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# Efficacy of some Plant Extracts against Sawtoothed Grain Beetle, *Oryzaephilus surinamensis (L.)*

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***Abstract***
*The study designates the efficacy of plant extracts against Oryzaephilus surinamensis L. under laboratory conditions. The results evaluate that alcoholic seed extracts of Azadirachta indica, Pongamia glabra, and Ricinus communis leave their residues on rice for 15 to 20 days @ 74.0, 66.0 and 80.0 mg/gm respectively.*
***Keywords****: Alcoholic extracts, Azadirachta indica, Pongamia glabra , Ricinus communis, rice, storage, Oryzaephilus surinamensis L.*

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## I. INTRODUCTION

The storage pests destroy over 96 million metric tonnes of cereals and grains and if this loss could be saved, it would be sufficient for 375 million people for an entire year [1,2].

Pest management cannot be done without accurate estimate of pests and densities of their natural enemies [3]. Among stored grain pests, *Oryzaephilus surinamensis (*L.*) (Coleoptera:Silvanidae)* is a globally distributed species [4] and one of the most serious and destructive pests.

This pest is a cosmopolitain invader of packaged consumer food [5] and feeds on a variety of products including almost all grains and their products, dried fruits and almost all items used as human food [6,7]. The insect is not believed to chew directly through packaging material but to use opening or flaws in damaged or improperly sealed packages as entrance [8].

This has also resulted in infestation of chocolates that were under packaged and unpackaged conditions in laboratory [9].

Several pesticides have been introduced to control this pest and mitigate damage, but regular and frequent application of these pesticides creates lots of problems such as damage of biodiversity, pest resistance and resurgence, affecting human health and the environment . This has created worldwide interest in research particularly as alternative method of synthetic chemicals.

To minimize the use of pesticides and to avoid pollution of the environment, natural antifeedents, deterrents and repellent substances have been recovered for pest control during recent times[10,11,12,13].

Number of investigators have isolated and identified chemical compounds from leaves and seeds of many plants species as insect antifeedents[14,15].

Limited information is available with regard to the indigenous plant materials against *Oryzaephilus surinamensis.*

Under present investigation, some plant extracts have been evaluated to find out their efficacy against *Oryzaephilus surinamensis* (L.).

## II. MATERIAL AND METHOD

The plant parts (seeds of *Azadirachta indica, Pongamia glabra and Ricinus communis*) were dried in shade and pulverized into powder. All the materials were passed through a domestic flour sieve. The extracts were prepared through Soxhlet apparatus in alcohol. The experimental insects saw-toothed grain beetle, *Oryzaephilus surinamensis* were obatained from laboratory culture, maintained on rice at the temperature of 30 degree C. and 70 % humidity. The various dosages of extracts were sprayed uniformaly in culture vials containing 20 gm of rice grain. 10 pairs of insects were released in each vial. Each vial was covered with muslin cloth after spray and kept in suitable conditions for 24 hours. Each treatment was replicated three times. The adult mortality was recorded after 24 hours.

## III. RESULT AND DISCUSSION

Alcoholic seed extracts of *Azadirachta indica, Pongamia glabra, and Ricinus communis* deposited their residues on rice for 15 to 20 days @ 74.0, 66.0 and 80.0 mg/gm concentration respectively. It was found by [16] that neem seed extract @ 1.0 ml/100gm seed of moth bean, were found to be most effective causing 49.17 % mortality of adults of *Callosobruchus maculates* (Fab.) after three days of treatment.

**TABLE-1**

**Residual toxicity of deposits of individual Alcoholic plant Extracts to the adult *of Oryzaephilus surinamensis (L.)* at different intervals after spraying**

| S.No. | Plant Extracts | Part | Dose (mg/gm) | Residual Toxicity of deposits at interval of | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 1DAT % Mortality | 3 DAT % Mortality | 5 DAT % Mortality | 7 DAT % Mortality | 15 DAT % Mortality | 30 DAT % Mortality |
| 1 | *Azadirachta indica* | Seed | 74.0 | 100 | 95 | 80 | 65 | 10 | _ |
| 2 | *Pongamia glabra* | Seed | 66.0 | 100 | 95 | 65 | 45 | 25 | _ |
| 3 | *Ricinus communis* | Seed | 80.0 | 100 | 80 | 60 | 40 | 5 | _ |

**DAT= Days After Treatment**

## IV. CONCLUSION

It has been estimated through the present research work that *Pongamia glabra* seed extract in alchohol @66.0 mg/gm dose has been found most effective ecofriendly ingredient, which deposited its residue on rice grain for more than 15 days to protect it from the infestation of *Oryzaephilus surinamensis (*L).

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