

Mella Leaves (*Olax zeylanica*) as an eco-friendly repellent for storage insect pest management

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Abstract

Among the cereals, rice is the most important staple food supplying energy requirements for most of the worlds' population. However during storage about 10-20% losses of rice grains take place and a primary factor in these losses is the depredation by stored product insect pests. Repellents have potential for the exclusion of stored product pests from grain, and have been used to prevent insect feeding and oviposition on food materials. Due to this, repellents are considered as the best source of protection against insect attack upon stored products. Various plant materials have been used effectively through time as repellents due to their ease of use, eco- friendliness and safety.

The present study was therefore aimed at investigating the potential of powder and extracts of *Olax zeylanica* leaves as repellents against *Sitophilus oryzae* infestations. All the experiments were carried out under laboratory conditions using 1-7 day old unsexed adult weevils.

Plant powder was tested for fumigant repellency in a dual-choice bio-assay apparatus using 1.0g, 3.0g, 5.0g, and 7.0g of leaf powder. Repellent action of leaf extracts was evaluated by means of an area preference test using methanol, ethanol and n- hexane as solvents.

Repellent effect of plant powder against rice weevils was found to be significantly high ($P < 0.05$) at all doses. The highest repellent effect was produced by 7.0g of leaf powder resulting in repellency of 97%, while the lowest dose (1.0g) also elicited more than 50% repellency in weevils indicating a very strong repellent action of the plant powder. In comparison, methanol extract of plant leaves produced the highest repellent effect (96%) on weevils whereas n-hexane extract elicited the lowest. Nevertheless, at higher concentrations all three extracts produced more or less significantly similar repellent effect on the weevils.

The findings of the present study suggest that certain active materials of *Olax zeylanica* leaves have potential to act as a grain protectant and may be exploited for rice weevil control in grain storage in an environment-friendly way.

Key words: *Olax zeylanica*, *Sitophilus oryzae*, repellent effect