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OVICIDAL ACTIVITY OF INSECTICIDES ON EGGS OF *Brevennia rehi* LINDINGER

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Biphenyl Methyl Carbamate 50 EC (BPMC) 0.25 kg a. i./ha was found to be ovicidally active followed by carbaryl 50 WP @ 0.5 kg and dimethoate @ 0.15 kg a. i /ha. BPMC delayed hatching of eggs and it caused death of the crawlers at the time of hatching.

Effectiveness of organophosphorus compounds in control of *B. rehi* on rice wasreported by Alam *et. al.* (1979). The ovicidal activity of carbamates was studied by Smith and Salkeld (1966) and Singh *et al.* (1982). The results of the laboratory experiments conducted to evaluate the ovicidal activity of certain organochlorine, organophosphorus and carbamate insecticides are reported in this paper.

MATERIALS AND METHODS

Laboratory experiments were conducted to test the ovicidal action of endosulfan (Thiodan 35 EC), phosphamidon (Dimecron 85 WSC), monocrotophos (Nuvacron 36 WSC), fenthion (Lebaycid 100 EC), chlorpyriphos (Dursban 20 EC), methyl demeton (Metasystox 25 EC), dimethoate (Rogor 30 EC), phosalone (Zolone 35 EC), biphenyl methyl carbamate (BPMC 50 EC) and carbaryl (Sevin 50 WP) @ 0.33, 0.25, 0.20, 0.50, 0.35, 0.125, 0.15, 0.35, 0.25 and 0.5 kg a. i /ha respectively as well as deltamethrin (Decis 2.8 EC) 10g a. i /ha.

For each treatment 50 eggs were taken in Petridish lined with moist filter paper and sprayed with one ml of the respective insecticides with a hand atomizer impoverised by MohammedHanifa and Chelliah, (1981). The treatments were replicated thrice. Eggs sprayed with water served as control.

Observations were made every fifteen minutes for three days, a day longer than the maximum incubation period of two days and the total number of eggs hatched was counted in different treatments.

Data on mealy bug infestation was converted into corresponding arcsin values for statistical analysis (Snedecor and Cochran, 1967). The mean values were separated using Duncon's Multiple Range Test (Gomez and Gomez, 1976).

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Table 1 Effect of Insecticides on the Mortality and Hatchability of Eggs of *B. rehi*

Insecticides	Dose (kg ai/ha)	Hatchability Mean period (%)	Total hatchability (%)	Mortality 1/ (%)
Endosulfan	0.33	11.3 (12.5) def	68.0	31.3 (28.8) de
Phosphamidon	0.25	13.0 (13.0) efg	78.0	22.0 (20.8) f
Monocrotophos	0.20	10.7 (12.5) def	64.0	36.0 (32.1) de
Fenthion	0.50	11.0 (12.2) cde	66.0	34.0 (30.6) de
Chlorpyriphos	0.35	12.9 (13.3) efg	77.3	22.7 (21.3) f
Methyl demeton	0.125	10.1 (11.2) c	60.7	39.3 (34.5) d
Dimethoate	0.15	8.1 (11.6) cd	48.7	51.3 (42.4) c
Phosalone	0.35	12.8 (13.0) efg	76.7	23.3 (21.7) f
BPMC	0.25	2.0 (6.9) a	12.0	88.0 (68.5) a
Deltamethrin	10g	14.2 (13.5) fg	85.3	14.0 (11.9) g
Carbaryl	0.50	7.0 (10.1) b	42.0	58.0 (46.7) b
Control		14.9 (14.0) g	89.3	

1/ Mean of three replications

Figures in parentheses are arcsin transformed values

In a column, means followed by a common letter are not significantly different [P=0.05] by DMRT

Table 2 Data on hatchability of eggs (%) in different treatments during different periods on *B. rehi* eggs

Time of observation (h)	Per cent hatchability[1]—Insecticides												
	Endosulfan	Phosphamidon	Monocrotophos	Fenthion	Chlorpyriphos	Methyl demeton	Dimethoate	Phosalone	BPMC	Deltamethrin	Carbaryl	Control	Mean
0-3	53.3	54.7	43.4	46.0	55.4	43.4	26.8	63.4	3.3	73.3	25.3	74.1	46.9
	(46.9)a	(47.7)a	(41.2)a	(42.7)a	(48.1)a	(41.2)a	(31.2)a	(52.8)a	(10.4)a	(58.9)a	(30.2)a	(59.4)a	(42.5)a
3-6	13.2	23.4	18.0	19.2	21.3	17.5	19.2	12.4	1.4	11.9	14.7	15.3	15.6
	(21.3)b	(28.9)b	(25.1)b	(26.0)b	(27.5)b	(24.7)b	(26.0)b	(20.6)b	(6.7)ab	(20.2)b	(22.5)b	(23.0)b	(22.7)b
6-12	0.9	0.0	1.7	0.3	0.3	0.0	1.7	0.3	2.6	0.0	1.4	0.0	0.8
	(5.5)c	(0.4)c	(7.6)c	(3.0)d	(3.0)d	(0.4)c	(7.6)c	(3.0)c	(9.2)a	(0.4)c	(6.7)c	(0.4)c	(3.9)c
12-24	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	2.6	0.0	0.0	0.0	0.3
	(0.4)d	(0.4)c	(0.4)d	(0.4)d	(0.4)d	(0.4)c	(4.1)c	(0.4)c	(9.2)a	(0.4)c	(0.4)d	(0.4)c	(1.4)d
24-36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.02
	(0.4)d	(0.4)c	(0.4)d	(0.4)d	(0.4)d	(0.4)c	(0.4)d	(0.4)c	(3.0)b	(0.4)c	(0.4)d	(0.4)c	(0.6)d
36-48	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.02
	(0.4)d	(0.4)c	(0.4)d	(0.4)d	(0.4)d	(0.4)c	(0.4)d	(0.4)c	(3.0)b	(0.4)c	(0.4)d	(0.4)c	(0.6)d

1/ Mean of three replications

Figures in parentheses are arcsin transformed values

In a column, means followed by a common letter are not significantly different (P = 0.05) by DMRT

RESULTS AND DISCUSSION

BPMC was found to be superior to all other chemicals and exhibited high ovicidal activity registering a mean egg mortality of 88 per cent (Table 1). The ovicidal action of carbaryl and dimethoate was intermediate inflicting a mean mortality of 58 and 51.3 per cent respectively while the remaining insecticides were weak ovicides.

Significantly less number of eggs (a mean of two eggs per period amounting to 12%) hatched due to BPMC treatment as compared to all other treatments followed by carbaryl recording a mean of 7 eggs per period. The per cent hatchability per period was high in the untreated control which was found to be on a par with deltamethrin, chlorpyriphos and phosalone recording 14.2, 12.9 and 12.8 per cent hatchability respectively.

The hatchability of eggs when observed at different intervals, the insecticides - treated eggs hatched (46.9%) within three hours after treatment. A mean of 15 6 eggs was found to hatch during three to six hours after treatment. Beyond six hours after treatment the percentage of hatchability was 0.8% 0.3, 0.02 and 0.02% during 6 to 12, 12 to 36 and 36 to 48h respectively and were on a par with each other. Interaction effect between periods and effect of insecticides on eggs of *B. rehi* was also significant (Table 2).

The hatchability of eggs in BPMC treatment was 3.3 per cent as against from 25 3 to 63.4 per cent in other treatments within 3 hours after treatment Within 6 hours after treatment the eggs hatched completely in all the treatments except in BPMC. BPMC prolonged the hatchability of eggs upto 48 hours after treatment. (Table 2).

The carbamates have been reported to be poor ovicides possibly because they are not able to penetrate inside or being easily detoxified (Smith and Salkeld, 1966). The eggs of several lepidopteran insects have been reported to have varying susceptibility to carbaryl but carbamates treated eggs developed normally until just before eclosion (Bruson, 1960).

The eggs of *Earias* spp. and *Clavigrella gibbosa* were on a par in their susceptibility to all the carbamates tested as reported by Singh *et al.* (1982).

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EFFECT OF ORGANIC AND INORGANIC FORMS OF NITROGEN ON THE CRUDE PROTEIN CONTENT OF RAGI (*Eleusine Coracana* GAERTN) CROP

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The crude protein content of the ragi grain and husk was higher in the variety Co. 9 compared to Co. 7. Application of FYM or $(NH_4)_2SO_4$ @ 90 kg N/ha increased the crude protein content of the grain and straw. The highest crude protein content of grain to the tune of 12.08 per cent was recorded by the combined application of FYM @ 90 kg N/ha and $(NH_4)_2SO_4$ @ 90 kg N/ha.

Judicious combination of organic and inorganic forms of fertilizers would increase the nutritive value of grains especially the protein content and mineral constituents. Among the inorganic elements, Nitrogen (N) is required in larger quantities than other elements. The farming systems in India depend heavily on soil reserves to meet the N requirement of crops. This necessitates the application of both organic and inorganic forms of nitrogenous fertilizers to supplement soil N for successful crop production for which experiments were conducted and results furnished.

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