# Pupa of *Ficalbia (Mimomyia) chamberlaini* (Ludlow) (Diptera: Culicidae)

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ABSTRACT. Detailed chaetotaxy of *Ficalbia (Mimomyia) chamberlaini* (Ludlow) has been described and illustrated from Dacca and compared with the descriptions of other workers.

## Introduction

Qutubuddin (1960) in a review listed the various works on the taxonomy of immature stages and adult mosquitoes of the Indo-Malayan area and the Philippines between 1900 and 1960 and noted the existence of a big gap in our knowledge of the immature stages of mosquitoes in the area. Brief and provisional description of the pupae of the Indian Anophelini was given by Christophers (1933) and of the Megarhinini and Culicini by Barraud (1934). Other works on the pupae of the area have been listed by Qutubuddin (1960). Recently Ameen and Talukdar (1974a) described the detailed chaetotaxy of five common anopheline pupae, viz., *Anopheles vagus* Dönitz, *A. subpictus* Grassi, *A. annularis* Van der Wulp, *A. hyrcanus* var. *nigerrimus* Giles, and *A. barbirostris* Van der Wulp, from Dacca and gave a provisional key for their identification. They also described the pupa of *Toxorhynchites splendens* (Wiedemann) from Dacca (Ameen and Talukdar, 1974b). In the present paper the detailed chaetotaxy of the pupa of *Ficalbia (Mimomyia) chamberlaini* (Ludlow) and its diagnostic characters are being described. Mattingly (1957) gave a very short account of the larva and pupa of *F. chamberlaini* from the Indo-Malayan region.

## Materials and Methods

About one hundred *F. chamberlaini* larvae were collected from near the village Zinzira, on the south bank of the river Buriganga, about 4 miles to the South of Dacca University Campus. The collection was made from a flooded rice field. The field remains dry during the summer; it was flooded during the monsoon and the water was about 3 feet deep. Water hyacinths were floating on the water; the larvae were collected from near these plants. The collected larvae were reared in the laboratory until the adults emerged. The species identification was made from these adults. The present description is based on 10 pupal skin mounts. The Belkin system of nomenclature for the pupal chaetotaxy has been followed in the description.

In the description of the chaetotaxy the figures within parentheses after setal numbers show the range of branching and the usual number of branches. Hairs smaller than half the length of the succeeding segment

have been called short; about half as long as the succeeding segment - medium; more than half the length of the succeeding segment - long; and those longer than the succeeding segment - very long.

## Detailed Description of the Chaetotaxy

Cephalothorax (Fig. 1)

The respiratory trumpets are very long, tubular, about 15 times as long as the width in its middle part, and slightly expanded at their apices. Most of the cephalothoracic hairs are medium to long. Seta 1 (1-4,3); 2(2-5,3); 3(1-4,3); 4(1-2,1); 5(not observed); 6(1); 7(1); 8(4-7,5); 9(2-3,2); 10(3-4, 3); 11(1); 12(1).

Abdomen (Fig. 2)

Paddles more or less quadrangular in shape, brownish pale area on the outer side and saw-like teeth throughout the lower margin, mid-ribs distinct and ending with the paddle hair. On abdominal segments III-VII hair 2 occupies the most median position on the dorsum. Where nothing has been mentioned about the length of a particular seta in the following description, it is to be regarded that the seta is short.

Segment I. Seta 1 (dendritic, moderately developed, 3-4 primary branches divide to form more than 26 branches); 2(1) long; 3(1) long; 4(1-3,2); 5(1-3, 2) medium to long; 6(1-3,1) long; 7(1-3,1); 9(1-2,1).
Segment II. Seta 0(1); 1(5-11,8) long; 2(1-2,1) medium to long; 3(2-4,3) medium; 4(1-3,2); 5(1); 6(1); 7(1-3,1) shifted dorsally; 9(1).
Segment III. Seta 0(1); 1(5-11,8) long; 2(1); 3(2-4,3); 4(1-2,1); 5(1-2,1) medium; 6(1); 7(1); 8(1-4,2); 9(1); 10(1); 11(1-2,1); 14(1).
Segment IV. Seta 0(1); 1(4-12,8) long; 2(1); 3(1-4,2); 4(1); 5(4-12,7) long; 6(1); 7(1); 8(1-2,2); 9(1); 10(1-2,1); 11(1); 14(1).
Segment V. Seta 0(1); 1(3-10,7) long; 2(1); 3(1-3,2); 4(1-3,2); 5(4-9,6) long; 6(1); 7(1); 8(1-3,1); 9(1); 10(1); 11(1); 14(1).
Segment VI. Seta 0(1); 1(3-7,6) long; 2(1); 3(1-3,2); 4(1); 5(3-7,5) long; 6(1-2,1); 7(1); 8(1-2,1); 9(1); 10(1); 11(1); 14(1).
Segment VII. Seta 0(1); 1(3-6,4) long; 2(1); 5(3-5,3) long; 6(1-2,1); 7(1-2, 1); 8(1-2,2); 9(1); 10(1); 11(1); 14(1). Seta 3 and 4 absent.
Segment VIII. Seta 0(1); 4(1-2,1); 9(4); 14(1-2,1).
Segment IX. Paddle hair 1(1). Accessory paddle hair absent.

## Discussion

Barraud (1934) and Mattingly (1957) briefly described the pupa of *F. chamberlaini*. Knight and Chamberlain (1948) studied the pupa of *Ficalbia (Etorleptiomyia) elegans* (Taylor) and remarked that the dendritic hair on abdominal segment I is reduced to an ordinary hair. Barraud (1934) also stated that in the genus *Ficalbia* the dendritic tuft is not well developed or is absent, but he showed it in *F. chamberlaini*. Mattingly (1957) also found it in this species, which agrees with the present observation.

Barraud (1934) noted that the paddles in the genus *Ficalbia* are rather narrow or very narrow, with serrations or spines along the margins, at least towards the apex; and that the paddle of *F. chamberlaini* is comparatively wider than in other species. He further noted that there is usually no terminal paddle hair in the genus, but showed one in *F. chamberlaini* (Barraud, 1934, Fig. 24b). Knight and Chamberlain (1948) also stated that the paddle hair is absent, among others, in the genus *Ficalbia*. Mattingly (1957) found the paddles in *F. chamberlaini* about twice as long as their greatest width; with a fringe of dark, widely spaced teeth; and a very small, unbranched, apical seta. Our observations agree with those of Barraud and Mattingly in these respects.

Knight and Chamberlain (1948) found hair 3(4 of Knight and Chamberlain) to be absent on abdominal segment VII in the genus *Ficalbia* and *Mansonia (Mansonioides)*; however, in *F. chamberlaini* we found that both hairs 3 and 4 are absent on segment VII.

Mattingly (1957) noted that seta 7(9 of Belkin) on abdominal segment VIII is very small and bifid or trifid. However, in the present material it was found to be 4-branched.

In *F. chamberlaini* hair 5 on abdominal segments II and III was not found in its usual position at the posterior margin of the segment, but was shifted a little cephalad and mesad from its original position, as shown by its homologues on the succeeding segments. Such a change in position of hair 5 on segment II was also noted by Knight and Chamberlain (1948) for mosquito pupae in general and by Ameen and Talukdar (1974a,b) in *Anopheles* spp. and *Toxorhynchites splendens*.

No ventral hair was seen on abdominal segments I-II, except hair 7; but this hair has shifted dorsally on these segments. The dorsal shifting of hair 7 (10 of Knight and Chamberlain, 1948) on these segments of mosquito pupae, however, is rather common as observed by Knight and Chamberlain (1948) and Ameen and Talukdar (1974a).

From a study of 13 species of mosquito pupae belonging to the genera *Anopheles* (Ameen and Talukdar, 1974a); *Toxorhynchites* (Ameen and Talukdar, 1974b); *Culex*, *Aedes*, and *Armigeres* (to be published); and *Ficalbia* from Dacca it was concluded that the pupa of *Ficalbia* may be distinguished from those of other genera by (1) very long, tubular respiratory trumpets; (2) serrated margin of the paddles; and (3) seta 9-VIII not more than 4 branched.

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Figs. 1-2. Pupa of *Ficalbia chamberlaini* (Ludlow). 1. Cephalothorax. 2. Metathorax and abdomen: the ventral half on the left and the dorsal half on the right.