



**FUMIGANT AND CONTACT TOXICITY OF
SELECTED UNDERUTILIZED PLANTS
AGAINST GRAIN STORAGE PEST
Tribolium castaneum (Herbst)**

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**SCIENCE AND TECHNOLOGY DEGREE PROGRAM
OCTOBER, 2012**

ABSTRACT

Since Sri Lanka is a developing and agriculture based country, it is crucial to minimize the post-harvest losses. The insect infestation of stored grains and their products is a serious problem. Nowadays controlling insects is mainly practiced by using synthetic insecticides and fumigants. But their widespread use has led to some serious problems. This study was carried out to screen the contact and fumigant toxicity of underutilized and highly abundant herbaceous plants on storage pest *Tribolium castaneum*. For this study methanol crude extract of dried leaves and fresh flowers of *Bidens sulphurea*, *Heliunthus annuus*, *Tagetes erecta* and *Tithonia diversifolia* were obtained and experiments were conducted with Randomized Complete Block Design and two factor factorial designs. Contact toxicity and fumigant toxicity were tested for *T. castaneum* with five different doses and three different doses respectively. Highest mortality values were found even at the low doses in *T. erecta* dry leaves, *H. annuus* dry leaves and *T. erecta* flowers for contact toxicity. *T. erecta* dry leaves and *T. diversifolia* fresh flowers show high fumigant toxicity. *T. erecta* dry leaves show the highest both toxicity effects on *T. castaneum*. Any mortality was not observed in control, even without food and air supplement. According to the ANOVA, there was no significant interaction effect between dose and crude type to the mean mortality % ($p > 0.05$). The best selected plants were re-examined under randomly selected dose series to calculate the median lethal doses (LD_{50} value) using probit analysis. LD_{50} values of *T. erecta* dry leaves, *H. annuus* dry leaves and *B. sulphurea* fresh flowers are $13.129 \mu\text{g}/\text{cm}^2$, $38.925 \mu\text{g}/\text{cm}^2$ and $51.716 \mu\text{g}/\text{cm}^2$ respectively for contact toxicity. LD_{50} values of *T. erecta* dry leaves and *T. diversifolia* fresh flower were $109.044 \mu\text{g}/\text{cm}^2$ and $196.368 \mu\text{g}/\text{cm}^2$ respectively for fumigant toxicity. Hence those two types of extracts can be used in developing a fumigant to eradicate the infestation of *Tribolium castaneum*.