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EVALUATION OF THREE ANTIFEEDANTS AGAINST CATERPILLARS OF *SPODOPTERA LITURA* BOISD AND *ACHOEA JANATA* LINN

L. SARASWATHI AMMAL and D. DALE
College of Agriculture, Vellayani

Antifeedants do not harm non-target organisms and hence are selective in action. Most of them are not toxic to mammals. These attributes render them suitable for use in integrated control of insect pests. The use of antifeedants in plant protection in India has already been shown by several workers (Joshy *et al*, 1967., Kareem, 1970., Dale and Chandrika, 1972 and Regupathy, 1973 a & b). The present studies were undertaken to asses the relative efficacy of three antifeeJants - fentin acetate, fentin chloride and AC 24055 in protecting castor leaves from damage by two of its important insect enemies, *Spodoptera litura* Boisd. and *Achoea Janata* Linn. (Noctuidae).

Materials and Methods

Fourth instar caterpillars reared in the laboratory were used for the studies. Pre-weighed leaf bits were sprayed with different concentrations of the chemicals (See Tables), air dried and kept in petri dishes over wet paddings of cotton and filter paper. Leaf bits sprayed with distilled water were kept as control. Two caterpillars were permitted to feed on the treated leaf bits in each treatment for 48 hours. All the treatments were replicated thrice. Mean percentage of leaf weight protected over control was calculated and used as the crittrion for comparing the antifeedant activity of the chemicals.

To assess persistence of antifeedants under field conditions potted castor plants were sprayed with 0.2 per cent solutions of the antifeedants. The leaves were collected at two days' intervals, fed to the caterpillars and persistance evaluated as elaborated by Pradhan (1967).

Contact toxicity of the antifeedants was assessed by spraying the caterpillars with different concentrations of the antifeedants under a Potter's spraying tower. After air-drying the caterpillars were provided with fresh caster leaves. Mortality counts were taken at the end of 48 hours.

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Table 1

Antifeedant action of some chemicals to caterpillars of S. *litura*,

Antifeedant	Concentration.	Larval mortality. (%)	Weight of leaf consumed (gm)	Mean wt. of leaf protected over control (%)	PC 60
Fentin acetate	0.00 (Control)	0.00	6.45	..	
,,	0.0125%	0.00	4.95	23.15	
,,	0.025%	0.00	4.44	31.16	
,,	0.05%	66.66	1.77	72.55	0.0354
,,	0.1%	83.33	1.36	78.83	
,,	0.2%	100.00	0.96	83.56	
Fentin chloride	0.00 (Control)	0.00	6.25	..	
,,	0.0125%	0.00	4.41	29.36	
,,	0.025%	0.00	3.16	49.44	
,,	0.05%	0.00	1.49	76.16	0 0232
,,	0.1%	83.33	0.12	98.08	
,,	0.2%	100.00	0.10	98.40	
AC 24055	0.00 (Control)	0.00	6.02	..	
,,	0.0125%	0.00	5.23	13.12	
,,	0.025%	0,00	4.52	24.91	
,,	0.05%	16.66	2,65	55.98	0.0410
,,	0.1%	66.66	0.80	86,71	
,,	0.2%	100.00	0.27	95.51	

PC. = Concentration of antifeedant giving 50 per cent protection of leaf weight.

Table 2

Antifeedant action of some chemicals to caterpillars of *A. Janata.*

Antifeedant	Concentration	Larval mortality. (%)	Weight of leaf consumed (gm)	Mean wt. of leaf protected over control (%)	PC_{50}
Fentin acetate	0.00 (Control)	0.00	5.48	- -	
,,	0.0125%	0.00	4.11	25,00	
,,	0.025 %	0.00	3.71	32.29	
,,	0.05%	16.66	3.97	64.05	0.0350
,,	0.1%	83.33	1.06	80.65	
,,	0.2%	100.00	0.47	91.42	
Fentin chloride	0.00 (Control)	0.00	5.63	- -	
,,	0.0125%	0,00	3.48	38.18	
,,	0.025%	0.00	2.87	49,02	
,,	0.05%	16.66	1.45	74.24	0,0365
,,	0.1%	66.66	0,73	87.03	
,,	0.2%	100.00	0.40	92.89	
AC 24055	0.00 (Control)	0,00	5.52	- -	
,,	0.0125%	0.00	5.05	8.51	
,,	0.025%	0.00	4.56	17.39	
,,	0.05%	0.00	4.08	26.08	0.1102
,,	0.1%	66.66	2.72	50.72	
,,	0.2%	100.00	1.92	65.21	

Phytotoxicity of the antifeedants was assessed by spraying 0.2 per cent solutions of the antifeedants over potted castor plants. The plants were watched regularly for symptoms of phytotoxicity for one month.

Results and Discussion

The results are given in Tables 1 and 2.

From Table 1 it is clear that 0.2 per cent concentration of the antifeedants gave maximum protection of castor leaves from catterpillars of *S. litura*, the mean percentages of leaf weight protected over control being 83.56, 98.40 and 95.51 by fentin acetate, fentin chloride and AC 24055 respectively. There was an increase in the percentage of leaf weight protected with the increase in antifeedant concentrations. PC_{50} values indicate that all the antifeedants are almost equally effective against *S. litura*.

Table 2 shows that against caterpillars of A. *Janata* fentin acetate and fentin chloride at 0.05 per cent and above and AC 24055 at 0.1 percent and above gave more than 50 per cent protection of the leaf. The highest concentration of all the antifeedants caused cent per cent mortality of caterpillars. PC_{50} values show that fentin acetate and fentin chloride are more than 3 times as effective as the product AC 24055 as an antifeedant.

Observations on the persistance of the antifeedants on castor plants showed that the residues sufficient to provide 50 per cent protection were present even after 16, 18 and 14 days after application for S. *litura* and upto 24, 24 and 16 days for A *Janata* for the 3 antifeedants fentin acetate, fentin chloride and AC 24055 respectively.

Studies on contact toxicity of the antifeedants, showed that only 13.3 per cent mortality was caused at 0.1 and 0.2 per cent concentrations and no mortality at lower levels when tested on *S. litura*. However, no mortality was obtained with A. *Janata* in any of the treatments.

According to the intensity of symptoms, phytotoxicity was graded as 'very high', 'high' 'medium', 'low' and 'nil'. Phytotoxicity caused by fentin acetate was 'medium' while with fentin chloride it was 'low' and 'nil' with AC 24055.

Summary

Fentin chloride ranked first in the antifeedant action against S. *litura* followed by fentin, acetate; but in the case of A. *Janata* fentin acetate was the best followed by fentin chloride and AC 24055. Persistant antifeedant action was very high with fentin chloride when tried under field conditions. No significant contact toxicity was caused by any of the chemicals. The slight phytotoxicity caused by the

application of antifeedants on castor plants did not affect the growth of the crop significantly. Hence these chemicals can be considered safe for application even at the highest dose of 0.2 per cent concentration.

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സംഗ്രഹം

ഫെൻറിൻ ക്ലോറൈഡ്, ff)<xda5oo1a% അസിറേറ്റ്, എ. സി. 24055 എന്നീ പ്രതിഭക്ഷ്യ രാസവസ്തുക്കൾ 0.2 ശതമാനം വീര്യത്തിൽ ആവണക്കിൻെറ ഇലയിൽ പ്രയോഗിച്ചാൽ ഈ ഇലകളെ അവയുടെ ശത്രുക്കളായ സ്പോടോപ്റ്റീറ ലിറ്റുറ, അക്കേയ ജനാറ എന്നീ നിശാശലഭങ്ങളുടെ പുഴുക്കളിൽനിന്നു സംരക്ഷിക്കാമെന്നു ലാബറട്ടറി പഠനങ്ങൾ തെളിയിച്ചു. ഫെൻറിൻ ക്ലോറൈഡിൻെറ പ്രതിഭക്ഷ്യവീര്യം പ്രയോഗാനന്തരം 24 ദിവസംവരെ ഇലകളിൽ തങ്ങിനിrcfl<0acrroമൽപ്പറഞ്ഞ രാസവസ്തുക്കൾക്കൊന്നിനുംതന്നെ പുഴുക്കളിൽ സ്പർശവിഷാക്തത ഇല്ല. സസ്യവിഷാക്തതയും ഇവയ്ക്കൊന്നിനും ഇല്ല.

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