



## KAIROMONES OF *EARIAS VITELLA* (F.) AND THEIR INFLUENCE ON THE PARASITIC POTENTIAL OF *TRICHOGRAMMA* SPP (TRICHOGRAMMATIDAE: HYMENOPTERA)

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### ABSTRACT

Bioassay with whole body wash of host insect, *Earias vitella* revealed the kairamonal activity against *T. achaeae*, *T. brasiliensis*, *T. chilonis*, *T. evanescens*, *T. exiguum* and *T. japonicum*. Among the different species, *T. brasiliensis* elicited the highest response to the host extract as compared to *T. evanescens* in terms of parasitoid activity index (PAI) and per cent parasitisation. Hydrocarbon profile of *E. vitella* body wash elucidated by gas chromatography indicated the presence of various saturated hydrocarbons in the range of  $C_{13}$  to  $C_{30}$  with varying quantities. The whole insect body wash was found to increase parasitoid activity index (PAI) and per cent parasitism which may be attributed to the presence of more number of hydrocarbons in whole body wash. Highest overall response to all the parasitoid species was recorded in egg cards treated with highest concentration  $C_5$  (10,000ppm). The lowest parasitoid activity index and parasitism were recorded at lowest concentration  $C_1$  (1 ppm). The presence of favorable hydrocarbons in combination with other hydrocarbons could be the reason for highest parasitoid activity index and parasitism.

**Key words:** Kairomone, Hydrocarbon, *Earias vitella*, *Trichogramma* spp.

Natural enemies use a variety of chemical stimuli to locate and identify their prey or host insects based on chemical cues that emanate from their host insects and host plants. In many instances, kairomones emanating from the herbivores and their by products along with semiochemicals released by host plants are successfully used by the parasitoids and predators to find their hosts. These semiochemicals aid the natural enemy in effective orientation towards its hosts (Yadav *et al.*, 2005).

Foraging entomophagous insect parasitoids such as egg parasitoid, *Trichogramma* use chemical cue extensively to locate, identify and exploit their hosts. These chemical cues are present in plant odours, host sex pheromones, egg odours (Yadav *et al.*, 2008). It is well documented that saturated hydrocarbons such as tricosane, docosane, pentacosane *etc.*, act as kairomone for *Trichogramma* species (Padmavathi and Paul, 1998).

Among the different groups of parasitoids utilized in biological control of insect pests, the chalcid egg parasitoid, *Trichogramma* spp are very important and have received the maximum attention because of their importance in biological control. *T. chilonis* is an effective egg parasitoid of *Helicoverpa armigera* (Hubner) and release of this parasitoid, either alone or

in combination with other bio-control agents effectively controlled the bollworm incidence in cotton (Balakrishnan *et al.*, 2004). These parasitoids have a very short life cycle and are highly amenable for mass production on the eggs of a number of factitious hosts. However, their activity is reported to vary in different agro-ecosystems based on the semiochemicals released by the crop as well as host insects. In order to evaluate the role of kairomones released by host insect on parasitism by *Trichogramma* spp, laboratory bioassay were conducted with the whole body wash of *E. vitella* and saturated hydrocarbon profiles were elucidated by gas chromatography to explain the kairamonal interaction between the parasitoids and the host insects.

### MATERIALS AND METHODS

#### Host insects

The culture of the host insect, *E. vitella* was maintained at  $28 \pm 2^\circ\text{C}$  and  $60 \pm 5\%$  R.H. The larvae of *E. vitella* were reared on okra as well as artificial diet developed by Gupta *et al.* (2005).

#### Egg parasitoids

The nucleus culture of *T. chilonis*, *T. japonicum*, *T. brasiliensis*, *T. exiguum*, *T. achaeae* and *T. evanescens* were obtained from the Biological Control