A CASE STUDY OF PHYSICO-CHEMICAL AND BACTERIOLOGICAL CHARACTERS OF THE DESICCATED COCONUT MILL EFFLUENT.

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ABSTRACT

Desiccated coconut industry is one of the major exporting industries in Sri Lanka. This industry generates a liquid waste with a high degree of complex organic matter including oil and grease.

Due to adverse impacts on the quality of surface as well as ground water by these liquid waste and because of the enforcement of industrial waste water standards implemented by the Sri Lankan government, Desiccated coconut (DC) industries are now being forced to discharge waste water according to the standards for discharge of industrial effluent into inland surface waters.

This study was carried out on the samples that were collected over a period of 10 months commencing from 05.08.1996 to 08.05.1997. Samples were collected from five locations of the DC liquid waste drain. For bacteriological studies samples were collected from another two DC industries other than the above collected samples. The samples were analysed for Physico chemical parameters such as pH, Electrical conductivity (EC), Dissolved Oxygen (DO), temperature, turbidity, BOD, COD, Nitrogen as NO_3, Phosphorous as Po_4 and oil content. The total aerobic plate count was carried out as microbiological enumeration parameter.

In addition to the above ,the study extended to isolate and to identify the bacterial flora present in the DC effluent. These results initiated the final part of the study. That was to find the lipolytic activity of the isolated bacteria and the effctivness of them on the effluent when they were introduced to the effluent. Among identified bacteria ***Pseudomonas areuginosa***, ***Bacillus subtilis***, ***Bacillus megaterium*** and ***bacillus mycoides*** were the selected bacteria as most efficient lipolytic bacteria. Combination of ***Pseudomonas areuginosa***, ***Bacillus megaterium*** and ***Bacillus mycoides*** have appeared as the most effective population on decomposition of Desiccated coconut waste water according to the measurements of BOD and COD in Desiccated coconut effluent.

During this investigation an industrial audit focus specially with respect to desiccated coconut liquid waste was performed. It produced important information on Desiccated coconut waste minimization and end of pipe waste water treatment which is useful to upgrade the industry as well as to conserve the environment through source identification, Cause evaluation and option generation.

In the desiccated coconut industry they consume highly chlorinated water for washing the coconut pieces and without recycling it is discharged as waste water. Coconut water is the other main liquid waste which also can be used as a raw material for other products. Through the audit focus it is found that by taking certain measures the waste could be minimised during the process and by utilizing coconut water directly to irrigate or to produce other products. Taking measures to separate coconut water from washing water and to avoid mixing, introducing cream traps and screeners and high pressure water jets to hoses, dechlorinating the washing water at the end of process can be mentioned as main options. Therefore, after taking measures to minimize waste during the process and treat effluent with such selected bacteria in trained and Bioaugmented manner the degradation may be accelerated and an effective economical treatment system can be developed.