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### Abstract

Energy crisis involved the excessive consumption of fuels causing the increased in energy demands, oil price and depletion of fossil fuels. This has resulted in generation of high level of greenhouse gases emission. Therefore, in order to overcome these problems, alternative fuel has to be produced. This study was conducted to isolate potential fungal strains which can hydrolyze oil-palm residues as feedstock for bioethanol production. One hundred and sixty four fungal isolates were isolated from various sources and were screened for reducing sugars and protein production using submerged fermentation system. Out of these, 65 fungal strains were found capable to produce high specific activity relatively on oil-palm residues with the assay condition of temperature at 50oC for incubation time of 24 hours. Fungal isolate namely, Penicillium rolfssii was selected for subsequent study since it showed the highest capability to hydrolyze oil-palm residues comparing to other fungal strains based on time-course profile for 48 hours incubation time. Capability of Penicillium rolfssii on hydrolysis of oil-palm residues was evaluated by comparing to type strain of NBRC7735 and commercial enzymes (Celluclast 1.5L and Accellerase®1500). Conversion of these lignocellulosic oil-palm residues into fermentable sugars by enzymatic hydrolysis for bioethanol production has to be further investigated to move towards on alternative, renewable, sustainable, efficient and cost effective energy source.

**Keywords:** Penicillium rolfssii, oil-palm residues, feedstock, fermentable sugars