

OPTIMIZATION OF CULTURE CONDITIONS AND MEDIUM COMPONENTS FOR CARBOXYMETHYL CELLULASE (CMCase) PRODUCTION BY A NOVEL BASIDIOMYCETE STRAIN PENIOPHORA SP. NDVN01

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TÓM TẮT:

Background: Cellulytic enzymes including Carboxymethyl cellulases play the key role in hydrolysis of cellulose, a huge organic carbon reservoir on earth, into monomeric sugars and their eventual conversion into valuable chemicals and energy sources.

Objectives: In this study, we described the identification of a basidiomycete isolate NDVN01 and optimization of culture conditions and medium components for CMCase production by this strain under liquid state fermentation. The CMCase was estimated as 32 - 33 kDa on a native Polyacrylamide gel electrophoresis (PAGE).

Materials and Methods: We used 5 basidiomycetes for screening CMCase production, internal transcribed spacer (ITS) sequence analysis in combination with morphology for strain identification, and liquid state fermentation for optimization of CMCase production.

Results: The maximum CMCase production by *Peniophora* sp. NDVN01 was obtained at 28 °C, with the initial medium pH of 7 and within 120 hours of cultivation in the optimum medium containing 80 % (v / v) of potato infusion, 0.6 % (w / v) straw rice as additional carbon source and 0.2 % (w / v) ammonium hydrogen phosphate as an additional nitrogen source, and 0.5 % (w / v) pulp as inducer.

Conclusions: Under optimal conditions, *Peniophora* sp. NDVN01 produced 24.65 ± 0.37 units of CMCase per mL of culture supernatant, which was 8.6 times higher than the amount (2.87 ± 0.28 U.mL⁻¹) before optimization.