

A Mosquito Taxonomic Glossary

VII. The Pupa*

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For a full explanation of this project see Part I (Knight 1970). As before, terms recommended for standardized use are given fully capitalized. Synonyms or terms used in error are in lower case and underlined. Standardized abbreviations are also suggested. Included in this section is an appendix presenting reasons for the recommendation of terms not presently in common use and explanations of the derivation of some terms given in the glossary.

Readers are reminded that this is a preliminary presentation and that when all parts of the glossary are completed, they will be thoroughly revised and issued under a single cover. Because of this, all individuals interested in mosquito systematics are urged to comment fully on any portion of the included text when they feel this is necessary.

Part V of this series dealt with the abdomen and the male genitalia (Knight and Laffoon 1971) and Part VI (in this issue) with the female genitalia.

As before, the drawings were prepared by Mrs. Yvonne Lee. Mrs. Shuling Tung aided with the preparation of the plates.

ABDOMEN (Ab). - The third division of the insect body. In mosquitoes, divided into ten apparent segments (I-X).

ABDOMINAL SEGMENT IX (IX). - In the mosquito pupa, represented dorsally in both sexes chiefly by the median caudal lobe; in the male its sternum may be represented but is usually not distinct.

ABDOMINAL SEGMENT X (X). - In the mosquito pupa represented in both sexes principally by the anal lobe.

ABDOMINAL SPIRACLE (AbS). - One of a pair of tracheal orifices on an abdominal segment. In the mosquito pupa, borne ventrally near the anterolateral margin of I (stated to be functional by Christophers 1960, 361) and dorsally near the anterolateral margin of II-VII (non-functional); represented externally by the spiracular sensillum.

ANAL LOBE (AL). In the mosquito pupa, a small median lobe caudal and ventral to the median caudal lobe; representing all or most of the proctiger.

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ANGUSTICORN TRUMPET (AT). - Applied to a mosquito pupal trumpet having the longest axis vertical more or less in line with the stem of the trumpet, and narrowly funnel shape when closed, with a split (meatal cleft) down one side which allows the trumpet to open widely at the water surface (Reid and Knight 1961).

ANTENNAL SHEATH (ASh). - In the mosquito pupa, the elongate sac holding the developing adult antenna.

ANTERIOR TENTORIAL PIT (ATP). - In the mosquito pupa, indistinctly evident anteriorly just below the antennal base.

BUTTRESS (Bu). - The thickened sclerotized basolateral portion of the pupal paddle.

CEPHALOTHORAX (CT). - In mosquitoes, referring to the large globular anterior portion of the pupa, which combines the head and thorax.

CERCAL LOBE (CL). - In the female mosquito pupa, a more or less distinct pair of lateral lobes on the anal lobe; sometimes with a pair of cercal setae (1-X).

CLYPEAL PLATE (CP1). - In the mosquito pupa, the plate overlying the developing imaginal clypeus.

dorsal hairless setal ring. - See DORSAL SENSILLUM.

DORSAL SENSILLUM (s). - The "dorsal hairless setal ring" which occurs associated with setal group 4-5-6 on abdominal segments III-V (found anomalously on II by Belkin 1953, 324). (Syn.: dorsal hairless setal ring.) Possibly a sense organ (Belkin 1954).

float hair. - See SETA 1-I.

genal plate. - See OCULAR PLATE.

GENITAL LOBE (GL). - In the mosquito pupa, the sac (s) enclosing the developing genitalia of the adult; lying caudal and ventral to the anal lobe.

HALTER SHEATH (HS). - In the mosquito pupa, the saclike ventrolateral paired caudal projection of the metanotal plate holding the developing adult halter.

head shield. - See VERTICAL PLATE.

IMAGINAL EYE (IE). - In the mosquito pupa, the developing compound eye of the adult; represented internally by a heavily pigmented optic lobe and externally by slight cuticular facets.

LATICORN TRUMPET (LT). - Applied to a mosquito pupal trumpet having the longest axis transverse to the stem, and often with a secondary cleft in the pinna opposite the meatal cleft; sometimes it is less wide-mouthed but with a more or less elaborate lobe, the tragus, on the rim of the pinna (Reid and Knight 1961).

LEG SHEATH (LS). - In the mosquito pupa, the elongate paired cases holding the developing adult legs; the terminal segments are folded. The prothoracic leg sheath is the most anterior and dorsal one.

MEATAL CLEFT (MC). - The split occurring down one side of some mosquito pupal trumpets; it permits the trumpet to open widely on the water surface. This structure is the "basal notch" of Baisas (1935).

MEATUS (Mea). - In the mosquito pupa, the closed portion of the trumpet, extending from the extreme base to the most proximal point of the pinna; extent expressed as a fraction of the total length of the trumpet.

MEDIAN CAUDAL LOBE (MCL). - In the mosquito pupa, the transverse lobe caudal to the eighth tergum and dorsal to the proctiger; belonging to the ninth tergum.

MEDIAN KEEL (MK). - In the mosquito pupa, the more or less elevated and transversely striated longitudinal midline of the prothorax and mesothorax; the ecdysial line of the cephalothorax. (Syn.: middorsal ridge.)

METANOTAL PLATE (MP). - In the pupa, a transverse dorsal sclerite attached anteriorly to the cephalothorax and posteriorly to abdominal segment I, overlying the developing imaginal metanotum; lateroposteriorly produced to form the halter sheath.

middorsal ridge. - See MEDIAN KEEL.

MIDRIB (Mr). - In the mosquito pupa, the thickened central sclerotized supporting structure of the paddle.

NINTH TERGUM (IX-Te). - The tergum of the ninth abdominal segment. In the mosquito pupa, represented in both sexes principally by the median caudal lobe.

OCULAR PLATE (OP). - In the mosquito pupa, the plate overlying the developing imaginal eye; bearing the postocular setal group. (Syn.: genal plate, post-ocular plate.)

PADDLE (P). - In the mosquito pupa, the movable or immovable pair of appendages arising from the caudolateral part of abdominal segment VIII.

PADDLE INDEX. - In the mosquito pupa, the ratio of the maximum length of the paddle (parallel to the axis of the midrib) to its maximum width (at right angle to the length).

PADDLE FRINGE (PF). - In the mosquito pupa, the serrations and/or spicules occurring along the margins of the paddle.

PADDLE MARGINAL SERRATION (Se). - In the mosquito pupa, the name applied to elements of the paddle fringe when they are toothlike spicules, usually confined to the external margin.

PADDLE MARGINAL SPICULE (Sp). - In the mosquito pupa, the name applied to elements of the paddle fringe when they are acutely spiculate or filamentous in form.

PALPAL SHEATH (PSh). - In the mosquito pupa, the sac holding the developing maxillary palpus of the adult.

PINNA (Pi). - In the mosquito pupa, the open portion of the trumpet; extent expressed as a fraction of its greatest length to the total length of the trumpet.

post-ocular plate. - See OCULAR PLATE.

POSTSCUTAL PLATE (PsP). - In the mosquito pupa, the portion of the pupal integument overlying the developing adult scutellum and postnotum. (Syn.: postscutellar area.)

postscutellar area. - See POSTSCUTAL PLATE.

PROBOSCIS SHEATH (PbS). - In the mosquito pupa, the elongate sac holding the developing adult labium and its enclosed stylets. The palpal sheath is conspicuously different and is named separately.

PROCTIGER (Pr). - In the mosquito pupa, represented in both sexes chiefly by the anal lobe, caudal and ventral of the median caudal lobe; in females usually with a more or less distinct pair of lateral cercal lobes.

PROTHORACIC PLATE (PP1). - In the mosquito pupa, the lateral plate overlying the developing imaginal prothorax.

PUPAL EYE (PE). - Presumably the functional pupal eye; represented internally by a detached pigmented area caudal to the imaginal eye, apparently not indicated externally (Belkin 1962, 557).

REFRACTILE BORDER (RB). - In the mosquito pupa, the portion of the paddle border bearing the paddle marginal serrations (Reid 1968), refractile to light.

REFRACTILE INDEX. - In the mosquito pupa, the ratio of the maximum length of the paddle (a straight line joining the basal articulation of the paddle and the socket of the terminal paddle hair, 1-P) to the length of the refractile border.

RETICULATE AREA (RA). - In the mosquito pupa, the portion of the trumpet meatus in which the outer surface is covered with a fine network of lines.

SCUTAL PLATE (SP1). - In the mosquito pupa, the portion of the pupal integument overlying the developing adult scutum.

SECONDARY CLEFT (SeC). - See LATICORN TRUMPET. The "apical notch" of Baisas (1935).

SETA 1-CT. - The dorsal pupal cephalic seta; homologous with larval seta 10-C.

SETA 2-CT. - The median pupal cephalic seta; homologous with larval seta 12-C.

SETA 3-CT. - The ventral pupal cephalic seta; homologous with larval seta 13-C.

SETA 4-CT. - A dorsal pupal prothoracic seta, associated with seta 5-CT to form the more dorsal or mesal setal group of the prothorax; usually interpreted as being the more mesal and/or posterior of the two. With seta 5-CT, probably homologous with either larval setae 1- and 2-C, 1- and 3-C, or 2- and 3-C.

SETA 5-CT. - A dorsal pupal prothoracic seta, associated with seta 4-CT to form the more dorsal or mesal setal group of the prothorax; usually interpreted as being the more lateral and/or anterior of the two. With seta 4-CT, probably homologous with either larval seta 1- and 2-C, 1- and 3-C, or 2- and 3-C.

SETA 6-CT. - A dorsal pupal prothoracic seta, associated with seta 7-CT to form the more ventral or lateral setal group of the prothorax; usually interpreted as being the more anterior or dorsal of the two. With seta 7-CT probably homologous with either larval setae 3- and 4-C, 4- and 0-C, or 4- and 5-C respectively.

SETA 7-CT. - A dorsal pupal prothoracic seta, associated with seta 6-CT to form the more dorsal or mesal setal group of the prothorax; usually interpreted as being the more posterior or ventral of the two. With seta 6-CT probably homologous with either larval setae 3- and 4-C, 4- and 0-C, or 4- and 5-C respectively.

SETA 8-CT. - A dorsal pupal mesothoracic seta, associated with seta 9-CT to form a group dorsal or mesal to the trumpets; interpreted as being either the more anterior and/or mesal of the two. Probably homologous with larval seta 1-M, both on position and degree of development.

SETA 9-CT. - A dorsal pupal mesothoracic seta, associated with seta 8-CT to form a group dorsal or mesal to the trumpets; interpreted as being either the more posterior and/or lateral of the two. Homology not clear, possibly with larval seta 4-M.

SETA 10-CT. - A dorsal pupal metathoracic seta, associated with setae 11-12-CT to form a group mesally on the metanotal plate; interpreted as being the most mesal of the group. Homologous with larval seta 1-T.

SETA 11-CT. - A dorsal pupal metathoracic seta, associated with setae 10-12-CT to form a group mesally on the metanotal plate; interpreted as being the intermediate seta of the group. Homologous with larval seta 2-T.

SETA 12-C. - A dorsal pupal metathoracic seta, associated with setae 10-11-CT to form a group mesally on the metanotal plate; interpreted as being the most lateral of the group. Homologous with larval seta 3-T.

SETA 0-II-VIII. - In the pupa the most anterior dorsal seta; minute.

SETA 1-I. - The dorsal seta on abdominal segment I. Nearest both the posterior segmental margin and the longitudinal midline; usually inserted mesad of a large membranous area; generally developed as a large float hair with numerous dendritic branches. In Coquillettidia and Mansoniodes present anterior to membranous area as a very small simple hair. (Syn.: float hair.)

SETA 1-II-VII. - The dorsal seta on abdominal segments II-VII nearest to both the posterior segmental margin and to the longitudinal midline; when another seta (either seta 2 or 3, or both) is nearer the midline it is usually further from the posterior margin, or if equally posterior than it is smaller than seta I. Missing on abdominal segments posterior to VII.

SETA 1-IX. - Sometimes developed; arbitrarily named (Belkin 1952, 127).

SETA 1-X. - A lateral seta on the cercal lobe of abdominal segment X; observed only in Toxorhynchites.

SETA 2-I. - One of the two (usually noticeably paired with seta 3) dorsal setae on segment I occurring nearest both to the anterior segmental margin and to the longitudinal midline, in most genera interpreted as being either the more anterior and/or the more mesal of the two; often the shorter (except in Anophelinae).

SETA 2-II-VII. - The dorsal seta on abdominal segments II-VII usually associated with setae 1 and 3, occurring anywhere along an anterior arc extending from lateral to mesal of seta 1; sometimes distinguishable from seta 3 on one or more segments only because of a serial resemblance down the line of segments; often very short. Missing on abdominal segments posterior to VII.

SETA 3-I. - Nearly always associated with seta 2-I; in most genera interpreted as being the more posterior and/or the more lateral of the two; usually also the longer.

SETA 3-II-VII. - A dorsal seta on abdominal segments II-VII usually associated with setae 1 and 2, exhibiting sufficient lack of serial resemblance in form and position on some segments and in some genera as to be frequently difficult to name; usually determinable by the process of elimination. Missing on abdominal segments posterior to VII.

SETA 4-I. - A dorsoanterior seta nearly always separately grouped with seta 5-I; usually serially identifiable beginning with seta 4-II.

SETA 4-II-VIII. - A dorso-posterior seta, often separately grouped with seta 5; usually serially identifiable beginning with 4-II.

SETA 5-I. Nearly always separately grouped with seta 4-I in an anterior position midway between groups 2-3-I and 6-7-9-I; usually serially identifiable beginning with seta 5-II.

SETA 5-II-VII. - Usually separately grouped with seta 4 and 6 in a dorso-posterior position midway between setal group 1-2-3 and the lateral margin; in the Culicini beginning with segment I this seta generally rotates from a position anterior to seta 4 to one posterior to it on the succeeding segments. Interpreted as being absent on abdominal segments posterior to VII.

SETA 6-I. - Interpreted as being the most anterior (and often the most mesal) of the laterodorsal setal group 6-7-9-I.

SETA 6-II-VII. - Interpreted as being the most mesal of the laterodorsal setal group 6-7-9 (except on segment II in Anophelinae). Absent on abdominal segments posterior to VII.

SETA 7-I. - Closely associated with setae 6 and 9; posterior to 6: always longer than seta 9.

SETA 7-II. - Usually dorsally associated with setae 6 and 9; identifiable by comparison with segment I.

SETA 7-III-VII. - Lateroventrally associated with seta 8; interpreted as the more posterior of the two.

SETA 8-II-VII. The ventral seta nearer both the lateral and the anterior segmental margins; absent from segments I and from segments posterior to VII; often also absent from II. Associated with seta 7. Laterodorsal on VI in Toxorhynchitinae.

SETAE 9-I. - Lateral seta closely associated with setae 6 and 7; distinctly the shorter and finer of these three (except in Anophelinae).

SETA 9-II-VIII. - A lateral seta, ranging from median to posterior and dorsal to ventral in position; usually very fine and short on segments II-VI (except in Anophelinae), large on VII-VIII.

SETA 10-I. - A small ventral seta present medially near to the longitudinal midline; associated with seta 11 when that seta is present. Only rarely present.

SETA 10-II-VII. - A ventral posterior seta present approximately midway between the longitudinal midline and the lateral margin, associated with seta 11. Missing on abdominal segments posterior to VII.

SETA 11 - I. Ventrally associated with seta 10. Only rarely present.

SETA 11-II-VII. - A ventral posterior seta associated with seta 10, generally interpreted as the smaller of the two. Missing on abdominal segments posterior to VII.

SETA 12-V-VI. - A transitory ventral seta reported from Anopheles freeborni Aitken by Belkin (1953; labeled as "hair 9"); regarded by Belkin (in correspondence) as being homologous with larval seta 12.

SETA 13-II-VII. - A ventral setal ring present approximately medially between longitudinal midline and lateral margin and posterior and anterior margins in some sabethine genera; present sometimes with a minute seta as an anomaly. Absent on abdominal segments posterior to VII.

SETA 14-III-VIII. - A minute ventral seta near anterior margin at the longitudinal midline.

SETA 1-P. - The terminal or outer seta of the paddle; arbitrarily named (Belkin 1952, 127).

SETA 2-P. - The subterminal or inner seta of the paddle; often absent; arbitrarily named (Belkin 1952, 127).

SPIRACULAR SENSILLUM (sp). - External manifestation of spiracular areas on pupal abdominal segments I-VII.

TENTORIUM (TB). - In the mosquito pupa, a hollow rodlike structure that remains in the pupal exuvia following emergence of the adult.

TRACHEOID AREA (TA). - In the mosquito pupa, the proximal portion of the trumpet meatus when it shows more or less distinct transverse striations on the external wall; its extent expressed as a fraction of its greatest length to the total length of the trumpet.

TRAGUS (Tg). - Applied to a more or less elaborate lobe sometimes occurring on the rim of the pinna of the laticorn type of mosquito pupal trumpet (Reid and Knight 1961). Probably the "flap" of Baisas (1935).

TRUMPET (T). - Paired dorsolateral appendage of the pupal cephalothorax, usually movable, containing the spiracle of the metathorax.

TRUMPET INDEX. - In the mosquito pupa, the ratio of the greatest length to the median width (L/W). Length is determined by measuring from the point of articulation of the trumpet to its extreme apex. The width is determined by measuring medially at right angles to the length; to provide a greater standardization here, it is recommended that width be determined only when the trumpet is laterally oriented.

VERTICAL PLATE (VP1). - In the mosquito pupa, the plate overlying the developing imaginal head; projects anteriorly in the dissected mounted skin. (Syn.: head shield).

wing case. - See WING SHEATH.

wing pad. - See WING SHEATH.

WING SHEATH (WS). - In the mosquito pupa, the broad sac holding the developing mesothoracic wing of the adult. (Syn.: wing case, wing pad).

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ABBREVIATIONS

Ab	-abdomen	Mr	-midrib
AL	-anal lobe	OP	-ocular plate
AT	-angusticorn trumpet	P	-paddle
ASh	-antennal sheath	PbS	-proboscis sheath
ATP	-anterior tentorial pit	PE	-pupal eye
Bu	-buttress	PF	-paddle fringe
CT	-cephalothorax	Pi	-pinna
CL	-cercal lobe	PPl	-prothoracic plate
CP1	-clypeal plate	PSh	-palpal sheath
s	-dorsal sensillum	RA	-reticulate area
GL	-genital lobe	Se	-paddle marginal serration
HS	-halter sheath	SeC	-secondary cleft
IE	-imaginal eye	Sp	-paddle marginal spicule
LT	-laticorn trumpet	sp	-spiracular sensillum
LS	-leg sheath	SP1	-scutal plate
MC	-meatal cleft	TA	-tracheoid area
Mea	-meatus	Tg	-tragus
MCL	-median caudal lobe	T	-trumpet
MK	-median keel	Vp1	-vertical plate
MP	-metanotal plate	WS	-wing sheath

EXPLANATION OF FIGURES

Fig. 33

- a. Aedes aegypti (L.). Anterior aspect of female pupal cephalothorax. (Redrawn from Christophers 1960, 357.)
- b. A. aegypti. Dorsal aspect of cephalothorax and first two abdominal segments. (Redrawn from Christophers 1960, 357.)
- c. Dorsal and ventral aspects (diagrammatic) of male pupal terminal abdominal segments. (Redrawn from Belkin 1962, fig. 410.)
- d. Dorsal and ventral aspects (diagrammatic) of female pupal terminal abdominal segments. (Redrawn from Belkin 1962, fig. 410.)
- e. Anophelinae. External aspect of portion of pupal cephalothorax (cast skin).
- f. Toxorhynchitinae. External aspect of portion of pupal cephalothorax (cast skin).

Fig. 34

- a. Aedes (Ochl.) canadensis (Theobald). Left lateral aspect of pupa.
- b. Pupal trumpet (diagrammatic). (Redrawn from Penn 1949, 5.)
- c. Anopheles (Anopheles) barbirostris Van der Wulp. Left pupal trumpet. Angusticorn type. (Redrawn from Reid 1968, 20.)
- d. Anopheles (Cellia) maculatus Theobald. Left pupal trumpet. Laticorn type. (Redrawn from Reid 1968, 20.)
- e. Culicinae. External aspect of portion of pupal cephalothorax (cast skin).
- f. A. (A.) letifer Sandosham. Left pupal trumpet. (Redrawn from Reid 1968, 176.)

Fig. 35

- a. Anophelinae (composite). Dorsal and ventral aspect of pupal abdomen (cast skin).
- b. Toxorhynchitinae (composite). Dorsal and ventral aspect of pupal abdomen (cast skin).

Fig. 36

- a. Culicinae (composite). Dorsal and ventral aspect of pupal abdomen (cast skin).
- b. Culicidae. Dorsal and ventral aspect of pupal abdomen. Composite drawing illustrating area occupied by each seta (when present) of segments I-VIII.

Fig. 33

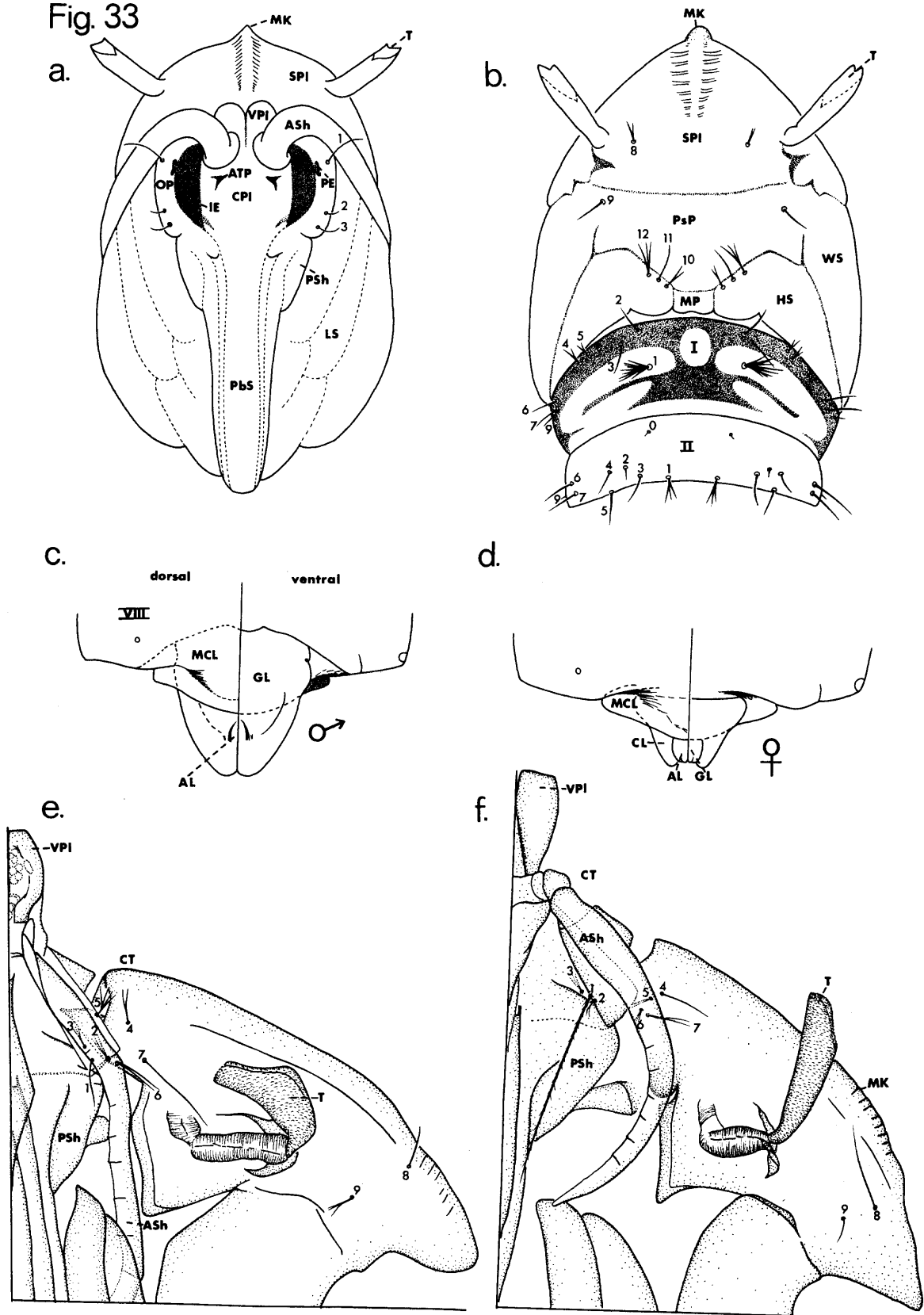


Fig. 34

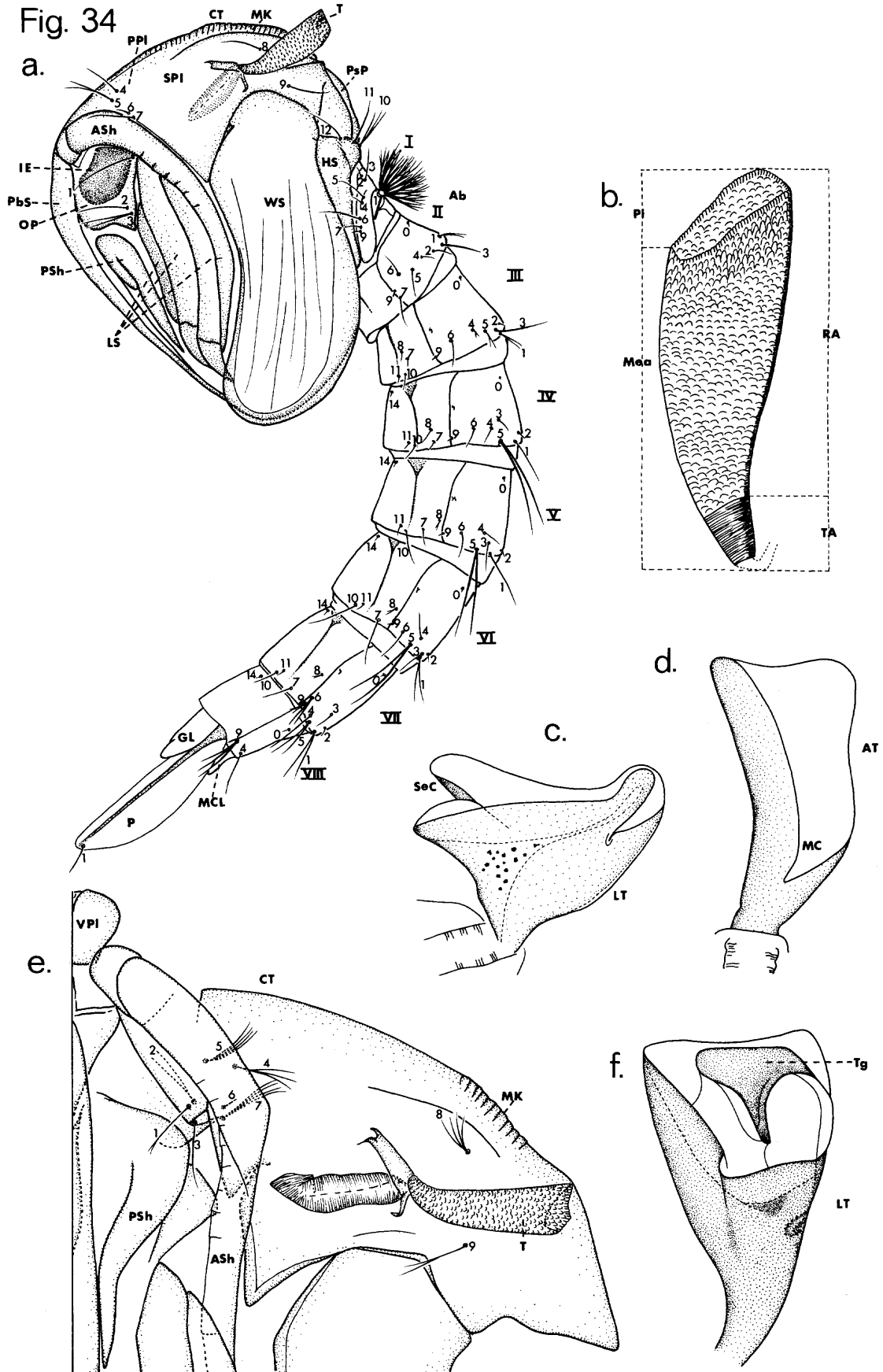


Fig. 35

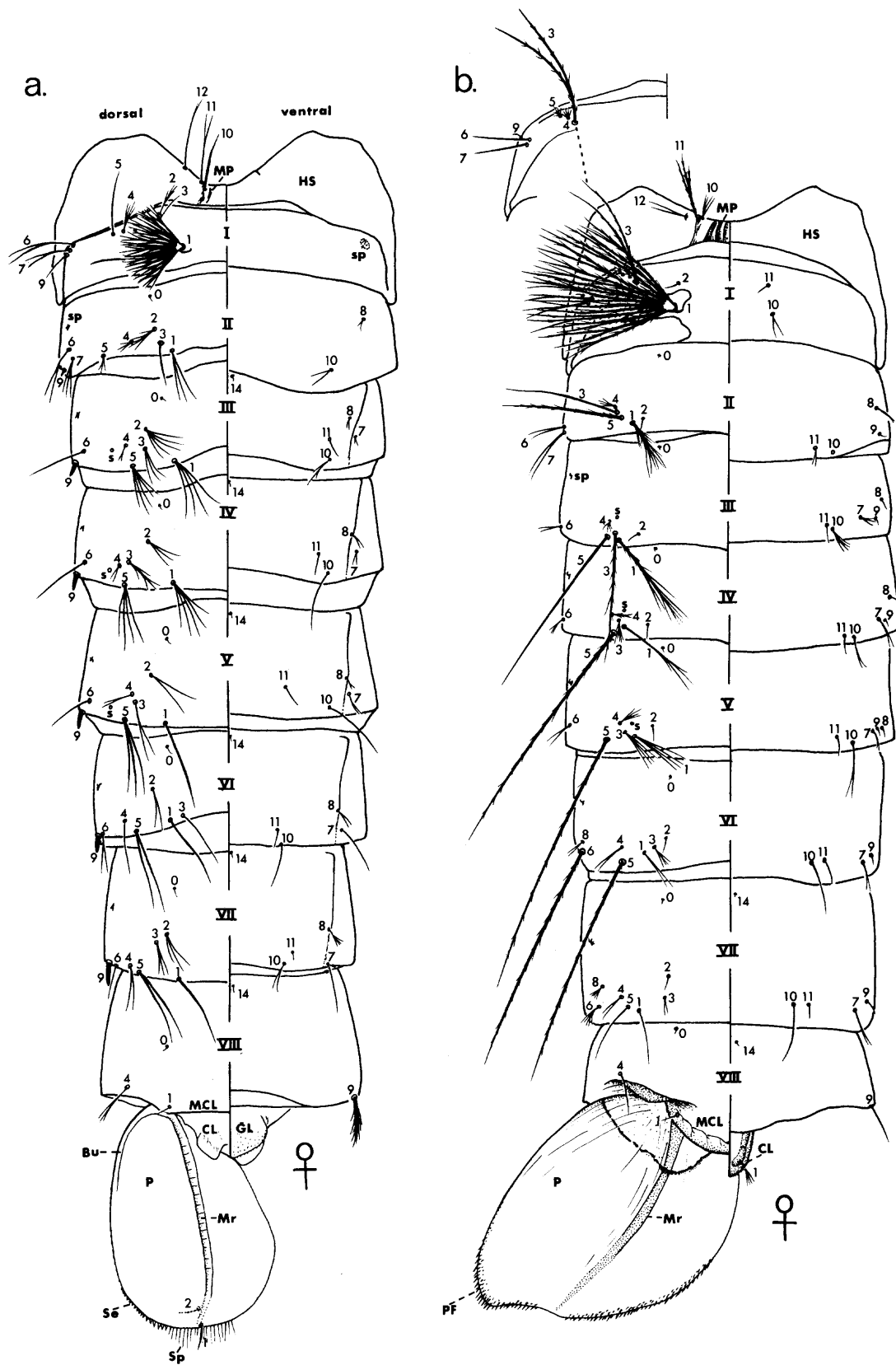
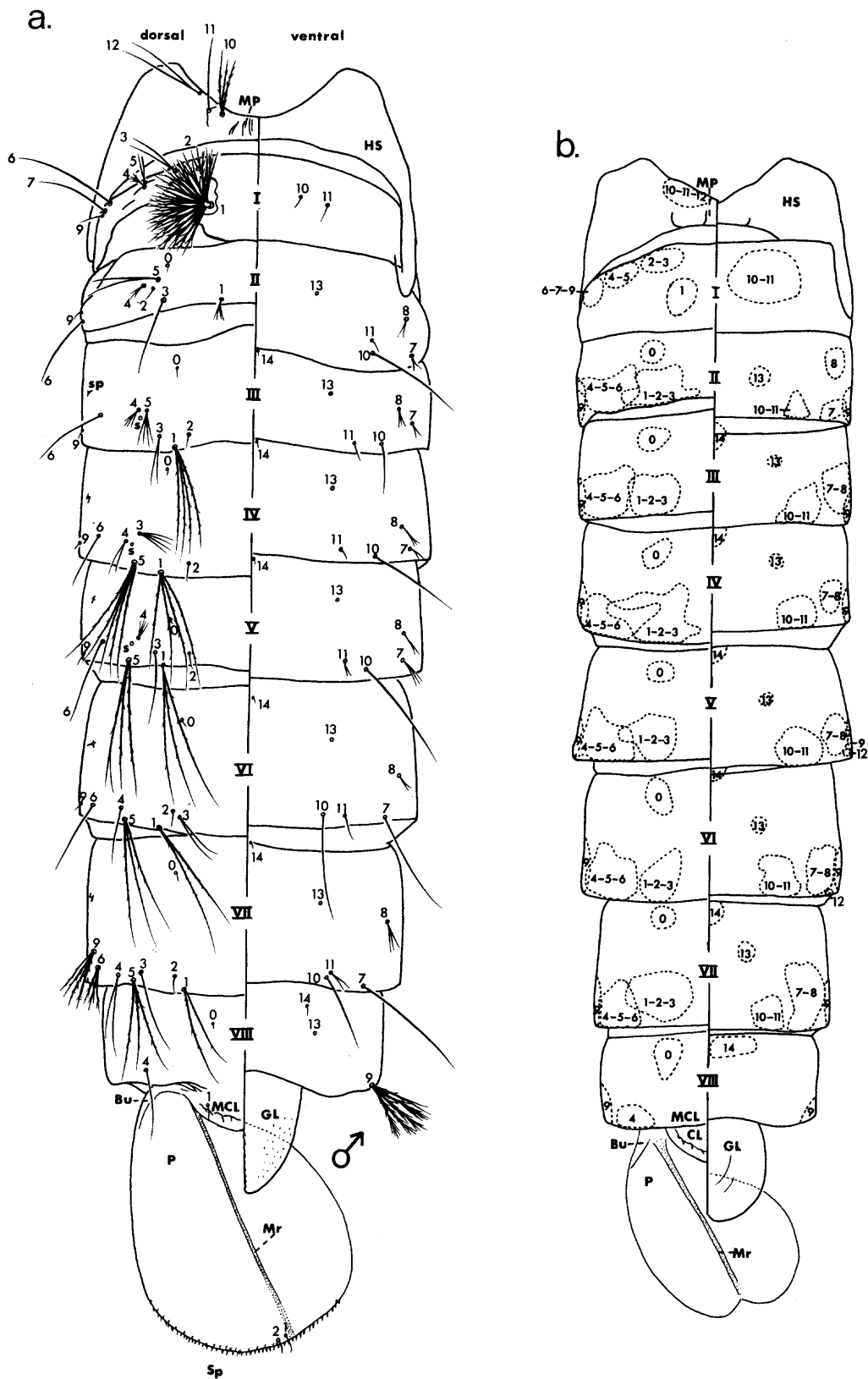


Fig. 36



APPENDIX

As pointed out in previous issues, this section is appended for the purpose of explaining the recommendation of terms not presently widely accepted for use in the Culicidae. Now added as another reason for this section is its use to explain the derivation of terms given in the glossary.

Pupal Setal Nomenclature

For the past 50 years, an understanding of the pupal chaetotaxy has been developing. Progress has been slow because only in relatively recent years have the pupae of sufficient numbers of mosquito species been collected, identified and described to assure us that this chaetotaxy is of monophyletic origin and that its components are homologous phylogenetically as well as ontogenetically and in part serially. The discovery by Belkin (1960; 1962, 555) that a nerve fiber basally connects the external hairs of the fourth instar larva and the internally developing hairs of the pupa established beyond doubt the ontogenetic homology of the elements of the chaetotaxy of the immature mosquito.

In the period since names were first applied to most of the pupal setae (Macfie 1920), numerous naming systems and modifications thereto have been proposed. This process has culminated in a nomenclature (Belkin 1962) which is both soundly based and convenient to use. The notational systems proposed during this period of time are detailed in Table 1. In this table, each setal name of the various previously proposed terminologies is correlated with the name used for it by Belkin (1962) for an equivalent taxon. For example, Christophers' (1933) terminology developed for anophelines was tabulated by comparing the anopheline figure illustrating his system with the first anopheline pupal drawing contained in Belkin (1962, fig. 44). Comparative tables have also been published by Penn (1949), Foote (1953), and Nakagawa (1963) but interpretations of setal relationships expressed there differ in a number of ways from the interpretations commonly accepted today.

Although most pupal setae are easily named by the presently-used terminology, there are situations where two or three setae are grouped in such a way as sometimes to make the choice of which is which a purely arbitrary decision. The setal definitions presented in the preceding section are based on the interpretations of Belkin (1962) and of the numerous publications issued since by Belkin and his students.

Because it is convenient to think of the abdominal setae in groups, Fig. 36b was prepared as a composite. It shows the area on each segment occupied by each setal group for all the species and genera illustrated by Belkin (1962). Additionally, many drawings of pupa published since 1962 were checked against the drawing. Setal arrangements not covered in Fig. 36b will undoubtedly still be discovered, but the drawing probably is representative of the greater proportion of the mosquito species.

Belkin in his various publications developed a useful and now commonly used setal notational system by giving the setal number and following with a hyphen and the capital letter C for cephalothoracic setae or with a Roman numeral indicating the segment number in the case of the abdomen. The same system is now commonly used for the larva with the result that a setal number coming before the letter "C" can apply to either a cephalic larval seta or to a cephalothoracic pupal seta. This is unfortunate since the nomenclature for

the setae of these two areas does not indicate ontogenetic homologies as is the case with the abdominal setal terminology used for these two stages. When questioned by mail on the advisability of having different suffix letters for the larval cephalic setae and the pupal cephalothoracic setae, Dr. Belkin suggested that the non-relationship of the two sets of terminology be indicated by using "C" for the former setae and "CT" for the latter. This suggestion has been adopted here.

cephalothorax - As first pointed out by Crawford (1933,7), there is no true morphological justification for this name since the head and its appendages are distinct from the thorax and its appendages. The appearance of a cephalothorax is due to the cementing together of all of these appendages and their body areas to form an apparent whole (Christophers 1960, 355). However, because of its great convenience in descriptive work, the term cephalothorax is retained.

KEY TO TABLE 1

Mac	Macfie 1920, 163	<u>Aedes (Stegomyia) aegypti</u> (Linnaeus).
Sen	Senevet 1930, 301	<u>Anopheles</u> (generalized).
Chr	Christophers 1933, 32	<u>Anopheles</u> (generalized).
Ba	Baisas 1936, 84.	<u>Anopheles (Anopheles) gigas formosus</u> Ludlow.
Bai	Baisas 1938, 179	<u>Culex (Culex) annulus</u> Theobald (as <u>adela</u> Baisas).
Cra	Crawford 1938, 12, 15	<u>Anopheles (Anopheles) barbirostris</u> Van der Wulp.
Edw	Edwards 1941, 354	<u>Aedes (Stegomyia) aegypti</u> (L.) and <u>albolineatus</u> (Theobald).
R & K	Rozeboom and Knight 1953, 128	<u>Anopheles (Cellia) farauti</u> Laveran
K & C	Knight and Chamberlain 1948, 3	" " " "
B & P	Baisas and Pagayon 1949, 43	<u>Tripteroides (Tripteroides) dyari</u> Bohart & Farner
Pen	Penn 1949, 3	<u>Anopheline</u> (generalized).
Bel	Belkin 1952, 115	<u>Tripteroides (Rachisoura) mathesoni</u> Belkin.
Be	Belkin 1953, 321	<u>Anopheles (Anopheles) freeborni</u> Aitken.
B & M	Barr and Myers 1962, 96	<u>Culiseta (Culiseta) inornata</u> (Williston).
Bl	Belkin 1962, 557	<u>Anopheles (Cellia) farauti</u> Laveran.

Table 1. - Comparison of Mosquito Pupal Setal Terminologies

Mac	Sen	Chr	Ba	Bai	Cra	Edw	R&K	K&C	B&P	Pen	Bel	Be	B&M	Bl
					Cephalothorax									
1. Superior post-ocular	-	-	-	-	superior ocular	1	3	1	14	1	hair 1	-	-	1
2. Median post-ocular	-	-	-	-	median ocular	2	2	2	15	2	2	-	-	2
3. inferior post-ocular	-	-	-	-	inferior ocular	3	1	3	13	3	3	-	-	3
5. upper anterior antero-thoracic	-	-	-	-	upper anterior antero-thoracic	5	5	4	pro-3	5	5	-	-	4
4. lower anterior antero-thoracic	-	-	-	-	lower anterior antero-thoracic	4	4	5	pro-1	4	4	-	-	5
6. lower posterior antero-thoracic	-	-	-	-	lower posterior antero-thoracic	6	6	6	pro-5	6	6	-	-	6
7. upper posterior antero-thoracic	-	-	-	-	upper posterior antero-thoracic	7	7	7	pro-4	7	7	-	-	7
8. dorsal	-	-	-	-	dorsal	8	8	8	meso-1	8	8	-	-	8
9. supra-alar	-	-	-	-	supra-alar	9	9	9	meso-5	9	9	-	-	9
internal postero-thoracic	0	0	0	0	0	0	10	10	meta-1	10	10	-	-	10
median postero-thoracic	P	P	P	P	P	P	11	11	meta-2	11	11	-	-	11
external postero-thoracic	R	R	R	R	R	R	12	12	meta-5	12	12	-	-	12
Abdominal Segment I														
dendritic tuft	dendritic tuft	dendritic tuft	dendritic tuft	dendritic tuft	dendritic tuft	float hair	10	2	1	float hair	1	1	1	1
antero-internal	K	K	H	H	K	H	6	4	0	K	2	2	2	2
antero-external	H	H	K	K	H	K	9	3	2	H	3	3	4	3
medio-external	L	L	L	M	L	M	5	6	4	L	4	5	3	4
medio-internal	M	M	M	L	M	L	4	5	3	M	5	4	5	5
postero-internal	S	S	T	S	T	S	2	7	5	S	6	6	6	6
postero-external	T	T	S	T	S	T	3	10	7	T	10	10	7	7
lateral	U	U	U	U	U	U	1	8	6	U	7	7	9	9

Table 1. - Comparison of Mosquito Pupal Setal Terminologies, continued

Mac	Sen	Chr	Ba	Bai	Cra	Edw	R&K	K&C	B&P	Pen	Bel	Be	B&M	Bl
					Abdominal Segment II									
D	V	5	5	5	v	5	7	1	2	5	0	0	0	0
C	C	C	C	C	C	C	10	2	1	C	1	1	1	1
C''	IV	4	4	3	iv	4	6	3	0	C'	2	2	2	2
C'	III	3	3	B	iii	B	5	4	5	B	3	3	4	3
B'	II'	2	2	2	ii'	3	4	6	3	4	5	4	3	4
B	II	2	2	4	ii	2	8	5	4	3	4	5	5	5
A''	I	1	1	1	i	1	2	7	8	2	6	6	6	6
A'	I'	1	1	-	i'	-	3	10	7	1	10	10	7	7
-	-	-	-	-	antero-lateral ventral	-	-	9	-	-	8	8	-	8
A	-	-	A	-	A	A	1	8	6	A	7	7	9	9
-	-	-	-	-	postero-medial ventral	-	-	-	-	-	-	12	-	10
inner ventral	-	-	-	-	-	-	-	-	13	-	13	11	-	11
-	-	-	-	-	-	-	-	-	-	-	-	13	-	13
-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
					Abdominal Segment III									
D	V	5	5	5	v	5	7	1	2	5	0	0	0	0
C	C	C	C	C	C	C	10	2	1	C	1	1	1	1
C''	IV	4	4	C'	iv	C'	6	3	0	C'	2	2	2	2
C'	III	3	3	B	iii	B	5	4	5	4	3	3	4	3
B'	II	2	2	2	ii	4	4	6	3	2	5	4	3	4
B	B	B	B	4	B	2	8	5	4	B	4	5	5	5
A'	I	1	1	1	i	1	2	7	8	1	6	6	6	6
postero-lateral	α	7	-	7	postero-lateral ventral	-	15	10	7	-	10	10	7	7
medio-lateral	β	6	-	6	antero-lateral ventral	-	14	9	12	-	8	8	8	8
A	9	A	A	-	A	A	1	8	6	A	7	7	9	9
outer ventral	E	E	-	D	postero-medial ventral	-	16	11	9	-	12	12	10	10
inner ventral	γ	8	-	8	antero-medial ventral	-	17	12	13	-	13	11	11	11
-	-	-	-	-	-	-	-	-	-	-	-	13	-	13
anterior ventro-central	-	-	-	9	small anterior	-	-	13	-	-	14	14	14	14
-	-	-	-	3?	-	3?	3	-	10	3	-	s	s	s

Table 1. - Comparison of Mosquito Pupal Setal Terminologies, continued

Mac	Sen	Chr	Ba	Bai	Cra	Edw	R&K	K&C	B&P	Pen	Bel	Be	B&M	Bl
					Abdominal Segments IV & V									
D	V	5	-	5	v	5	7	1	2	5	0	0	0	0
C	C	C	-	C	C	C	10	2	1	C	1	1	1	1
C''	IV	4	-	C'	iv	C'	6	3	0	C'	2	2	2	2
C'	III	3	-	4	iii	4	5	4	3	4	5(as 3 on V)	3	4	3
B'	II	2	-	2	ii	2	4	6	4	2	3(as 5 on V)	4	3	4
B	B	B	-	B	B	B	8	5	5	B	4	5	5	5
A'	I	1	-	1	i	1	2	7	8	1	6	6	6	6
postero-lateral	α	7	-	7	postero-lateral ventral	-	15	10	7	-	10	10	7	7
medio-lateral	β	6	-	6	antero-lateral ventral	-	14	9	12	-	8	8	8	8
A	9	A	-	-	A	A	1	8	6	A	7	7	9	9
outer ventral	E	E	-	D	postero-medial ventral	-	16	11	9	-	12	12	10	10
inner ventral	γ	8	-	8	antero-medial ventral	-	17	12	13	-	13	11	11	11
-	-	-	-	-	-	-	-	-	-	-	-	13	-	13
anterior ventro-central	-	-	-	9	small anterior	-	18	13	-	-	14	14	14	14
-	-	-	-	3?	-	3?	3	-	10	3	-	dorsal s sensillum	s	s(IV)
-	-	-	-	-	-	3?	3	-	10	3	-	s''	s	s(V)
														9(V)*

D(onV.)
?

*Belkin has stated (in correspondence) that he considers this to be seta 12 in our present terminology.

Table 1. - Comparison of Mosquito Pupal Setal Terminologies, continued

Mac	Sen	Chr	Ba	Bai	Cra	Edw	R&K	K&C	B&P	Pen	Bel	Be	B&M	Bl
					<u>Abdominal Segment VI</u>									
D	V	5	5	5	5	5	7	1	2	5	0	0	0	0
C	C	C	C	C	C	C	10	2	1	C	1	1	1	1
C''	IV	4	4	C'	iv	C'	6	3	0	C'	2	2	2	2
C'	C'	C'	C'	4	C'	4	9	4	3	4	3	3	3	3
B'	II	2	2	2	ii	2	4	6	4	2	5	4	4	4
B	B	B	B	B	B	B	8	5	5	B	4	5	5	5
A'	I	1	1	1	i	1	2	7	8	1	6	6	6	6
postero-lateral	α	7	-	D	postero-lateral ventral	-	15	10	7	-	10	10	7	7
medio-lateral	β	6	-	6	antero-lateral ventral	-	14	9	12	-	8	8	8	8
A	9	A	A	-	A	A	1	8	6	A	7	7	9	9
unnamed (B')	E	E	-	E	postero-medial ventral	-	16	11	9	-	12	12	10	10
inner ventral	γ	8	-	8	antero-medial ventral	-	17	12	13	-	13	11	11	11
-	-	-	-	-	-	-	-	-	-	-	-	9*	-	-
-	-	-	-	-	-	-	-	-	-	-	-	13	-	13
anterior ventro-central	-	-	-	9	small anterior	-	18	13	-	-	14	14	14	14

D(?) D(?)

*Belkin has stated (in correspondence) that he considers this to be seta 12 in our present terminology.

Table 1. - Comparison of Mosquito Pupal Setal Terminologies, continued

Mac	Sen	Chr	Ba	Bai	Cra	Edw	R&K	K&C	B&P	Pen	Bel	Be	B&M	Bl
D	8	5	5	5	<u>Abdominal Segment VIII</u> v	5	7	1	2	5	0	0	0	0
P	7	A'	A'	A'	accessory hair	A'	8	5	5	A'	4	5	4	4
A	6	A	A	A	A	A	1	8	6	A	7	7	9	9
anterior ventro-central	-	-	-	9	small anterior	-	18	13	13	-	14	14	14	14
-	-	-	-	-	<u>Abdominal Segment IX</u> -	-	-	1 1/	-	V	1 1/	1	-	1
-	-	-	-	-	<u>Abdominal Segment X</u> -	-	-	8 1/	-	W	1 1/	-	-	1
P	4	paddle hair	paddle hair	-	<u>Paddle</u> terminal paddle hair	paddle hair	12	8	-	X	1 1/	1	-	1
-	5	accessory paddle hair	accessory paddle hair	-	accessory paddle hair	accessory paddle hair	13	7	-	Z	2 1/	2	-	2

1/Labeled from other genera.

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