samples. The pH value of different water samples ranged from 6.5 to 7.0. There is an influence of temperature on pH but the other parameters also play a vital role in pH determination in addition to temperature. The variation in turbidity ranges from 3.0 NTU to 3.33 NTU in different sampling stations. The differences in water turbidity values differ significantly in different seasons, in monsoon water are more turbid influenced by the continuous addition of the different pollutant to the waste water.

Sr.No	Parameter	July-Aug 2015	Sept-Oct -2015	Nov-Dec-2015
		Influent/ Effluent	Influent/Effluent	Influent/Effluent
1	Temperature (°c)	32/33	29.4/29.4	20.4/20.5
2	pH	6.91/6.59	6.91/6.59	6.91/6.59
3	Turbidity (NTU)	3.2/3.0	3.3/3.1	3.1/3.00
4	Colour(hazen unit)	6/2	6/3	6/2
5	Total hardness (mg/l)	90/50	92/51.5	91/51
6	Total dissolved solids(mg/l)	355/351	355/353.4	356.7/355
7	Chloride (mg/l)	50/50	51/49	53/48
8	Sulphate (mg/l)	50/49	53.2/49.2	51/50
9	Dissolved Oxygen	6.70/6.5	6.82/6.1	7.0/6.9
10	Biochemical Oxygen demand(mg/l)	13/8	12.08/6	12.14/6
11	Chemical oxygen demand (mg/l)	40/7	45.6/8	48.6/9
12	Total Bacteria Count	10 ⁴ /10 ³	10 ⁵ /10 ²	10 ⁵ /10 ²
13	Escherichia Coli	Present/Absent	Present/Absent	Present/Absent

Table 1: Showing result of Influent and Effluent after filtration through membranes.

The result shows that the hardness calculated in different seasons ranged 50.00 to 92.00 mg/L in different sampling stations also due to continuous application of pollutant while the total dissolved solid recorded in different seasons ranged from 353.00 to 355.00 mg/L in different sampling stations. The differences in water TDS Values differ significantly in different period of summer, rainy and winter seasons (5).

The concentration of Chloride recorded in different Sodium value found in the range of 48 to 53mg/l, Sulphate 49.00 to 53.2 mg/l and Iron 0.3 to 0.6mg/L in different sampling stations the difference in value is due to addition of pollutant and seasonal variation (6).

Present study shows that the dissolved oxygen varied from 6.1 to 7.0 mg/l in different sampling stations of Malad and Borivali. A very little increase in the amount of the dissolved oxygen is observed in monsoon as compared to pre-monsoon (7). The Biochemical oxygen demand (BOD) varied from 6 to 13mg/L in different water samples. BOD is a measure of the amount of oxygen that bacteria consume while decomposing organic matter under aerobic conditions, thus in summer due to heavy load of pollution it was less. The result shows that the chemical oxygen demand (COD) recorded in different sampling stations. The difference in COD values is recorded as 7.0 to 48.6 mg/L.

The findings of this work indicate that water of this area is highly contaminated, the water is so hard, harmful to the human health and beyond permissible limit. It is concluded that the water quality is deteriorated which may be due to abiotic as well as biotic reasons. The problems associated with water pollution have the capabilities to disrupt life to a great extent. Therefore, the industrial waste and use of pesticides etc. Should be treated before disposal.

IV. CONCLUSION

The waste water from different sources is thrown into rivulets, instead of thinking the problem of water scarcity we should save water and try to reuse it. As this type of water cannot be used directly for society so by using simple membranes water can be filtered and can be recycled at the lowest cost so that every common man can filter and save it and indirectly contribute his help to save environment.

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