



VALORIZATION OF CASSAVA WASTE, GRAPE POMACE, AND WINERY SPENT YEAST FOR MYCOPROTEIN PRODUCTION

ABSTRACT

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The impact of global gas emissions from food production on the environment and food security has driven the development of single-cell protein as a meat substitute. Mycoprotein or filamentous fungal biomass, is nutritious, healthy, and sustainable, producing a lower amount of gas emissions which is potential for a protein alternative. Moreover, the agricultural sector generates a high amount of waste, rich in starch and lignocellulosic material, that can be utilized for sustainable mycoprotein production at a lower cost. Cassava peel, cassava pulp, and grape pomace, obtained from Kalasin and Khorat, Thailand, were treated with the acid hydrolysis method to convert the complex carbohydrates into reducing sugar. Acid hydrolysis was able to increase the reducing sugar and protein content in each substrate. The submerged fermentation using *Rhizopus oligosporus* was carried out at 35°C, pH 4.5, 150 rpm for 72 hours. Among the wastes, hydrolysed grape pomace was found to be the best substrate yielded in 1.5170 g/L dry biomass and 50.27 %db protein. In this research, yeast extract derived from wine lees (WL) were studied as the supplement to boost biomass production in order to cut costs and support sustainability. It turned out that WL increased the fungal biomass and protein content better which can substitute the commercial yeast extract. Hydrolysed grape pomace substrate enriched with WL yielded 3.1635 g/L dry biomass and 51.97%db protein content.

Keywords: Cassava peel; cassava pulp; grape pomace; wine lees; *Rhizopus oligosporus*; mycoprotein; yeast extract supplement