ABSTRACT

Bacillus thuringiensis is being used widely as a biological control agent against insects. This bacterium produces a parasporal crystal consisting of a delta endotoxin which is toxic to larvae of Lepidoptera, Diptera, and Coleoptera. An attempt was made to study the relationship between selected enzymes produced by local isolates to spore and crystal formation in the bacteria. Protease, alkaline phosphatase, pyruvate carboxylase, isocitrate dehydrogenase and citrate synthase were monitored at various stages of growth in fermentation media. The high activity of isocitrate dehydrogenase for IPT BT 6 could be used as an useful tool to identify IPT BT 6 and also proves that it is a different strain from Florbac.

Crystals were purified from spore-crystal complex and molecular weights were determined by SDS-PAGE. IPT Bt 6, IPT Bt 15 and Florbac exhibited polypeptides with molecular weights of 56 000 and 120 000 Dalton; Florbac at 92 000, 73 000 and 39 000; IPT Bt 15 at 120 000 and 56 000; IPT Bt 16 at 56 000, 39 000 and 19 000 while IMR Bt 8 and IMR Bt 16 at 80 000 and also at 45 000 Dalton.

Florbac and IPT Bt 6 were selected for scale-up studies in B Braun fermentors. 1.5 litres was scaled up to 10 litres. Process optimization was carried out to achieve maximum product yield. The efficacy of the two isolates was assessed against *Plutella xylostella* known as the Diamond back moth which is a pest of cabbage. The activity was compared in various combination against a commercial product (Agrimec). IPT Bt 6 and Agrimec were active against *P. xylostella* while the local population had built up resistance to Florbac.