Management of Rice Weevil, Sitophillus Oryzae (Curculionidae: Coleoptera) Using Certain Botanicals

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Abstract- *The rice weevil, Sitophilus oryzae (L.) is a major stored grain pest. In Tamil nadu 14% loss was caused annually in paddy by S.oryzae. Management using synthetic chemical insecticides in the storage is limited due to the side effects. In this situation traditional methods are followed with lot of hope. To support the idea an experiment was carried out in laboratory by using powders of Notchi leaf, Moringa seed, Dry chilli pod and Pepper seed at various concentrations. Among all the botanicals Chilli pod and Notchi leaf powders were effective in controlling the multiplication of rice weevil in storage.*

Keywords- S. oryzae, botanical insecticide, traditional method

I. INTRODUCTION

According to FAO, the world wide annual loss due to stored grain insect pest is 10%. In Tamil nadu 14% loss was recorded annually in paddy due to S. oryzae. Sixty to seventy per cent grains are stored at farmers' level in India. Majority of stored insect pest belong to orders Coleoptera and Lepidoptera which account for about 60% and 8-9% of total number of species respectively. The most destructive insects of stored rice are lesser grain borer, Rhyzopertha dominica (F.); Angoumois grain moth, Sitotroga cerealella (Oliv.); rice weevil, Sitophilus oryzae (L.) and the maize weevil Sitophilus zeamals Mots (Schroeder and Calderwood, 1972).

The major effect of infestation by Sitophilus spp. is the damage to grain by feeding activities of the adults and the development of immature stages within the grain. This not only reduces the grain quality but also produces a considerable amount of grain dust mixed with frass (Longstaff, 1981). The rice weevil infests rough rice only when there are defects in hulls, or untight hulls after blooming. Prevett (1971) also pointed out that even when a hull defect permits oviposition the adult progeny rice weevil may be trapped within the hull because the defect was not large enough to allow escape. Management of storage pest using synthetic chemical insecticides in the storage is limited due to the side effects of them. In this situation traditional and mechanical methods are followed with lot of hope.

II. MATERIALS AND METHOD

Rice weevil (Sitophilus oryzae) was collected from our experimental from and reared on polished rice (Variety: ADT 38) in our laboratory under controlled conditions of 25 ± 2 and 70± 5% RH. For rearing, glass jars of 1Lit capacity were used. In each glass jar 250g of polished rice was filled and the weevil collected from our farm was released @ 25/jar. Then the mouths of the jars were covered using muslin cloth and secured by elastic band.

Leaves of Notchi (Vitex negundo Linn) and seeds of Moringa (Moring olifer) were collected, shade dried in the green house and powered using mixer. Pepper seed and dry chilli pod were procured from market and powered botanicals were placed in muslin cloth and made in to 1 and 2gm packets. Hundred grams of rice grains were weighed using electronic balance and transferred in to plastic containers of 250g capacity. Then rice weevil, newly emerged 8 to 10 days old, were obtained from our culture and released in to the container @ 25/container. Then the packets of botanicals were placed in the container and closed. There were 9 treatments and 3 replications. All the treatments were maintained for about 7 weeks and the population counts were recorded once in a week.

III. RESULTS AND DISCUSSION

The lowest survival of weevils (5.66) was found in notchi leaf powder treated jars @ 5g/100g. It was followed by dry chilli pod powder @ 5g/100g where 8.33 weevils survived after seven weeks of introduction. In control the population increased up to 40.77 in 7 weeks. Pepper and moringa seed powder recorded lower mortality than notchi leaf powder and dry chilli pod powder. Regarding cumulative mortality Notchi leaf powder (5g/100g of rice grain) showed 19.34 out of 25 weevils. In dry chilli pod powder (5g/100g of rice grain) the cumulative mortality was 16.67 out of 25.

Table 1: Effect of botanicals on the population rice weevil

Treatment (powder/100g of rice grain)		Weevils Released per container	*Survival after seven week	*Cumulative mortality
Dry chilli pod powder	1g	25	19.64	5.36 $(2.52)^{e}$
	2g	25	17.71	7.29 $(2.87)^{g}$
	5g	25	8.33	16.67 $(4.20)^{i}$
Notchi leaf powder	1g	25	20.23	4.77 $(2.40)^{d}$
	2g	25	16.55	8.45 $(3.07)^{h}$
	5g	25	5.66	19.34 $(4.51)^{j}$
Pepper seed powder	1g	25	22.33	2.67 $(1.91)^{b}$
	2g	25	20.66	4.34 $(2.31)^{c}$
	5g	25	20.76	4.24 $(2.28)^{c}$
Moringa seed powder	1g	25	22.53	2.47 $(1.86)^{a}$
	2g	25	20.26	4.74 $(2.39)^{d}$
	5g	25	19.21	5.79 $(2.60)^{f}$
Control		25	40.77	0.00 $(1.00)^{a}$
CD(0.05)				0.05

*Mean of 3 replications

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