

Efficacy of *Withania somnifera* (Dunal) extracts against *Tribolium castaneum* (Herbst) and *Callosobruchus chinensis* (L.) on stored grains in Sri Lanka

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Abstract

Among storage pests, *Tribolium castaneum* and *Callosobruchus chinensis* are inflicting severe damages on stored commodities. Attention has been given to the possible use of plant products or plant derived compounds as promising alternatives to synthetic insecticides in controlling insect pests of stored products. The grain protectant efficacy of *Withania somnifera* (Solanaceae) despite its excellent pharmacological activity was evaluated against both pests following completely randomized design. The aqueous extract of *W. somnifera* was applied to the substrates at five concentrations (20, 40, 60, 80 and 100%) as treatments and replicated five times. Newly emerged adults of *T. castaneum* and *C. chinensis* were exposed to treated rice and green grams respectively. Rice grain weight loss (GWL) by *T. castaneum* after 7, 30 and 60 days and percentage damage on green gram by *C. chinensis* after seven days were calculated. The results revealed that the extract was effective in dose dependant manner for both pests when compare to control. Minimum GWL by *T. castaneum* as observed in 30 and 60 days after treatment (DAT) were 0.7 ± 0.12 and 3.17 ± 0.47 % respectively. There was significant difference noticed among concentrations at 30 DAT. GWL was increased with time due to loss of efficacy. Damage percentage of *C. chinensis* exhibited an indirect relationship with the concentration. The sets treated with 100% of extracts recorded lowest damage ($3.36 \pm 1.31\%$) while control was 14.24 ± 2.07 %. This study suggests that *W. somnifera* extracts can be used to manage storage pests by small scale farmers who store the grains for consumption and seed purpose.