

THE BIOLOGY OF *CHRYSOCHARIS JOHNSONI* SUBBA RAO A LARVAL PARASITE OF *EPILACHNA VIGINTIOCTOPUNCTATA* FABRICIUS

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Epilachna vigintioctopunctata is a very destructive pest of cucurbitaceous vegetable in Kerala. During the course of a survey for the natural enemies of the pest, a parasite later described by Subba Rao (1957) as *Chrysocharis johnsoni* (Hymenoptera: Eulophidae: Entodontinae) was reared out from the grubs of *E. vigintioctopunctata*. This parasite was in later surveys also occurring as a common parasite of the pest. Studies were hence undertaken on the biology of *C. johnsoni* the findings of which are presented in this paper.

Materials and Methods

The parasite cultures were established from adults reared out from parasitised host grubs collected from the field. The parasite pupae were dissected out from host grubs and these were kept separately in glass vials 4.5 cm X 1.0 cm for adult emergence. Freshly emerged adults were sexed and individual pairs were confined in specimen tubes 7.5 cm x 2.5 cm containing healthy grubs of *E. vigintioctopunctata* for biological studies. The cultures were maintained at $27^{\circ} \pm 1.5^{\circ}\text{C}$. Adult parasites were fed on 20 per cent honey solution streaked inside the containers.

Life history of *C. johnsoni*

Egg: The freshly deposited egg is ovoid to elliptical with rounded ends, one side being slightly more blunt than the other (Fig. 1, a). It is yellowish-white with a transparent chorion and measures 0.26 mm X 0.12 mm. The egg hatches in about 12 to 24 hours. Measurements obtained periodically indicated that the egg does not increase in size during incubation.

Larva: Newly emerged grub is nearly transparent and creamy yellow (Fig. 1, b). It is apodous and reniform with tapering ends and a bend in the middle. On an average it measures 0.37 cm x 0.16 mm. The body comprises of 13 segments none of which bears any external structures. As the grub becomes older, its colour changes into dark yellow. The larval period varies from 5 to 7 days, during which the grubs consume the internal content of the host. The fully developed grub (Fig. 1, c) is translucent, dark brownish and somewhat cylindrical, tapering abruptly towards the anterior and gradually towards the posterior ends. The body is indistinctly segmented measuring 1.94 mm x 0.86 mm.

Pupa: The fully grown apodous grub transforms in to an exarate pupa (Fig. 1, d), masses of which may be seen within the host grub. The pupal length is 1.35 mm and breadth 0.60 mm. The duration of the pupal period lasts for 6 to 8 days and the adult emerges out by cutting a hole in the host cuticle. The entire life - cycle from egg to adult lasts for 12 to 16 days.

Adult: In female (Fig. 1, e), the head and thorax are dull greenish. The abdomen is conical and of metallic green colour. The average length of a female is 1.67 mm. Adult male is relatively smaller (length 1.45 mm) with a shorter abdomen (Fig. 1, f).

Mating and oviposition

The parasites start copulating immediately after emergence from host mummy and mating lasts for about 30 seconds. Fourth instar grubs are preferred for oviposition which starts within 24 hours after mating and this is completed within 72 hours. Eggs are thrust in groups into the host body fluid through dorsal punctures made by the ovipositor in the anterior region of the abdomen. Each female can parasitise up to 4 host grubs in succession laying a maximum of 75 eggs, the average being 31 eggs per female. The mean number of parasites emerging out from a single host grub is twenty.

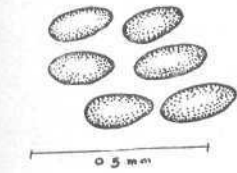
The progeny from unmated females are all males. The mated females give rise to both sexes in the ratio of 4.75 females per male. The mean longevity of fertilized females and mated males is 4-5 days and 3-4 days respectively when fed on 20 per cent honey solution. The maximum field parasitisation of host grubs is observed during July-August (6.47 per cent) and a progressive decline in parasitism is indicated in the succeeding months. The parasite population is lowest during March-May, the percentage of parasitisation being only 0.52.

REFERENCE

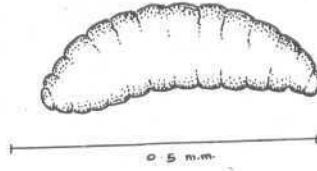
Subba Rao, B. R. 1957. Some new species of Indian Eulophidae. *Indian J. Ent.*, 19: 50-53

(M.S. received: 1-10-1973)

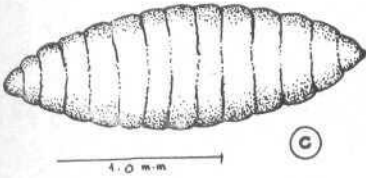
DIFFERENT DEVELOPMENTAL STAGES OF *Chrysocharis johnsoni* SUBBA RAO



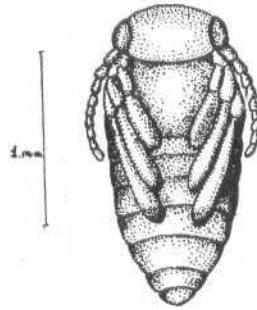
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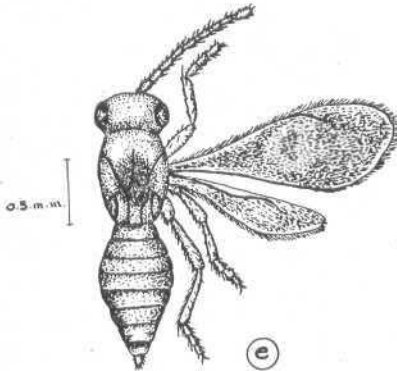
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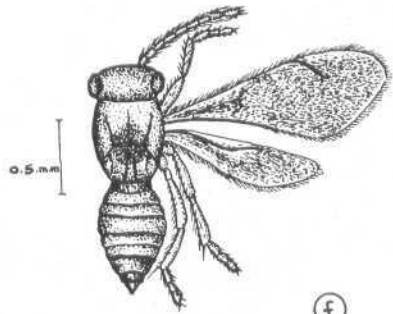
c



d



e



f

- a. Egg
- b. Newly emerged grub
- c. Mature grub
- d. Pupa
- e. Adult female
- f. Adult male