

## Sub-Lethal Effects of Thiamethoxam and Pirimicarb on Life-Table Parameters of *Diaeretiella rapae* (Hymenoptera: Braconidae), Parasitoid of *Lipaphis erysimi* (Hemiptera: Aphididae)

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**Abstract :** Integrated Pest Management (IPM) aims to combine biological and chemical strategies and measures, hence highlighting the study of acute toxicity and sub-lethal effects of pesticides comprehensively. The present research focused on the side effects of thiamethoxam and pirimicarb sub-lethal concentrations on demographic parameters of *Diaeretiella rapae* (McIntosh Laboratory) (Hymenoptera: Braconidae). Adult parasitoids were exposed to LC<sub>25</sub> of insecticides as well as distilled water as the control. The results showed that thiamethoxam adversely affected population parameters ( $r$ ,  $\lambda$ ,  $R_0$ ,  $T$ ), adults' longevity, females' oviposition period and mean fecundity, and a similar trend was obtained for pirimicarb with the exception of generation time ( $T$ ), the latter did not significantly change compared to the control. The intrinsic rate of increase ( $r$ ) in the control and those treated with pirimicarb and thiamethoxam were 0.2801, 0.2064, 0.1525 days<sup>-1</sup>, respectively, and the sex ratio was biased toward females in all treatments. Furthermore, none of the insecticides influenced total pre-oviposition period (TPOP) and offspring emergence rate. In general, these results indicated that both insecticides potentially distort the demographic parameters of the parasitoid even at sub-lethal concentrations, and then they should not be considered for IPM program in the presence of *D. rapae*.

**Keywords :** *Diaeretiella rapae*, *Lipaphis erysimi*, life-table study, pirimicarb, thiamethoxam

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