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Residual Toxicity of Plant Powders and Inorganic Compound against *Rhizopertha dominica (Fab.)*

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Abstract
Bioassay studies were carried out in the laboratory to evaluate the residual toxicity of plant powders and inorganic compound against adults of Rhizopertha dominica (Fab.). The results showed that Argemone mexicana leaf powder, Madhuca indica seed cake powder and magnesium carbonate were effective for about 60,60 and 75 days respectively at the doses of 20,50 and 10 gm/25gm.
Keywords: *Argemone maxicana, Madhuca indica, Rhizopertha dominica (Fab.), Magnesium carbonate.*

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I. INTRODUCTION

Wheat grain in storage is infested by a large number of stored grain pest. The average percent infestation was studied 9.19 which is equivalent to calculated weight loss of 2.03 percent [11] *Rhizopertha dominica (Fab.)* commonly known as lesser grain borer is cosmopolitan and major infesting pest of wheat cereals, millets, pulses, maize, barley and paddy. [2,3,8,15]

In ancient times synthetic insecticides were used to protect stored grains from insect pest. The synthetic insecticides have increased ecological and environmental problems and also causes the development of resistance in storage pests [5]

Plants are good source of grain protectants and plant products have minimum or no toxicity to mammals [4,6,7,16] Although certain plants have already been reported to have residual toxicity against stored grain pests including *Rhizopertha dominica (Fab.)* [10,13] Some workers have reported the effectiveness of several minerals, dusts, ash and clays against stored grain pest [1,9,14]

But very little published literature was available on the residual toxicity of different insecticides of plant origin and inorganic compounds against lesser grain borer, *Rhizopertha dominica (Fab.)*

Therefore, the present study was undertaken to evaluate residual toxicity of two plant powders viz. Satyanashi (*Argemone mexicana*) leaf powder, Mahua (*Madhuca indica*) seed cake powder and an inorganic compound magnesium carbonate against adults of lesser grain borer *Rhizopertha dominica (Fab.)*

II. MATERIAL AND METHOD

The experimental insect *Rhizopertha dominica (Fab.)* were obtained from the laboratory culture maintained on wheat seeds at 30 ± 2^0 C temperature and $70 \pm 5\%$ relative humidity. *Argemone maxicana* leaves and *Madhuca indica* seed cakes were dried in shade and powdered separately. 25 gm of crushed wheat seeds was measured and filled in each culture jar. The seed protectants 20 gm of *Argemone mexicana* leaf powder, 50 gm of *Madhuca indica* seed cake powder and 10 gm of magnesium carbonate was weighed with the help of balance then mixed with crushed wheat seeds in culture jars.

Twenty freshly emerged adults were released in each culture jar which were filled with treated crushed wheat seeds. The mortality counts were made after 24 hours of treatment. The experiment was repeated by releasing twenty freshly emerged experimental insects in the same treated crushed wheat seeds to give mortality count three, seven, fifteen, thirty, forty five, sixty, seventy five and ninety days interval after treatment.

III. RESULT AND DISCUSSION

The residual toxicity of various seed protectants was estimated till the deposits of insectide gave no mortality of lesser grain borer *Rhizopertha dominica (Fab.). Argemone mexicana* leaf powder and *Madhuca indica* seed cake powder was found effective more than sixty days at the dose of 20 and 50 gm/25 gm respectively and magnesium carbonate was found effective more than seventy-five days at the dose of 10 gm/25 gm.

Table – 1
Residual Toxicity Of Seed Protectants To The Adults Of *Rhizopertha dominica (Fab.)* At Different Intervals After Treatment.

S. No.	Name of seed protectant	% mortality of show residual toxicity of seed protectants at interval of								
		1 DAT	3 DAT	7 DAT	15 DAT	30 DAT	45 DAT	60 DAT	75 DAT	90 DAT
1	*Argemone mexicana* leaf powder (20 gm/25gm)	095.00	083.30	0.61.65	050.00	038.30	018.30	008.30	-	-
2.	*Madhuca indica* seed cake powder (50 gm/25gm)	095.00	088.30	063.30	046.65	035.00	016.65	005.00	-	-
3.	Magnesium carbonate (10 gm/25 gm)	0.95.00	083.30	083.30	083.30	066.65	046.65	016.65	005.00	-

DAT = Day After Treatment

IV. CONCLUSION

From the observations it can be concluded that among the plant powders (*Argemone mexicana* leaf powder, *Madhuca indica* seed cake powder) and inorganic compound (magnesium carbonate) the most effective seed protectant was found magnesium carbonate (10 gm/25 gm). These insecticides can be used as alternative to commercially available, synthetic insecticides against adults of *Rhizopertha dominica (Fab.)*

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