

Broad Spectrum Biofilm Inhibition by Chitosanase Purified from *Bacillus licheniformis* Isolated from Spoilt Vegetables

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Abstract : A novel strain of *Bacillus licheniformis* isolated from spoilt cucumber and pepper samples have the ability to produce the chitosanase enzyme when grown on chitosan substrate. Chitosanase was purified to homogeneity with a recovery yield of 35.71% and 5.5 fold of purification by using ammonium sulfate at 45% saturation followed by ion exchange chromatography on DEAE-cellulose column and gel filtration chromatography on Sephadex G-100 column. The purified chitosanase inhibited the biofilm formation ability for all Gram-negative and Gram-positive biofilm-forming bacteria (biofilm producers) after using Congo Red agar and Microtiter plates methods. Highly antibiofilm of chitosanase recorded against *Pseudomonas aeruginosa* followed by *Klebsiella pneumoniae* with reduction of biofilm formation ratio to 22 and 29%, respectively compared with (100)% of control. Thus, chitosanase has promising benefit as antibiofilm agent against biofilm forming pathogenic bacteria and has promising application as alternative antibiofilm agents to combat the growing number of multidrug-resistant pathogen-associated infections, especially in situation where biofilms are involved.

Keywords : chitosanase, *Bacillus licheniformis*, vegetables, biofilm

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