

## **Isolation and Characterization of Novel Insecticidal *cry1*-Type Genes from *Bacillus thuringiensis* Strains**

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To identify new *cry1*-type insecticidal genes, 56 lepidopteran-specific *Bacillus thuringiensis* (Bt) strains were isolated from Korea. Universal oligonucleotide primers, K5un2 and K3un2, were designed and used to amplify all known *cry1*-type genes with PCR from 56 Bt isolates. The restriction fragment length polymorphism (RFLP) patterns of the PCR-amplified fragments revealed 7 distinct patterns, and a standard isolate was selected from each one of the RFLP groups. Through cloning and sequence analysis of the PCR-amplified fragments showing unique RFLP pattern, 7 novel *cry1*-type genes were identified. Bt K-1 and Bt 2385-1 strains were selected to isolate and characterize the active regions of the novel genes, and then 5 novel genes were cloned from them. To verify the activity against lepidopteran larvae, the novel genes were expressed using baculovirus expression vector system and the bioassay was performed to *Plutella xylostella* (Px) and *Spodoptera exigua* (Se). All novel *cry1*-type genes had high toxicities against Px larvae and, *cry1-44* and *cry1-5* had the highest toxicity against Px and Se larvae, respectively. Also, *cry1-1* and *cry1-5* had dual toxicities against Px and Se larvae. Finally, each novel gene must be a very useful resource for development of microbial insecticide and insect resistant plants.