



Research Article

Kairomonal effect of host body washing on the egg parasitoid *Trichogramma brasiliensis* (Ashmead) (Hymenoptera: Trichogrammatidae)

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ABSTRACT: Bioassay with hexane extracts of male and female whole body wash of host insects viz., *Earias vittella* and *Spodoptera litura* with *Trichogramma brasiliensis* 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 C₈ to C₃₅. The concentration of these hydrocarbons ranged from 0.02 µg/g to 2579 µg/g of insect extract. 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 (12.00) in *S. litura* male body extract at concentration C₄ (1000 ppm) followed by (10.83) in *E. vittella* female body extract at C₅ (10,000 ppm) by *T. brasiliensis*. Maximum percentage parasitism of (45.55) and emergence (12.50) was observed at concentration C₄ in *S. litura* male body extract followed by *E. vittella* 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. vittella*, 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. These favourable hydrocarbons at appropriate concentration of body extract of *E. vittella* female and *S. litura* male could be used for enhancing parasitization by *T. brasiliensis*.

KEY WORDS: semiochemical, kairomone, *Earias vittella*, *Spodoptera litura*, *Trichogramma brasiliensis*.

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INTRODUCTION

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. Number of chemicals released from hosts, host secretions, hosts by-products and associated organisms influence the behaviour of natural enemies. Foraging female insect parasitoids use these chemical cues extensively to locate, identify and exploit their host in different ecosystem (Beevers *et al.*, 1981). Among the different chemical stimuli involved in host selection by a natural enemy, kairomones appear to be the most important. The host insects emit 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). It has been reported that the host-searching stimulant for *Trichogramma evanescens* Westwood was present in the scales left by ovipositing corn earworm moth, *Heliothis zea* (Boddie) (Lewis *et al.*,

1972). 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. (Ananthakrishnan *et al.*, 1991; Padmavathi and Paul, 1997). Among the egg parasitoids, the genus *Trichogramma* (Hymenoptera: Trichogrammatidae) has received greater attention because of its polyphagous nature against many potential lepidopterous pests (Nagarkatti and Nagaraja, 1979). *T. brasiliensis* is extensively used to manage bollworm complex viz., *H. armigera*, *Earias vittella* (Fab.), *E. insulana* (Boisduval), *Spodoptera litura* (Fab.) and *Pectinophora gossypiella* (Saunders) (Ballal and Singh, 2003; Kumar *et al.*, 2009). In order to evaluate the role of kairomones released by host insect on parasitism by *T. brasiliensis*, a laboratory bioassay was conducted with the whole body wash of male and female of *E. vittella* and *S. litura* and their saturated hydrocarbon profiles were elucidated by gas chromatography to explain the kairomonal interaction between the parasitoids and the host.