The prospect of microbial oil production and applications from oil palm biomass

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Abstract

Biomass wastes from oil palm production have the potential to be converted into high value bioproducts. Oil palm biomass (OPB) includes empty fruit bunch, mesocarp fibre, palm shell kernel, oil palm fronds and trunks. The production of microbial oils from OPB can be achieved through biochemical routes comprising pretreatment and enzymatic hydrolysis of OPB to produce fermentable sugars (OPB hydrolysates), followed by the cultivation of oleaginous microorganism on OPB hydrolysates. This paper reviews the methods and processes of producing microbial oils and biodiesel from OPB. This paper also presents conceptual microbial oil-based lignocellulosic biorefinery development within the palm oil industry, based on existing and not-yet-explored potential application of microbial oils. OPB-derived microbial oils are a promising non-food feedstock for the production of biodiesel and palm oil substitutes. Biorefming of OPB to microbial oils can be integrated with traditional palm oil processing operations to expand markets for food and oleochemicals. This integrated biorefinery has the potential to generate sustainable outcomes for the palm oil industry.

Keywords

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