309/C

Reduction of pollutants in wastewater of cold soaking paddy at small scale rice mills in Sri Lanka

T P Liyanage and B C Liyanage*

Department of Civil Engineering, The Open University of Sri Lanka.

Rice is the most valuable and largely harvested grain throughout the world. The demand for rice is increasing day by day with the growth of population all over the world. However, there is severe environmental pollution of inland water bodies in Sri Lanka due to discharging of untreated wastewater of rice mills. Hot soaking and cold soaking is mainly under parboiling methods. However, the wet process is important because it produces nutrient rich rice.

Wastewater with high COD (>500 mg/l) generated in soaking process of paddy directly discharges into the inland water bodies. The continuous discharge of COD is causing water pollution of surface water at alarming levels. Though there are advanced treatment methods, due to high capital and operational cost small scale millers are unable to use those methods. Therefore, it is an essential to introduce a simple treatment method for rice mill effluent for small scale mills.

In this study, amount of pollutants of paddy soak water in parboiling was studied. Aerobic and anaerobic digesters were used for experimental work with different experimental conditions (batch and continuous systems). Also COD variation with the soaking time was studied and it is noted when soaking time increases, COD has increased rapidly. Both batch and continuous experiment were conducted under aerobic and anaerobic conditions after introducing a microbial source using lab scale aerobic digester and anaerobic digester. COD, DO and pH variation, with time were recorded. Average COD reduction with time at aerobic digestion was about 80%, and the final COD was around 100mg/l which is lower than the permissible level (i.e., 250mg/l) to discharge into inland water bodies. At anaerobic conditions, COD reduction at batch test within four days is about 28.9% and at continuous flow test within one day is 7.7%.

The results of this study revealed that the aerobic digestion is the most suitable simple treatment method for treating the rice mill effluent to reduce the COD amount. Continuous flow system with aeration is more effective compared to the batch system, which can be easily implemented coupling with a maturation pond before discharging into the inland surface waters.

bcliy@ou.ac.lk Tel: 0777577321