Indian Journal of Entomology, **70**(3): 278-291 (2008)

FEASIBILITY OF USING PLANT PRODUCTS AND BIO-PESTICIDE AGAINST *EPILACHNA* BEETLE, *HENOSEPILACHNA VIGINTIOCTOPUNCTATA* FABR. INFESTING BRINJAL

Of about fiftythree species of insect-pests (Nayar *et al.*, 1976), the brinjal leaf beetle, *Henosepilachna vigintioctopunctata* Fabr. causes appreciable damage to brinjal. Bhalla and Pawar (1977) also observed this beetle in brinjal to cause upto 65% loss in vegetative stage. Keeping this in view, an attempt was made to find out the bio-efficacy of two indigenous plant extracts *viz.*, *Annona squamosa* (Annonaceae), commonly known as Sweetsop and *Strychnos nuxvomica* (Loganiaceae), commonly known as Kuchla and a bio-pesticide, *Verticillium lecanii,* against *Epilachna* beetle, *Henosepilachna vigintioctopunctata* Fabr. infesting brinjal, in order to develop effective alternatives to synthetic pesticides for insect-pest management. The results achieved have been focussed in this paper.

The experiment was conducted during 2005 – 2006

Table 1. Bio-efficacy of different plant products and bio-pesticide in reducing population build up of *H. vigintioctopunctata* on brinjal

Treatment	Dosage (ml. or g./lit. of water)	Pretreatment population	Mean no. of population build up at different DAS*					% reduction over control
			1	3	5	7	10	
A. squamosa (methanol seed extract)	2 ml/lit	16.40 (4.05)	10.27 (3.20)	8.42 (2.90)	6.48 (2.55)	6.43 (2.54)	4.42 (2.10)**	70.06
	3 ml/lit	17.80 (4.22)	9.43 (3.07)	7.22 (2.69)	5.28 (2.30)	4.45 (2.11)	4.41 (2.10)	71.27
	4 ml/lit	18.40 (4.29)	10.23 (3.20)	10.47 (3.24)	5.82 (2.41)	4.40 (2.10)	3.32 (1.82)	75.50
S. nuxvomica (methanol seed extract)	2 ml/lit	14.38 (3.79)	9.21 (3.03)	10.42 (3.23)	9.33 (3.05)	9.48 (3.08)	9.94 (3.15)	52.09
	3 ml/lit	14.00 (3.74)	9.00 (3.00)	9.00 (3.00)	8.42 (2.90)	8.04 (2.84)	8.00 (2.83)	56.31
	4 ml/lit	15.24 (3.90)	14.00 (3.74)	13.08 (3.62)	7.21 (2.69)	5.02 (2.24)	2.24 (1.50)	77.79
V. lecanii	1.5 g/lit	12.67 (3.56)	12.60 (3.55)	11.27 (3.36)	10.77 (3.28)	8.21 (2.87)	7.17 (2.68)	56.53
	2 g/lit	13.71 (3.70)	13.00 (3.61)	13.00 (3.61)	10.21 (3.20)	8.02 (2.83)	6.23 (2.50)	60.99
	3 g/lit	12.45 (3.53)	12.44 (3.53)	10.22 (3.20)	10.20 (3.19)	8.00 (2.83)	5.75 (2.40)	60.74
Triazophos 40% EC	1 ml/lit	18.00 (4.24)	2.14 (1.46)	2.00 (1.41)	3.21 (1.79)	3.42 (1.85)	3.00 (1.73)	76.44
	1.5 ml/lit	18.06 (4.25)	2.10 (1.45)	2.00 (1.41)	2.02 (1.42)	2.41 (1.55)	2.07 (1.44)	80.44
	2 ml/lit	19.21 (4.38)	3.20 (1.79)	2.12 (1.46)	3.20 (1.79)	2.02 (1.42)	2.00 (1.41)	81.41
Untreated control	–	10.07 (3.17)	12.41 (3.52)	15.02 (3.88)	19.41 (4.41)	25.02 (5.00)	30.04 (5.49)	–
S.Em (±)	–	0.17	0.18	0.12	0.09	0.14	0.08	–
CD at 5%	–	(0.69)	(0.71)	(0.58)	(0.51)	(0.63)	(0.48)	–

* DAS – Days after spraying

** Figures in parentheses indicate square root transformed values

at Instructional Farm of Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia, West Bengal, to evaluate the bio-efficacy of seed extract of two indigenous plants, *viz.*, *A. squamosa* (Family : Annonaceae) and *S. nuxvomica* (Family : Loganiaceae) using methanol as solvent and a bio-pesticide, *V. lecanii*, against epilachna beetle, *H. vigintioctopunctata* (Coccinellidae : Coleoptera), on 'Muktakeshi' variety of brinjal. The experiment was conducted in randomized block design. Triazophos which is widely used by the farmers against epilachna beetle was taken as a check. The doses of both the plant extracts, used in the experiment were 2 ml, 3 ml and 4 ml/lit. of water, while for bio-pesticide, these were 1.5 g, 2 g and 3 g/lit. of water and triazophos was used at 1 ml, 1.5 ml and 2 ml/lit. of water. With the help of a Knapsac sprayer, three sprayings were given at 15 days interval initiating at fourtyfive days of transplanting. In total, there were thirteen treatments including a control and each treatment was replicated thrice.

Observations on the population build up of the beetle were recorded at 1 day before spraying and 1, 3, 5, 7 and 10 days after spraying (DAS) from five randomly selected plants from each treatment replication. For phytotoxicity study of these products, the leaf injury on tips and leaf surface, vein clearing, necrosis, wilting, epinasty and hyponasty were taken into consideration and were observed for a period of 10 DAS. The data thus obtained during 2005 and 2006 were pooled together and were subjected to square root transformation for statistical calculation to ascertain the test of significance of different treatments.

The results, as obtained during 2005 and 2006 were pooled together and presented in Table 1. Methanol – seed extract of *S. nuxvomica* was found to offer 77.79% reduction in beetle population at 10 DAS when used @ 4 ml/lit. of water followed by seed extract of *A. squamosa* with the same solvent and same dose, producing 75.5% and *V. lecanii* recording 60.99% at 2 g/lit. of water (Table 1) as compared to control. But the reduction in population build up of the beetle was found to be little less as compared to triazophos 40EC i.e., 81.41% reduction in population when treated with 2 ml/lit. of water. No phytotoxicity in terms of leaf injury on tips and surface, vein-clearing, necrosis, wilting and epinasty and hyponasty for a period of 10 DAS was noticed.

Brinjal is used mostly as vegetable. Utmost care should be taken to keep the fruits free from pesticide residues. Therefore, one should be very cautious while recommending pesticidal measures against its insect pests. Plant products are supposed to be safe in this regard and hopefully, the seed extracts of *S. nuxvomica* and *A. squamosa*, both at 4 ml/lit. of water, help in reducing the population build up of *H. vigintioctopunctata vis-à-vis* minimizing its damage to brinjal and increased yield.

REFERENCES

Bhalla, O.P. and Pawar, A.D. 1977. A survey study of insect and non-insect pests of economic importance in Himachal Pradesh, Tiku, Kitab-Mahal, 192 D.N. Road, Bombay, 80 p.

Nayar, M.R., Ghosh, A. and Patel, S. 1976. Insects and Mites of Crops in India. Indian Council of Agricultural Research, 320 p.

Department of Agricultural Entomology,
Bidhan Chandra Krishi Viswavidyalaya,
Mohanpur, Nadia, West Bengal– 741252

S.S. GHATAK
SUJOY MONDAL

(Manuscript Received : April 2008)