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Microalgae acclimation and selection for food processing wastewater treatment

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Microalgae are promising source for biodiesel production and wastewater treatment. The purpose of this study was to select microalgae species that can efficiently treat food processing wastewater and accumulate biomass for biodiesel production. Seven microalga species were screened and finally three species and combination of two of them were acclimatized to help them adapt to the nutrient rich food processing wastewater. Results showed that acclimatized microalgae showed better growth in wastewater. And combination of Chlorella protothecoides and Scenedesmus obliquus removed 89.5% chemical oxygen demand (COD), 86.2% total phosphorus and 48.5% total nitrogen. Scenedesmus obliquus and the combination of Chlamydomonas reinhardtii and Scenedesmus obliquus achieved the highest biomass accumulation (1.91 g/L and 1.82 g/L respectively). The strains evaluated in this study were able to stand high levels of COD (>5,000 mg/L) and coexist with bacteria naturally present in wastewater. The algae/bacteria synergy improved the removal of total nitrogen and total phosphorus and accelerate the rate of COD removal.

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