

## Evaluation of *Withania somnifera* extracts on a storage pest Rice weevil, *Sitophilus oryzae*

<sup>1</sup>Suvanithini. S., <sup>1</sup>Mikunthan. G., <sup>2</sup>Thurairatnam. S., <sup>1</sup>Pakeerathan. K.

<sup>1</sup>Department of Agricultural Biology, Faculty of Agriculture, University of Jaffna, Sri Lanka

<sup>2</sup>Provincial Department of Indigenous Medicine, Northern Province, Sri Lanka

### Abstract

Rice weevil, *Sitophilus oryzae* is the major stored pest of rice all over the world. Control of this pest using inorganic pesticides leads to even many health hazards, environmental pollution and detrimental to non target organisms. Plant based pest management is an ecologically compatible alternative to synthetics. This study was conducted to evaluate the efficacy of medicinal plant, *Withania somnifera* (Solanaceae) extracts against adults of *Sitophilus oryzae*. The plant extracts were applied at five concentrations on green gram which were at 20, 40, 60, 80 and 100%. Adult insects were exposed to treated green gram grains and mortality was calculated after 5 and 10 days of exposure. Damage percentage was calculated after seven days. The results revealed that mortality and damage percentage were proportional to concentrations. Higher concentrations had stronger toxicity and lowered the damage percentage. Maximum mortality registered as 86.07% and 84.17% in five and 10 days after treatment (DAT), respectively. Lower concentration (20%) also checked the population build up of this pest which was 25.41% in 10 DAT. Toxicity was increased with time. In another experiment minimum damage registered in leaf extracts (2.40%), fruit extracts (2.47%) and root extracts (2.93%) at 100% concentration when compared to control (8.13%). There was a clear observation significantly between 80% and 100% of leaf and fruit extracts but not in root extracts at the same concentration. Even though, root extracts reduced damage from lower concentration compared to other two. Overall the root extracts were effective followed by leaf and fruit extracts. The results of this study suggest that various extracts of *W. somnifera* were effective and can be used to manage stored pests as admixture of integrated pest management tactics.