



Short communication

## Occurrence of parasitoid, *Leiophron* sp. (Hymenoptera: Braconidae), on adults of *Helopeltis antonii* Signoret in cashew

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### ABSTRACT

*Helopeltis antonii* is a major pest of cashew, cocoa, neem, guava and pepper in the old world tropics. Survey for parasites identified a parasitoid, *Leiophron* sp. (Hymenoptera: Braconidae), on adults of *H. antonii*. The parasitism was low (1.3%), of which 59.4% was observed during the month of June. Size of the parasitoid larvae was  $3.66 \pm 0.11$  mm in length, and  $1.31 \pm 0.03$  mm in breadth. Pre-pupation period was  $1.75 \pm 0.22$  days. Copulation was observed between parasitized *H. antonii* males and females indicating, that, mating was not affected by parasitism. Parasitoid activity showed significant positive correlation ( $r = 0.62$ ;  $P = 0.05$ ) with rainfall. Parasitism provided by this parasitoid certainly warrants further investigation on biological control of this economically important pest.

**Key words:** Cashew, *Helopeltis antonii*, Tea Mosquito bug, parasitoid larvae, biological control

Tea mosquito bug (TMB), *Helopeltis antonii* Signoret (Hemiptera: Miridae), is one of the major pests of cashew (*Anacardium occidentale* L.) in India, damaging tender shoots, inflorescences, immature nuts and apples at various stages of development, resulting in yield loss of 30-50 per cent (Devasahayam and Nair, 1986). Typical feeding-damage by *H. antonii* appears as a discoloured necrotic area or lesion around the point of entry of the labial stylets inside plant tissue. In severe infestation, young shoots and panicles dry up, giving the infested trees a scorched appearance. Successive attacks on new growth can result in death of the tree (Stonedahl, 1991; Sundararaju, 1996).

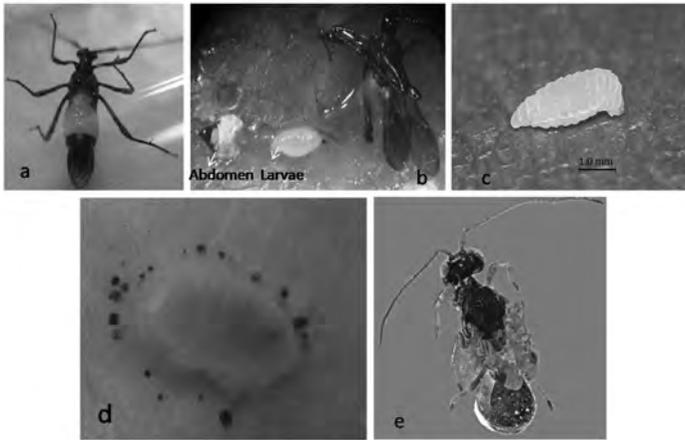
At present, chemical control measures are recommended for management of *H. antonii* on cashew (Sundararaju, 1993). Since there is a potential restriction in USA and EEC countries for import of cashew kernels containing pesticide residues, developing integrated pest management with main emphasis on non-insecticidal control methods, viz., biological control, is required. Egg parasitoids are potential biological control agents for *Helopeltis* (Stonedahl, 1991). *Telenomus* sp. *laricis* group (Hymenoptera: Platygasteridae) and *Erythmelus helopeltidis* Gahan (Hymenoptera: Mymaridae), which parasitize eggs, are particularly promising, as are the nymphal adult parasitoids of the genus *Leiophron* spp. (Hymenoptera: Braconidae) (CIBC, 1983; Sundararaju, 1993). In India,

nymphal parasitoid and the mermithid nematode, *Agamermis paracaudata* Steiner, has been reported from *H. theivora* on tea (Durgadas and Sambhunath, 1956) and *H. antonii* on cashew (Sundararaju, 2002). The present study aimed to record adult parasitoids of *H. antonii* and their seasonality in occurrence.

The current study was undertaken during 2010 to 2013 at Directorate of Cashew Research, Puttur, Karnataka (Dakshina Kannada province). Random surveys were made to record *H. antonii* incidence in cashew plantations. Adults were observed for abnormal size with swollen, whitish abdomen described in earlier reports, to record the presence of adult parasitoids (Giesberger, 1983; Sundararaju, 1996).

To assess influence of weather parameters, data on physical parameters, including minimum and maximum temperature ( $^{\circ}$ C) forenoon and afternoon humidity (%), rainfall (mm) and sunshine (hrs) recorded at the meteorological observatory, were correlated with parasitoid population using Spearman's rank correlations (Siegel and Castellan, 1988).

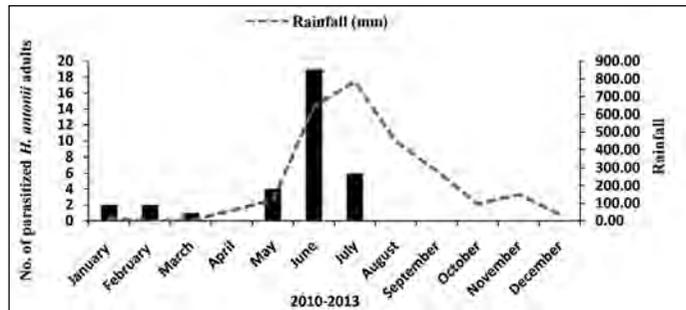
In the course of the investigation, several specimens of *Helopeltis antonii* Sig. (Hemiptera: Miridae) parasitized by the adult parasitoid, *Leiophron* sp. (Hymenoptera: Braconidae), were collected. A total of 2452 *H. antonii* adults were observed in which 32 abnormal sized *H. antonii*



**Fig 1.** (a) *H. antonii* female of abnormal size (b) Parasitized *H. antonii* adult dissected out (c) *Leiophron* sp. larva (d) Pupation (e) *Leiophron* sp. adult

**Table 1.** Various parameters of *Leiophron* sp. emergent from *H. antonii*

<i>Leiophron</i> sp. larvae (n- 32)		Pre-pupation period (days)	Parasitized <i>H. antonii</i> adults (Nos.)	
Length	Breadth		Male	Female
3.66 ± 0.11	1.31 ± 0.03	1.75 ± 0.22	21	11
1 to 3 (1-3 days)				



**Fig 2.** Seasonal activity of *Leiophron* sp.

**Table 2.** Correlation coefficient (r) of adult *Leiophron* sp. parasitism with reference to temperature, humidity, rainfall and sunshine averaged over three years

Temperature (°C)		Humidity (%)		Rainfall (mm)	Sunshine (hrs)
Max.	Min.	Forenoon	Afternoon		
-0.28	0.23	0.38	0.41	0.62*	-0.39

\*Significant at  $P = 0.05$

(21 male and 11 female) were noticed (Fig. 1a). On dissection, it was confirmed that these adults were parasitized by the hymenopteran parasitoid (Fig. 1b). Sundararaju (2002) recorded that the parasitic larvae emerging from *H. antonii* died on the same day without pupating in spite of providing different media, viz., soil, saw dust, paper and leaf bits. However, in the current study, whitish parasitoid larvae (one

per adult) emerged from *H. antonii* and pupated on the surface of the glass tubes (25 × 200mm) supported with cotton (Fig. 1c and d).

Size of the mature parasitoid larvae (just before pupation) was 3.66±0.11mm in length and 1.31±0.03mm in breadth. Pre-pupation period of the parasitoid larvae was 1.75±0.22 days (Table 1). From the 15 pupae, 2 adults emerged (Fig. 1e). The parasitoid was identified and deposited at National Bureau of Agriculturally Important Insects (NBAII), Bangalore, India.

Copulation was observed between parasitized *H. antonii* males and females indicating, that, mating was not affected by parasitism. *H. antonii* adults died within 2 days after emergence of the parasitoid. Further, when parasitized females were dissected immediately after emergence of the parasitoid larva, their ovarioles were found to be empty without any developing oocytes. It is reported from northern United States that heavy parasitism by *Leiophron uniformis* Gahan significantly depressed populations of *Halticus bractatus* (Hemiptera: Miridae) (Day and Saunders, 1990).

Activity of *Leiophron* sp. was seen to be greater during May - July in a three-year study period (Fig. 2). The highest number, i.e., 19 parasitised adults, were collected during June. This is in concurrence with studies of Sundararaju (2002). The population of adult parasitoid showed significant positive correlation with rainfall (r0.63) (Table 2).

Even though parasitism levels of 6 to 66 per cent have been reported for *Leiophron sahlbergellae* (Wilkinson) on *Sahlbergella singularis* Haglund (Heteroptera: Miridae) from West Africa (CIBC, 1983), the present study has shown a low level of parasitism by *Leiophron* sp. on *H. antonii*. However, in-depth studies are needed to understand the role of the parasitoid in regulating *H. antonii* population.

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