Chaetotaxy of the Pupa of the Mosquito *Culex tarsalis* Coq.

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For purposes of classification of pupae, most early workers relied on gross morphological structures such as the respiratory trumpets and swim paddles. Among early morphological studies of the pupal stage of mosquitoes are those of Nuttall and Shipley (1), and Wesche (2).

Macfie (3), made a detailed study of the pupal setae of *Aedes aegypti*, at that time known as *Stegomyia fasciata*, and applied numbers or descriptive names to each seta. In a later study, Macfie and Ingram (4), applied the same terminology to the pupal stages of *Culex decans* Theo. and *Culex invidosus* Theo. Many of the names used by these workers have fallen into disuse, but the numbers and capital letters used to designate the setae in their illustrations have remained in the literature up to the present time.

The significance of the setae as a basis for pupal taxonomy gained increasing recognition following Macfie's study (3). More recent studies of pupal chaetotaxy with reference to taxonomy include those of Knight and Chamberlain (5), (in which at least one species from each of the twenty-eight genera of mosquitoes is depicted), and Penn's extensive study (6).

In the present study, the nomenclature of the setae of the cephalothorax follows that of Penn (6); designation of abdominal setae follows Knight and Chamberlain (5). Figure 1 denotes the setal arrangement on the cephalothorax. Figure 2 illustrates the arrangement of setae on the dorsal and ventral surface of the abdomen. The grouping of the setae was determined by examining fifty-four pupal skins.

LITERATURE CITED

1. Nuttall, G. H. G., and A. E. Shipley. 1901. Studies in Relation to Malaria, II. The Structure and Biology of *Anopheles maculipennis*, III. The Pupa. Jour. Hyg. 1:269-275.

2. Wesche, W. 1910. On the Larval and Pupal Stages of West African Culicidae. Bul. Ent. Res. 1 (1):7-50.

3. Macfie, J. W. S. 1920. The Chaetotaxy of the Pupa of *Stegomyia fasciata*. Bul. Ent. Res. 10 (2): 161-169.

4. Macfie, J. W. S., and A. Ingram. 1920. The Early Stages of West African Mosquitoes, V. *Culex decans*, (Theo.) and *Culex invidosus*, (Theo.) Bul. Ent. Res. 11:105-112.

5. Knight, K. L., and R. W. Chamberlain. 1948. A New Nomenclature for the Chaetotaxy of Mosquito Pupae based on a Comparative Study of the Genera (Diptera, Culicidae). Proc. Helminthological Soc. Wash. 15:1-10.

6. Penn, G. H. 1949. The Pupae of the Mosquitoes of New Guinea. Pacific Sci. 3:3-85.

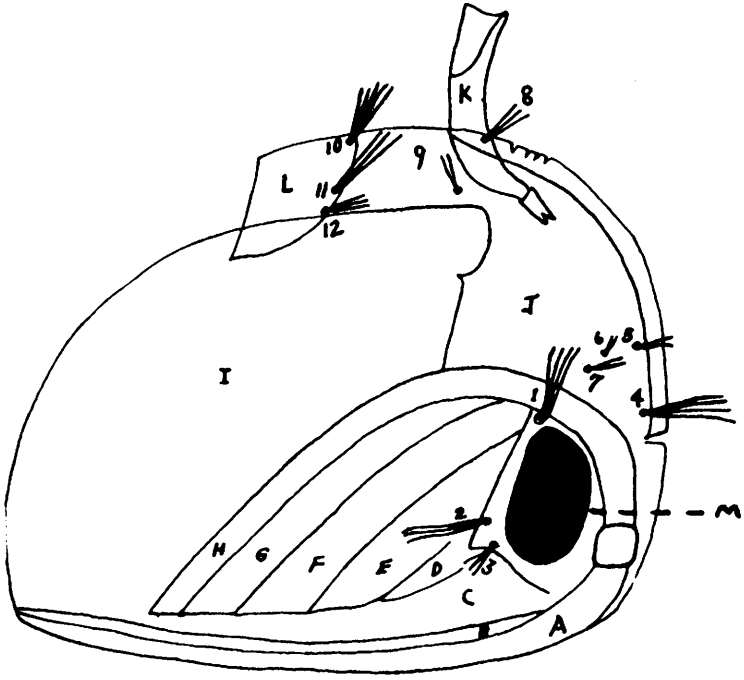

FIG. 1. Cephalothorax of pupa of *Culex tarsalis*. Abbreviations: A labral sheath, B mandibular sheath, C maxillary sheath, D maxillary palpus sheath, E leg F leg, G leg, H antenna sheath, I wing pad, J dorsal plate, K respiratory trumpet, L metathoracic plate, M eye. Numbers designate setae.

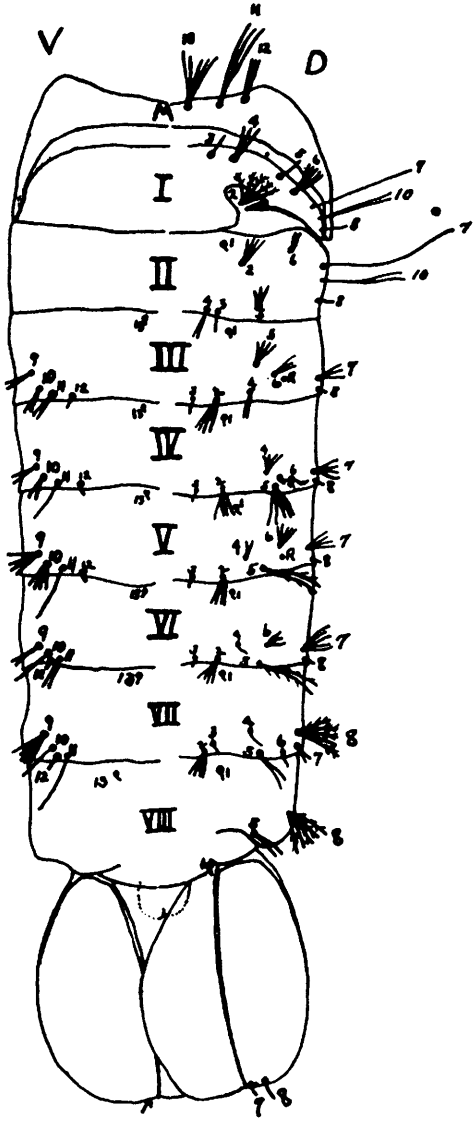

FIG. 2. Diagram of abdomen of pupa of *Culex tarsalis* Abbreviations: D Dorsal half of abdomen, V Ventral half of abdomen, I-VIII Abdominal segments.