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B-GLUCOSIDASE B FROM *MICROBACTERIUM SP.* BG28 AS A BIOFILM CONTROL AGENT IN FOOD PROCESSING ENVIRONMENT

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About one in ten people contract a foodborne illness within a year. Children under the age of five are the most affected, with 125,000 deaths each year. Many of the foodborne illness outbreaks can be linked to the presence of biofilms in the food industry, and *Salmonella enteritidis* is an extremely important foodborne pathogen that thrives in these conditions. It has been shown that biofilms can be resistant to physical and chemical treatments used in cleaning and disinfection procedures in food processing. The problem with using more aggressive disinfectants is that they often violate food safety regulations. The use of enzymes which degrade biofilm matrix structural components should facilitate current disinfection procedures and not compromise food safety. In this study, the anti-biofilm activity of recombinantly expressed β -glucosidase B and its potential use as a protective agent to control *Salmonella* biofilm formation is investigated. The putative target of this enzyme is cellulose, the structural component of the *Salmonella* biofilm matrix. β -Glucosidase B deriving from the environmental strain *Microbacterium sp.* BG28 was heterologously expressed in *Escherichia coli* and successfully purified by affinity chromatography. The anti-biofilm activity of the enzyme was evaluated in in vitro assays using various clinical isolates of *S. enteritidis*. The toxicity of the enzyme was studied in *Caenorhabditis elegans*. β -glucosidase B effectively inhibited the formation of *Salmonella* biofilms grown in a temperature range of 8°C to 37°C, achieving 50% inhibition at concentrations of 100 μ g/ml. Biochemical characterization showed that the optimal pH activity of the enzyme is between 6 and 7, with the highest activity observed at temperatures between 37°C and 47°C. The absence of toxicity and other presented results indicate that beta-glucosidase B can be used in biofilm control in the food industry.

Keywords: *Salmonella*, biofilm, beta glucosidase, enzyme

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