



BEHAVIOURAL RESPONSE OF TRICHOGRAMMA CHILONIS ISHII (HYMENOPTERA: TRICHOGRAMMATIDAE) TO KAIROMONES

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ABSTRACT

Bioassay with hexane extracts of male and female whole body wash of hosts viz, *Earias vitella* and *Spodoptera litura* with *Trichogramma chilonis* revealed their kairomonal activities. Whole body extracts of male and female moths were analysed separately by gas chromatography for determining their hydrocarbon profile, which showed the presence of straight chain saturated hydrocarbons ranging from C_8 to C_{35} . Both the host insects showed variation in number and concentration of these chemicals, which were responsible for influencing the parasitoid activity, parasitism and emergence. The foraging activity of the parasitoid as indicated by parasitoid activity index (PAI) was highest (14.17) in *S. litura* male body extract at concentration C_5 (10,000 ppm) followed by (11.50) in *E. vitella* female body extract at C_4 (1000 ppm) by *T. chilonis*. Maximum percentage parasitism of (52.22) and emergence (15.00) was observed at highest concentration in *S. litura* male body extract followed by *E. vitella* female body extract. Highest overall response was recorded in egg cards treated with whole body wash of male and female of *S. litura* and *E. vitella*, respectively, which may be attributed to the presence of more number of favourable saturated hydrocarbons viz.; heneicosane, tricosane, pentacosane, hexacosane, octacosane, and nonacosane, as revealed by GC. Kairomonal interaction observed in the whole body extract of male and female of *E. vitella* were significantly different from male and female of *S. litura* as well as control. These favourable hydrocarbons at appropriate concentration of body extract of *E. vitella* female and *S. litura* male could be used for enhancing parasitization by *T. chilonis*.

Key words: Semiochemical, kairomone, *Spodoptera litura*, *Earias vitella*, *Trichogramma chilonis*, GC

Behavioural manipulation of natural enemies through utilization of semiochemicals is one of the important components of a successful biological control programme. Semiochemicals that convey information between organisms as signalling chemicals play a critical role in enabling insects to find food, mates and a suitable location for their progeny. Foraging female insect parasitoids use chemical cues extensively to locate, identify and exploit their host in different ecosystems (Beevers *et al.*, 1981). Among the different chemical stimuli involved in host selection by a natural enemy, kairomones appear to be one of the most important. The host insects contain characteristic hydrocarbons, fatty acids and proteins present in their body or by-product, which act as stimulants or arrestants to the parasitoids to intensify their search in the near vicinity of the host (Tumlinson *et al.*, 1992). Saturated long chain hydrocarbons present on the body surface of *Helicoverpa armigera* (Hubner) and *Corcyra*

cephalonica Stainton moths have been reported to elicit kairomonal response in *Trichogramma* spp (Anathakrishnan *et al.*, 1991; Padmavathi and Paul, 1997). The egg parasitoid, *T. chilonis* widely distributed in the Indian subcontinent is responsible for large-scale mortality of a variety of lepidopterans occurring in several crops. It is extensively used to manage bollworm complex viz.; *H. armigera*, *Earias vitella* (Fab.), *E. insulana* (F.), *Spodoptera litura* (Fab.) and *Pectinophora gossypiella* Saunders (Ballal and Singh, 2003; Bilal *et al.*, 2002). In order to evaluate the role of kairomones released by host insect on parasitism by *T. chilonis* laboratory bioassay were conducted with the whole body wash of male and female of *E. vitella* and *S. litura* and their saturated hydrocarbon profiles were elucidated by Gas Chromatography to explain the kairomonal interaction between the parasitoids and the host.

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