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Cloning, Sequencing, and Expression of Chitinase gene from *Bacillus licheniformis* N1 in *Escherichia coli*

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Bacillus licheniformis N1 strain showing high antifungal activity to *Botrytis cinerea* LVF12 is a potent antifungal bacteria, which has applied as a biocontrol agent in our laboratory. In other to enhance the biocontrol ability, the chitinase gene (CHI) of N1 strain was cloned and expressed in *Escherichia coli* by pGem-T vector. The chitinase of N1 strain in the *E. coli* was produced and secreted on media containing colloidal chitin as carbon sources. The recombinant plasmid containing the 1.8kb chitinase gene was designated as pCHI1. The nucleotide sequence revealed a single open reading frame containing 1815bp and encoding 605 amino acids with a molecular mass of about 66kDa. The deduced amino acid sequence of chitinase gene was examined and found to be three functional domain, such as catalytic domain (amino acid residues 44 to 433), fibronectin typeIII like domain (amino acid residues 460 to 541) and chitin-binding domain (amino acid residues 549 to 581). For the high level of chitinase production, recombinant chitinase will be overexpressed in *E. coli* BL21 by pET42-a vector. Our final goal is to transfer the cloned chitinase gene to *B. licheniformis* N1 to improve its efficacy for the biological control to plant pathogenic fungus.