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Molecular cloning and characterization of a cDNA encoding a toxin from the spider, *Araneus ventricosus*

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We have constructed cDNA library from the whole body of the spider, *Araneus ventricosus*. A cDNA encoding a toxin was cloned from the cDNA library of *A. ventricosus*. Sequence analysis of the cDNA encoding the toxin of *A. ventricosus* revealed that the 195 bp cDNA has an open reading frame of 65 amino acid residues. The deduced protein sequence of the toxin gene of *A. ventricosus* was aligned to that of the scorpion *Centruroides limpidus*. Northern blot analysis indicated that *A. ventricosus* toxin gene showed fat body-specific expression pattern at the transcriptional level. Furthermore, we have constructed a recombinant *Bombyx mori* nuclear polyhedrosis virus expressing *A. ventricosus* toxin under the control of the polyhedrin promoter. The cDNA encoding the toxin of *A. ventricosus* was expressed as approximately 5.8 kDa band in baculovirus-infected insect cells. Bioassays with the recombinant virus on 5th instar of *B. mori* demonstrated a decrease in the time to kill (LT50 5.50 days) compared to wild-type BmNPV-K1 (LT50 6.72 days) in the injection of 10 virus. These results indicate that *A. ventricosus* toxin is a novel member of the spider toxin family, suggesting that the toxin gene can be used in recombinant baculoviruses to reduce insect feeding damage and increase the rate of insect kill.