TOXICOLOGICAL AND HISTOPATHOLOGICAL STUDIES ON THE EFFECT OF *BACILLUS THURINGIENSIS* VAR. *ISRAELENSIS* (ABG-6193) AGAINST FOUR MOSQUITO SPECIES LARVAE

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Four species of mosquito larvae, representing two genera, were tested for their responses to the pathogen preparation ABG-6193, *Bacillus thuringiensis* var. *israelensis*. After one hour exposure, *Culex antennatus*, *C. poicilapus* and *C. pipiens molestus* rapidly ingested the bacterium resulting in high mortality. The LC_{50} values were 1.513, 1.737 and 3.157 ppm for the three species respectively. *Aedes caspius* larvae were moderately susceptible to the *B.t.*-preparation (LC_{50} = 47.734 ppm). The toxicity response of the four species increased as the exposure periods increased.

According to the LC_{50} values the fourth instar larvae of the three culicine mosquitoes species were more susceptible to the pathogen than *A. caspius* but the *B.t.*-preparation proved to be more effective against the *Aedes* species after 7 hrs.

The first histopathological change of the treated mosquito larvae *C. pipiens molestus* with *B. thuringiensis* var. *israelensis* detected with the light microscope was a general separation of the midgut epithelial cells from each other and from the basement membrane. Some cells were sloughed into the lumen of the alimentary tract and possessed ruptured peritrophic membrane and a high vacuolization. Sloughing of midgut cells was due to the action of the bacteria. Using the electron microscope, it was apparent that *Bacillus* had penetrated and established inside the epithelial cells and fat body, and the most obvious ultrastructural change noticed in the epithelium was the disruption of the microvilli. The modes of action of the *B.t.i.*-preparation have been elucidated largely through the present study. There was a paralysis of the midgut through 3 hrs after exposure and general paralysis of the entire insect body after 4 hrs.

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