

THE POTENCY OF TWO PLANT OILS AGAINST SAWTOOTHED GRAIN BEETLE, *ORYZAEPHILUSSURINAMENSIS (L.) IN STORED RICE*

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ABSTRACT

Stored grain insects cause serious loss of stored rice and degrade the nutritional value of grains. A number of plant products are active against specific target insects, biodegradable and potentially sound for use in pest management. In this study, Oils (ether Extracts of seeds) of *Azadirachta indica* and *Sesamum indicum* were evaluated for protection of rice grains against saw-toothed grain beetle, *Oryzaephilussurinamensis(L.)*. *Azadirachta indica* seed extract was used as a standard. Results demonstrated that Oils (ether Extracts of seeds) of *Azadirachta indica* and *Sesamum indicum* leave their residues on rice for 30 days @50.0 ml/L and for 60 days @66.0 ml/L respectively.

Keywords: *Azadirachta indica*, *Sesamum*, *Oryzaephilussurinamensis*, Saw-Toothed Grain Beetle.

Introduction

Rice and other food grains are major sources of food for humans. Rice is the staple diet of many South Asians and its huge production comes from Asia. Rice contains carbohydrates, proteins and other nutritional properties. Protection of rice and other food grains against pests is a matter of paramount concern for developing and developed countries.

The most extensively used method to control stored product pests is chemical pesticides. These chemical pesticides act as fumigant, contact poison and antifeedant. Unfortunately, excessive and unmindful use of these pest repellents makes insect populations impervious of them. Chemical insecticides can hazardously affect other species. Alternative efficacious methods are being devised to circumvent such collateral damages. Laboratory and field trials with many botanicals have yielded encouraging results against a number of stored grain pests. Many research papers have been published related to the insecticidal properties of botanicals. *Azadirachta indica* has been shown to be effective against insect pest species.

According to Mishra *et al.* (2012) The essential oils from *Ocimumbasilicum(L.)* leaves has a repellent effect against red flour beetle, *Triboliumcastenium* (Herbst) (Coleoptera: tenebrionida) and *Sitophilus oryzae* (L.) (Coleoptera: curculionidae).

In the present study, Oils (ether extracts) of seeds of *Azadirachta indica* and *Sesamum indicum* were evaluated for protection of rice grain against *Oryzaephilussurinamensis (L.)* *Azadirachta indica* was used as a standard.

Materials and Method

The experimental insect *Oryzaephilussurinamensis L.* was reared in a laboratory, culture maintained on rice grain at 30 ± 2 degree celsius and 70 ± 5 % RH. Plant material (*Azadirachta indica* and *Sesamum indicum* seeds) were dried in sunlight. Oils (ether extracts) of *Azadirachta indica* and *Sesamum indicum* seeds were extracted by Soxhlet apparatus.

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20 gm of sterilized grain was filled in each culture tube, the test solution was measured one ml. by pipette and dropped in the tubes in spiral manner; lid was put on it and shaken well by rolling in up and down movement. 10 pairs of freshly emerged adult *O. surinamensis* were released in culture tubes with treated grain and covered with muslin cloth tied with rubber band properly. Mortality was counted after 24 hours of treatment.

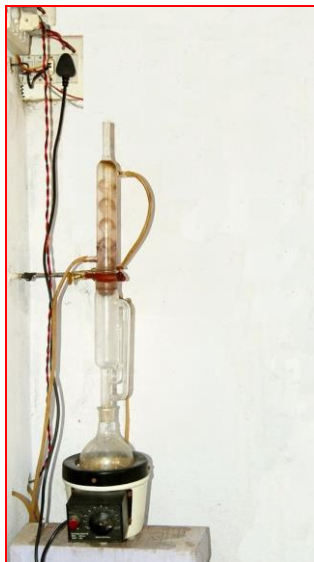
In every count moribund insects and the insect which could not walk properly, we are also considered as dead. For more accuracy of individual oil, the treatments were done in triplicates. The experiment was repeated by releasing new batches of insects in the same treated grains for mortality count after three, five, seven, fifteen, thirty, fortifive and sixty days interval after treatment.



Sesamum indicum seeds



Azadirachta indica seeds



Soxhlet Apparatus

Result

The efficacy of various oils (ether extracts) were estimated till the deposits of toxicant gave no mortality of saw-toothed grain beetle, *Oryzaephilus surinamensis* L. Continued observations revealed that Oils (ether Extracts of seeds) of *Azadirachta indica* and *Sesamum indicum* leave their residues on rice for 30 days @ 50.0 ml/l and 60 days @ 66.0 ml/L respectively.

Conclusion

Among *Azadirachta indica* and *Sesamum indicum*, the better effective oil (ether extract) was reported as *Sesamum indicum* @ 66.0 ml/L. for 60 days.

Table 1

Residual toxicity of deposits of individual plant Oils to the adult of <i>Oryzaephilus surinamensis</i> (Linn.) at different intervals after spraying												
S. No.	Plant Oils	Plant Part	Dose (ml/L)	Residual Toxicity of deposits at interval of								
				1DAT % Mortality	3 DAT % Mortality	5 DAT % Mortality	7 DAT % Mortality	15 DAT % Mortality	30 DAT % Mortality	45 DAT % Mortality	60 DAT % Mortality	
1	<i>Azadirachta indica</i>	Seed	50.0	100	90	80	50	25	10			
2	<i>Sesamum indicum</i>	Seed	66.0	100	100	100	95	90	80	50	15	

DAT = Days After Treatment

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