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Comparison of Coleoptera and Lepidoptera Response to Insect Control by Radio Frequency Heating

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Abstract

Insect pests of stored products are a key issue for achieving post-harvest handling of agricultural produce. The use of clean and safe treatments with no chemicals for maintains product quality is competitive in the market. This research aims to gather research involving the use of heat from radio frequency (RF) to control the insect pest. The study consisted of the growth stages of insects that are resistant to RF. The effect of RF on the number of insects in the progeny was investigated. The appropriate temperatures and time used in eliminating insects. The study found that growth stages of order Coleoptera insect that resistant to RF frequency of 27.12 MHz were pupae and larvae stages. The insects in the order Lepidoptera such as rice moth (*Corcyra cephalonica* (S.)) found that egg stage was resistant to most RF followed by a pupal larva and egg stage, mortality rates were 100 % respectively. The insects in the order Lepidoptera showed the growth stage of eggs and larva that resistant to radio frequency heat treatment. Angoumois grain moth (*Sitotroga cerealella* (O.)) in the pupal stage was strongly resistant to RF followed by egg and larvae stages, respectively. Red flour beetle (*Tribolium castaneum* (H.)) adult stage was resistant to most RF treatments, followed by egg and larval instars and larvae stage respectively. The temperature and the treatment duration for completely controlled were varied. The temperatures used for control both families of insects were in the range of 55–74°C with the treatment duration approximately 1 to 3.40 minutes.

Keywords: Coleoptera, heat treatment, insect pest control, Lepidoptera, radio frequency