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EVALUATION OF SOME PLANT EXT RACT AGAINST GARDEN SLUG *LAEVICAULIS ALTE* (FERUSSAC) (SYSTELLOMMATOPHORA : VERONICELLIDAE) UNDER LABORATORY CONDITION

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Observation was made on selected plant extract against garden slug during 2008-09 under laboratory condition. Fourteen plant species were selected for their efficacy and three species were found effective in reduction of slug in comparison with control. Among tested plant Tobacco, *Nicotina tobaccum*, found to be most effective molluskisidal properties followed by Sadaphuli, *Cantharanthus ruseus* and Non-edible alu, *Arum triphyllum*. These extracts would be low or non-toxic to environment, cheap and ecofriendly hence must be used for large scale level in IPM.

Key words : Evaluation, plant extract, slug, efficacy and control.

INTRODUCTION

Now days a slug become a serious pest on various crops around the riverbed. It feed on vegetables, live in moist and dump places and nocturnal. It cut young and germinating plants. It appears as a serious pest in Uttar Pradesh, Maharashtra, Assam and Madhya Pradesh. (Mishra & Verma, 1975). Curiously, the molluscan pest has been relatively neglected but it becomes serious now. Now a day it becomes a prominent pest on lucern, basil, beans, cabbage, dahlia, delphinium, hosta, lattice, marigold, strawberries, cucumber and many vegetable plants, damaging plant and reduces yield. Lucern, *Medicago sativa* (Linn) is fodder crop and mostly cultivated in Maharashtra. The farmers save their crop from pest using synthetic pesticides that are costly and hazardous. These pesticides cause serious problem indicating pesticides pollution (Ntow, 2001), resistance (Metcalf, 1980), accumulation in system (Benevue *et al.*, 1982), secondary pest out break (Craft, 1978), reproductive effect (Hueck, 1992), and DNA damage (Yanez *et al.*, 2004). These chemicals reach in the human body directly or indirectly causing hazards effect (WHO, 1980; Ntow, 2001). Hence, an attempt has been taken to control the slug by the plant extract, which is cheap, and eco- friendly.

The plant species showed various pest control properties. Bioactivity of plant products such as growth and metamorphosis disruption (Varma & Yadav, 2003), attractiveness (Schroder & Schimdt, 1987), food preference (Varma & Yadav, 2003), etc has been work out on insect species. However, in the present investigation it has been focused that selective plant extracts have been screened against slug so as to evaluate molluskisidal properties.

MATERIALS AND METHODS

A laboratory experiment was conducted at Department of Zoology, P.V.P. College, Pravaranagar (Ahmednagar) 2008-09. The plant species were collected from local area and college campus. The leaves material was washed with distilled water and shade dried at room ($27 \pm 2\ ^0$C) temperature. The powered of dried leaves were prepared with the help of mixture and it was kept in polyethylene packets whenever required. The powder was dissolved in distilled water and stirred on stirrer. The sample were kept for 48 hours at

room temperature and filtered through Whatman filter paper No. 1 and removed suspended particles. The water made extract suspension ratio was 5 : 1. The examination of garden slug was done for mortality counts. For the experimentation 10 slugs were used for each treatment thrice. These selected bugs were same size, age and weight. The plant extract was spread as the 1 ml of each another on food (Lucern leaves) and target species with the potter's tower at the same pressure (1lbs/sq) and kept in petri plate (15 cm Diameter). The observation was made on 12 hours interval up to 60 hours post- treatment. The data were subjected to obtain percent mortality which relative toxicity was calculated. The observation presented here augment the need to develop plant product that can be successfully utilized for the management of pest in field.

RESULTS AND DISCUSSION

It was seen from the present study that the mortality in the treated slug was occurred due to treatment of respective products. The data presented in Table I, that indicates the percent mortality of various plants extracts were varied plant to plant on slug at 12, 24, 36, 48 and 60 hours post treatment. It was revealed that high percent mortality in Tobacco, *Nicotina tobaccum,* Sadaphuli, *Cantharanthus ruseus* and followed by non-edible alu, *Arum triphyllum.* This showed molluskisidal properties.

The extract of Tobacco showed highest mortality which compare to those of standard control as 24.33, 32.33, 38.67, 46.67 and 63.67 % at 12, 24, 36, 48 and 60 hours post-treatment respectively. Tobacco consists of alkaloids as nicotine, nornicotine and anabasine. Nicotine present in tobacco showed effect on digestive gland and respiration on snail (Umapathi & Venkateswava, 2000). In the present study, which might be a cause of slug mortality.

Sadaphuli, *Cantharanthus ruseus* showed second rank of mortality to compare with standard control as 21.33, 26.33, 36.33, 56.67 and 61.67% at 12, 24, 36, 48 and 60 hours treatment respectively. According to Kokate *et al.* (1990) Sadaphuli contains of alkaloid as vinblastine and vincristine, which might be cause of death to slug in the present study. Followed by Non-edible alu, *Arum triphyllum* 26.33, 33.33, 42.33, 53.33 and 59.33% at 12, 24, 36, 48, and 60 hours treatment, respectively. These observations are at par to those of Sadaphuli. A least percent mortality was reported by *Allium sativum* and *Solanum stramonium* at initial and final phase. Dathura contains alkaloids among which mostly hypscine, l-hyoscyamine and atropine while garlic contains allin that might be a non-molluskisidal activities, hence received least mortality.

At prime phase of mortality in conducted experiment all extract have not equal mortality; some had more while some least. These extract have some other properties such as- insecticidal, nematocidal, bactericidal, fungicidal, rodenticidal, properties. But in the present investigation the scope of molluskiside was considered.

There are several methods to control slug or snail population such as-physical elimination, choose snail/slug proof plant, trap (beer baits), barriers, copper screen or foil, Bordeaux mixture, baits (metaldehyde or iron phosphate), but these are expensive and have limitations. Also it is difficult due to nocturnal and hiding habitat.

Table I : Showing plant species and present mortality of slug after post treatment.

S. No.	Plant species	Family	Common name	Per cent mortality (Hours)				
				12	24	36	48	60
1.	*Adhathoda vasica*	Acanthaceae	Adulsa	17.33 (4.17)	24.67 (4.97)	33.67 (5.81)	39.67 (6.30)	43.67 (6.98)
2.	*Allium sativum*	Liliaceae	Garlic	14.33 (3.79)	22.33 (4.73)	30.67 (5.54)	36.67 (6.06)	42.33 (6.51)
3.	*Annona reticulata*	Annonaceae	Bullock heart	16.67 (4.09)	26.33 (5.14)	33.33 (5.78)	38.67 (6.22)	49.67 (7.05)
4.	*Annona squamosa*	Annonaceae	Custard apple	16.67 (4.09)	24.33 (4.94)	38.67 (6.22)	42.33 (6.51)	47.67 (6.40)
5.	*Arum triphyllum*	Araceae	Non-edible oil	26.33 (5.14)	33.33 (5.78)	42.33 (6.51)	53.33 (7.31)	59.33 (7.71)
6.	*Cassia ouriculata*	Caesalpinaceae	Tarward	16.67 (6.09)	24.33 (4.94)	33.33 (5.78)	38.67 (6.22)	44.33 (6.66)
7.	*Catharanthus ruseus*	Apiaceae	Sadaphuli	21.33 (4.62)	26.33 (5.14)	36.33 (6.03)	56.67 (7.53)	61.67 (7.86)
8.	*Nicotina tobaccum*	Solanaceae	Tobacco	24.33 (4.94)	32.33 (5.78)	38.67 (6.22)	46.67 (6.83)	63.67 (7.98)
9.	*Ipomea fistulosa*	Convulaceae	Besharme	14.33 (3.79)	24.33 (4.94)	36.67 (6.06)	44.67 (6.69)	59.33 (7.71)
10.	*Mentha spicala*	Lamiaceae	Spermint	17.33 (4.17)	23.67 (4.87)	38.67 (6.22)	43.67 (6.61)	49.33 (7.03)
11.	*Moringa oleifera*	Moringaceae	Drumstick	20.33 (4.52)	32.67 (5.72)	38.67 (6.22)	44.33 (6.66)	55.67 (7.46)
12.	*Murrayas koengi*	Rutaceae	Curryleaf	22.33 (4.73)	27.33 (5.23)	32.67 (5.72)	40.67 (6.38)	44.67 (6.69)
13.	*Nerium indicum*	Apocynaceae	Oleander	16.67 (4.09)	24.33 (4.94)	33.33 (5.78)	38.67 (6.22)	48.67 (6.98)
14.	*Solanum stramonium*	Solanaceae	Dathura	18.33 (4.29)	26.67 (5.17)	33.33 (5.78)	40.67 (6.38)	42.67 (6.54)
15.	Methomyl 40% S.P.	-	-	44.67 (6.69)	50.33 (7.10)	62.33 (7.90)	76.67 (8.76)	88.67 (9.42)
16.	Water control	-	-	-	-	-	-	-
	Mean			**20.51**	**28.22**	**37.51**	**45.46**	**53.42**
	S.D.			7.54	7.02	7.56	10.25	12.15
	CV%			36.76	24.88	20.15	22.54	22.76

Figures in parentheses are poison value.

After years of using pesticides, negative side effect come evident, which creates serious problems. It is better to avoided effect and concentrate on easy and simple method to control pest in farm level and that is plant extract used for control of pest. The plant extracts are biodegradable, non-toxic, non accumulative, economically cheap and easily available. Hence it must be considered on large-scale level in Integrated Pest Management.

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