

Eurytoma albotibialis Ashm.; *Perilampus microgastris* Ferr.; and *Brachymeria nephantidis* Gahan.

In the present work, the authors report two more hyperparasites attacking the developmental stages of *A. taragamae*. A short account on the biology of one of them is also given.

1. *Pediobius imbreus* (Walker) (family: Eulophidae)

This species originally collected from the cocoons of *Apanteles taragamae* was also found parasitising the cocoons of *Bracon brevicornis* in the field. In the laboratory they can be reared on the pupae of *B. brevicornis*. When reared under the laboratory conditions (Temp. 28.7 ± 2.7 ; R.H. 57.3 ± 5.4) with 50% diluted honey, this hyperparasite lived for more than 40 days. Mating takes place on the same day of emergence and is accomplished in 43 seconds ($n = 21$). However, mating is not essential for oviposition. It is found that the female starts to oviposit on the same day of emergence and is completed within about 30 seconds ($n = 53$). The life cycle from egg to adult is completed within 17 days ($n = 19$). Only one hyperparasite developed from a host pupa.

Adult females readily feed on the host body fluid. When a female *Pediobius* visits one clutch of the pupae of *B. brevicornis*, it oviposits in most of them and the remaining ones are mostly damaged due to the injury caused by its host feeding behaviour. Some of the injured pupae develop into small-sized individuals which cannot successfully paralyse the actively moving pest larva.

(2) *Eurytoma braconidis* Ferriere (family: Eurytomidae)

This hyperparasite was also obtained from the cocoons of *A. taragamae*, collected from the fields in Malabar. Only one hyperparasite was found to emerge from a host cocoon.

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EFFECT OF THE JUVENOID HYDROPRENE ON OVIPOSITION AND HATCHABILITY IN THE SWEET POTATO WEEVIL, *CYLAS FORMICARIUS* F. (COLEOPTERA = CURCULIONIDAE)

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THE action of juvenoids brings about the disruption of a variety of processes such as larval development, metamorphosis, reproduction and embryonic development in insects^{1,2}. In the sweet potato weevil, *Cylas formicarius* F., the juvenoid hydroprene caused several deformities in the ovaries³. In the present communication, the action of the juvenoid on the oviposition and hatchability in this weevil which is a serious pest of sweet potatoes has been investigated and reported.

The insect was mass cultured in the laboratory³. Pupae were segregated from the infested tubers and were kept in 4 inch petridishes containing moist cotton and a filter paper above it. Adults were separated as soon as they emerged. Different age groups of adult females were treated with 0.1 $\mu\text{g}/\text{sp}$ of the juvenoid hydroprene. Untreated males of the same age were added to these females for mating purpose. The oviposition and hatchability rates were studied. The parallel controls were maintained throughout.

The results of the experiments are presented in table 1. Oviposition and hatchability rates were age-dependent. The oviposition rate was low initially and it increased with the time and later it decreased irrespective of the treated stage. The hatchability was almost negligible in the first week but increased with time and finally it was found to be cent percent. The grubs that hatched out of the eggs laid in the first week by the 1-day old females died immediately. But the grubs that hatched out of the eggs laid after first week survived and fed normally.

Decreased fecundity in the treated insects was caused by the defects evoked in the ovaries. Such decreased fecundity was also observed earlier⁴⁻⁶.

Table 1 Effect of the juvenoid hydroprene on the female adults of sweet potato weevil, *Cylas formicarius* F.

Age of the insects (days)	Mortality rate in the			Oviposition* / Hatchability rate in the				
	1st week	3rd week	6th week	1st week	2nd week	3rd week	5th week	6th week
0	30	—	—	—	—	—	—	—
1	28	2	—	10/3	8/4	4/3	—	—
3	20	4	2	7/-	13/4	14/6	12/8	14/14
6	20	4	2	8/-	16/4	22/14	18/16	14/14
Control	2	1	—	80/72	72/65	66/61	55/52	46/46

* Oviposition starts from 7th/8th day onwards after the adult emergence. The total number of insects treated was 30.

Failure of hatching in the eggs was due to the derangements in embryogenesis^{7,8}. The slow recovery of hatchability may be due to the restoration of normal JH titre at a later stage^{5,9} in different insects.

Hence the above mentioned results confirm the effectiveness of the juvenoid hydroprene on the adult stage of the sweet potato weevil, *C. formicarius* F.

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