

Toxic Effect of Mustard (*Brassicacampestris*) Seed Oil on Lesser Grain Borer *Rhizoperthadominica* (Fab.)

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Abstract: *Wheat is an important component in the food. It suffered during storage by a number of insect pests out of which Rhizoperthadominica (Fab.) is the major pest. Synthetic insecticides are used to protect the grains from attack of this noxious pest, but these insecticides pose a serious threat to man, animal and environment. The undesirable effects of synthetic insecticides may be solved with the use of plant origin insecticides. But very few significant contributions have been made to use of vegetable oils so far. In the present study Brassica campestris seed oil used as seed protectant against lesser grain borer Rhizoperthadominica (Fab.) Result demonstrated that the mustard seed oil was found more effective for adults whereas less effective for larvae giving LD₅₀ value (00.5084) and (1.0040) respectively.*

Keywords: Rhizoperthadominica (Fab.). Brassica campestris, wheat grain, lesser grain borer, mustard Oil.

I. INTRODUCTION

Wheat grain in storage is infested by a large number of insect pests of which the lesser grain borer *Rhizoperthadominica* (Fab.) is important. This insect pest is one of the most devastating pest of stored grains both at larval and adult stage [1] It is distributed especially in the warmer climate and infest wheat [2]. In order to protect the grains from the attack of large numbers of insect pests under storage conditions, commercially available pesticides are used. But their repeated use create environmental pollution and toxic effects on food and humans [3]. Plant origin pesticides, because of their natural origin are biodegradable and often do not leave toxic residues or by products to contaminate the environment and safe to human and domestic stock. [4,5]. Hence, in recent years there has been a number of plants identified for their biological activities and Plant essential oils are the odorous components and secondary metabolites. More recently, they have become the focus of interest in developing "ecologically sensitive pesticides" [6]. A large number of essential oils are known to behave as insecticidal/ovicidal/attractants/ repellents / antimicrobial/ antigonadal agent and antihelmintic etc. [7,8]. Some workers earlier have reported various plant oils effective in checking the multiplication of pests in stores. [6,9] These workers, however used oils after diluting them in some organic solvents and reported their effect on adult stored grain pest only. [10,11] Very little work on the storage of wheat seed using mustard oil seems to have been carried out. [12,13,14] The present investigations were therefore undertaken with a view to find out use of *Brassica campestris* seed oil as such and their toxic effect on adults and larvae of lesser grain borer *Rhizoperthadominica* (Fab.).

II. MATERIAL AND METHOD

To find out the toxic effect of mustard (*Brassica campestris*) seed oil, the culture of experiment insect was maintained on wheat grains at the temperature of $31 \pm 2^{\circ} \text{C}$ and $70 \pm 5\%$ relative humidity. The required volume of seed protectant was measured and dropped spirally on a fine Whatman filter paper. Twenty freshly emerged adults of test insects were released inside hollow filter paper tube and kept in suitable conditions for 24 hours. Each treatment was replicated three times. For determination of toxic effect of seed protectant on larvae of *Rhizoperthadominica* (Fab.) the same method was employed. The mortality counts were made after 24 hours of the treatment.

III. LITERATURE REVIEW

Gupta and Ahmed (1988) studied the efficacy of non-edible oils (neem, mahua, dhupa and palas) on wheat seeds protection from pest infestation in storage with their effect on germination. Mohanty and Chakraborty (1988) tested the contact toxicity of oil fraction of *Psoralea corylifolia*, *Pongamia glabra* and *lens esculenta* against stored grain pests such as *Callosobruchus chinensis* and *Rhizoperthadominica*. They found that the oil of fraction of *Pongamia glabra* was most effective. Chauhan *et.al.* (1987) worked on petroleum ether extracts of *Croton sparsiflorus*, *Anona squamosa*, *Acorus calamus*, *Brassica campestris* and *Melia azedarach* were 0.00273, 0.0072, 0.0017, 0.0004 and 0.0003 time less toxic as compared to malathion when treated against *Corcyra cephalonica* (st.). Persaiet *al.* (1990) studied the mahua, mustard and groundnut oil were effective in reducing the seed damage and loss in seed weight in comparison to soyabean, sesame and coconut oil treated seed against *Callosobruchus chinensis* (L). Gupta *et. al.* (2000) evaluated the oils of castor, mustard, linseed, soyabean, coconut, groundnut and sesamum were effective on weight loss and grain damage done by *Sitophilus oryzae*. It was observed that all the oils offered protection. The mustard and linseed oil at both the concentrations were significantly superior in comparison to other oils taken into consideration. Reddy *et.al.* (1994) tested neem, karanj, mustard groundnut and castor oil as surface protectants against pulse beetle *Callosobruchus chinensis* and also its effect on seed viability. They observed karanj, mustard and castor oil were found more effective followed by neem oil and groundnut oil.

IV. RESULT AND DISCUSSION

A series of experiments were conducted under laboratory conditions for determination of toxic effect of *Brassica campestris* seed oil on adult and larvae of *Rhizoperthadominica* (Fab.).

It is evident from the result of these experiments that *Brassica campestris* seed oil (Table -1) have shown that it was more toxic for adult giving LD₅₀ value (00.5084), while this seed protectant was less toxic for larvae of *Rhizoperthadominica* (Fab.) giving LD₅₀ value (1.0040) after 24 hours of the treatment.

The order of toxicity of *Brassica campestris* seed oil as seed protectant under investigations as follows Adults (00.5084 > Larvae (1.0040)

Table 1: Toxic Effect of *Brassica campestris* seed oil on *Rhizoperthadominica* (Fab.).

| S.No. | Life Stage | Heterogeneity | Regression Equation | LD ₅₀ |
|-------|------------|---------------|-----------------------|------------------|
| 1. | Adults | 1.5272 | Y = 2.6607 x - 2.2006 | 00.5084 |
| 2. | Larvae | 3.2912 | Y = 3.3129 x - 4.9439 | 1.0040 |

V. CONCLUSION

It has been concluded through the present investigations the *Brassica campestris* seed oil has insecticidal property against adults and larvae of *Rhizoperthadominica* (Fab.) The use of mustard seed oil offers an alternative to the commercially available insecticides in protecting grain without affecting its consumption quality.

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