



Eco-friendly alternatives for storage pest management: Leaves of *Ruta graveolens* (Aruda) as a repellent against the rice weevil, *Sitophilus oryzae* L. (Coleoptera: Curculionidae)

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ABSTRACT

*In view of worldwide interest and greater public awareness in finding plant products as the most promising and ecologically safer alternatives for synthetic insecticides in post-harvest protection of stored rice, present study was undertaken to explore the potential of leaves of *Ruta graveolens* (Aruda) as a repellent against *S.oryzae* infestations. Leaf powder and solvent extracts of *R. graveolens* were evaluated for their contact and fumigant repellent properties against seven day old *S. oryzae* adults. In contact repellency test, weevils (20 each) were exposed to 1.0 g, 3.0 g, 5.0 g, and 7.0 g of leaf powder mixed with white raw rice grains in a modified cup bioassay apparatus. Fumigation repellency of leaf powder was tested using same dosages and the number of weevils in a fumigation-repellency chamber. Number of weevils that moved from the bioassay chamber was recorded one hour after weevil introduction. Leaves of *R. graveolens* were extracted in hexane, ethyl acetate, methanol, distilled water and different concentrations 10, 50, 100% (v/v) were assessed separately to evaluate repellent activity by means of an area preference bioassay. In all experiments, ten weevils for each were tested and the number repelled was recorded 30 minutes after weevil introduction. Highest contact and fumigant repellent effects were elicited by 7.0 g of leaf powder resulting 96% and 95% respectively, whilst lowest dose also produced more than 50% repellency indicating extremely strong repellent action of the plant powder. In comparison, aqueous extract exhibited the most potent repellent activity (91%) while other extracts were producing over 70% repellent effects on weevils at the concentration of 100% (v/v). Overall findings of the study suggest that both powder and extracts of *R. graveolens* leaves could be used as eco-friendly agents for post-harvest rice protection.*

KEYWORDS: *Ruta graveolens*, *Sitophilus oryzae*, stored rice, leaf powder, repellent

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