ABSTRACT

GROWTH OPTIMIZATION AND CHARACTERIZATION OF FUNGAL BIOMASS FROM *Rhizopus oligosporus* CULTIVATED IN TAPIOCA EFFLUENT

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Protein alternative currently needed due to several reasons, namely the high prevalence of protein malnutrition, the high fat content in animal products, and livestock production is not environmentally friendly because it contributes to greenhouse gases. Biomass of filamentous presents potential as meat substitute due to its favorable nutritional profile, such as protein. Fungal biomass can be produced using agricultural residue, one of which is tapioca effluent. This study aims to assess the potential of tapioca effluent as substrate for fungal biomass production, determine the optimum growth conditions, and characterize of the fungal biomass produced. The research uses tapioca effluent as the fungal biomass substrate and Raprima starter as the *R. oligosporus* culture. The study commences with the characterization of tapioca effluent, optimization of growth conditions in terms of supplementation, pH, and agitation speed, followed by the chemical and nutritional characterization of the fungal biomass. The results of this study show that tapioca effluent holds potential as a fungal biomass production medium, containing 0.47% carbon, 0.04% nitrogen, and 1.36 mg/kg phosphate. *R. oligosporus* exhibits optimal growth and produces the highest biomass in supplemented media with yeast extract, at pH 5.5, and agitation speed of 125 rpm. Media supplementation does not significantly affect the protein content but affect the fat content of the fungal biomass, with yeast extract supplementation resulting in the lowest fat content. The nutritional composition of the fungal biomass cultivated on tapioca effluent contains 26.447% protein, 4.81% fat, 4.26% ash, 5.96% crude fiber, and a protein digestibility of 61.25%. The result of this study showed that tapioca effluent shows potential as a medium for high-quality mycoprotein production.

Keywords: Fungal biomass, *Rhizopus oligosporus*, tapioca effluent