

ABSTRACT

Rice is the primary staple food in Indonesia, making post-harvest storage an essential stage in maintaining its quality and quantity. One of the major challenges during storage is infestation by *Sitophilus oryzae*, *Tribolium castaneum*, and *Oryzaephilus surinamensis*, which can cause significant losses and reduce rice quality. Kaffir lime (*Citrus hystrix*) peel has the potential to be used as a botanical insecticide due to its bioactive compounds, including terpenoids, flavonoids, essential oils, saponins, tannins, and alkaloids. This study aims to evaluate the bioactivity of kaffir lime peel extract against the repellency and mortality of the three major stored-product insect pests. The experiment was conducted under laboratory conditions using a Completely Randomized Design (CRD) with six extract concentrations (0%, 0.5%, 1%, 2%, 4%, and 8%), each replicated three times, resulting in 18 experimental units. The data were analyzed using analysis of variance (ANOVA), followed by *Duncan's Multiple Range Test* (DMRT) at the 5% significance level and probit analysis to determine the LC_{50} value. The results showed that repellency increased with increasing extract concentration and exposure time. At the highest concentration (8%), repellency reached 93.33% for *S. oryzae*, 100.00% for *T. castaneum*, and 86.67% for *O. surinamensis* after 5 hours of exposure. Mortality began on the first day after treatment and increased until the seventh day, with *T. castaneum* exhibiting the highest mortality (90%), followed by *S. oryzae* and *O. surinamensis* (83.8% each). The 8% concentration was the most effective treatment, indicating that kaffir lime peel extract has strong potential as an environmentally friendly botanical insecticide for the management of stored-product pests.

Keywords : *Citrus hystrix*, *Oryzaephilus surinamensis*, Repellent activity, *Sitophilus oryzae*, Toxicity, *Tribolium castaneum*.