Pectinolytic Potential of Different *Bacillus* Species Isolated From Lepidopteran Insects and Infected Soil

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Abstract

Background: The microorganisms are preferred over plants and animals for the bulk production of industrially important enzymes like pectinases because of their low production-cost, availability of fermentation raw material and the easily controllable production conditions. The pectinolytic potential of a large pool (130) of *Bacillus cereus* group and non-*Bacillus cereus* was evaluated. The effect of different physicochemical parameters on polygalacturonase(PGase) production by three promising strains, *B. pumilus*S76, *B.thuringiensis* S140(b) and *B.taquilensis* S140(c) with gene bank accession no. KU981112, KU981113 and KU981114, were studied and the enzyme was partially characterized. The enzyme activity was assayed using dinitrosalicylic acid method.

Results: The polygalacturonases produced by Bp S76, Bt S140(b) and BtqS140(c) were thermostable at temperature above 55°C with a melting temperature (T_m) of 72°C,62°C and 57°C, respectively and the half-life ($T_{1/2}$) at 60°C of 50, 65 and 30 min., respectively. The catabolite repression was noted in presence of glucose while the production increased upon addition of 1% yeast extract to the growth medium. The enzyme activity was also induced in presence of Na^+ and Ca^{+2} .

Conclusion: The strain Bp S76 appeared a better candidate for future biotechnological application owing to the production of higher titers (6.11 IU/L.hrs) of polygalacturonase with greater stability.

Full Text

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Figures

Figure 1

Influence of growth temperature on polygalacturonase production

Figure 2

Effect of pH on polygalacturonase production.

Figure 3

Influence of varying concentration of substrate on polygalacturonase production.

Figure 4

Effect of nitrogen-concentration on polygalacturonase production.

Figure 5

Effect of glucose concentration on polygalacturonase production.

Figure 6

Comparison of growth, polygalacturonase production kinetics and amount of reducing sugars production by BpKU-S-76. (g= generation time; Qp= volumetric productivity of enzyme)

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