

Optimization of Process Parameters for Peroxidase Production by *Ensifer* Species

Authors : Ayodeji O. Falade, Leonard V. Mabinya, Uchechukwu U. Nwodo, Anthony I. Okoh

Abstract : Given the high utility of peroxidase in several industrial processes, the search for novel microorganisms with enhanced peroxidase production capacity is of keen interest. This study investigated the process conditions for optimum peroxidase production by *Ensifer* sp, new ligninolytic proteobacteria with peroxidase production potential. Also, some agricultural residues were valorized for peroxidase production under solid state fermentation. Peroxidase production was optimum at an initial medium pH 7, incubation temperature of 30 °C and agitation speed of 100 rpm using alkali lignin fermentation medium supplemented with guaiacol as the most effective inducer and ammonium sulphate as the best inorganic nitrogen. Optimum peroxidase production by *Ensifer* sp. was attained at 48 h with specific productivity of 12.76 ± 1.09 U mg⁻¹. Interestingly, probable laccase production was observed with optimum specific productivity of 12.76 ± 0.45 U mg⁻¹ at 72 h. The highest peroxidase yield was observed with sawdust as solid substrate under solid state fermentation. In conclusion, *Ensifer* sp. possesses the capacity for enhanced peroxidase production that can be exploited for various biotechnological applications.

Keywords : catalase-peroxidase, enzyme production, peroxidase, polymerase chain reaction, proteobacteria

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