DETERMINATION AND DISTRIBUTION OF CRY1-TYPE GENES IN *Bacillus thuringiensis* ISOLATED FROM NORTH INDIA

Shiv Shankar¹*, Sarvjeet Kaur²

¹Department of Food Engineering and Bionanocomposite Research Institute, Mokpo National University, 61 Dorimri, Chungnyeomyon, Muangun, 534-729 Jeonnam, Republic of Korea

²National Research Centre on Plant Biotechnology, Indian Agricultural Research Institute, New Delhi-110012, India

Abstract

*Bacillus thuringiensis* (*Bt*) is a spore-forming bacterium which produces insecticidal crystal protein in the sporulation phase. Polymerase chain reaction (PCR)-based identification of *Bacillus thuringiensis* toxin genes has become a routine step in most *B. thuringiensis* isolation and characterization initiatives. In the present study, eighteen native *Bt* isolates from diverse habitats of North India were taken for the presence of *cry1* type genes. The distribution of *cry1* gene families in native *Bt* isolates was examined by PCR amplification of genes with three sets of corresponding PCR primers. In native *Bt* isolates many variant bands were also observed in addition to expected bands on PCR amplification. Different sets of primers for the same gene gave different results due to different sites of primer binding. Maximum number of isolates showed expected bands when primers designed by Ceron were used compared to other primers. However, with other primers, the numbers of variant bands was larger. The isolates, SK-13, 63 and 105 showed the maximum number of *cry1*-type genes, followed by SK-20, 28, 48, 88, 94, 301, 304 and 307, whereas SK-3 showed the presence of only 3 *cry1*-type genes. RFLP analysis of 1.6 kb fragment indicated the presence of variant bands from the reference strains. Several promising isolates with predicted toxicity towards lepidoptera have been observed in this study.

Key words: *Bt* isolates, *cry* gene, molecular characterization, PCR analysis

Received: December, 2012; Revised final: June, 2014; Accepted: July, 2014; Published in final edited form: March 2018

*Author to whom all correspondence should be addressed: Email address: shivbiotech@gmail.com; Phone: +66-86-7475-65