CONTROL OF INSECT PEST, *PRODENIA LITURA F*. ENVIRONMENT, ECOFRIENDLY BIOPESTICIDES FROM PLANTS

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Abstract- **Indiscriminate sprinkle of unnatural pesticides a serious problem to contaminate the habitat. The *Prodenia litura* F., also known as the Tobacco caterpillar, is amongst the worst polyphagous insects and attack a great number of impressive 73 host plant species, and other insects' pests. A serious issue is that all the bugs have created a defence mechanism against poison. Bug framework is represented mainly by phenol oxidase chemical regulating in their body similar to haemocytes which are strong against poisons and invaders. Any composite which can intervene with the defence mechanism would significantly impede the bug's fitness. Taking into consideration the significance of safety of plants for existence, use of naturally obtained pesticides and insecticides are being preferred. Impact of fifteen plant species insecticidal affectivity is tested against tobacco caterpillar, *Prodenia litura* F. The materials were separated with petroleum ether extract tried at various fixations.**

***Keywords*: *Prodenia litura*, Larvae, Plant, Insect, Defence, Bio-pesticide, Pest, Crop.**

INTRODUCTION

A good yield of crop is attainable by protection of crops against insects and pests, who are the major enemies for agricultural field, stores, warehouses and animals. These creepy crawlies ingest leaves, feed on crops, fruits, cause damage to cultivable harvest and blood suck live stocks, supplementary being a nuisance to human welfare. Pests develop defence mechanism against chemical pesticides and adapting themselves to every newly introduced toxin. These insects have become one of the major threats for our environment because of the chemicals sprayed to get rid of them. These chemicals have been detected in mother milk, soil, air and water, leading to various kinds of pollutions. These problems force us to resort to application of bio-pesticides.

Being a land of rich variable crops, its protection from diseases, infections and insects becomes even more challenging. Application of naturally obtained bio-pesticides is considerably safer, cheaper, environment friendly and easily available. Indigenous parts of some plants are successful in providing protection to crop by insuring them against the vegetarian insects. Our rich flora and fauna help to investigate more in diagnosing whose chemical composition could be utilised to get hold of bother insects. Phytoecdysones are the plant derived ecdysteroids, defence that plants synthesize for themselves against phytophagous insects. These ecdysteroids, when ingested by insects' pests, hampers their metabolism, thereby, leading to early metamorphosis and female fecundity. Insects undergo early moulting and further transformations, leading to their early death, especially in arthropods. Naturally obtained bio-pesticides are harmful only to insects and pests. Keeping in view the extensive significance of bio-pesticides, the untreated concentrates from various plants are being researched for resistance against insects. (Park et al., 2016).

MATERIALS AND METHODS

Fifteen insecticidal plants were selected for detailed study. These plant materials were accumulated in large quantity and washed with tap water, dried and powdered with home grown grinder. The grind samples were extracted in Soxhlet apparatus till the extract became colourless with petroleum ether for (bp 40-60^{o} C) for Boswellia serrata (Gum), Dalbergia latifolia (Leaf), Spongomorpha indica (Sea-weed), Cucurma longa (Rhizome), Piper nigrum (berries), Mimosa rubicaulis (Stem), Annona squamosal (seed), Acacia intsia (Wood), Cleistanthus collinus (leaf), Azadirachta indica (Seed), Ocimum basilicum (Seed), Solanum xanthocarpum (seed), Tagetes indica (Leaf), Verbena officinalis (Leaf) and Zingiber officinale (Rhizome). The extracts thus obtained were taken in porcelain dish separately and the solvent was completely evaporated on the steam water bath. (Kim et al.)

Six square centimeter area of cauliflower leaves were cut and dipped in five different concentrations of each extract. The leaf placed fastened under clip and left under electric for about half an hour so as to complete dry up of the extract. In each extract, with different concentration one control was introduced, where the leaf places were dipped in emulsified water only. The treated leaf places were kept in petridishes on wet filter paper. Two 24 hours starved 2nd instar larvae were released in each petridish to feed there for 24 hours. The area consumed by the larvae in each replication was measured with the help of "Planimeter" and the information obtained were exposed to examine and compare based on their respective ED50 values. All the compulsions were made with control. A polythene paper was spread on the ground in between the rows to protect the larvae falling on the ground. Care was taken to protect the fresh larvae coming in the plots from outside. All treatments were replicated thrice. Observations on the mortality of larvae were recorded after 24hr, 40hr and 72hr from their release at different concentrations .i.e. 0.5, 1.0 & 2.0.

The data were statistically analysed to test the significance and compared the respective concentration with control on the basis of percentage reduction of nymphs.

Table 33. Mean mortality percentage of Prodonia litura Fabr.

Treatment (Plant extract)	**Concentration (%)**	**Mean mortality percentage after**		
		24 Hr.	**48 Hr.**	**72 Hr.**
Baswelia serrata	0.5	43.07 (46.6)	77.70 (95.5)	90.00 (100.0)
	1.0	46.92 (53.4)	90.00 (100.0)	90.00 (100.0)
	2.0	66.14 (83.6)	90.00 (100.0)	90.00 (100.0)
Dalbergia latifalia	0.5	12.29 (4.5)	23.85 (16.4)	52.77 (63.4)
	1.0	21.14 (13.0)	33.21 (30.0)	72.29 (89.7)
	2.0	23.85 (16.4)	43.07 (46.6)	90.00 (100.0)
Spongomarpha indica	0.5	15.00 (6.7)	28.77 (23.1)	41.15 (43.3)
	1.0	23.85 (16.4)	37.22 (23.1)	54.78 (66.6)
	2.0	39.99 (26.5)	43.07 (46.6)	72.29 (89.7)
Cucurma longa	0.5	23.85 (16.4)	23.85 (16.4)	23.85 (16.4)
	1.0	8.85 (2.3)	33.21 (30.0)	33.21 (30.0)
	2.0	12.29 (4.5)	41.15 (43.3)	43.07 (46.6)
Piper nigrum	0.5	23.85 (16.4)	30.99 (26.5)	48.84 (56.7)
	1.0	8.85 (2.3)	37.22 (36.6)	57.00 (70.4)
	2.0	12.29 (4.5)	43.07 (46.6)	72.29 (89.7)
Mimosa rubicaulis	0.5	23.85 (16.4)	43.07 (46.6)	52.77 (63.4)
	1.0	30.99 (26.5)	46.92 (53.4)	72.29 (89.7)
	2.0	41.15 (43.3)	66.14 (83.6)	90.00 (100.0)
Annona squamosa	0.5	12.27 (4.5)	30.99 (26.5)	46.92 (53.4)
	1.0	8.85 (2.3)	41.15 (43.3)	61.22 (76.8)
	2.0	21.14 (13.0)	61.22 (76.8)	66.14 (83.6)

Acacia intsia	0.5	21.14 (13.0)	37.22 (36.6)	48.84 (5.37)
	1.0	23.85 (16.4)	45.00 (50.00)	66.14 (83.6)
	2.0	28.77 (23.1)	54.78 (66.6)	77.70 (8.5)
Cleistanthus collinus	0.5	23.85 (16.4)	35.21 (33.3)	48.84 (53.7)
	1.0	30.99 (26.5)	52.77 (63.5)	57.00 (70.4)
	2.0	41.15 (43.3)	59.00 (73.5)	72.29 (89.7)
Azadirachta indica	0.5	43.87 (46.6)	54.78 (66.6)	50.00 (73.5)
	1.0	52.77 (63.4)	68.85 (87.0)	84.52 (99.9)
	2.0	59.00 (73.5)	83.85 (98.8)	90.00 (100.0)
Ocimum basillicum	0.5	43.07 (46.6)	59.00 (73.5)	77.70 (95.5)
	1.0	48.84 (56.7)	66.14 (83.6)	83.85 (98.8)
	2.0	66.14 (83.6)	90.00 (100.0)	90.0 (100.0)
Solanum xanthocarpum	0.5	0.00	23.85	35.21
	1.0	6.14 (1.1)	30.99 (26.5)	41.15 (43.3)
	2.0	18.44 (10.3)	41.15 (43.3)	59.00 (73.5)
Tagetes indica	0.5	23.85 (16.4)	30.99 (26.5)	35.21 (3.3)
	1.0	23.85 (16.4)	37.22 (36.6)	41.15 (43.3)
	2.0	21.14 (13.0)	43.07 (46.6)	59.0 (73.5)
Verbena officinalis	0.5	15.00 (6.7)	37.22 (36.6)	46.92 (53.4)
	1.0	23.85 (16.4)	45.00 (50.00)	54.78 (53.4)
	2.0	30.99 (26.5)	54.66 (66.5)	75.00 (93.3)

Zingiber officinale	0.5	12.29 (4.5)	37.22 (36.6)	48.84 (56.7)
	1.0	21.14 (13.0)	37.22 (36.6)	66.14 (83.6)
	2.0	23.85 (16.4)	48.93 (56.7)	77.70 (95.5)
C.D. For control vs. treated			=	5.448
C.D. for insecticide maan			=	4.399
C.D. for concnetration means			=	1.967
C.D. for inseticide and concentration means			=	7.620
C.D. for period means			=	1.959
C.D. for period means at the same insecidie and concentration level			=	13.924
C.D. for inseticide and concentration means at the same period			=	13.252

The analysis of variance table of mean mortality percentage of Prodenia litura Fabr. reveals that the main effects of insecticides, concentration and periods are highly significant.

RESULTS AND DISCUSSIONS

The ED_{50} values on the basis of number of larvae repellents in each treatment over control were calculated. It is apparent from results that all the extracts showed good repellent property against Prodenia litura larvae, when compared with control, Ocimum basilicum was most effective and Solanum xanthocarpum was the least. The decreasing order of repellent property is worked out as Ocimum basilicum, Acacia intsia, Boswellia serrata, Azadirachta indica, Cucurma longa, Piper nigrum, Spongomarpha indica, Annona squamosa, Mimosa rubicaulis, Tagetes indica, Cleistanthus callinus, Dalbergia latifalia, Verbena officinalis, Zingiber officinale and Solanum xanthocarpum and ED_{50}values for these extracts were 0.0019, 0.0022, 0.014, 0.029, 0.838, 0.039, 0.070, 0.087, 0.15, 0.16, 1.69, 3.15, 3.71, 10.23 and 18.62 respectively.

The results of the above studies reveal that the crops can be protected from cruciferous insect-pests viz. Prodenia litura Fabr. by applying the soxhlet extracts of Boswellia serrata, Dalbergia latifalia, Spongomorpha indica, Cucurma longa, Piper nigrum, Mimosa rubicaulis, Annona squamosa, Acacia intsia, Cleistanthus collinus, Azadirachta indica, Ocimum basilicum, Solanum xanthocarpum, Tagetes indica, Verbena officinalis and Zingiber officinale respectively. These plant materials are very cheap, easily available safe and negligible hazardous to human lives.

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