

Research Paper :

Neem based pesticides as an antifeedant against Tobacco Caterpillar, *Spodoptera litura* Fab.

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ABSTRACT

Laboratory studies on the antifeeding effect of azadirachtin on the Tobacco caterpillar, *Spodoptera litura* Fab. showed that neem based pesticide may be efficacious for the control of this insect. Based on the laboratory studies commercial neem pesticides, Nimba, Neemark and Neem Plus against *Spodoptera litura* Fab. Azadirachtin-rich Neemark proved very effective at deterring feeding of the *Spodoptera litura*.

KEY WORDS : Neem, Azadirachtin, Pesticides, *Spodoptera litura* Fab., Neemark

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Neem is the most important among all biopesticides for controlling pests. These pesticides do not leave any residue on the crop like other chemical pesticides and therefore is preferred. Neemark is a commercial neem based insecticides with Azadirachtin. Azadirachtin is a tetranortriterpenoid botanical insecticide of the liminoid class extracted from the neem tree *Azadirachtin indica*. Its molecular formula is $C_{35}H_{44}O_{16}$. Ley *et al.* (1993) worked on the chemistry of azadirachtin.

The effect of neem allelochemicals *viz.*, azadirachtin, salanin, nimbinene, and ninbin on nutritional physiology of *Spodoptera litura* larve. Nutritional analysis revealed strong antifeedant and growth regulatory effects of azadirachtin which were independent to each other, while salanin and nimbinene induced concentration dependent feeding deterrence only. Nimbin was inactive to the 1000ppm level against this species. (Koul *et al.*, 1996). A study, therefore, was conducted to know the antifeeding effect of neem based pesticides on the *Spodoptera litura* Fab.

EXPERIMENTAL METHODOLOGY

The larvae of *Spodoptera litura* Fab. were collected from Departmental Insectory of Entomology, Chandra Shekhar Azad University of Agriculture and Technology,

Kanpur and reared in the laboratory of IIT, Kanpur on castor leaves. Fresh food was supplied at libitum daily. The fully grown larval were allowed to pupate in moist soil. Soon after emergence, adults were transferred on potted plants for egg laying. The egg laid on leaves were removed from the slits of castor leaf margins and were kept in petridishes for hatching. The third instar larvae were used for the proposed experiments. Different concentrations of neem based pesticides (Neemark, Nimba and Neem Plus) were prepared in laboratory.

Leaf pieces were cut from the castor leaves. Measured leaves pieces were dipped in neem based pesticide. Each treatment was released on the treated leaves material in each petridishes. Observations were recorded after 48 hours. Antifeeding effectiveness of different neem based pesticides against the larvae of *S. litura* was evaluated on the basis of leaf area protection and leaf area consumed over control.

EXPERIMENTAL FINDINGS AND ANALYSIS

The feeding response of *S. litura* was deterred on Nimba, Neemark and Neem Plus treated leaves compared to those on water treated leaves (Table 1). Among the three pesticides tested at five different concentrations (0.5-2.5%), Neemark exhibited maximum antifeedant

Table 1 : Antifeeding effect of neem based pesticides on lemon butterfly, *Papilio demoleus* Linn

Treatments	Mean feeding per cent	Mean per cent protection	Corrected per cent protection due to treatment	
Neemark 2.5%	12.78	87.22	86.46	(68.68)
Neemark 2.0%	16.11	83.89	82.94	(65.76)
Neemark 1.5%	18.88	81.12	80.00	(63.43)
Neemark 1.0%	22.77	77.23	75.88	(60.59)
Neemark 0.5%	27.22	72.78	71.17	(57.58)
Control	94.44	5.56	-	
S.E.±				1.77
C.D. (P=0.05)				5.57
CV%				4.85
Nimba 2.5%	15.00	85.00	84.11	(66.62)
Nimba 2.0%	17.22	82.78	81.76	(64.89)
Nimba 1.5%	23.88	76.12	74.71	(59.80)
Nimba 1.0%	26.11	73.12	72.35	(58.27)
Nimba 0.5%	31.16	68.34	66.47	(54.65)
Control	94.44	5.56	-	-
S.E.±				1.56
C.D. (P=0.05)				4.92
CV%				4.45
Neem Plus 2.5%	18.55	81.45	80.35	(63.78)
Neem Plus 2.0%	22.22	77.78	76.47	(61.04)
Neem Plus 1.5%	24.44	75.56	74.12	(59.42)
Neem Plus 1.0%	28.33	71.67	70.00	(56.79)
Neem Plus 0.5%	32.22	67.78	65.88	(54.29)
Control	94.44	5.56	-	
S.E.±				1.36
C.D. (P=0.05)				4.29
CV%				3.99

property (27.22, 22.77, 18.88, 16.11, 12.78) followed by Nimba (31.16, 26.11, 23.88, 17.22, 15.00) and Neem Plus (32.22, 28.33, 24.44, 22.22, 18.55). However, higher the concentration of pesticides, greater was the reduction in feeding. The results of the present studies have clearly shown that azadirachtin rich Neemark was the best antifeedant and made the larvae to starve and die. The result obtained from laboratory studies on feeding of *S. litura* are in conformity with the antifeedant effects of neem seed kernel suspension against *S. litura* (Joshi *et al.*, 1984). Phadke, (1988) observed that Neemark at 0.5 per cent has been effective for the control of bollworm damage on cotton. Patel *et al.* (1990) also reported similar result. Ishida *et al.* (1992) have also worked on several antifeedants from neem oil, *Azadirachta indica* A. Juss, against *Reticulitermes speratus* Kolbe.

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