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Bioprotein optimization from spent mushroom substrate for fish feed application

Abstract

The utilization of spent mushroom substrate as potential substrate for bioprotein production is being explored in this study. The objectives of this study were to screen three different types of fungi in bioprotein production from spent mushroom substrate and to optimize the process condition of the best fungi for production of bioprotein by using Design Expert Software. In this present study, screening of three different strains; Aspergillus terreus UniMAP AA-1, Aspergillus niger (ATCC 16404) and Phanerochaete chrysosporium (ATCC 24725), was done for bioprotein production by solid state fermentation process. P. chrysosporium produced the highest amount of protein on the sixth day, with the amount of 0.3951 mg/mL. Optimization of two parameters; substrate concentration and inoculum size for the selected fungi, P. chrysosporium was done conducted by Response Surface Methodology (RSM): Central Composite Design (CCD) to investigate optimal condition of bioprotein production. The optimum condition for P. chrysosporium to produce bioprotein using SMS was achieved at 60% of substrate concentration and 15% (w/v) of inoculum size with maximum protein concentration of 0.3812 mg/mL.