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Purification and Characterization of Esterase Enzyme from *Aspergillus Versicolor*

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ABSTRACT: *Esterase is a biotechnologically important enzyme as it hydrolyzes water-soluble short-chain fatty acid esters. We tried to isolate and purify the esterase enzyme from Aspergillus versicolor in this investigation. The enzyme was purified with ammonium sulfate precipitation, dialysis, and column chromatography. The enzyme was salted out, with maximum specific activity at 60 to 70 percent of saturation during precipitation. The column chromatography was performed with Sephadex G-75 to purify the esterase from Aspergillus versicolor and was able to achieve the purification fold of 6.9 nM. The partially purified enzyme was analyzed in SDS-PAGE and showed a single 32-kDa band. The partially purified esterase enzyme was checked for its optimum conditions for maximal enzyme activity. This enzyme has a huge industrial potential which makes a significant contribution to eco-friendly approaches such as textile, food, and agrochemical industries as well as for bioremediation.*

KEYWORDS: *Esterase; Partial purification; Sephadex G-75; SDS-PAGE; Characterization.*

INTRODUCTION

Enzymes are biocatalysts that catalyze biological and metabolic reactions [1, 2]. The global market for enzymes is expected to grow at a rapid rate in recent years [3-6]. Microorganisms can be cultivated in huge quantities in a limited time as well as genetic changes in bacterial cells may be made to improve enzyme synthesis. They are the primary source of enzymes [7-11]. Furthermore, because of their dynamic and consistent nature, microbial enzymes have more importance when compared with enzymes from animals as well as plants [12]. Lipolytic enzymes (phosphor lipases, lipases, and esterase) are important enzymes in the hydrolysis of peptides, fatty acid esters, and acylglycerols.

Extremophile enzymes appear to be the most promising for industrial use [13]. According to the Enzyme Commission classification [14], lipases and esterase are hydrolase enzymes that catalyze the production and hydrolysis of ester bonds. The biodegradation of polyurethane (PU) is mediated by two well-known enzymes: esterase and lipase. Esterase is found in abundance in living things and can be isolated from bacteria, plants, and mammals [15,16]. Esterase [17] catalyzes the breakdown of fat as well as the formation of fatty acid esters. Enantioselectivity, as well as area specificity, is desirable features in microbial esterase,

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