Pengujian kemampuan rhizopus microsporus UICC 500, 531, dan 539 memfermentasi campuran lumpur dan bungkil sawit = Fermentation of slurry and palm kernel cake mixtures by rhizopus microsporus UICC 500, 531, and 539

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Abstrak

ABSTRAK
Penelitian ini bertujuan menguji kemampuan tiga strain R. microsporus UICC500, UICC 531, dan UICC 539 dalam memfermentasi campuran lumpur danbungkil sawit 3:1 dan 4:1 nonsteril, serta 3:1 dan 4:1 steril, selanjutnya menganalisis perubahan komposisi karbohidrat, lemak, protein, air, dan abu campuran limbah setelah fermentasi. Konsentrasi inokulum sebesar 10 v/b ,dengan jumlah sel awal sebanyak 1x107 CFU/mL digunakan dalam campurandengan berat total 20g. Kemampuan R. microsporus memfermentasi campuran lumpur dan bungkil sawit ditunjukkan melalui pertumbuhan R. microsporus padacampuran limbah sawit, yaitu morfologi, jumlah sel/mL, kepadatan miselium, dansporulasi; pengamatan pada campuran limbah sawit, yaitu warna, kekompakan,aroma, dan pH; serta perubahan komposisi campuran limbah sawit. Hasilpengamatan mengindikasikan Rhizopus microsporus UICC 500, UICC 531, danUICC 539 tidak memfermentasi campuran lumpur dan bungkil 4:1 nonsterilyang ditunjukkan dengan tidak ada pertumbuhan ketiga strain tersebut. Rhizopusmicrosporus UICC 539 memfermentasi campuran lumpur dan bungkil sawit 3:1 nonsteril, 3:1 steril, 4:1 steril yang ditunjukkan dengan adanya pertumbuhan.Rhizopus microsporus UICC 500 dan UICC 531 memfermentasi campuran lumpur dan bungkil sawit 3:1 dan 4:1 steril yang ditunjukkan dengan adanyapertumbuhan. Pertumbuhan tercepat dan jumlah sel terbanyak pada campuranlumpur dan bungkil sawit 3:1 steril ditunjukkan oleh R. microsporus UICC 539yaitu 1,77 x108 CFU/mL, selanjutnya R. microsporus UICC 531 yaitu 1,35 x108CFU/mL, dan R. microsporus UICC 500 yaitu 1,3 x 108 CFU/mL. Rhizopusmicrosporus UICC 539 dapat mengubah komposisi campuran lumpur dan bungkil 3:1 steril setelah lima hari fermentasi, yaitu dapat meningkatkan kandunganprotein, karbohidrat, dan abu pada campuran limbah steril sebanyak 16 , 1,71 ,dan 17,5 secara berturut-turut, serta menurunkan kandungan lemak dan airsebanyak 48 dan 0,1.
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ABSTRACT
This study aims to test the ability of three strains of R. microsporus UICC 500,531 UICC and UICC 539 to ferment slurry and kernel cake mixtures 3 1 and4 1 non sterile, and 3 1 and 4 1 sterile, then analyzes the composition change carbohydrates, fats, protein, water and ash of waste mixtures after fermentation.Fermentation of slurry and palm kernel cake mixtures with inoculumconcentration of 10 v w of the total weight from the mixtures as much as 20 gwith initial cell number 1x107 CFU mL. Rhizopus microsporus was able toferment slurry and kernel cake mixtures, showed by growth of R. microsporus onwaste mixtures, includes morphology, number of cells mL, density of mycelium,and sporulation the observation of slurry and kernel cake mixtures, includes color,compactness, odor, and pH, and also the change of waste mixtures rsquo s composition.The observation results indicated that R. microsporus UICC 500, UICC 531, andUICC 539 were unable to ferment the slurry and kernel cake 4 1 non sterilemixtures,

showed by no growth. Rhizopus microsporus UICC 539 was able toferment the slurry and kernel cake mixtures 3 1 non sterile, 3 1 sterile, 4 1 sterile, indicated by growth on the mixtures. Rhizopus microsporus UICC 500 andUICC 531 was able to ferment slurry and kernel cake mixtures 3 1 and 4 1 sterile, showed by growth on the mixtures. The fastest growth and the highestnumber of cells showed by Rhizopus microsporus UICC 539 with 1.77 x108CFU mL, then Rhizopus microsporus UICC 531 with 1.35 x108 CFU mL, and R.microsporus UICC 500 with 1.3 x108 CFU mL on slurry and kernel cake mixtures 3 1 sterile. Rhizopus microsporus UICC 539 was able to change the compositionof slurry and kernel cake 3 1 sterile mixtures after five days fermentation. Theprotein, carbohydrates, and ash content increased by 16 , 1.71 , and 17.5 ,respectively, whereas fats and water content decreased by 48 and 0.1 ,respectively.