DESCRIPTION OF THE THIRD INSTAR LARVA OF SARCOPHAGA AFRICA (= S. HAEMORRHOIDALIS) FALL. (DIPTERA: SARCOPHAGIDAE)

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ABSTRACT

Sarcophaga africa Fall. considered to be medical and veterinary importance, therefore, its third larval instar was described by digital camera under compound and dissecting microscope. This description includes spines type, shaped and cephalopharyngeal skeleton. Furthermore the anterior and posterior spiracles were also studied.

INTRODUCTION

The immature stages of the majority of dipterous families remain poorly known (Henning, 1968). In the case of the Sarcophagidae relatively few papers have appeared dedicated to the larval morphology of the family (Zumpt, 1965; Aspoas, 1991; Ebejer, 2000; Kirk-Spriggs, 2000). The larval stages of many species of Sarcophagidae are necrophagous and for this reason those species termed "flesh – flies" are significant in forensic entomology (Sukontason et al. 2001).

Larvae normally develop in decaying meat but are also known as parasitoids of various animals (Povolny and Verves, 1997). Flies belonging to the sarcophagidae have received much attention due to their myiasis potential and vector for pathogens (Greenberg, 1971).

The larvae present a number of useful characters which aid in distinguishing the species; one has only to compare the structure of the cephalopharyngeal sclerites of the different known species to appreciate the morphological variations of this structure in sarcophagid group. The more important characters used in the descriptions, in addition to the cephalopharyngeal skeleton, are: size and general appearance of the larvae; shape, size and distribution of spines and size, and shape of posterior spiracles. Other less important diagnostic characters are the size of the posterior cavity and size and number of the papillae on the border, general appearance of anal area, and structure of the first apparent or cephalic segment (Kinpling, 1936, Zumpt, 1965).

Recently, attention has been focused on the sarcophagidae because of their use in medico-criminal entomology (Byrd and Bulter, 1998; Introna et al. 1998; Benecke, 1998; Wells et al. 2001).

In Iraq this species was reported by Derwesh (1965) and Kaddou (1967); in addition to that studies on this species in Iraq is very scarce.

As a result to the above; this study was suggested.

MATERIALS AND METHODS

(a) Specimens collection

As bait we employed rabbit carcass; it was placed in a metal cage and left out in the garden of Iraqi Natural History Museum. This bait was placed directly on the soil which is put in the
container; the bait attracted sarcophagid and other flies for deposit eggs or larvae (especially Sarcophagid females).

After larval development on carcass was complete, maggots left the carcass and drop its self on the soil, then penetrated to few millimeter for pupation. These larvae were collected by forceps and put it in test tube. Larvae brought to the laboratory and divided in to (2) lots: One was fixed in hot water (40 – 50 °C) to avoid shrink, when it will be stored in alcohol. The other lot was placed in container (Full by Sand) to obtain the pupae. These pupae were reared in incubator at (30±1 °C) and relative humidity (r. h.) 70% (according to Peterson (1953)). After adults emerged from these pupae, the adult and larva specimens were identified according to, Roback (1951) Zumpt (1965) and Salem (1936).

(b) Taxonomic aspect of 3rd instar larvae:

The larvae were cleared in boiling 10% KOH and stored in lactophenol for detailed study of cephalopharyngeal skeletons, spine bands and spine types, anterior and posterior spiracles, and tubercle size and arrangement; the description above of the characters were supply be camera digital and lucida under compound and dissecting Microscope.

RESULTS AND DISCUSSION

The results indicated that the length of postfeeding larvae was 1.82 cm in average (1.5-2.2 cm). Larvae appeared to have 12 segments; spines of each segments (2-12) are similar and they were 2-12 (figure 1,2), shortly unpigmented and toward to anal. Segment-1 (head region) have a rows of feeble spines (figure 3), darkling and strong, around ending area of head segment.

Segment-2 have anterior spinuos annuli only; the spines are similar to those of head segment and have pair of anterior spiracles. In other segments 3-12 have densely spinulose in dorsal and lateral view but in ventral view this spines are found in anterior and posterior region only; this characters were in agreement with Zumpt (1965) observation, distributed of these spines are equal, except in near of tubercles area; we found no spines.

In dorsal view, segments 3-11 have six small tubercles (figure 2) three on each side of the median line, which are close together on the more anterior segments but spread a part posteriorly, especially on segments 10 and 11, and larger tubercles on each side of the median group and separated from it by a distinct interval. The lateral group consists of two tubercles, a smaller dorso-lateral and a larger lateral. In ventral view, the tubercles are found on segment (4-11), these tubercles are very similar to those found in dorsal view.

Anterior spiracles (figure 4) with short stalk and consist from 11-14 branches (mostly 13 branched), these result assured by Walker (1937). Figure (5) showed the posterior spiracles; surrounded by incomplete ventrally, lightly sclerotized peritreme; it is nearly straight on the mesial side, but is strongly curved or bent laterally; in addition to, the peritreme without button, also its extended between slits in upper region, the slits are not straight.

The posterior spiracles pit is deep (figure 6), surrounded by a thick ended ridge bearing six pairs of tubercles, three above and three below, of the three upper pairs are equal in size and distance between one to other, while the tubercles below are deferent in size; outer and median are equal and largest if compared with the inner tubercles. The distance between inner tubercles in above and below is equal. On the other hand the pit surrounded by rows of spines pigmented and feeble or needled shaped (singles and groups) (figure 3) also the spines are similar to the spines in head region. In posterior view of ending larve, showed that larvae consist in ventral region from pair of anal protuberance; these anal protuberance are covered by spines as similar to these spines which are found on other segments.

The cephalopharyngeal skeleton as showed in fig.7,8 that have been already described by Zumpt (1965) but in shortly, in this present study refigured in detail, the mouth hooks arise
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each form a thick base with a prominent dorsal angle and a blunt ventral process. The rudiment of the dental sclerite is seen just behind the ventral process. The hypostomal sclerite is H-shaped as viewed dorsally. The parastomal sclerites are seen in lateral view, there have a two slender rods projecting forward from the pharyngeal sclerite over the hypostomal sclerite.

The pharyngeal sclerite, as indicated by the broader lateral plates and heavily sclerotized dorsal and ventral cornua and bifid clearly in dorsal cornua, while in ventral cornua; the bifid is not clearly, this result is in agreement with Zumpt (1965). On the other hand, the bifid is very clearly in Wohlfahrtia sp. (Walker, 1937).

LITRETATURE CITED


Description of the Third Instar Larva


Figure (1) Show the spines that found around thoracic region

Figure (2) Spines (S) and tubercles (T) found in abdominal region
Description of the Third Instar Larva

Figure (3) Represent the spines that found around posterior pit
Figure (4) Anterior spiracle
Description of the Third Instar Larva

Figure (5) Posterior spiracles (Sp: spiracle slit, P: peritreme)
Fig. (6) Show posterior view of larva

Pst: posterior spireacles; Pe: posterior cavity; At: anal tubercles (prostomane); Um: upper margin; Od: outer dorsal tubercles; Md: median dorsal tubercles; Id: dorsal tubercles; Lm: lower margin; Ov: outer ventral tubercles; Mv: median ventral tubercles; Iv: inner ventral tubercles
Description of the Third Instar Larva

Fig. (7) Cephalopharyngeal skeleton (lateral view)
Mh: mouth hook; Pb: pharyngeal sclerite; Dc: dorsal cornu; Vc: ventral cornu; Des: dental sclerite; Pass: parasomal sclerite; Hss: hypostomal sclerite
Fig. (S) Cephalopharyngeal skeleton (dorsal view)
(Mh: mouth hooks; Phs: pharyngeal sclerite; Dc: dorsal cornu; Vc: ventral cornu; Dphs: dorso-pharyngeal sclerite; Vh: ventral hook; Da: dorsal arch; Hs: hypostomal sclerite)
Description of the Third Instar Larva


*Sarcophaga africa* Fall. (Sarcophagidae Diptera; )

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الخلاصة

مجلة بيلفورد، اقتَرِحَت هذه المِجلة بِلِقطة انتفاح* Sarcophaga africa* Fall. الدراسة لوصف بيوت الطور الثالث باستخدام كاميرا رقمية ونَسِدا تحتنَد للنَزَك وتشريحيه. تَضَمُّ الوصف: نَوع الأشواك ونَزُعُها، الهيكل البلعومي الرَأسِي بالإضافة إلى الفتحات التنفسية الأَمامية وخلفية.