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Periplasmic secretion of an antifungal *Bacillus amyloliquefaciens* BLB369 endo-*β*-1,3-1,4-glucanase in *Escherichia coli*

Abstract:

The endo-*β*-1,3-1,4-glucanases are glycoside hydrolases involved in the enzymatic depolymerization of 1,3-1,4 β-glucans and showed an antifungal activity against some fungi. *Bacillus amyloliquefaciens* BLB369 has a high antagonistic activity against phytopathogenic fungi. Its *glu369* full-coding sequence of the endo-*β*-1,3-1,4-glucanase gene (732 bp) was sequenced, cloned, and successfully expressed in *Escherichia coli* Top10. The encoded protein (243 amino acids) has a calculated molecular mass of 27.3 kDa. In order to simplify the purification procedure, the *glu369* coding sequence was cloned into the vector pKJD4. The produced OmpA-His-Glu369 harboured OmpA signal sequence for *E. coli* periplasmic localisation and followed by a 6His residues for its purification. The purified His-tagged proteins revealed two bands on SDS-PAGE analysis with molecular masses of about 30.5 (His-Glu369) and 32.5 kDa (OmpA-His-Glu369). They had the ability to inhibit the growth of phytopathogenic fungus *Alternaria alternata*. These favourable properties make the endo-*β*-1,3-1,4-glucanase a good candidate for biotechnological applications.

Keywords: Antifungal activity; *Bacillus amyloliquefaciens* BLB369*;* Endo-*β*-1,3-1,4-glucanase*;* Heterologous expression