

Ecofriendly Approach for the Management of Red Cotton Bug *Dysdercus koenigii* by Botanicals

Authors : S: Kayesth, K. K. Gupta

Abstract : The indiscriminate use of insecticides causes environmental contamination, adversely affects non-target organisms and develops resistance among insects and pests. There has always been felt a need for methods of control which can overcome these environmental and other ecological issues. The present study was designed to evaluate the effect of different plants volatiles on survival, longevity, growth, development and reproduction of *Dysdercus koenigii*. The hexane extract of three different plants (*Catharanthus roseus*, *Ocimum sanctum* and *Lantana camara*) was used. The fifth instars were exposed to hexane extract with concentrations of 10%, 5%, 2.5%, 1.25%, 0.1%, 0.5%, 0.25%, 0.13% and 0.06% while adults were treated with 10%, 5%, 2.5% and 1.25%. 1-ml of each of these concentrations was used to make a thin film in sterilized glass jars of 500 ml capacity. Fifteen newly emerged fifth instar nymphs and ten pairs of adult bugs were treated separately with the extracts for 24 hour exposure to the plant volatiles. The effect of these plant extract was observed and readings were recorded for 23 days. Survival and longevity of both fifth instars and adults were in correlation with the concentrations of the plant extracts. The extracts did not influence growth of fifth instars significantly but impaired their development significantly at higher concentrations. The treated nymphs at higher concentrations either could not moult or died and those which could moult moulted into supranumery instars, adultoids or adults with wing deformities. The supranumery insects retained the nymphal characters except increased body size and wing pads. The adultoids had wing deformities and non-functional reproductive organs. Adultoids exhibited courtship and mounting attempts but were not able to mate. At lower concentrations from 0.1 to 0.06% the fifth instars developed into adults with fewer deformities. At these concentrations, the fecundity and fertility of these adults were drastically reduced. On the contrary, the treated adults also had reduced fecundity and fertility compared to control. Among three plant extracts *Ocimum* was most toxic for both fifth instars and adults in terms of survival and longevity. *Catharanthus*, *Ocimum* and *Lantana* appeared to have potential molecules which possessed insect juvenile hormone like activity. Potential application of these plant extracts in IPM was discussed.

Keywords : *Catharanthus*, *Ocimum*, *Lantana*, *Dysdercus koenigii*

Conference Title : ICEWES 2014 : International Conference on Energy, Water and Environment Systems

Conference Location : Barcelona, Spain

Conference Dates : October 27-28, 2014