

## **Target and non-target effects of a spider venom toxin produced in transgenic cotton and tobacco plants**

The peptide  $\omega$ -Hexatoxin-Hv1a (Hvt) is one of the most studied spider toxins. Its insecticidal potential has been reported against species belonging to the arthropod orders Lepidoptera, Diptera and Orthoptera. The gene encoding Hvt has been transformed into cotton and tobacco to protect the plants from damage by lepidopteran pests. This study evaluated the expression of the  $\omega$ -HXTX-Hv1a gene in transgenic plants, and the toxicity of plant-expressed and purified Hvt on target lepidopteran insects and on several non-target species. Transgenic Bollgard II cotton plants, which produce Cry1Ac and Cry2Ab2 and purified Cry2Ab2 protein were included in the study as comparators. LC95 values of purified Hvt against *Spodoptera littoralis* and *Heliothis virescens* were 28.31 and 27.57  $\mu\text{g/ml}$  of artificial diet, respectively. Larval mortality was 100% on Hvt-transgenic tobacco plants but not on Hvt-transgenic cotton, probably because of the significantly lower toxin expression level in the transgenic cotton line. Non-target studies were conducted with larvae of the predators *Chrysoperla carnea* and *Coccinella septempunctata*, adults of the aphid parasitoid *Aphidius colemani*, and adult workers of the honey bee, *Apis mellifera*. Even at 40  $\mu\text{g/ml}$ , Hvt did not adversely affect the four non-target species. Purified Cry2Ab2 at 10  $\mu\text{g/ml}$  also did not adversely affect any of the non-target species. Our results show that Hvt might be useful for developing insecticidal plant varieties to control pest Lepidoptera.

For more information:

<http://onlinelibrary.wiley.com/doi/10.1111/jen.12156/abstract;jsessionid=79FBBA74EE54EF4B91645971516962CE.f02t01>