

On Some Hyperparasites of *Opisina arenosella*
The Black-Headed Caterpillar Pest of Coconut
in Malabar, India.

S. M. GHOSH and U. C. ABDURAHIMAN
Division of Entomology, Department of Zoology,
University of Calicut, Kerala - 673635, India

ABSTRACT

Investigations carried out on the parasite-hyperparasite complex of the coconut pest *Opisina arenosella* Walker indicate that the hyperparasites considerably reduce the population of the parasites and thus lower the efficiency of the latter as biological control agents. Over half the cocoons of the parasitoid *Apanteles taragamae* Vier., were parasitised by the hyperparasites, with *Aphanogmus manilae* Ashmead accounting for 27.14% followed by *Meteoridea hutsoni* (Nixon) (17.14%), *Brachymeria nephantidis* Gahan and *Pediobius imbreus* (Walker) (2.86% each) and *Eurytoma albotibialis* Ashmead (1.42%). *P. imbreus* also caused 29.8% parasitism on *Bracon brevicornis* Wesm. Brief descriptions of the biology of some of the hyperparasites are also given.

INTRODUCTION

Of the many parasites and predators that attack the different stages of the pest *Opisina arenosella* Walker (= *Nephants serinopa* Meyr.), (Lepidoptera: Aecophoridae) some species are utilized in the biocontrol programmes against this notorious pest. A few species of such parasites in its turn serve as hosts for many hyperparasites. The present paper deals with some of the hyperparasites attacking the braconid parasites of *O. arenosella*.

MATERIALS AND METHODS

The larvae and pupae of the pest, *Opisina arenosella* were collected regularly at monthly intervals, from various parts of Malabar. From these samples the percentage of parasitism and its hyperparasitism were studied. Various aspects of the biology of the hyperparasites were studied by rearing them in the laboratory ($T = 28.65 \pm 2.65$, $RH = 57.32 \pm 5.43$), and presenting them with appropriate stages of parasites as hosts.

OBSERVATIONS AND DISCUSSION

Hyperparasites attacking *Apanteles taragamae* Vier.

Apanteles taragamae (Braconidae) is an important parasitoid of *Opisina arenosella* attacking its early larval stages.

The percentage parasitism in the study area varied from 1.25 to a maximum of 16.6, with an average of 8.9. However more than 50% of the parasitoid cocoons collected

from the field were parasitised by hyperparasites, thus reducing the efficiency of *A. taragamae* as a primary parasite to nearly half. *Aphanogmus manilae* (Calliceratidae), *Meteoridea hutsoni* (Braconidae), *Brachymeria nephantidis* (Chalcididae), *Pediobius imbreus* (Eulophidae) and *Eurytoma albotibialis* (Eurytomidae) were found to be the important hyperparasites of this primary parasite.

Aphanogmus manilae parasitised the pupae of *Apanteles taragamae*. The hyperparasite laid 3 to 6 eggs in a single host pupa. The adults that emerge within 16 to 20 days lived for 23 days when given 50% honey as food. On 50% sucrose they lived for 15 days and when starved they survived only for 3 days. *A. manilae* caused 27.14% parasitism on *A. taragamae*.

Meteoridea hutsoni was originally recorded as a primary parasitoid of *Opisina arenosella* as it was found to attack the late instar larvae of the pest (Sudheendra kumar *et al.*, 1979; Ghosh and Abdurahiman, 1984). Recently it has also been reported as a hyperparasite of *O. arenosella* (Ghosh and Abdurahiman, 1985) and caused 17.14% parasitism on *Apanteles taragamae* in the present study.

Brachymeria nephantidis and *Eurytoma albotibialis* are primary parasitoids of *Opisina arenosella*, and act as hyperparasites on the pupae of *Apanteles taragamae* (Rao *et al.*, 1948). As a hyperparasite *E. albotibialis* completes its life stages in 12 to 15 days. *B. nephantidis* and *E. albotibialis* caused 2.86% and 1.42% parasitism, respectively, on their host, *A. taragamae*. *Pediobius imbreus* caused 2.86% parasitism on *A. taragamae*

Hyperparasite attacking *Bracon brevicornis* Wesmæl

The eulophid *Pediobius imbreus* has been found to parasitise *Bracon brevicornis* soon after the latter has spun its cocoon. The total developmental period of *P. imbreus* from egg to adult is completed in 17 days at $28 \pm 2^\circ\text{C}$. This includes the egg stage lasting for 1 day, the larval period of 6 to 8 days and pupal period of 9 to 10 days. The total developmental period of its host, *B. brevicornis* is completed in 7 to 8.5 days (Sudheendrakumar *et al.*, 1982). With 50% honey as food the adult hyperparasite lived for more than 30 days. Thus a single hyperparasite can lay eggs in the pupae of nearly three successive generations of *B. brevicornis*.

Present studies revealed that nearly half of the parasite clutch of *Bracon brevicornis* collected were sometimes found parasitised by *Pediobius imbreus*. However, the rate of its parasitism on *B. brevicornis* varied considerably with a mean of 29.57 percent. Thus nearly one-third of its population is reduced, which in turn, adversely affects its field efficiency.

Hyperparasite attacking *Meteoridea hutsoni* (Nixon)

When the late stage pupae of *Meteoridea hutsoni* which were enclosed inside the pupal case of its host, *Opisina arenosella* were presented to *Eurytoma albotibialis* females, they readily oviposited. The eggs were mostly deposited inside the pupae of *M. hutsoni*, and the larva that hatches from the egg feeds on *M. hutsoni* pupa. This observation confirms the fact that *E. albotibialis*, though a primary parasitoid of *Opisina arenosella* also serves in the field as a hyperparasite of *M. hutsoni*, thus making it difficult to estimate its percentage of hyperparasitism. However, since the number of *E. albotibialis* emerging from the pupae of *Opisina* is very low, the rate of its hyperparasitism is rather negligible.

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