Juvenomimetic Effects of Neem Based Pesticide on The Diamond Back Moth (*Plutella xylostella*) Linn.

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SUMMARY

The juvenomimetic effects of Neem based pesticide-Neemazal, investigated on the 3rd instar larvae of Diamond back moth, *Plutella xylostella* Linn. by oral feeding method at different concentrations (0.50 to 4.00%) resulted in to the larval - pupal intermediates (at higher concentration), deformed pupae (at medium and higher concentration) and deformed adults (at medium and lower concentrations).

Key words : Neemazal, Diamond back moth, *Plutella xylostella* Linn.

In view of problems associated with the indiscriminate use of chemical insecticides, emphasis is now shifted in favour of biological control and botanical pesticides. Several neem extracts have been tested and found effective against many pests (Kaur *et al.*, 2001; Fakhri and Murad, 2004 and Bhanukiran and Panwar, 2002). However, very scanty information is available on the juvenomimetic effects of neem based pesticides. The diamond back moth, *Plutella xylostella* (L.) is a major pest of cruciferous crops. A study, therefore, was conducted to know the juvenomimetic effect of Neemazal on the *Plutella xylostella.*

MATERIALS AND METHODS

The larvae of *Plutella xylostella* were collected from local vegetable market, reared in the laboratory and cabbage fresh leaves were supplied daily as food. The fully grown larvae were allowed to pupate on cabbage leaves. Soon after emergence, adults were transferred on potted plants of cabbage, covered with a glass chimney for egg laying. The newly hatched larvae were transferred on soft, newly grown up leaves of cabbage in Petridishes with the help of camel hair brush. The 3rd instar larvae were used for the experiments. Different concentrations of neem product - Neemazal was prepared by adding desired quantity of distilled water. For this purpose, 10% stock solution was prepared for test compound. The desired concentration of Neemazal was prepared from the stock solution by diluting with desired amount of distilled water. Cabbage leaves were dipped in solutions for two seconds and the solvent was evaporated under fan for 30 for minutes. Each treatment was replicated trice. Ten newly emerged adults starved for 24 hours were released on treated leaf material in each Petridish. Observations were recorded after 48 hours and leaves treated only with solvent served as control.

RESULTS AND DISCUSSION

In the present investigations, results have shown that neem based pesticide, Neemazal has induced morphogenetic changes in *Plutella xylostella* (Table 1). A critical look of the results obtained revealed that different abnormal forms of the test insect were larval-pupal intermediates, pupal-adults intermediates and deformed pupae and adults. The maximum larval mortality (96.66%) was observed at higher dose (4.0%) while minimum (40.00%) at lower dose (0.50%). The larval-pupal intermediate were maximum (6.66%) at 3.00%, while minimum (3.33%) at 2.50% and 4.00% concentrations. It can further be seen from Table 1 that extent of pupation was 60.00 per cent at lower concentration, however, it decreased with the increase of dose of Neemazal. The pupal-adults intermediates were recorded at lower and medium concentrations of 0.50, 1.00, 1.50 and 2.00 per cent of the test pesticide and their percentages were 16.66, 13.33, 6.66 and 3.33, respectively. In the resultant deformed adults, it was found that there was no definite sequence of such forms at different concentrations. In control, no such

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Table 1: Juveno-mimetic effect of Neemazal on 3rd instar larvae of *P. xylostella*

Sr. No.	Concentration in per cent	Number of treated	Larval mortality (%)	Larval-pupal intermediate (%)	Deformed pupae (%)	Pupa-adults intermediate (%)	Pupa-adults intermediate (%)	Deformed adults (%)	Normal adults (%)	Inhibition of adults emergence (%)
1.	0.50	30	40.00	-	-	60.00	16.66	-	43.33	56.66
2.	1.00	30	46.66	-	-	53.33	13.33	-	40.00	60.00
3.	1.50	30	56.66	-	-	43.33	6.66	6.66	30.00	70.00
4.	2.00	30	60.00	-	6.66	33.33	3.33	3.33	26.66	73.33
5.	2.50	30	70.00	3.33	-	26.66	-	3.33	23.33	76.66
6.	3.00	30	83.33	6.66	3.33	6.66	-	-	6.66	93.33
7.	3.50	30	93.33	-	6.66	-	-	-	-	100.00
8.	4.00	30	96.66	3.33	-	-	-	-	-	100.00
9.	Control	30	3.33	-	-	96.66	-	-	96.66	3.00

abnormality could be seen in the emerging adults.

Recovery of normal adults was noticed in all the concentrations of the test compound including control except the highest dose of 4.00%. Mininum concentration of 0.50% was found to develop maximum percentage of normal adults and their percentage was 43.33% followed by 40.00% and 30.00% at lower concentration of 1.00 and 1.50 per cent, respectively. Minimum percentage (6.66) of normal adults was found to recover at the concentration of 3.00 per cent. Inhibition of adult emergence occurred at the higher concentrations of 4.00, 3.50 and 3.00 per cent resulted in 100.00, 100.00 and 93.33 per cent, respectively. Intermediary doses of 2.50 and 2.00 per cent gave 76.66 and 73.33 per cent inhibition of adult emergence. Lower concentration of 1.50, 1.00 and 0.50 per cent gave 70.00, 60.00 and 56.66 per cent inhibition of adult emergence. In control there was 3.33 per cent inhibition of adult emergence and no abnormality could be seen in adults.

The juvenilizing effect of neem based pesticide, Neemazal against phytophagous pest, *P. xylostella* is more effective. Bambarkar (1990) has also demonstrated that azadirachtin acts as a metamorphosis and growth disrupter in *Spodoptera litura* and *Heliothis armigera.* The neem pesticide, Neemazal evaluated for the junveomimetic effects agianst *P. xylostella* revealed that it induced deformities in different morphogenetic forms *viz*., larval-pupal intermediates, deformed pupae, P-A. intermediates and deformed adults in different stages of their development.

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