

Residual Toxicity of Some Plant Oils and Magnesium Carbonate against, *Rhizopertha dominica* (Fab.)

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Abstract: *Wheat seeds in storage are attacked by a large number of lesser grain borer, Rhizopertha dominica (Fab.) In the present investigations the residual toxicity of two plant oils viz. neem (Azadirachta indica) seed oil, mustard (Brassica campestris) seed oil and an inorganic compound (magnesium carbonate) were evaluated against adults of Rhizopertha dominica (Fab.) in a laboratory conditions, the results reveal that Azadirachta indica seed oil and Brassica campestris seed oil and magnesium carbonate were effective for 90,90 and 75 days respectively at the doses of 0.85 ml, 0.65 ml and 10 gm/25gm*

Keywords: Azadirachta indica, Brassica campestris, Magnesium carbonate, Rhizopertha dominica (Fab.).

I. INTRODUCTION

Healthy wheat seed is an important input in agriculture, governing field of crops. Wheat seeds in storage conditions are attacked by various insect pests and become unfit for human consumption. In order to protect the seeds under storage conditions from the attacks of large number of insect pests synthetic insecticides are used in many ways.[1,2]. The indiscriminate and wide spread use of these health hazardous pesticides poses a serious ecological and environmental problems and many storage pests have developed resistance against these pesticides. [3,4,5].The use of plant origin insecticides and minerals offer an alternative to the synthetic insecticides in protecting stored products without affecting its consumption quality [6].Neem in different ways and in different formulations found effective against stored grain pests [7,8,9,10].Some workers, earlier have reported mustard and $mgco_3$ also effective in stored products against storage pests [11,12,13].Very little information is available on the insecticidal properties of plant seed oils and inorganic compound against stored grain pests.Keeping this in mind the studies were conducted under laboratory conditions to evaluate the residual toxicity of neem seed oil, mustard seed oil and magnesium carbonate against adults of *Rhizopertha dominica* (Fab.) in wheat seeds.

II. MATERIAL AND METHOD

Required volume of two plant oils viz neem (*Azadirachta indica*) seed oil and mustard (*Brassica campestris*) seed oil were measured in a pipette and the required quantity of an inorganic compound (magnesium carbonate) weighed with the help of balance. For each treatment 75 gm seeds of the same age, size and shape were counted and divided into three equal replications, each comprising of 25 gm seeds. The seeds in each replication were kept in a glass jar (15×5 cm) covered with muslin cloth. Different seed protectants *Azadirachta indica* seed oil, *Brassica campestris* seed oil and magnesium carbonate were mixed individually with the seeds in the jars @0.85 ml/25gm, 0.65 ml/25 gm and 10 gm/25 gm respectively. Twenty freshly emerged experimental insect *Rhizopertha dominica* (Fab.) adults were introduced in each jar. The jars were kept at a temperature of 30 ± 2^0 C and $70 \pm 5\%$ relative humidity, mortality of insects was taken after 24 hours of treatment. The experiment was repeated by releasing twenty freshly emerged experimental insects *Rhizopertha dominica* (Fab.) in the same treated wheat seeds to give mortality count 3,7,15,30,45,60,75 and 90 days interval after treatment.

III. LITERATURE REVIEW

Rajak and Pandey (1964) reported mustard oil effective in checking the multiplication of pests in storage. Jotwani and Sircar (1965) found that powder of neem seed kernels was effective for *Sitophilus oryzae* (Linn.). Saramma and Verma (1971) studied the efficacy of powdered drups of neem seeds, costus roots and magnesium carbonate against storage pest. Ali et.al.(1983) tested plant oils including neem,mustard and mahua against pulse beetle. Verma et.al. (1983). Studied the comparative efficacy of neem and mustard against stored grain pests. Sharma et.al. (1989) showed mortality of *Rhizopertha dominica* (Fab.) at the lowest dose of neem kernel powder in stored grains. Sharma (1999) revealed that neem oil was toxic to adults of *Rhizopertha dominica* (Fab.) up to 9 months.

IV. RESULT AND DISCUSSION

The residual toxicity of different seed protectants estimated till the deposits of insecticide gave no mortality of experimental insect *Rhizopertha dominica* (Fab.). The data are presented in table. Results revealed that the plant oils *Azadirachta indica* seed oil 0.85 gm/25 gm and *Brassica campestris* seed oils (0.65 ml/25gm) were effective more than 90 days and inorganic compound magnesium carbonate (10gm/25gm) was found effective more than 75 days. Thus, the order of residual toxicity of seed protectants was as follows –*Brassica campestris* seed oil >*Azadirachta indica* seed oil > Magnesium carbonate.

Table-1: Residual toxicity of seed protectants to the adults of *Rhizopertha dominica* (Fab.) at different intervals after treatment.

S. N	Name of seed protectant	% mortality of show residual toxicity of seed protectants at interval of								
		1 DAT	3 DAT	7 DAT	15DAT	30DAT	45 DAT	60 DAT	75 DAT	90 DAT
1	<i>Azadirachta indica</i> seed oil (0.85ml/25 gm)	100.00	096.65	090.00	085.00	081.65	052.00	040.00	018.30	005.00
2.	<i>Brassica campestris</i> (0.65 ml/25 gm)	100.00	095.00	091.65	086.65	068.30	066.65	060.00	028.30	008.30
3.	Magnesium Carbonate (10 gm/25 gm)	095.00	083.30	083.30	083.30	066.65	096.65	016.65	005.00	_____

(DAT- Day After Treatment)

V .CONCLUSION

Although the most effective seed protectant was found *Brassica campestris* seed oil (0.65 ml/25 gm), but all these insecticides (*Azadirachta indica* seed oil and magnesium carbonate) can be used as alternative to synthetic insecticides against adults of *Rhizopertha dominica* (Fab.).

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