

***Xylanase Production from Coffee Bean Shell Waste Using Trichoderma viride
with Solid State Fermentation Method***

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ABSTRACT

Xylanase enzymes can be used for paper bleaching, animal feed mixtures, the food industry, xylose sugar manufacture, and the production of xylooligosaccharides. This study aims to determine the optimum conditions for the enzyme production process on the coffee bean shell substrate using *Trichoderma viride* through solid-state fermentation. The research method used was experimental with the help of Design Expert 13.0® software using a central composite design (CCD). In this study, enzyme activity, protein content, and specific activity were analyzed at various fermentation times of 24 hours, 48 hours, and 72 hours using substrate concentrations of 25%, 50%, and 75%. Data were analyzed using Analysis of Variance (ANOVA) in Design Expert 13.0® software. The results of the study showed that the optimum conditions for the production of xylanase enzymes were a substrate concentration of 75% and a fermentation time of 24 hours with a desirability value of 0.738, which resulted in an enzyme activity value of 36.388 U/mL and a dissolved protein content of 0.494 mg/mL with a specific activity of 73,660 U/mg. The verification results showed conformity with the formula predicted by the Design Expert 13.0® software, namely enzyme activity of 36.292 U/mL and protein content of 0.488 mg/mL with a specific activity of 74,369 U/mg.

Keywords: Xylanase, Coffee Bean Shells, Solid State Fermentation.