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TOXIC EFFECT OF INSECTICIDES ON NATURAL ENEMIES OF INSECT PESTS OF MOTHBEAN [*VIGNA ACONITIFOLIA* (JACQ.) MARECHAL]

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ABSTRACT

In the trial conducted to test the comparative toxic effect of insecticides against coccinellid predators, associated with sucking insect pests of mothbean at S.K.N. College of Agriculture, Jobner (Raj.) during *kharifi* 2005, Profenophos + cypermethrin (0.04%), lambda-cyhalothrin (0.005%) and dimethoate (0.03%) were found highly toxic to coccinellid predators. Thiamethoxam (0.025%), imidacloprid (0.005%) and novaluron (0.02%) were ranked in middle order of toxicity while, the plant products *viz; azadirachtin* (5 ml/l), NKSE (5.0%) and KSE (5.0%) proved least toxic.

Key words: Insecticides, sucking insect pests, coccinellid predators, plant products etc.

The mothbean crop is damage at various stages of plant growth by number of insect pests. Among them jassid, whitefly and thrips are the major insects that cause moderate to severe damage right from germination to maturity of the crop and causes considerable losses in yield (Puttaswami *et al.*, 1977). Whiteflies also act as vector of yellow mosaic virus besides causing damage by desaping (Satyavir *et al.,* 1984).

MATERIALS AND METHODS

Field experiments on toxic effect of 10 insecticides including untreated control against sucking insect pests were carried out at the Agronomy Farm, S.K.N. College of Agriculture, Jobner during *kharif* 2005. Mothbean variety RMO-40 was sown and the Trial was laid out in randomized block design with three replications. Two sprays of insecticidal solution were applied at an interval of 20 days with the help of knapsack sprayer. The observations on the population of coccinellid predators *viz; Coccinella septempunctata* Linn. and *Menochilus sexmaculatus* (Fab.) were recorded on five randomly selected tagged plants. The population (both grub and adult) was recorded one day before and 1, 3, 7 and 15 days after the application of the insecticides in both the sprays. The data obtained on coccinellid population from experimental field were transformed into $\sqrt{x+0.5}$ value and subjected to statistical analysis.

RESULTS AND DISCUSSION

The data presented in Table-1 revealed that pre-treatment mean population of coccinellid predators was somewhat uniform (3.67 to 4.33) on the mothbean crop and did not differ significantly. It was observed that all the insecticidal treatments were found significantly toxic to coccinellids over untreated control, however, their existed a considerable difference among them. The maximum reduction in coccinellid predators was recorded at 7 days after application of insecticides.

The population of coccinellids in treatments with profenophos + cypermethrin (0.04%) at pre-count and one and three days after spraying was 4.33 and 1.67 and 0.33 coccinellids / five plants and reached to zero at 7 days after first spraying. Whereas, in second spraying, the pre-count and 1, 3, 7 days after spraying, the coccionellids population was 3.67 and 1.33, 0.00 and 0.00, Rathod and Bapodra (2002) also reported that the treatment of profenophos + cypermethrin (0.04%) was highly toxic to coccinellid predators, dimethoate was moderately toxic. The next toxic treatment were lambda-cyhlothrin (0.005%), dimethoate (0.03%) and thiamethoxam (0.025%) which registered coccinellid population at pre-count as 4.33, 4.33, 5.00 and 7 days after treatment as 1.00, 1.00 and 1.33, respectively in second spray.

In the treatments of imidacloprid (0.05%) and novaluron (0.02%) the coccinellid population at pre-count and 7 days after spraying was 5.33 and 1.67, 2.00. These insecticides ranked as moderately toxic to coccinellids. The plant products (neem and karanj) were found safer as compared to the synthetic insecticides. The coccinellid population in the treatment of NSKE (5.0%), KSE (5.0%) and azadirachtin (5 ml/l) was 4.00, 3.67 and 3.67 at 7 days

Table 1: Toxic effect of insecticides on the population of coccinellid predators on mothbean

S. No.	Treatment	Reduction in coccinellids population*							
		First spray				Second spray			
		Pre-treatment count	After one day	After seven days	After fifteen days	Pre-treatment count	After one day	After seven days	After fifteen days
1.	Dimethoate (0.03%)	4.00(2.12)**	2.33(1.68)	1.00(1.22)	2.67(1.78)	4.33(2.20)	2.67(1.78)	1.00(1.22)	1.67(1.47)
2.	Imidacloprid (0.005%)	4.00(2.12)	2.67(1.78)	1.33(1.35)	3.67(2.04)	5.33(2.41)	3.33(1.95)	1.67(1.47)	2.33(1.68)
3.	Thiamethoxam (0.025%)	4.00(2.12)	2.33(1.68)	1.00(1.22)	3.00(1.87)	5.00(2.34)	3.00(1.87)	1.33(1.35)	2.00(1.58)
4.	Profenophos 40 EC + cypermethrin 4 EC (0.04%)	4.33(2.20)	1.67(1.47)	0.00(0.71)	1.33(1.35)	3.67(2.04)	1.33(1.35)	0.00(0.71)	1.00(1.22)
5.	l-Cyhalothrin (0.05%)	4.00(2.12)	2.00(1.58)	1.00(1.22)	2.67(1.78)	4.33(2.20)	2.33(1.68)	1.00(1.22)	1.67(1.47)
6.	Novaluron (0.02%)	4.00(2.12)	2.67(1.78)	1.67(1.47)	3.67(2.04)	5.33(2.41)	3.33(1.95)	2.00(1.58)	2.33(1.68)
7.	Azadirachtin (5 ml/l)	3.67(2.04)	3.00(1.87)	2.67(1.78)	4.00(2.12)	5.67(2.48)	4.00(2.12)	3.67(2.04)	2.67(1.78)
8.	NSKE (5.0%)	4.00(2.12)	3.00(1.87)	3.00(1.87)	5.00(2.34)	5.67(2.48)	4.00(2.12)	4.00(2.12)	3.00(1.87)
9.	KSE (5.0%)	3.67(2.04)	3.00(1.87)	3.00(1.87)	5.00(2.34)	5.67(2.48)	4.00(2.12)	3.67(2.04)	3.00(1.87)
10.	Control	3.67(2.04)	3.67(2.04)	3.67(2.04)	5.33(2.41)	6.00(2.55)	5.67(2.48)	5.00(2.34)	3.67(2.04)
	SEm ±	0.06	0.05	0.05	0.05	0.08	0.06	0.04	0.04
	CD (p = 0.05)	0.19	0.15	0.14	0.16	0.23	0.19	0.13	0.12

* Data presented are mean of three replications

** Figures in parentheses are $\sqrt{x+0.5}$ values

after second application. Balikai and Lingappa (2004) also reported that neem, karanj and other plant products were safer to the coccinellid predators.

REFERENCES

Balikai, R.A. and Lingappa, S. (2004). Effect of natural plant products on predators of aphid, *Melanaphis sacchari* (Zehntner) in sorghum. *Indian Journal of Entomology,* **66**: 57-59.

Puttaswami, Gowda, B.L.V. and Ali, T.M.M. (1977). Record of pests infesting mothbean, *Phaseolus aconitifolia* (Jacq.) a potential pulse crop. *Current Research,* **6**: 69-71.

Rathod, R.R. and Bapodra, J.G. (2002). Relative toxicity of various insecticides to coccinellid predators in cotton. *Indian Journal of Plant Protection,* **30**: 29-31.

Satyavir, Jindal, S.K. and Lodha, S. (1984). Screening of mothbean cultivars against jassid, whitefly and yellow mosaic virus. *Annals of Arid Zone*, **23**: 99-103.