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Morphological and taxonomical characteristics of *Chrysomya putoria* (Diptera: Caliphoridae)

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Abstract

The egg, larval stages (I, II, and III) and the adult male and female were examined under a dissecting microscope. For each one of the above stages the body length, colour and other morphological characteristics were investigated. The anterior and the posterior spiracles of the three larval stages were dissected out and examined under a phase contrast microscope.

Introduction

A number of *Chrysomya* species have been associated with wound myiasis. Those considered with importance in North Africa are *C. albiceps* and *C. megacephala*. Of lesser importance are *C. chloropyga*, *C. putoria* and *C. marginalis* (Hall, 2000). Within the Chrysomyines, five of the seven southern African species are known or suspected to be necrophagous: *Chrysomya albiceps*, *C. chloropyga*, *C. marginalis*, *C. megacephala* and *C. putoria* (Lunt, 2000).

The larvae of many species of blowflies feed on live and dead animals, that is why there is a long history of applied studies of blowflies in forensic (medical and veterinary) entomology (Smith 1986).

According to Holdaway (1933), *Chrysomya putoria* is mainly Ethiopian. In most of the inhabited parts of the Sudan there are only three species of *Chrysomya*, *Chrysomya marginalis* with its conspicuous dark costal wing markings, and the clear-winged *Chrysomya albiceps* and *Chrysomya putoria*. The two last- named have different habits from each other but the adults are very similar in appearance (Lewis, 1955). Although *Chrysomya putoria* is widely distributed in Sudan, no work has been carried out on its biology (Idris, 1985).

Materials and Methods

Large numbers of *Chrysomya putoria* were collected from Bahri (Khartoum North) meat market, by sweeping hand net and separated from other flies under the net. They were transferred to the laboratory and kept in a cage (40 cm x 40 cm x 40 cm) with walls made of wire and the whole cage covered with mosquito net. In this way no flies could escape and no house fly could enter the cage. They were provided with tissue papers moistened with sugar solution, which was renewed every day. They were fed mostly on decomposing meat, mango fruits (*Mangifera indica*), Melon (*Cucumis melo*) and souring milk with sugar crystals. The flies were reared until they produced enough eggs to establish a colony.

Eggs, larvae (I, II, and III) and the adult males and females were isolated and each one was put in a separate slide with few drops of 60% acetic acid and then examined under a dissecting microscope. For each one of the above stages the body length, colour and other morphological characteristics were noticed.

The anterior and posterior spiracles of the three larval stages were dissected out and each one

was placed on a clean slide with one drop of 60% acetic acid. Then the slides were covered with cover slips and examined under a phase contrast microscope and photographed with a camera attached to the microscope.

Results

The life cycle of *Chrysomya putoria* is in figure 1.

The egg: The colour was cream - white and eggs were rod shaped, with one end slightly pointed. The body length was about 1.5mm.

Larva I: The colour was cream - white. The body length was 3 – 4mm consisting of 12 segments with eleven bands of minute spines. The anterior spiracles were absent but a pair of tube-like posterior spiracles was present in segment 12 (Fig 2).

Larva II: The colour was cream - white. The body length was 6 – 10mm and it was well segmented with four fleshy processes in the ventral side in each fold. The number of body segments and the spines were also 12 as in larva I. A pair of anterior spiracles was present in the second segment (one spiracle in each lateral side) and each spiracle with 10 – 12 branches (Figs 3, 4, 5). The pair of posterior spiracles was present with open peritreme and two spiracular opening in each spiracle (Fig 6).

Larva III: The colour was creamy. The body length can reach 13mm. The number of body segments was the same as in larva I and II but the segments were moreclear and separated with larger spinulous folds, the fleshy processes in the ventral side were larger. The anterior spiracles were present with 10 – 12 branches in each one (Figs 7, 8, 9). The posterior spiracles with open peritreme and there were 3 spiracular openings in each peritreme (Fig 10).

The pupa: The colour of the pupa changed gradually from the creamy colour of larva III to brick red colour and then to dark brown.

The adult: The body colour was metallic green, rarely blue with bronze reflection. The body length was 8 – 10mm. The legs were dark brown and black. The wings were hyaline and the frons were black. The hind margin of the abdominal segments with blackish bands. The buccae in both sexes were black. A single stigmatic and one propleural (prostigmatic) bristles were present. The anterior spiracles and lower squama were white. In the male the eyes were very close to each other but in the female they were separated by a broad fron

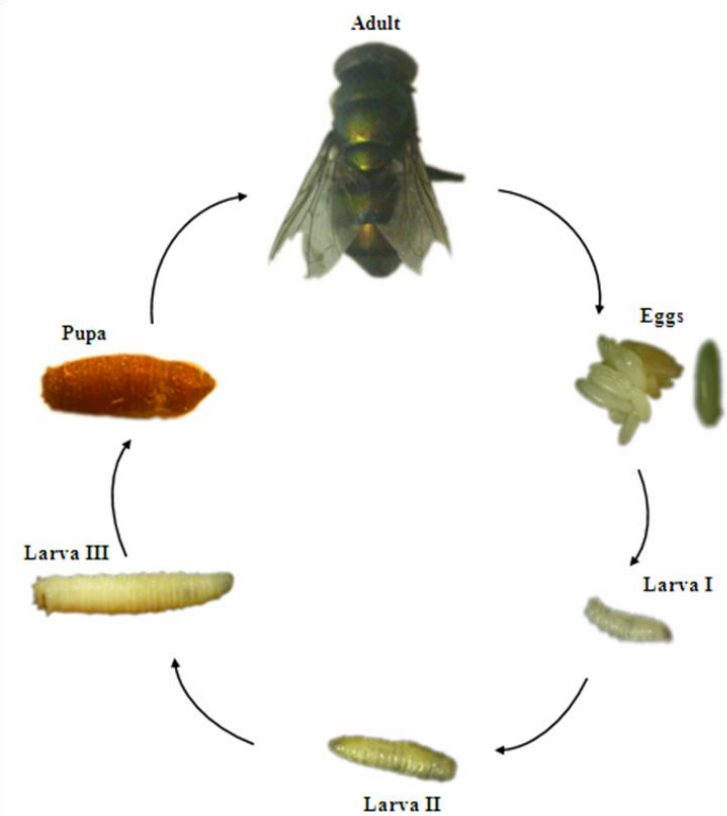

Fig 1 The life cycle of *Chrysomya putoria*

Fig 2 Anterior spiracle of larva I of *Chrysomya putoria*

Fig 3 Anterior spiracle of larva II of *Chrysomya putoria*. Note the presence of 10 branches.

Fig 4 Anterior spiracle of larva II of *Chrysomya putoria*. Note the presence of 11 branches.

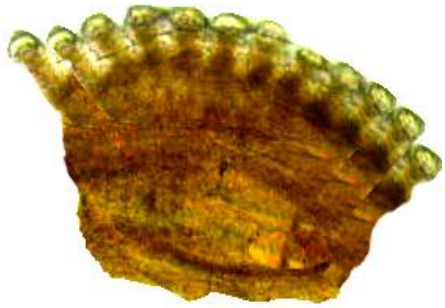

Fig 5 Anterior spiracle of larva II of *Chrysomya putoria*. Note the presence of 12 branches.

Fig 6 Posterior spiracle of larva II of *Chrysomya putoria*. Note the presence of two spiracular openings and the open peritrem.

Fig 7 Anterior spiracle of larva III of *Chrysomya putoria*. Note the presence of 10 branches.

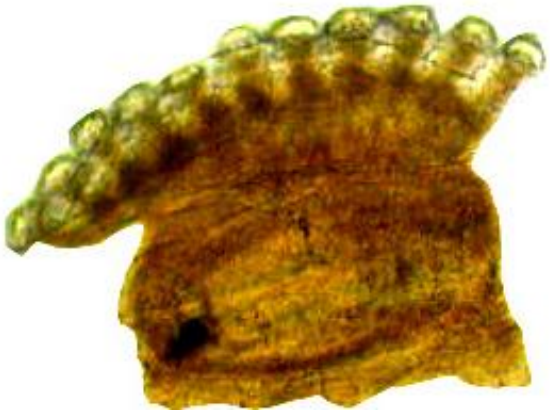

Fig 8 Anterior spiracle of larva III of *Chrysomya putoria*. Note the presence of 11 branches.

Fig 9 Anterior spiracle of larva III of *Chrysomya putoria*. Note the presence of 12 branches.

Fig 10 Posterior spiracle of larva III of *Chrysomya putoria*.Note the presence of three spiracular openings and the open peritrem.

Discussion

Chrysomya albiceps and *Chrysomya putoria* shares several characteristics with the Oriental *C. rufifacies* Maequart and *C. megacephala* Fabr (Bohart and gressitt 1951, Lewis 1955). *Chrysomya putoria* is very closely related to *Chrysomya chloropyga* and not even specifically distinct from it. Also it shows a superficial resemblance to *Chrysomya albiceps* and *Chrysomya rufifacies* with respect to colouring and so it has been confused by many former authors. The larval stages have not yet been studied, but probably coincide with those of chloropyga. There maybe differences in the bionomic data, but this subject too is open to future investigations (Zumpt, 1965).

The distinguishing taxonomic features of the adult are that, the anterior spiracles and lower squama are white. A single propleural (prostigmatic) bristle is present. Body is metalic dark blue and green, with a characteristic pattern; abdominal bands are occupying approximately one–third of length of segments (http://icb.usp.br/marceicp/chrysomya.htm).

Holdaway (1933) gives the following characters for distinguishing this species from *Chrysomya albiceps*: one propleural bristle the same size as the stigmatal bristle, abdominal bands occupying approximately one third of lengths of segments. The colour varies from bronze to purple. The larva lacks the fleshy processes seen in *Chrysomya albiceps* and that agree with the observations in this study.

A comparison of the morphological characteristics of *C. putoria* with those of other *Chrysomya* species is shown in table [1].

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