

Research Notes

EFFECT OF JUVENILE HORMONE ANALOGUE METHOPRENE (ZR-515)  
ON DEVELOPMENT OF EGGS AND LARVAE OF *CORCYRA CEPHALONICA*  
STANTON (LEPIDOPTERA: PYRALIDAE)

*Corcyra cephalonica* is a major pest of stored grain and grain products causing substantial losses. Insecticidal treatment against this pest is undesirable in view of the residue hazards. The impairment of development of some stored product pests due to JH analogues has been reported by Bhatnagar-Thomas (1975, 1976). In the present study the effect of the JH analogue methoprene on eggs and larvae of *C. cephalonica* was evaluated under laboratory conditions.

Thirty days old larvae of *C. cephalonica* were collected from stock cultures maintained on crushed 'Jowar' at room temperature and these were used for the experiments while the eggs of the test insect were obtained from cylindrical ovipositional cages in which moths were confined on the previous day. The JH analogue methoprene (ZR-515) was a gift from Dr. G. B. Stall, Zoecon Corporation, Palo Alto, California and this was dissolved in acetone for the preparation of the required dilutions. Solutions of methoprene (2 ml) were applied through Potter's spraying tower at 25 lbs/sq. in pressure at 0.1, 0.3 and 0.5  $\mu\text{g}$  to eggs of *Corcyra* (200 nos.) kept in petridishes. The treated eggs were then transferred to glass troughs containing 'jowar' meal and maintained at room temperature. There were five replicates for each treatment. The eggs in control were sprayed with acetone.

Forty members of fourth instar larvae were given topical application of methoprene at 0.5 and 1.0  $\mu\text{g}$  each on the abdominal sterna using a microsyringe while the control larvae were treated with acetone. There were seven replicates for each treatment. The control as well as treated larvae were reared in glass jars containing crushed jowar for a period of 3 months.

The data on the percentage of eggs failed to hatch and on the mortality of treated larvae are furnished in Table 1. The percentage of eggs that failed to hatch was comparatively low in control (40%) as compared to those of eggs treated with methoprene in various doses. A comparison of the different dosages applied shows that at 0.5  $\mu\text{g}$  the egg mortality was the highest (92%).

The control larvae moulted normally and completed the life-cycle in 90 days. With 1.0  $\mu\text{g}$  topical application, all the larvae were dead in 42 days after treatment, whereas those treated with 0.5  $\mu\text{g}$  complete mortality was noted only in 90 days after treatment. Formation of supernumerary larvae was observed among larvae treated with 0.5  $\mu\text{g}$  and 1  $\mu\text{g}$  methoprene. The supernumerary larvae were larger in

size (25.5 x 3,8 mm, n = 10) than the normals (14.2 x 1.9 mm, n = 10) and were sluggish, pale coloured, with stouter setae, large light-brownish prolegs. These abnormal larvae never completed the life-cycle and were found dead within 7-9 days after the supernumerary moult.

None of the larvae treated with 1 $\mu$ g survived beyond 42 days after treatment. All the larvae treated with 0.5 $\mu$ g were found dead within 90 days. Controls moulted normally and completed the life cycle in 90 days.

The effect of JH analogues on eggs and larvae has been demonstrated in number of other insects (Riddiford and Williams, 1967; Gelbic and Sehnal, 1973 Slama *et al.*, 1974; Bowers, 1976).

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Table 1  
Mortality of eggs and larvae of *C. cephalonica* treated with various doses of methoprene

Dosage	Percentage of eggs failed to hatch	Percentage of mortality of larvae on 42nd day after treatment
<b>(a) egg treatment</b>		
0.1 $\mu$ g	46,5	—
0.3 $\mu$ g	<b>64</b>	—
0.5 $\mu$ g	<b>92</b>	—
(Control)	40	—
<b>(b) larval treatment</b>		
1 $\mu$ g	—	100
0.5 $\mu$ g	—	48
(Control)	—	11

സംഗ്രഹം

മിതോപ്രിൻ എന്ന ജീവനൈൽ ഹോർമോൺ അനലോഗ് കോർസീറാ സെഫാലോണിക്ക എന്ന പ്രാണിയുടെ മുട്ടയിലും പൂഴുകളിലും നിക്ഷേപിക്കുന്നതുമൂലം തുടർന്നുള്ള ജീവിതശക്തികളിൽ കാണുന്ന വ്യതിയാനങ്ങളെക്കുറിച്ച് പഠനം നടത്തുകയുണ്ടായി. ഇതിൽ നിന്നും മുട്ടവിരിയലിനെ ഏറ്റവും കൂടുതൽ തടസ്സപ്പെടുത്തുവാൻ 0.5 മൈക്രോഗ്രാം മിതോപ്രിനും, പൂഴുകളുടെ സമാധിദശയിലേക്കുള്ള രൂപാന്തരം പ്രാപിക്കലിനെ തടസ്സപ്പെടുത്തുവാൻ 1 മൈക്രോഗ്രാമും 0.5 മൈക്രോഗ്രാമും പര്യാപ്തമാണെന്നുകണ്ടു.

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