



A COMPREHENSIVE EVALUATION OF OXYGEN DYNAMICS AND PADDY HYDRATION DURING CONVENTIONAL SOAKING OF PADDY PARBOILING PROCESS

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Paddy parboiling is very popular in Sri Lanka as rice is considered to be a staple food. However, it generates significant amount of effluent with higher BOD values, resulting in significant environmental pollution. The information about DO profile, grain hydration and quality of soaking water of paddy parboiling is very limited and needs to be scientifically explored. Hence, an attempt was developed to investigate DO profile of soaking water of paddy parboiling in order to propose a viable strategy for reducing effluent quantity and strength in terms of BOD for the environmental sustainability. A column experiment was conducted with long paddy grains using conventional soaking concept for a period of 48 hours. The DO profile, TDS, TS, EC, pH and BOD of soaking water were measured using standard procedures and equations along with hydration profile of paddy grain during soaking. Results revealed that paddy grains reached 30 % moisture content (wb) after 48 hours of soaking and a rate of moisture absorption was higher during first 24 hours. The DO concentration drops to 0.89 mg/L from 7.91 mg/L during the 48 hours of soaking. The changes in TDS, TS and EC had an increasing trend with soaking time and the pH and DO decreased with soaking time. This comprehensive study therefore is highly useful for researchers and industrial people for proposing viable option to mitigate effluent generation and improve paddy hydration during the soaking process of paddy parboiling for the environmental sustainability.

Keywords: Cold water; Dissolved oxygen profile; Evaluation; Paddy parboiling; Pollution