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Using Radio Frequency Heat Treatment to Control the Insect *Rhyzopertha dominica* (F.) During Storage in Rice Seed (*Oryza sativa* L.)

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Abstract

Insect pests are response for severe crop losses, its feed directly on rice seed tissue. *Rhyzopertha dominica* (F.) is the seriously stored insect in rice seed. It infested the seeds and damaged the seed at the endosperm and embryo. In addition, the infected seed may loss in their germination and viability heavily and can not consider as the seed. This investigation was established to evaluate the efficiency of radio-frequency heat treatment on eliminating stored insect *Rhyzopertha dominica* (F.) both on the surface, and inside the seeds, which decrease seed qualities at the least. The rice seeds cv. "KDML105" with 10.4 % moisture content and 93 % germination were treated with radio-frequency heat treatment at 27.2 MHz under the temperature of 70, 75, 80 and 85°C for 180 seconds. The result showed that *Rhyzopertha dominica* (F.) were 100 % dead in all treatments. However, the rice seed qualities decreased with the increasing of the temperature used. The seed viability by tetrazolium test was reduced to 91, 82, 64 and 39 % at the treated temperature of 70, 75, 80 and 85°C, respectively. Therefore, the radio frequency heat treatment had significantly a high efficiency in killing *Rhyzopertha dominica* (F.), however it reduced also the seed qualities. The best temperature level was at 70°C with the remain viability still as high as 91 %. Thus, it can be concluded that radio frequency heat treatment has a good potential in controlling storage insect pest which maintain the rice seed qualities. Further study is suggested to investigate and develop more on radio-frequency post-harvest treatment to control insects in rice seed during storage.

Keywords: Insect control, radio-frequency, *Rhyzopertha dominica* (F.), rice

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