

## **Efficacy of aqueous extracts of a medicinal crop, *Withania somnifera* on the storage rice weevil, *Sitophilus oryzae***

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### **Abstract**

Rice weevil, *Sitophilus oryzae* is the major storage pest of rice all over the world. Chemical pesticides are used to curb the menace of these pests that lead to many health hazards, environmental pollution and detrimental to non target organisms. Plant based pest management is an ecologically compatible alternative to such synthetics. This study was conducted to evaluate the efficacy of a medicinal plant, *Withania somnifera* (Family: Solanaceae) extracts against adults of *S. oryzae*. Plant extracts were applied at five concentrations at 20, 40, 60, 80 and 100% on green gram. Adult weevils 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 of weevils registered was 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 84.17% in 10 DAT. Toxicity was increased with time. In another experiment minimum damage was 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* are effective and can be used to manage stored pests as an admixture of integrated pest management tactics.