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Lethal and Sub-Lethal Effects of Pyriproxyfen on Demography of Convergent Lady Beetle, Hippodamia convergens (Goeze) (Coccinellidae: Coleoptera)

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Abstract : To further develop integrated pest management (IPM) tactics against insect pests, demographic toxicology is considered important and efficient to evaluate the long-term effects of pesticides on biological control agents. In this study, lethal and sub-lethal effects of Pyriproxyfen (insect growth regulator) two concentrations of LC10 and LC30 were tested on second instar larvae of convergent lady beetle, Hippodamia convergens (Goeze) in order to evaluate the effect of insecticide on demographic parameters of the predator under laboratory conditions. The life table parameters were analysed statistically by using age-stage, two sex life table procedure. The results of this study show that developmental time for immature was prolonged in treated population (LC30 and LC10) rather than in control. Similarly, male and female longevity was also longer in the control group as compared to the treated population. Adult pre-oviposition period and fecundity were also greater in control as compared to the treated population. In addition, population parameters such as net reproductive rate (R0), intrinsic rate of increase (r) and finite rate of increase (λ) were also greater in control group rather than treated population. However, mean generation time (T) was greater in the treated group. The results revealed that pyriproxyfen, even at low concentrations, has potential to greatly affect the population growth of predatory lady beetle, therefore care should be taken when insect growth regulators are used within an IPM framework.

Keywords : ladybird beetle, IGR, integrated pest management, population inhibition
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