

# Molecular Characterization of a New Crystal Protein Gene from *Bacillus thuringiensis* KSK-1182

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A new *Bacillus thuringiensis* strain (KSK-1182) was obtained, having high toxicity to *Spodoptera exigua*. It produced 130 kDa and 65 kDa proteins, and was found to belong to subsp. *kurstaki* (3a3b3c) serologically. Its gene type analysis by PCR revealed *cry1Aa*, *cry1Ab*, *cry1Ac*, *cry1E*, *cry1F* and *cry2A* genes. But the sequence analysis of a PCR fragment containing *cry1F* showed a difference, showing 78.4% similarity only, from that of the *cry1Fa1* gene reported from *B. thuringiensis* subsp. *aizawai*. To verify the *cry1F* gene as a new crystal protein gene, a 2 kb fragment containing *cry1F* gene was cloned by PCR using an ATG-region primer and a *cry1*-type gene-conserved 3' primer. The cloned fragment had 56.6% and 70.9% homology with *cry1Fa1* and *cry1Ha1* (Gene Bank acc. No. z22513), respectively. Southern hybridization with the cloned fragment was performed to clone the full gene and a *HindIII*-*XhoI* 8 kb fragment was cloned. Through subcloning and construction of an *ExoIII*-deleted mutant, it seems to be a new crystal protein gene in *B. thuringiensis* and its characteristics will be discussed.