

# Technical Difficulties and Solutions of Direct Transesterification Process of Microbial Oil for Biodiesel Synthesis

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## ABSTRACT

Microbial oils are considered as alternative to vegetable oils or animal fats as biodiesel feedstock. Microalgae and oleaginous yeast are the main candidates of microbial oil producers' community. However, biodiesel synthesis from these sources is associated with high cost and process complexity. The traditional transesterification method includes several steps such as biomass drying, cell disruption, oil extraction and solvent recovery. Therefore, direct transesterification or in situ transesterification, which combines all the steps in a single reactor, has been suggested to make the process cost effective. Nevertheless, the process is not applicable for large-scale biodiesel production having some difficulties such as high water content of biomass that makes the reaction rate slower and hurdles of cell disruption makes the efficiency of oil extraction lower. Additionally, it requires high heating energy in the solvent extraction and recovery stage. To resolve these difficulties, this review suggests the application of antimicrobial peptides and high electric fields to foster the microbial cell wall disruption.

## KEYWORDS

Antimicrobial peptides; Biodiesel; Direct transesterification; Electroporation; Microbial oils

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