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Biodiesel Production from Bioremediation of Palm Oil Mill Effluent via Oleaginous Fungi
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Abstract
Palm oil mill effluent (POME) is a by-product of palm oil production. POME can be considered as harmful waste without any treatment. POME, however, has the potential to be a source of low-cost carbon for lipid production. This study aims to isolate potential oleaginous fungi from POME and to evaluate the ability of lipid production capacity of the purified isolates and commercial oleaginous fungi strains (Aspergillus niger, Aspergillus oryzae and Rhizopus spp.) from POME. POME is converted into lipid via the metabolic pathway of oleaginous fungi, where the lipids can be further trans-esterified into microbial biodiesel. In this study, two fungal strains are successfully isolated from POME. The combination of Bligh and Dyer with Soxhlet extraction results in better lipid extraction efficiency. A. niger has the highest lipid yield from the cultivation on POME. The projected fuel properties of microbial biodiesel from A. niger are within the limits of Biodiesel Standard. Chemical oxygen demand (COD) removal from POME using A. niger is proven to be effective with 70% COD removal. The production of biodiesel from wastes of the palm oil industry may improve the industry's sustainability through the use of nonfood feedstock coupled with simultaneous bioremediation of POME. © 2022 Wiley-VCH GmbH.

Author Keywords
biodiesel; bioremediation; fungi; lipid; palm oil mill effluent; POME

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