

## Receptor Binding Domain of Cry1Aa Toxin and Receptor Proteins in *Bombyx mori*

**Shin-ichiro Asano, Masatsugu Kitamura, Sahara Ken, Hisanori Bando  
and Toshihiko Iizuka**

*Graduate School of Agriculture, Hokkaido University, N9W9 Sapporo,  
060-8589 Japan*

Cry1Aa protein from *Bacillus thuringiensis* serovar *sotto* was highly toxic to silkworm, *Bombyx mori*. Cry1Aa toxin showed specific, high affinity to brush border membrane vesicles (BBMV) from *B. mori* midgut. Deletion mutagenesis was used, truncated toxins were analyzed for structural stability, toxicity to silkworm, binding to receptors on BBMV. Analysis of the domain II region of Cry1Aa toxin have been carried out to assess their role in receptor binding and toxicity.

Aminopeptidase N and cadherin-like proteins were reported as receptor molecules in *B. mori* of Cry1Aa toxin. Then, aminopeptidase N and cadherin-like genes were cloned from *B. mori* midgut, then expressed in *E. coli* as GST (Glutathione S-Transferase)-fusion proteins. Cry1Aa protein was expressed in *E. coli* as a MBP (Maltose Binding Protein)-fusion protein. The dissociation reaction between Cry1Aa toxin and receptor proteins were examined by protein blot analysis and biomolecular interaction analysis using BIACORE. The results were revealed that their receptor proteins have specific affinity against Cry1Aa toxin. There are to say, the reciprocal action between Cry1Aa toxin and receptor-binding may play a role in specific activity.