

Bioefficacy of *Ocimum sanctum* on Reproductive Performance of Red Cotton Bug, *Dysdercus koenigii* (Heteroptera: Pyrrhocoridae)

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Abstract : *Dysdercus koenigii* is serious pest of cotton and other malvaceous crop. Present research work aimed at ecofriendly approach for management of pest by plant extracts. The impact of *Ocimum sanctum* was studied on reproductive performance of *Dysdercus koenigii*. The hexane extract of *Ocimum* leaves was prepared by 'cold extraction method'. The newly emerged fifth instar nymphs were exposed to the extract of concentrations ranging from 0.1% to 0.00625% by 'thin film residual method' for a period of 24h. Reproductive fitness of the adults emerged from the treated nymphs was evaluated by assessing their courtship behaviour, oviposition behaviour, and fertility. The studies indicated that treatment of *Dysdercus* with the hexane extract of *Ocimum* altered their courtship behaviour. Consequently, the treated males exhibited less sexual activity, performed fewer mounting attempts, increased time to mate and showed decreased percent successful mating. The females often rejected courting treated male by shaking the abdomen. Similarly, the treated females in many cases remained non-receptive to the courting male. Premature termination of mating in the mating pairs prior to insemination further decreased the mating success of the treated adults. Maximum abbreviation of courtship behaviour was observed in the experimental set up where both the males and the females were treated. Only females which mate successfully were observed for study of oviposition behaviour. The treated females laid lesser number of egg batches and eggs in their life span. The eggs laid by these females were fertile indicating insemination of the female. However, percent hatchability was lesser than control. The effects of hexane extract were dose dependent. Treatment with 0.1% and 0.05% extract altered courtship behaviour. Doses of concentrations less than 0.05% did not affect courtship behaviour but altered the oviposition behaviour and fertility. Significant reduction in the fecundity and fertility was observed in the treatments at concentration as low as 0.00625%. The GCMS analysis of the extract revealed a plethora of phytochemicals including juvenile hormone mimics, and the intermediates of juvenile hormone biosynthesis. Therefore, some of these compounds individually or synergistically impair reproductive behaviour of *Dysdercus*. Alteration of courtship behaviour and suppression of fecundity and fertility with the help of plant extracts has wide potentials in suppression of pest population and 'integrated pest management'.

Keywords : courtship behaviour, *Dysdercus koenigii*, *Ocimum sanctum*, oviposition behaviour

Conference Title : ICE 2017 : International Conference on Entomology

Conference Location : Paris, France

Conference Dates : October 19-20, 2017