

Effects of heat treatments on mortality of different development stages of the red flour beetle, *Tribolium castaneum* Herbst. (Col., Tenebrionidae)

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Abstract

The red flour beetle, *Tribolium castaneum* Hbst., is an important pest of food processing facilities world wide. The use of elevated temperatures or heat treatments is a very effective method for managing of stored pests. In this study, the mortality of pest in 5 constant temperatures, including 35, 45, 50, 55 and 60°C at times 5, 10, 15, 20 and 30 minutes on different growth stages (5-days larvae, 15-days larvae, pupae and adult of *T. castaneum*) were determined. Insects after heating, at temperatures of 28±1°C and relative humidity 65±5% were maintained. The results showed that, the most sensitive and resistant stages were 15-days larvae and pupal stages, respectively. It also revealed that the minimum temperature controller for 5-days larvae, 15-days larvae, pupal and adults stages were 55, 50, 55 and 50°C, respectively. Therefore, considering the possible all growth stages in an infected mass, 15°C temperature in 55 minutes, can be effective for control of all pest growth stages.

Key words: Red flour beetle, Heat treatments, Development stage, *Tribolium castaneum*

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