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EFFECTS OF INSECTICIDES ON EGG PARASITOID *TRICHOGRAMMATOIDEA BACTRAE* (NAGARAJA) (HYMENOPTERA: TRICHOGRAMMITIDAE) UNDER LABORATORY CONDITIONS

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Trichogrammatoidea bactrae Nagaraja (Hymenoptera: Trichogrammitidae) has been identified as a potential biocontrol agent to use in augmentative release to manage rice leaf folder, (RLF) *Cnaphlocrosis medinalis.* However, under heavy infestation, use of insecticide is inevitable to manage the pest and it may affect *T. bactrae*. Therefore, it is necessary to know how the currently recommended insecticides affect *T. bactrae.* The objective of this study was to examine the toxic effect of *a*zadirachtin, chlorfluazuron and fipronil on *T. bactrae.* Toxicity of the insecticides was tested against *T. bactrae* at egg, larva, pre pupa, early pupa, pupa, late pupa and adult stages / instars under laboratory conditions. Mortality was assessed following the treatment with insecticides and sub lethal effects such as longevity, and sex ratio were assessed with the individuals who survived following the insecticide treatments. In addition, effect of insecticide residues was also assessed by exposing the adult *T. bactrae* to residue containing host plant. Mortality of the *T. bactrae* significantly varied across the insecticides ($F=2103$ $df=3,216$ $P<0.005$) and the stage of *T. bactrae* ($F=135$ $df=5,216$ $P<0.05$). Further, the interaction between stage of *T. bactrae* and the insecticides was also different ($F=80$ $df=15,216$ $P<0.05$). Of the three insecticides tested, fipronil had the highest mean mortality of all stages of *T. bactrae* followed by chlorfluazuron and azadirachtin. However, mortalities due to chlorfluazuron and azadirachtin were significantly different only at egg and larva stages of *T. bactrae.* Sex ratio of the survived adults did not shift due to insecticide treatments compared with control, when they were treated at the stages of egg, larva, pre-pupa, early-pupa and late-pupa. Longevity of adults who survived the insecticide treatments at immature stages of *T. bactrae* was significantly varied across the insecticide treatment as well as across the stage. Longevity of *T. bactrae* significantly different with the insecticides ($F=362$ $df=3,$ 5908 $P<0.05$) and the life cycle stage of *T.bactrae* ($F=30$ $df=5,$ 5908 $P<0.05$). Also interaction between insecticides and stages of *T. bactrae* significantly varied ($F=8$ $df=15,$ 5908 $P<0.05$) with longevity. When insecticide residues are in contact with *T. bactrae* adults, there was a significant mortality along the time across the insecticides ($X^2= 980$ $df=3$ $P<0.05$), and also time and insecticide interaction was significant ($X^2= 362$ $df=3$ $P<0.05$). Probability of death with time was significant for all three insecticides and was explained by the equations: $y/(1-y)=\exp(x0.052-1.247)$, $y/(1-y)=\exp(x0.080-0.522)$, and $y/(1-y)=\exp(x2.221-2.707)$ for azadirachtin, chlorfluazuron, and fipronil respectively.

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