International Journal of Agricultural Sciences ISSN: 2167-0447 Vol. 3 (5), pp. 510-512, June, 2013. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Short Communication

Record of egg parasitoids *Telenomus* sp. laricis group (Hymenoptera: Platygastridae) and *Chaetostricha* sp. (Hym: Trichogrammatidae) from *Helopeltis theivora* Waterhouse (Heteroptera: Miridae) infesting cocoa

P. S. Bhat[1] and Srikumar.K.K[2]

[1]Directorate of Cashew Research, (Indian Council of Agricultural Research) Puttur 574 202, Karnataka, India.

[2]Department of Entomology, Directorate of Cashew Research, Puttur 574 202, Karnataka, India.

Accepted 1 April, 2013

***Helopeltis theivora* Waterhouse (Heteroptera: Miridae) is an economically important pest of cocoa causing significant reduction in yield and marketable fruits. From an economic perspective the other plants attacked are cashew and tea. Survey for egg parasitoids of *H.theivora* from cocoa host has determined two parasitoids *viz*., *Telenomus* sp. laricis group (Hymenoptera: Platygastridae) and *Chaetostricha* sp. (Hymenoptera: Trichogrammatidae). *Telenomus* sp. was observed predominant with 3.2% parasitism and *Chaetostricha* sp. showed low level of parasitization of 0.8%. According to our knowledge this is the first report from *H.theivora* eggs on cocoa. The parasitism provided by these parasitoids certainly warrant further investigations on biological control programmes for this economically important pest.**

Key words: Egg parasitoids, biological control, *H.theivora*, cocoa.

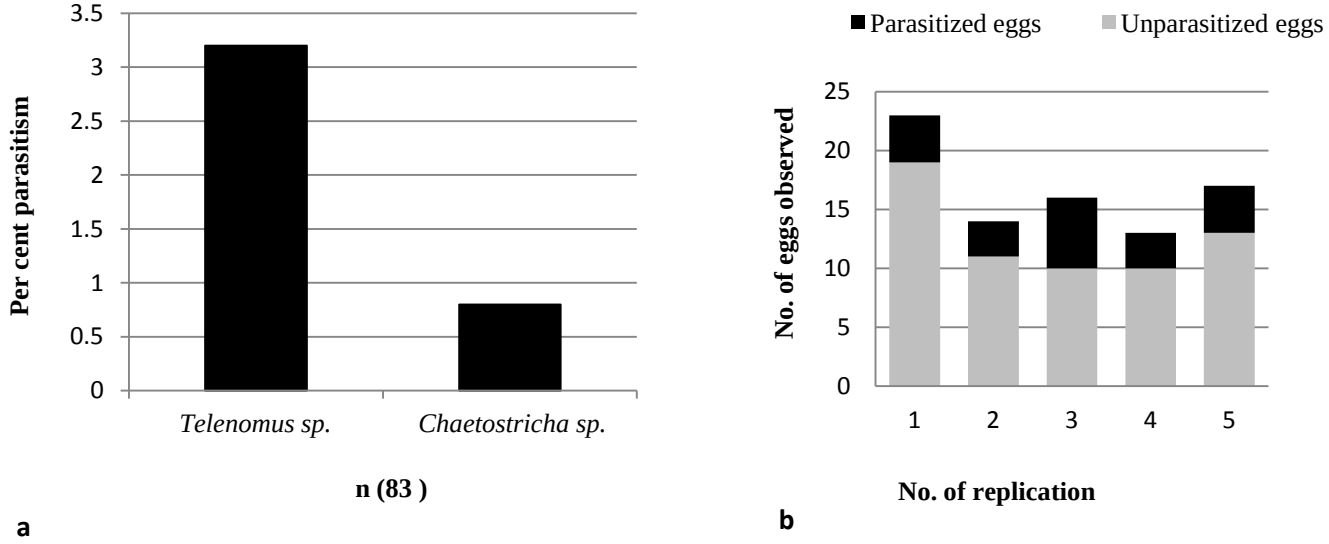
INTRODUCTION

The Tea Mosquito Bug, *Helopeltis theivora* Waterhouse (Heteroptera: Miridae) is a key pest of cocoa and an emerging pest of cashew in India (CPCRI, 1991; Srikumar and Bhat, 2012). The importance of cocoa pods as a source of food and as an oviposition site for *H.theivora* has been stressed by many workers (Miller, 1941; Tan, 1974). The nymphs and adults of *H.theivora* infest cherelles, pods and young shoots. Pod feeding is preferred by both nymphs and adults, with adult longevity and fecundity being much greater in pod reared individuals (Awang et al., 1988). Feeding damage on pod appears as dark, circular lesions usually hardening as scars on the husk (Figure 1a). Heavy infestations can result in pod malformation and premature drop (Abraham and Remamony, 1979). Shoot feeding occurs primarily on the midribs of leaves and on young stems, with linear lesions (Figure 1b). Chronic infestations of *H. theivora* on cocoa lead to repeated growth and dieback that causes witches-broom symptom similar to that induced by the fungus *Moniliophthora perniciosa* (Stahel) Aime & Phillips-Mora (Agaricales: Marasmiaceae) (Khoo, 1989). As has been found with other crops, *H.theivora* feeding damage on cocoa is generally concentrated on shaded parts of the plant (Fernanado and Manickavasagar, 1956).

Chemical insecticides are still used extensively to control *Helopeltis* infestations on the major economic crops. Gamma-hydrogen cyanide (lindane) was widely used in the control of *H.theivora* on cocoa (Chong, 1987), but there were problems with resistance (Tan, 1974). As an alternative to gamma HCH, endosulphan was widely used to control *H.antonii* on cashew (Devasahayam and Nair, 1986) and *H.theivora* on tea (Chowdhury, 1993). The insecticides, λ-cyhalothrin (0.003%) and carbaryl (0.1%) had shown longest residual action against nymphs and adults of *Helopeltis* spp. (Sundararaju et al., 1993). Integrated control programmes that reduce the

*Corresponding author. E-mail: sreeku08@gmail.com.

Figure 1. *H.theivora* damage symptoms on cocoa pod (a) and cocoa young shoot.



n **-** no .of eggs observed

Figure 2. Per cent parasitism (a) and no. of eggs parasitized (b) of *H.theivora*

use of pesticides and monitor the natural enemies of *Helopeltis* have been suggested as reasonable alternatives to blanket spraying of chemicals (CIBC, 1983).

Egg parasitoids are potential biological control agents for *Helopeltis* (Stonedahl, 1991). *Telenomus* sp. laricis group (Hymenoptera: Platygastridae) and *Erythmelus helopeltidis* Gahan (Hymenoptera: Mymaridae), which parasitize the eggs, are particularly promising, as are the nymphal parasitoids of the genus, *Leiophron* spp. (Hymenoptera: Braconidae) (CIBC, 1983). In Malaysia *E. helopeltidis* has been reported to parasitize up to 36% of the fertile eggs of *H.cinchona* (Heteroptera: Miridae) on tea (Lever, 1949) and 11-47% of the eggs of *H.theivora* on cocoa (Ibrahim, 1989). *E. helopeltidis* has been reported as egg parasitoid of *H.theivora* on tea (Sudhakaran and Muraleedharan, 2006) in India.

The objective of the present study was to record parasitoids that attack *H.theivora* eggs on cocoa.

MATERIALS AND METHODS

The cocoa plant parts (shoots and cherelles) containing eggs of *H. theivora* were collected and counted under a stereomicroscope. The counted eggs were treated wi

Figure 3. *Telenomus* sp. (a) and *Chaetostricha* sp. (b) emerged from *H.theivora* eggs on cocoa.

carbendazim (fungicide) 0.1% solution for 15 minutes. After treatment, samples were dried to remove the dampness of carbendazim solution and placed in a plastic container (250 ml capacity) fitted with a glass tube (75 mm x 7.5 mm) to record the emergence of parasitoids. The container was wrapped with black paper leaving the glass tube exposed for better view of parasitoids that emerge, if any.

RESULTS AND DISCUSSION

Observation of 83 eggs of *H. theivora* collected during the study determined the existence of two genera of egg parasitoids *viz*., *Telenomus* sp. (Figure 2a) and *Chaetostricha* sp. (Figure 2b). *Telenomus* sp. was observed predominant with 3.2% parasitism and *Chaetostricha* sp. showed low level of parasitization of 0.8%

(Figure 3a, b).

Telenomus sp. has been reported in India on *H. cinchonae* Mann, (Heteroptera: Miridae) (Simmon, 1970), on *H. theobromae* Miller from Malaysia (Ibrahim, 1989) and on *H. antonii* Signoret from India (Sundararaju, 1993). *Chaetostricha* sp. is a minor egg parasitoid of *H. antonii* on cashew (Sundararaju, 1993; Sundararaju, 1996).

On cashew, *Telenomus* sp. is predominant and acted as a constant mortality factor in the population of *H.antonii* and the extent of parasitization was observed almost throughout the year with a range of 1.8% to 45.5%, whereas *Chaetostricha* sp. showed low level of parasitization of 0.7% to 4.3% (Sundararaju, 1993).

Since *Telenomus* sp. appears to be dominant, there is further scope of enhancing its parasitization in the cropping season by suitable augmentation techniques.

ACKNOWLEDGEMENT

The authors are grateful to the Director, DCR, Puttur, for providing the facilities and ICAR network project 'ORP on management of sucking pests' (funded through IIHR, Bangalore) for providing financial support.

REFERENCES

Abraham CC, Remamony KS (1979) Pests that damage cocoa plants in Kerala. Ind. Arec. Spi., Coc. J., 2: 77-81.

Awang A, Muhamad R, Chong KK (1988) Comparative merits of cocoa pod and shoot as food sources of the mirid *Helopeltis theobromae* Miller. Planter, 64:100-104.

CPCRI (Central Plantation Crops Research) 1991. Annu. Report, p.76.

Chong KK (1987). The cocoa mirid in peninsular malayasia and its management. Planter, 63: 516-520.

Chowdhury PK (1993) Package for eradication of tea mosquito bug *Helopeltis theivora*. Two Bud, 40: 6-8.

CIBC (Commonwealth Institute of Biological Control) (1983) Possibility for the use of natural enemies in the control of *Helopeltis* spp. (Miridae). Biocontrol New. Inform., 4: 7-11.

Fernando HE, Manickavasagar P (1956) Economic damage and control of cocoa capsid, *Helopeltis* sp. in Ceylon. Trop. Agriculturist, 112: 25-36.

Ibrahim WA (1989) *Erythmelus helopeltidis*, an egg parasitoid of *Helopeltis theobromae* in cocoa. Planter, 65: 211-215.

Khoo KC, Chung GF (1989) Use of the black cacoa ant to control mirid damage in Cocoa. Planter, 65: 370-383.

Lever RJAW (1949) The tea mosquito bugs (*Helopeltis* spp.) in Cameron Highlands. Malayan Agri. J., 32, 91-108.

Miller NCE (1941) Insects associated with cocoa (*Theobroma cacao*) in Malaya. Bull. Entomol. Res., 32: 1-15.

Simmon FJ (1970). A memorandum on the possibilities of biological control of cocoa infesting mirids. Commonwealth Inst. Bio .Con. Repo. p. 9.

Srikumar KK and Bhat PS (2012) Field survey and comparative biology of tea mosquito bug (*Helopeltis* spp.) on cashew (*Anacardium occidentale* Linn.). J.Cell and Animal Biology, 6: 200-206.

Sudhakaran R and Muraleedharan N (2006) Biology of *Helopeltis theivora* (Hemiptera: Miridae) infesting tea. Entomon, 31:165-180.

Sundararaju D (1993) Studies on the parasitoids of Tea Mosquito Bug, *Helopeltis antonii* Sign. (Heteroptera: Miridae) on cashew with special reference to *Telenomous* sp. (Hymenoptera: Scelionidae). J. Biol. Control, 7: 6-8.

Sundararaju D (1996) Studies on *Helopeltis* spp. with special reference to *H.antonii* Sign. in Tamil Nadu.Ph.D. thesis. T.N. A.U., Coimbatore, India, p.200.

Sundararaju D, Bakthavatsalam N, Bhat PS (1993) Ovicidal activity and residual toxicity of certain insecticides of tea mosquito bug *Helopeltis antonii* Sign. (Heteroptera: Miridae) infesting cashew. Pestology, 17:14-17.

Tan GS (1974) *Helopeltis theivora theobromae* on cocoa in Malayasia, biology and fluctuations. Malaysian Agri. J., 3: 127: 132.