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Cell No. : 9579260877, 9822620877, Ph.No. : (0240) 2400877, 6969427.

E-mail : ajanta1977@gmail.com, www.ajantaprakashan.com

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20 STUDIES ON EFFECT OF PLANT EXTRACTS ON PEST CONTROL OF SELECT VEGETABLES AND FRUITS

Mohammed Asef Iqbal[1], Shafa M. Khan[2], and Syed R.O.[3]
[1]Department of Microbiology, Milliya Arts, Sci. & Mgmt. Sci. College, Beed
[1]Department of Botany, Milliya Arts, Sci. & Mgmt. Sci. College, Beed
[1]Department of Geography, Milliya Arts, Sci. & Mgmt. Sci. College, Beed

ABSTRACT

Present investigation is focused to study the effect of plant extracts on pest control of Ladies finger, pomegranate, brinjal, and guava Fruits. Accordingly, alcohol extracts of Fresh leaves of Dhatura (*Datura metal*), Morning glory (*Ipomoea carnea*), Congress grass (*Parthenium hysterophorus*), Creeping launea (*Launea procumben*), Swallow wart (*Calotropis procera*) were prepared and sprayed on experimental Fruits. Out of these botanicals, Creeping launea leaves extract showed best performance against the pest attack compare to other extracts. Swallow wart extract also showed good performance in the protection of fruit from pest. The efficacy of Morning glory leaf extracts was nearly same on fruit against the pest attack. Congress grass extract showed lowest efficacy on fruit pest.

Key words: plant extract, pest control, fruit etc.

INTRODUCTION:

The protection of plants and fruits against insect pests has been a major problem from the development of agriculture. Plant products have been successfully exploited as insecticides, insect repellents and insect anti-feedants [1-3]. Higher plants are a rich source of novel natural substances that can be used to develop environmental safe methods for insect control [4]. Insecticidal activity of many plants against several insect pests has been demonstrated [5-7].

Botanical insecticides are increasingly attracting research attention as they offer novel modes of action that may provide effective control of pests that have already developed resistance to conventional insecticides. They potentially offer cost-effective pest control to smallholder farmers in developing countries if highly active extracts can be prepared simply from readily available plants.

The use of synthetic pesticides during the last half century has often been careless and indiscriminate which resulted in malicious effects on the environment and leads to "ecological backlash" (Sundararaj, 1997). Concern about this has led to a surge of research into alternative pest control technologies. One of the efforts is the development of botanical insecticides as a novel and safer alternative strategy. Botanical insecticides, which contain plant extracts as active components, are safer as well as environmentally friendlier than synthetic insecticides. Use of these chemicals of plant origin, commonly called 'botanicals' or 'phytochemicals' have attracted particular attention because of their specificity to insect pests, their biodegradable nature and their potential for commercial application (Bishop and Thronton, 1997;Shukla *et al.,* 2000).

Synthetic insecticides have been used to contain insect populations since the inception of green revolution with the significant increase in crop production. However, the consequent pollution jeopardizes the agricultural as well as forestry business. In this context, plant products are preferred over synthetic chemicals as they are non-persistent and are compatible.

MATERIAL AND METHOD:

Plants were collected from the farm next to Late Ramesh Warpudkar College, Sonpeth Dist. Parbhani. 100 gm leaves of plants *Ipomoea carnea, Calatropis procera, Parthenium hysterophorus, Launea procumben, Dhatura metal* extracted in100 ml of pure ethanol respectively. Ethanol evaporated and crude extract prepared. 1gm extract dissolved in 1lit water with the help of ethanol and it sprayed on four non-infected fruits kept with fruits infected by pests and as an experimental, 1 ml alcohol in 1lit water sprayed on four non-infected fruits kept with infected fruits by pests as a control. Sets were kept away from each other to protect them from inter infection of pests.

RESULTS AND DISCUSSION:

Mostly crude extracts were found to have different type of pest management properties in laboratory condition against fruit pests of Brinjal, Pomegranate, Lady's finger, guava without identifying the active principles in the plant products [9]. Diseases and insect pests are the major limiting factors in the production of high quality agricultural products. Although conventional pesticides have become an indispensable tool in controlling some pests economically, rapidly, and effectively, extensive use of insecticides may lead to a number of undesirable side effects including the development of insect resistance and resurgence of primary and secondary pests outbreaks. Also they can have adverse effects on non-target organisms and general environmental contamination [10-13].

The extract of Creeping launea showed best performance against Brinjal pest Fruit Borer (*Leucinodes orbonalis*) after 3 days 93.75% and after 5 days 100%, against Pomegranate pest Pomegranate aphid, (*Aphispunicae* Passerini) after 3 days 95.28% and after 5 days 100%, against lady finger pest fruit borer(Helicoverpa armigera) after 3 days 97.10% and after 5 days 100% and against Guava pest Fruit flies(*Anastrepha suspense)* after 3 days 92.38% and after 5 days 100%.

The extract of Swallow wart (*Calotropis procera*) showed good performance against Brinjal pest Fruit Borer (*Leucinodes orbonalis*) after 3 days 87.00% and after 5 days 99.00%, against Pomegranate pest Pomegranate aphid, (*Aphispunicae* Passerini) after 3 days 86.32% and after 5 days 98.07%, against lady finger pest fruit borer(Helicoverpa armigera) after 3 days 91.77% and after 5 days 100% and against Guava pest Fruit flies(*Anastrepha suspense)* after 3 days 86.78% and after 5 days 100%.

The extract of Morning glory (*Ipomoea carnea*) showed middle performance against Brinjal pest Fruit Borer (*Leucinodes orbonalis*) after 3 days 78.28% and after 5 days 94.70%, against Pomegranate pest Pomegranate aphid, (*Aphispunicae* Passerini) after 3 days 75.25% and after 5 days 90.15%, against lady finger pest fruit borer(Helicoverpa armigera) after 3 days 81.50% and

after 5 days 95.65% and against Guava pest Fruit flies(*Anastrepha suspense)* after 3 days 70.20% and after 5 days 78.00%.

The extract of Dhatura (Datura metal) also showed middle performance against Brinjal pest Fruit Borer (*Leucinodes orbonalis*) after 3 days 72.37% and after 5 days 91.63%, against Pomegranate pest Pomegranate aphid, (*Aphispunicae* Passerini) after 3 days 70.25% and after 5 days 85.70%, against lady finger pest fruit borer(Helicoverpa armigera) after 3 days 76.38% and after 5 days 90.38% and against Guava pest Fruit flies(*Anastrepha suspense)* after 3 days 60.25% and after 5 days 72.08%.

The extract of Congress grass (*Parthenium hysterophorus*) showed lowest performance against Brinjal pest Fruit Borer (*Leucinodes orbonalis*) after 3 days 58.38% and after 5 days 60.55%, against Pomegranate pest Pomegranate aphid, (*Aphispunicae* Passerini) after 3 days 55.38% and after 5 days 61.00%, against lady finger pest fruit borer(Helicoverpa armigera) after 3 days 60.02% and after 5 days 69.55% and against Guava pest Fruit flies(*Anastrepha suspense)* after 3 days 52.30% and after 5 days 59.77%.

The efficacy of various plant extracts as Creeping launea **>** Swallow wart **>** Morning glory **>** Dhatura **>** Congress grass showed after 3 and 5 days. These plants have natural potential to bio-pest management.

CONCLUSION:

Botanicals used as insecticides presently constitute 1% of the world insecticide market and in Indian market it is less than 1%. To enjoy widespread use, plant based products must demonstrate efficacy that is competitive with existing chemicals and must remain within the reach of resource limited farmers in the developing countries. Besides, there is a need for promoting the use of plant products in the insect pest management programs.

Table No. 1 Efficacy of extracts of various plants on different species of pests.

Name of the prepared leaf extract	**Tested fruit**	**Effective Against**	**Mortality (%) over control with 1% extracts**	
			3 days	**5 days**
Morning glory (*Ipomoea carnea*)	**Brinjal,**	**Fruit Borer** (*Leucinodes orbonalis*)	78.28	94.70
	pomegranate,	**Pomegranate aphid**, (*Aphis punicae* Passerini)	75.25	90.15
	lady finger	**fruit borer**(Helicoverpa armigera)	81.50	95.65
	guava	**Fruit flies(***Anastrepha*	70.20	78.00

		suspense)		
Dhatura *(Datura metal)*	**Brinjal,**	**Fruit Borer** (*Leucinodes orbonalis*)	72.37	91.63
	pomegranate,	**Pomegranate aphid**, (*Aphis punicae* Passerini)	70.25	85.70
	lady finger	**fruit borer**(Helicoverpa armigera)	76.38	90.38
	guava	**Fruit flies(***Anastrepha suspense)*	60.25	72.08
Congress grass (*Parthenium hysterophorus*)	**Brinjal,**	**Fruit Borer** (*Leucinodes orbonalis*)	58.38	60.55
	pomegranate,	**Pomegranate aphid**, (*Aphis punicae* Passerini)	55.38	61.00
	lady finger	**fruit borer**(Helicoverpa armigera)	60.02	69.55
	guava	**Fruit flies(***Anastrepha suspense)*	52.30	59.77
Creeping launea (*Launea procumben*)	**Brinjal,**	**Fruit Borer** (*Leucinodes orbonalis*)	93.75	100
	pomegranate,	**Pomegranate aphid**, (*Aphis punicae* Passerini)	95.28	100
	lady finger	**fruit borer**(Helicoverpa armigera)	97.10	100
	guava	**Fruit flies(***Anastrepha suspense)*	92.38	100
Swallow wart (*Calotropis procera*)	**Brinjal,**	**Fruit Borer** (*Leucinodes orbonalis*)	87.00	99.00
	pomegranate,	**Pomegranate aphid**, (*Aphis punicae* Passerini)	86.32	98.07
	lady finger	**fruit borer**(Helicoverpa armigera)	91.77	100
	guava	**Fruit flies(***Anastrepha suspense)*	86.78	100
Control	**Brinjal,**	**Fruit Borer** (*Leucinodes orbonalis*)	NS	NS
	pomegranate,	**Pomegranate aphid**, (*Aphis punicae* Passerini)	NS	NS

	lady finger	**fruit borer**(Helicoverpa armigera)	NS	NS
	guava	**Fruit flies(***Anastrepha suspense)*	NS	NS

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