



Sustainable Treatment of Tannery Waste Water By Effective Microorganism (Em) Technology.



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A B S T R A C T

Tanning is major small scale industries in India. Tanning industries require large volume of water in the various tanning processes. Waste water, generated is enrich in suspended, dissolved, impurities and toxic chemicals. If it is not treated before discharg to open land or onto surface water, it will eventually cause serious environmental pollution. With the aim to combat pollution the use of Effective Microorganism (E.M.) is suggested. Tannery waste water was collected from different regions of Mumbai, India,. It was treated with Effective Microorganism - Bokashi and incubated at room temperature for 1 and 2 weeks. The solutions were utilized for estimations of PH, total solids (TS), total suspended Solids (TSS), total dissolved Solids (TDS) and Chlorides. The observable trend was observed from the results after completion of EM- applications. There was appreciable reduction in the values of H, TS, TSS, TDS and Chloride extent. Therefore this technique can be recommended for the treatment of various different types of waste water at the local area so that it will reduce the burden on municipalities or concerned system or liquid waste treatment.

Keywords : Liquid waste treatment, Tannaries waste water treatment Applications of Effective microorganism.

Introduction :

The economic development of 21st Century mainly involved the improvement in lifestyle of human being for their present as well for future. With this object man, instead of living in tune with nature by protecting himself and his environment, is out to destroy the very sustenance of life of soil, water, flora and diversified ecosystem. The quantity of waste generated due to industrialization pose a major problem for worldwide municipalities for its proper and adequate treatment, so that its final disposal should not cause environmental pollution. However sluge exhibits wide variations in the physical, chemical and biological properties^{2,3}.

Number of biological and chemical technologies are currently being used to dispose off the said wastes like landfill. For the treatment of waste waster activated sludge, trickling filter, lagooning, bioreactor etc., are used. But most of these techniques are costly and required a land for operational purpose. Therefore it is necessary to use such a method, which can convert waste into reusable by-product. One of these new technologies being proposed is the use of "Effective Microorganism" (EM)⁴.

Tanning is major small scale industries in India. With the increasing demand for leather and leather products, both for indigenous use as well as for export, large number of vegetables and chrome tanneries have mushroomed in India. Tanning industries require large volume of water in the various tanning processes⁵. Waste water generated is characterize by, it is rich in suspended, dissolved impurities and toxic chemicals. It is discharged either to open land or onto surface water. If it is not treated before discharge, it

will eventually cause serious enviornmetnal pollution⁶. In order to control the pollution it is important to treat the tannery waste water by sustainable and eco friendly method. Thus with the aim to combat pollution, the use of EM, is suggested to tannary waste water.

Experimental:

Tannery waste water was collected from different regions of Mumbai, like Dharavi, Thane, etc. Effective Organism (EM), is mixture of groups of humans, animals and the natural environment. Effective organism (EM) solution was purchased from Mapple Orgtech (India) Ltd., Pune. The solution was activated and Bokashi (Fermented organic Matter) was prepared. The Bokashi - EM was mixed with black jaggery and Zeolite, liquid waste obtained form tannery industries was treated with Bokashi - EM. PH, Total Solids (TS), Total Suspended Solids (TSS), Total Dissolved Solids (TDS) and chloride, were estimated^{8,9,10} before and after the treatment of EM-Bokashi. Before treatment the waste water was utilized for the estimation of PH, TS, TSS, TDS and Chloride. The waste water was treated with EM-Bokashi (1g) and incubated at room temperature. The solutions were label as control, test 1, test 2 and test 3. After incubation for 1 and 2 weeks, the solutions were utilised for estimation of PH, TS, TSS, TDS and Chloride.

Results :

The observable trend was observed from the results after completion of the EM application on tannery liquid waste. General characteristics of treated and untreated tannery waste water such as PH, total solids, total dissolved solids, total suspended solids and chloride content are summarized in Table 1 and Table 2.

Table 1 Analysis of treated and untreated waste water sample after 1 week

	Initial	Control	Test 1	Test 2	Test 3
PH	7.8	7.7	7.4	7.3	7.4
TSg/lit	9.06	8.20	4.68	4.64	4.56
TDS g/lit	6.76	5.98	3.40	3.37	3.30
TSS g/lit	2.31	2.21	1.28	1.26	1.25
Chloride g/lit	11771.72	10849.84	5673.12	6169.52	5885.866

Table 2 Analysis of treated and untreated waste water sample after 2 weeks

	Initial	Control	Test 1	Test 2	Test 3
PH	7.8	7.5	7.1	7.2	7.1
TS g/lit	9.06	4.13	2.57	2.56	2.61
TDS g/lit	6.76	3.36	1.52	1.52	1.56
TSS g/lit	2.31	1.11	1.05	1.04	1.05
Chloride g/lit	11771.72	8722.42	3545.70	3758.44	3545.60

Conclusion :

The present study was undertaken to determine the use of Effective Microorganism Technology for the treatment of tannery waste water, The parameters like PH, Total Solids, Total Dissolved Solids, Total Suspended Solids and Chlorides were estimated before and after the treatment of waste water, to observe the efficiency of selected process. There was appreciable reduction in the above mentioned values which has been observed by other studies 4, 8, 11-14, supported the theory for the use of EM technology for tannery liquid waste management

Waste water generated by tanneries is characterized by suspended, dissolved impurities and toxic chemicals like chlorides, if it is not treated before dis-

charge to either open land or onto surface water, it will eventually cause serious environmental pollution. Hence the best strategies could be to collect and treat the waste at local level and then subject to disposal. With this approach, use of EM-Technology and problem of waste generation not only solves but the treated waste water can be utilized for agriculture practices.

Use of EM-Technology for the treatment of tannery waste water indicated observable decrease in PH, Total Solids, Total Dissolved Solids, Total Suspended Solids and Chlorides, approximately to tolerable environmental standard. Therefore this technique can be recommended for the treatment of various different types of waste water at the local area so that it will reduce the burden on municipalities or system for liquid waste treatment.

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