Cautionary note on the presence of *Homalotylus turkmenicus* Myartseva (Hymenoptera: Encyrtidae) in the colonies of *Phenacoccus manihoti* Matile-Ferrero (Hemiptera: Pseudococcidae) in southern India

ANKITA GUPTA1∗, M. MOHAN1, M. SAMPATHKUMAR1, A. N. SHYLESHA1, S. R. VENKATACHALAM2 and N. BAKTHAVATSALAM1

1ICAR-National Bureau of Agricultural Insect Resources, 2491, H. A. Farm Post, Bellary Road, Hebbal, Bengaluru - 560 024, Karnataka, India
2TCRS, TNAU, Yethapur - 636 117, Tamil Nadu, India
∗Corresponding author E-mail: ankitagupta.nbaii@gmail.com

ABSTRACT: High percentage of *Homalotylus turkmenicus* Myartseva (Hymenoptera: Encyrtidae) parasitizing *Hyperaspis maindroni* Sicard (Coleoptera: Coccinellidae) predating on the colonies of the Cassava Mealybug (CMB) *Phenacoccus manihoti* Matile-Ferrero (Hemiptera: Pseudococcidae) is observed in southern India. In the present study, cautionary note on the presence of *H. turkmenicus* in the food web of insects associated with the CMB and brief diagnosis of the parasitoid is presented for quick identification. The parasitism of *Hy. maindroni* grubs by *H. turkmenicus* ranged from 65.67 to 80.95 per cent. However, no primary parasitoid of the cassava mealybug was observed so far.

KEY WORDS: Cassava Mealybug, Hyperparasitoid, Predation

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In early months of 2020, the cassava mealybug (CMB) *Phenacoccus manihoti* Matile-Ferrero (Hemiptera: Pseudococcidae), known as the most destructive pests of cassava in the world, was reported from Thrissur, Kerala (Joshi et al. 2020). Of the numerous parasitoids reported from the coccinellid larvae associated with/predating upon *P. manihoti*, five species of the genus *Homalotylus* Mayr (Hymenoptera: Encyrtidae) are reported worldwide viz., *H. africanus* Timberlake, *H. eytelweinii* Ratzeburg, *H. flaminius* Dalman, *H. hemipterinus* De Stefani and *H. quaylei* Timberlake (Noyes, 2020). Out of these five *Homalotylus* species, *H. africanus* is not reported from India (Noyes, 2020). In the present finding, *Homalotylus turkmenicus* Myartseva is reported to be gregariously parasitizing grubs of *Hyperaspis maindroni* Sicard (Coleoptera: Coccinellidae) in the colonies of *P. manihoti* in Tamil Nadu, India. Globally, this is the first report of *H. turkmenicus* playing an active role in the food web of insects associated with the cassava mealybug. *Homalotylus turkmenicus* is widely distributed in many states of India (Andhra Pradesh, Haryana, Punjab, Rajasthan, Tamil Nadu and Uttar Pradesh) and in the Palaearctic region it is prevalent in Iran and Turkmenistan (Noyes, 2020). It is well known to primarily attack many species of Coccinellidae (Coleoptera) and few species of Psuedococcidae (Hemiptera).

The aim of this study is to highlight the role of *H. turkmenicus* in the CMB colony as it can be easily mistaken as a primary parasitoid of *P. manihoti*.

Surveys were undertaken for tracing the cassava mealybug infestation at multiple locations in Namakkal and Salem districts of Tamil Nadu, India. Morphological studies of the pest and the parasitoids were conducted at the ICAR-National Bureau of Agricultural Insect Resources (NBAIR), Bengaluru. The specimens/vouchers of the present study were deposited in the National Insect Museum of ICAR-NBAIR. Images of the parasitoid were taken with a Leica M 205 A stereo zoom microscope with Leica DC 420 inbuilt camera using automontage software (version 3.8).

The cassava mealybug colonies were collected from Namakkal and Salem districts in Tamil Nadu, India (Table 1) and were later sorted (separating the predators/mummified grubs) and kept in glass tubes (Fig. 1) for further observation in the laboratory.

The cassava mealybug colony harbours many parasitoids and predators which are directly or indirectly associated with the CMB. However, it is extremely important to check for
the main source of parasitism as coccinellids are one of the predominant predators in the CMB colony and are prone to high parasitism. In the observed CMB colonies (Fig. 2A), *Hy. maindroni* was found actively predating on *P. manihoti* (Fig. 2B). Based on literature review, many species of *Homalotylus* have already been reported from *P. manihoti* (Noyes, 2020). Based on our observations, *H. turkmenicus* was the common parasitoid attacking *Hy. maindroni* (Figs. 2 C & D) in the colonies of *P. manihoti* from multiple locations in Tamil Nadu. When dissected, up to seven wasps of *H. turkmenicus* were observed per mummified *Hy. maindroni* grub. The brief diagnosis of parasitoid is as follows:

![Sorted cassava mealybug colonies in the glass tubes](image)

![Colony of Phenacoccus manihoti on Cassava](image)

![Larva/grub of Hyperaspis maindroni feeding P. manihoti](image)

![Mummified Hy. maindroni in P. manihoti colony](image)

![Immature Homalotylus turkmenicus Myartseva inside mummified Hy. maindroni](image)
Cautionary note on the presence of *Homalotylus turkmenicus* in the colonies of cassava mealybug

**Brief diagnosis of *Homalotylus turkmenicus* Myartseva, 1981**

(Figs. 3A&B)

**Colour:** Body dark brown with metallic shine antenna dark brown to blackish brown except white clava. Fore legs dark brown with light brown tarsi; mid and hind legs dark brown excluding off-white to white tarsi (Figs 3A & B).

**Body measurements:** Frontovertex 0.25–0.27 times head width. Antenna with pedicel about 2 times as long as wide; pedicel 0.72 times as long as combined length of funicular segment one and two; scape about 8.28 times as long as wide. Ovipositor (exerted part) 0.65 times as long as length of mid tibia. Relative measurements of mid tibia: mid tibial spur: mid tarsi- 10.51: 3.75: 8.01.

**Details of specimens examined (Homalotylus turkmenicus)**

Ten females and ten males, Tamil Nadu: Namakkal: T. Jeddarpalyam, 01.vi.2020, coll. M. Mohan; 10 females and 10 males, Tamil Nadu: Salem: Thalaivasal, 5.vi.2020, coll. M. Mohan.

Based on our surveys and findings, so far we have not come across any primary parasitoid of the cassava mealybug in India. However, we are still undertaking multiple location surveys and looking for potential parasitoids.

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