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EFFECT OF JUVENILE HORMONE ANALOGUE ZR-515 ON THE ADULTS OF Dysdercus cingulatus F. (Pyrrhocoridae; Heteroptera) (1)

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Introduction:

The use of analogues of insects such as juvenile hormones for the suppression of insect population are used these days. 'Altosid' an analogue of insect hormone has been used in this experiment to determine its effects on the adults of **Dysdercus cingulatus** at different concentrations.

The effect of JHA on the embryogenesis has been reported in the silk worm **Hyalophora cercropia** by Riddiford (1968); in the locust **Schistocerca gregaria** by Novak (1969) and in **Dysdercus cingulatus** by Judson et al. (1976, 1977), but details on fecundity, fertility and adult emergence remain to be fully elucidated. In the present investigation JHA ZR-515 was tested on the adults of **Dysdercus cingulatus** and its effects were studied.

Materials and Methods:

The test insects used in this experiment were from a pure culture maintained at $28 \pm 2°C$, reared on soaked cotton seeds. Two concentrations, 0.25% and 0.5% of ZR-515- Altosid (isopropyl (2E, 4E)- 11-mehtoxy-3, 7, 11- trimethyl-2, 4- dodecadienoate; Zoecon Corporation, U.S.A.) were prepared in acetone as solvent. Each of these concentrations were applied individually with the aid of a micropipette on the dorsal surface of a freshly moulted adult bugs at a dose of 2 milligramme

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per litre. In the first experiment males were treated and were allowed to mate with the untreated females. In the second experiment treated females were allowed to mate with untreated males and in the third experiment both sexes were treated and were allowed to mate. Controls were treated with 2 milligramme per litre/insect of acetone only. The treated insects were reared further in cages of 250 ml in volume.

Observations on the fecundity, fertility and adult emergence were recorded in each case. Experiments were replicated six times and the data are presented in Table 1.

Results and Discussion:

There was a significant reduction in the number of eggs laid and percentage of eggs hatched with increase of concentration of Altosid as compared to the control. A similar reduction of fecundity has also been reported by Masner **et al.** (1970) with **Pyrrhocoris apterus** after treatment with other synthetic juvenile hormone analogues and by Riddiford (1968) in the silk worm, **Hyalophora cercropia.**

Application of Altosid reduced egg laying and hatchability more effectively when both sexes were treated or when females were treated than when only males were treated, similar reduction of embryogenesis was also reported by Judson et **al.** (1977) in **Dysdercus cingulatus** treated with P-169.

In the present investigation there were significant decreases in adult emergence. Emergence was entirely suppressed in the second and third experiments as compared to 50% and 20%, when males only were treated with the 0.25% and 0.5% concentrations, respectively (Table 1). Further, the successfully moulted adults were observed for mating and egg laying, surprisingly no mating was observed for 7 to 10 days of their emergence as adult, while in control it was after 3 days. These findings are supported by Outram (1972) on **Prodenia litura.**

These results strongly support that JHA reruces fecundity, fertility and adult emergence in adult when treated and can be used in the field for the control of **Dysdercus cingulatus** and other plant bugs.

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Table No. 1

Effects of ZR-515 on the adults of *Dysdercus cingulatus* Fabr.

	Male treated			Female treated			Both treated		
JHA conc.	Average No. of eggs laid/Female ± S.E.	Percent eggs hatched	Percent adult emergence	Average no. of eggs laid/ Female ± S.E.	Percent eggs hatched	Percent adult emergence	Average no. of eggs laid/ Female ± S.E.	Percent eggs hatched	Percent adult emergence
.25%	92±0.92	50	50	73±1.86	40	Nil	60±1.87	5	Nil
.5%	45±1.29	30	20	37±1.65	10	Nil	20±1.15	Nil	Nil
Control (Acetone)	106±1.65	90	80	106±1.65	90	80	106±1.65	90	80

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