

ABSTRACT

Food loss/waste has been a problem and worrying issue growing at an alarming rate in many parts of the world, including the developing country, Malaysia. Amongst food waste, fruits and vegetables are wasted at the highest rate. This problem emerges because of many factors, the most significant of which is human consumption behavior. Food waste poses a great threat to the ecosystem because of its high biodegradability, leading to a significant release of methane and other greenhouse gasses dangerous to the environment. As the world progresses towards sustainable development, a more efficient waste management system should be implemented to treat FVW sustainably by generating eco-enzymes. Based on previous studies in which phenotypic characterisation was done on the microorganisms isolated from FVW eco-enzyme, a rich and diverse community of many microbial genera has been identified. Based on the findings, yeast and lactic-acid bacteria have been concluded to be among two of the most effective microorganisms to treat other sustainability issues by producing their eco-enzyme, one of which is wastewater treatment.. Through this study, yeast and lactic-acid bacteria were identified from FVW eco-enzyme samples using growth on specific agar and staining, and the eco-enzyme mixture was used to treat synthetic wastewater. The eco-enzymes were fermented at three different timings, namely 1 year, 3 weeks, and 3 days to see how long the fermentation should take place for the most effective microorganisms to grow and treat wastewater. Upon treatment, the eco-enzyme harvested after 3 weeks produced the best results as it was able to reduce the most concentrations of chemicals in the synthetic wastewater. Notably, the eco-enzyme also has the most diverse microbial community, which might have an effect towards its degradation ability. Based on the overall results of the research, eco-enzyme has proven to be able to treat synthetic Malaysian wastewater effectively.

Keywords: Eco-enzyme, Food Waste, Lactic Acid Bacteria, , Wastewater Treatment , Yeast