

**EFFECT OF SPINETORAM AND ABAMECTIN ON HEAT
TOLERANCE AND HEAT ACCLIMATION IN
Stegobium paniceum (L.) (COLEOPTERA: ANOBIIDAE) ADULTS**

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Drugstore beetle, *Stegobium paniceum* (L.) (Coleoptera: Anobiidae), has a broad host range among stored food including grains, spices, herbs and dried fruits. Reduced-risk insecticides spinetoram and abamectin have been tested against different stored-product insects but not yet for *S. paniceum*. High temperature exposure is a safer pest management method but expensive. Pre-exposure of certain stored product insect species to synthetic insecticides reduces their heat tolerance and heat acclimation leading to decline the thermal load required to kill insects. However, these effects were not tested for *S. paniceum* pre-exposed to abamectin and spinetoram. Therefore, this study was conducted to study the individual and combined effects of spinetoram and abamectin on heat tolerance and heat acclimation of *S. paniceum* adults. *Stegobium paniceum* adults were exposed to coriander treated with a series of concentration from each insecticide separately and in combination. Distilled water was sprayed as the control. Insects were held at 42°C for 36-48 h following introduction in coriander. The non-acclimated insect batch was exposed to 42°C directly. The acclimated batch of insects were held 6 h at 34°C and 3 h at 38°C before transferring to 42°C for different durations. Mortality of insects was determined 12 h following termination of exposure to 42°C. Percentage adult mortalities were arcsine transformed and analysed using GLM procedure of SAS. In all situations, exposure of insects to spinetoram and abamectin increased mortality of *S. paniceum* adults compared with no exposure to insecticides under both acclimated and non-acclimated conditions. Acclimation at intermediate temperatures 34°C and 38°C increased the heat tolerance of insects exposed to abamectin alone. When spinetoram used alone or in combination with abamectin, heat acclimation of treated insects increased. This study concludes that combination of insecticides with heat treatment is more effective in reducing heat tolerance of *S. paniceum* than they use as separate treatments.

Keywords: Combined effect, Drugstore beetle, Reduced-risk insecticide, Synergy