

PRODUCTION OF SINGLE CELL OIL BY LOCAL ISOLATE OF *MUCOR* SPECIES USING BY-PRODUCTS AS CARBON AND NITROGEN SOURCES AND DETERMINATION OF FATTY ACIDS PROFILE

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ABSTRACT

Eight local fungi isolates from different resources, namely soil, some agricultural by products, vegetable, dairy and meat products were isolated, identified and belonged to *Mucor* species (sp.). A primary screening was conducted to determine the capacity of producing of single cell oil at rate exceeding 20% of dried biomass. Seven isolates were selected for oil producing without toxicity when examined via bioassay with *Artemia salina*. Also, a secondary screening was conducted to evaluate the quality of the obtained oil from the seven isolates. The isolate *Mucor* sp.(Mu3) was found to produce high oil content and valued 5.474gm/L from 10.963gm/L of dry biomass with 49.93% total lipid. The best and the highest rate of polyunsaturated fatty acids (PUFA) profile was γ -Linolenic acid, Eicosapentaenoic acid, Docosapentaenoic acid (DPA), Docosahexaenoic acid at 10.95%, 4.6%, 0.39%, 1.47% respectively. The optimum isolate was studied for best carbon and nitrogen sources to support fungal growth and oil productivity. It was found that rice bran and chicken feather were the best carbon and nitrogen sources at rates of 7.5% gm/ml and 0.1% gm/ml respectively in liquid culture at 6-7pH, 10^6 or 10^7 spores/ml inoculums volume in shaking incubator at 28 ± 1 °C for 7 days at a speed of 200 rounds per minute. There was significant differences at ($p < 0.01$) in the productivity for some sources used in this study that leading to conclude the possibility of the isolate *Mucor* sp.(Mu3) to be a suitable source for oil and PUFA production.

KEYWORDS: Single Cell oil, Isolate, *Mucor* sp., Fatty Acids, Polyunsaturated Fatty Acids

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