Isolasi, identifikasi, dinamika, skrining pertumbuhan fungsi dan fermentasi palm kernel meal oleh fungsi indigenos terpilih

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Abstrak

Palm Kernel Meal is solid waste from Palm Oil extraction (Ng, 2003). Akubuo & Eje (2002) reported that mechanical extraction produced Palm Kernel Oil (PKO) dan Palm Kernel Meal (PKM). Perez (1997) mentioned that Palm Kernel Meal contains rich arginin, leusin, and sistein matters. Hem et al., (2008), utilizing Palm Kernel Meal pass through bioconversion process for developing larvae Hermetia illucens L. as alternative natural feedstuff in aquaculture industry. Macromolecule composition of Palm Kernel Meal like cellulose, hemicellulose and lignin can be degrade to be simply compound and can be used by another organism like larvae Hermetia illucens L. in bioconversion process. Bioconversion Palm Kernel Meal for feedstuff nutrition consist with microorganism assistance. Suharyanto et al., (2006) define bioconversion as a certain biological process which involving microorganism or enzyme that can change organic matters. Slime molds have great play role in process reduction macromolecule composition of Palm Kernel Meal. Molds have enzyme which can reduce cellulose, hemicellulose and lignin become more simple compound. Study about fermentation fungi already been done through isolation, identification, and fungi screening. However, only a few study about fungi related consist in process bioconversion Palm Kernel Meal reported in Indonesia. This study consist of two part. First part describes the isolation, identification, and growth screening fungi from bioconversion Palm Kernel Meal. Second part of this study describes the fermentation Palm Kernel Meal by selected indigenous fungi. The selected indigenous fungi obtained from result of the first part. The fermentation result included ash matters, crude fiber, crude protein and dry matters experiment. The study was carried out at the Institut de Recherche pour le Developpement (IRD) Laboratory, Depok and the Laboratory of Microbiology, Departement of Biology, UI, Depok during April?Oktober 2009. The isolation of fungi was conducted with spread methods on Potato Dectrose Agar (PDA). Identification of the isolates was carried out on Potato Dectrose Agar (PDA), Czapeck Dox Agar (CDA), and Malt Extract Agar (MEA) based on macroscopic and microscopic morphological observation of the colonies. The Mimura agar (MA) was used for growth fungi screening.

The isolation resulted in 15 representative isolates consisting of 4 group of fungi (Aspergillus, Mucor, Penicillium, and Geotrichum). Based on 7 days periods of fermentation processing, Mucor groups had the highest frequency distribution and Geotrichum had the highest quantity. After the growth fungi screening, 4 isolates (P3, P4, P10, P15) was selected for futher study in part II. Microscopic identification showed P3 (Penicillium chrysogenum), P4 (Mucor racemosus), P10 (Aspergillus flavus), and P15 (Geotrichum candidum). Mucor racemosus was the most wide diameter colony on Mimura agar?MA (9 cm) comparing to other isolates. These selected fungi was used for fermentation of Palm Kernel Meal as inoculant. After process bioconversion which fermented was done, proximate analysis were carried out to examine crude protein, crude fiber, ash matters, and dry matters. Ng (2003) methods was used for this Palm Kernel Meal fermentation and Hart & Fisher (1971) was used for proximate analysis.

The results after 7 days fermentation showed that the increased nutrition of crude protein composition of

Palm Kernel Meal fermented by fungus Aspergillus flavus (1,33%), Geotrichum candidum (5,90%), Mucor racemosus (0,29%), and Penicillium chrysogenum (12,09%). The increased crude fiber contains fermented by Aspergillus flavus (3,03%), Geotrichum candidum (1,93%), Mucor racemosus (4,32%), and Penicillium chrysogenum (14,11%). Chemical cellulose structure and fungi species influence the difference percentage of crude protein and crude fiber. Chemical cellulose structure which amorf shape was more easy to degrade better than crystal shape. Fungi species have difference complexity enzymes (cellulose, hemicellulose, ligninase) and optimum growth level. High oil that can blocked the optimum growth of fungi and raising temperature matter that have involved in aeration and water activity alteration were another influence factor that have made difference percentage of crude protein and crude fiber.