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Improved microbial oil production from oil palm empty fruit bunch by Mucor plumbeus (Article)

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Abstract

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This study investigated the effect of cultivation parameters on microbial oil production from hydrolysate of oil palm empty fruit bunch (EFB) using fungus Mucor plumbeus. The parameters selected for evaluation were sugar concentration (30–100 g/L), yeast extract concentration (0–13.3%, g yeast extract/g sugar), pH (5–7) and spore concentration (4.3–6.3, log spore number/mL medium). Response surface methodology was used to optimise the cultivation conditions which were based on the oil concentration and oil yield. Sugar concentration was the most influential parameter that affected oil concentration. However, the cultivation at high sugar concentration (~100 g/L) also resulted in ethanol accumulation. The optimum condition for oil yield was found at 30 g/L sugar, 0 g/L yeast extract and pH 5.0. Cultivation in 1 L bioreactor under the optimum conditions resulted in ~1.8-fold increase in oil yield compared to the shake-flask cultivation. Microbial oil produced from EFB hydrolysate has the potential to be used as the feedstock for biodiesel production from non-food feedstock, with cheaper cost of biodiesel production in comparison to glucose-derived microbial oil. © 2017

Reaxys Database Information

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Author keywords

Biodiesel Empty fruit bunch Lignocellulose Lipid Microbial oil Palm oil

Indexed keywords

Engineering controlled terms: Biodiesel Cultivation Feedstocks Fruits Lipids Oils and fats Palm oil Yeast

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