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INSECTICIDAL PROPERTIES OF PLANT OILS AGAINST *SITOPHILOUS ORYZAE*

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Abstract

The oils extracted from *Acorus calamus* and *Syzigium aromaticum* were most effective causing 100% mortality of *Sitophilus oryzae* on 4th and 6th day after incubation. Oils from *Brassica nigra* and *Pongamia pinnata* showed 40 and 60 % mortality as compared to the control which showed 70% mortality 7 days after incubation.

Keywords- *Sitophilus oryzae*, Mortality, Plant oil,

Introduction

Sitophilus oryzae is one of the insect pest damaging the seeds of cereals. The insecticidal activity of essential oils of plant origin against pests has been evaluated by earlier workers (Shaaya et al 1991, Sarac and Tunc, 2000, Kim et al 2003, Lee et al. 2003, Aslan et al. 2005, Negahban et al 2007 and Ayvaz et al. 2009). Present communication describes management of stored grains insect pest *Sirophilus oryzae* with oils extracted from certain plant parts.

Materials and Methods

The experiments were undertaken in the Department of Botany, Late Ramesh Warpudkar ACS college, Sonpeth during September - October 2014. The plant materials employed during present study were *Acorus calamus* (Rhizome) *Syzygium aromaticum*(Clove), *Cinnamomum zelyianicum* (Bark), *Annona squamosa* (Seed), *Brassica nigra* (Seed), *Pongamia pinnata* (Seed), *Azadirachta indica* (Seed). *Acorus calamus* (Rhizome) *Syzygium aromaticum* (Clove), *Cinnamomum zelyianicum* (Bark) were collected from local provision store while *Brassica nigra* (Seed), *Pongamia pinnata* (Seed), *Azadirachta indica* (Seed) were collected from sonpeth region and identified with the help of 'Flora of Maharashtra' (BSI) Plant oils were extracted from them using petroleum ether as a solvent with the help of Soxlet apparatus.

The oils extracted from different plant materials were screened against *Sitophilus oryzae*. For this purpose, filter paper strip (2.2 cm x 2.2 cm) was dipped in the oil and kept in petri-dish. Ten adult insects, along with wheat grains as a source of food, were introduced in the petri-dish and incubated at room temperature. The set without oil was considered as control. The mortality of the insect was counted daily up to seven days. There were three replications for each oil sample (treatment). The data were statistically analyzed for analysis of variance following Panse and Sukhatme (1985).

Results and Discussion

Table 1: Effect of plant oils on per cent Mortality of *Sitophilous oryzae*

Name of the plant	Days after incubation (DAI)						
	1	2	3	4	5	6	7
Syzygiumaromaticum	30	50	50	70	90	100	100
Cinnamomumzeylanicum	20	20	30	60	70	80	90
Annonasquamosa	10	10	50	60	60	60	70
Acoruscalamus	0	0	40	100	100	100	100
Brassica nigra	0	20	30	30	40	40	40
Pongamiapinnata	0	20	20	20	50	60	60
Azardirachtaindica	20	40	40	50	60	60	70
Control	0	0	10	30	50	70	70

Table 2: ANOVA for percentage mortality

Source	df	SS	MSS	F	
Days	6	320.43	53.40	31.09	**
Species	7	106.86	15.27	8.89	**
Error	42	72.14	1.72		
Total	55	499.43			

The oil extracted from *Acorus calamus* (Root) was found to be more effective showing 100% mortality of *Sitophilus oryzae* on 4th day after incubation. This was followed by *Syzygium aromaticum* (Clove) oil showing 100% mortality on 6th day after incubation. Similar results were recorded by El-Nahal et al. (1989), Risha et al. (1990), White and Leesch (1995), Zeng, et al. (2010) Ileke et.al (2014).*Cinnamomum zeylanicum* (Rhizome) was also found to be effective against *S. oryzae*, was also recorded by Takahiro et al (2010), and Brari and Thakur (2015). *Azardirachta indica* seed extract also showed insecticidal property, with 70 % mortality, which was similar that was observed with control or no oil treatment. Oil from *Bassica nigra* showed 40% mortality which was less than that observed in control which indicated its use as a source of food by the insects. Statistical analysis of the data indicated that the mortality of pest significantly varied with the days of incubation as well the plant species used.

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